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Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

# STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT AS OF JULY 1, 2014

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December 12, 2014

Minnesota State Retirement System
State Employees Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

The results of the July 1, 2014 annual actuarial valuation of the State Employees Retirement Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by the Board and staff and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety. GRS is not responsible for the consequences of any unauthorized use of this report.

The purpose of the valuation is to measure the Fund's funding progress and to determine the required contribution rate for the fiscal year beginning July 1, 2014. Note that we have not attempted to quantify the impact of GASB Statements No. 67 and No. 68 in this report. Please see the separate report dated December 1, 2014.

The valuation was based upon information furnished by the Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by MSRS.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Directors. 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. MSRS is solely responsible for communicating to GRS any changes required thereto.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. A revision of ASOP No. 27, applicable to valuation dates on or after September 30, 2014, will guide assumption setting for future valuations. A recent review of inflation and investment return assumptions for accounting and financial reporting purposes developed a recommended range of 6.99% to 7.92% for the assumed investment return. Additional review and discussion will be required before the next valuation.

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 such future measurements.

This report should not be relied on for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Brian B. Murphy and Bonita J. Wurst are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the State Employees Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

We are available to answer any questions or provide further details.

Respectfully submitted,

Brian B. Murphy

Brian B. Murphy, FSA, EA, MAAA

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA

BBM/BJW:sc

# Contents

# Summary of Valuation Results

## Contributions

The following table summarizes important contribution information as described in the Development of Costs section.

| | Actuarial Valuation as of | |
|---|---|---|
| **Contributions** | **July 1, 2014** | **July 1, 2013** |
| Statutory Contributions - Chapter 352 (% of Payroll) | 11.00% | 10.00% |
| Required Contributions - Chapter 356 (% of Payroll) | 12.82% | 12.45% |
| Sufficiency / (Deficiency) | (1.82)% | (2.45)% |

The contribution deficiency decreased from (2.45%) of payroll to (1.82%) of payroll. The primary reason for the decreased contribution deficiency is the 1.00% of payroll increase in the statutory contribution rate. The 2014 required contribution reflects additional liability due to the assumption that the post-retirement benefit increase rate will increase from 2.0% to 2.5% in 2016.

Based on the actuarial value of assets and current contribution rates, statutory contributions are not sufficient to fully amortize the unfunded actuarial accrued liability over the statutory amortization period of 27 years. On a market value of assets basis, contributions are sufficient by 1.02% of payroll.

The Plan Assets section provides detail on the plan assets used for the valuation including a development of the actuarial value of assets (AVA). The market value of assets (MVA) earned approximately 18.6% for the plan year ending June 30, 2014. The AVA earned approximately 14.5% for the plan year ending June 30, 2014 as compared to the assumed rate of 8.0%. The assumed rate is mandated by Minnesota Statutes.

Participant reconciliation and statistics are detailed in the Membership Data section. The Actuarial Basis section includes a summary of plan provisions and actuarial methods and assumptions used for the calculations in this report.

Accounting and financial reporting information prepared according to GASB Statements No. 67 and No. 68 was provided to MSRS in a separate report dated December 1, 2014.

# Summary of Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in plan provisions, actuarial assumptions or valuation methods and procedures between the two valuations are described after the summary.

| | Actuarial Valuation as of | |
|---|---|---|
| | **July 1, 2014** | **July 1, 2013** |
| **Contributions** (*% of Payroll*) | | |
| Statutory - Chapter 352 | 11.00% | 10.00% |
| Required - Chapter 356 | 12.82% | 12.45% |
| Sufficiency / (Deficiency) | (1.82)% | (2.45)% |
| | | |
| **Funding Ratios** (*dollars in thousands*) | | |
| Assets | | |
| - Current assets (AVA) | $ 10,326,272 | $ 9,375,780 |
| - Current assets (MVA) | 11,498,604 | 10,033,499 |
| Accrued Benefit Funding Ratio | | |
| - Current benefit obligations | $ 11,916,653 | $ 10,925,146 |
| - Funding ratio (AVA) | 86.65% | 85.82% |
| - Funding ratio (MVA) | 96.49% | 91.84% |
| Accrued Liability Funding Ratio | | |
| - Actuarial accrued liability | $ 12,445,126 | $ 11,428,641 |
| - Funding ratio (AVA) | 82.97% | 82.04% |
| - Funding ratio (MVA) | 92.39% | 87.79% |
| Projected Benefit Funding Ratio | | |
| - Current and expected future assets | $ 12,995,648 | $ 11,640,159 |
| - Current and expected future benefit obligations | 13,748,525 | 12,617,051 |
| - Projected benefit funding ratio (AVA) | 94.52% | 92.26% |
| | | |
| **Participant Data** | | |
| Active Members | | |
| - Number | 49,663 | 49,121 |
| - Projected annual earnings *(000s)* | 2,653,367 | 2,553,156 |
| - Average projected annual earnings | 53,427 | 51,977 |
| - Average age | 47.1 | 47.1 |
| - Average service | 12.0 | 12.2 |
| Service Retirements | 29,225 | 27,654 |
| Survivors | 3,686 | 3,830 |
| Disability Retirements | 1,818 | 1,802 |
| Deferred Retirements | 16,472 | 16,062 |
| Terminated Other Non-Vested | 5,818 | 5,574 |
| **Total** | **106,682** | **104,043** |

# Summary of Valuation Results

## Effects of Changes

The following changes in plan provisions, actuarial assumptions, and methods were recognized as of July 1, 2014:

- Member and employer contribution rates increased from 5.0% to 5.5% of pay effective the first day of the first full pay period beginning after July 1, 2014.
- Effective July 1, 2014, the actuarial accrued liability funding ratio threshold, on a market value of asset basis, that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years.
- The methodology for valuing future post-retirement increases was clarified in statutes, and the assumed post-retirement benefit increase rate was changed from 2.0% per year indefinitely to 2.0% per year through 2015 and 2.5% per year thereafter.
- As a result of the additional liability resulting from the change in the assumed post-retirement benefit increase rate, the amortization date was changed from June 30, 2040 to June 30, 2041 per Minnesota Statute 356.215, Subd. 11(c).
- Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.

Refer to the Actuarial Basis section of this report for a complete description of these changes. The combined impact of the above changes was to increase the accrued liability by $581 million and increase the required contribution by 1.7% of pay, as follows:

| | **Before Plan Changes** | **Reflecting Plan Changes** | **Reflecting Assumption and Plan Changes** | **Reflecting Assumption, Plan and Amortization Changes** |
|---|---|---|---|---|
| Normal Cost Rate, % of Pay | 7.0% | 7.0% | 7.4% | 7.4% |
| Amortization of Unfunded Accrued Liability, % of pay | 3.8% | 3.8% | 5.2% | 5.1% |
| Expenses (% of Pay) | 0.3% | 0.3% | 0.3% | 0.3% |
| Total Required Contribution, % of Pay | 11.1% | 11.1% | 12.9% | 12.8% |
| | | | | |
| Accrued Liability Funding Ratio | 87.0% | 87.0% | 83.0% | 83.0% |
| Projected Benefit Funding Ratio | 96.7% | 99.8% | 94.4% | 94.5% |
| | | | | |
| Unfunded Accrued Liability (in billions) | $1.5 | $1.5 | $2.1 | $2.1 |

# Summary of Valuation Results

## Valuation of Future Annual Post-Retirement Benefit Increases

Benefit recipients receive a future annual compounding 2.0% post-retirement benefit increase. If the funding ratio, determined on a market value of assets basis, reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.5%. As of July 1, 2014, this funding ratio exceeds 90%. If this funded ratio exceeds 90% as of the next valuation, the provision for an increased benefit increase will become operative.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns and liability discount rates of 8.00% through June 30, 2017; 8.50% thereafter;
- Open group; stable active population (new member profile based on average new members hired in recent years);
- The post-retirement benefit increase rate is assumed to be 2.0% per year until the funding ratio threshold required to pay a 2.5% post-retirement benefit increase is reached; and
- Current statutory contribution levels (i.e., not including potential contribution increases under the contribution stabilizer statutes).

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay a 2.5% post-retirement benefit increase in the year 2015, and that the plan would begin paying 2.5% benefit increases on January 1, 2016. This assumption is reflected in our calculations. This is only an assumption; actual timing will depend on actual experience.

# Supplemental Information

The remainder of the report includes information supporting the results presented in the previous sections.

- **Plan assets** presents information about the plan's assets as reported by the Minnesota State Retirement System. The assets represent the portion of total fund liabilities that has been funded.
- **Membership data** presents and describes the membership data used in the valuation.
- **Development of costs** shows the liabilities for plan benefits and the derivation of the contribution amount.
- **Actuarial basis** describes the plan provisions, as well as the methods and assumptions used to value the plan. The valuation is based on the premise that the plan is ongoing.
- **Additional schedules** includes a summary of funding progress over the long term.
- **Glossary** defines the terms used in this report.

# Plan Assets

## Statement of Fiduciary Net Position *(Dollars in Thousands)*

| | Market Value | |
|---|---|---|
| | **June 30, 2014** | **June 30, 2013** |
| **Assets** | | |
| Cash, equivalents, short term securities | $ 292,465 | $ 254,574 |
| Fixed income | 2,683,530 | 2,303,788 |
| Equity | 8,503,521 | 7,462,912 |
| Other* | 1,260,671 | 987,992 |
| **Total cash, investments, and other assets** | **$ 12,740,187** | **$ 11,009,266** |
| Amounts Receivable | 16,188 | 14,012 |
| **Total Assets** | **$ 12,756,375** | **$ 11,023,278** |
| Amounts Payable* | (1,257,771) | (989,779) |
| **Net Position Restricted for Pensions** | **$ 11,498,604** | **$ 10,033,499** |

** Includes $1,244,402 in Securities Lending Collateral as of June 30, 2014 and $978,479 as of June 30, 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 the Minnesota State Retirement System for the prior two fiscal years.

| **Change in Assets** | **Market Value** | |
|---|---|---|
| **Year Ending** | **June 30, 2014** | **June 30, 2013** |
| 1. Fund balance at market value at beginning of year | $ 10,033,499 | $ 9,098,097 |
| 2. Adjustment to match restated MSRS fund balance | (61) | 0 |
| **3. Fund balance at market value at beginning of year** *(1.) + (2.)* | **$ 10,033,438** | **$ 9,098,097** |
| 4. Contributions | | |
| a. Member | 131,033 | 124,150 |
| b. Employer | 128,037 | 121,673 |
| c. Other sources | 0 | 0 |
| d. Total contributions | $ 259,070 | $ 245,823 |
| 5. Investment income | | |
| a. Investment income/(loss) | 1,845,607 | 1,289,067 |
| b. Investment expenses | (15,986) | (13,759) |
| c. Net investment income/(loss) | 1,829,621 | 1,275,308 |
| 6. Other | 21,014 | 21,511 |
| **7. Total income:** *(4.d.) + (5.c.) + (6.)* | **$ 2,109,705** | **$ 1,542,642** |
| 8. Benefits Paid | | |
| a. Annuity benefits | (623,942) | (586,256) |
| b. Refunds | (11,986) | (12,222) |
| c. Total benefits paid | (635,928) | (598,478) |
| 9. Expenses | | |
| a. Other | (486) | (173) |
| b. Administrative | (8,125) | (8,589) |
| c. Total expenses | (8,611) | (8,762) |
| **10. Total disbursements:** *(8.c.) + (9.c.)* | **(644,539)** | **(607,240)** |
| **11. Fund balance at market value at end of year** *(3.) + (7.) + (10.)* | **$ 11,498,604** | **$ 10,033,499** |
| 12. State Board of Investment calculated investment return | 18.6% | 14.2% |

# Plan Assets

## Actuarial Asset Value *(Dollars in Thousands)*

| | | June 30, 2014 | | June 30, 2013 | |
|---|---|---|---|---|---|
| **1. Market value of assets available for benefits** | | | **$ 11,498,604** | | **$ 10,033,499** |
| 2. Determination of average balance | | | | | |
| a. Total assets available at beginning of year | | | 10,033,438 | | 9,098,097 |
| b. Total assets available at end of year | | | 11,498,604 | | 10,033,499 |
| c. Net investment income for fiscal year | | | 1,829,621 | | 1,275,308 |
| d. Average balance *[a. + b. - c.] / 2* | | | 9,851,211 | | 8,928,144 |
| 3. Expected return *[8.0% x 2.d.]* | | | 788,097 | | 714,252 |
| 4. Actual return | | | 1,829,621 | | 1,275,308 |
| 5. Current year asset gain/(loss) *[4. - 3.]* | | | 1,041,524 | | 561,056 |
| 6. Unrecognized asset returns | | | | | |
| | **Original** | **Unrecognized Amount** | | **Unrecognized Amount** | |
| | **Amount** | **%** | **$** | **%** | **$** |
| a. Year ended June 30, 2014 | 1,041,524 | 80% | $ 833,220 | | N/A |
| b. Year ended June 30, 2013 | 561,056 | 60% | 336,634 | 80% | $ 448,845 |
| c. Year ended June 30, 2012 | (554,532) | 40% | (221,813) | 60% | (332,719) |
| d. Year ended June 30, 2011 | 1,121,457 | 20% | 224,291 | 40% | 448,583 |
| e. Year ended June 30, 2010 | 465,050 | | N/A | 20% | 93,010 |
| **f. Unrecognized return adjustment** | | | **$ 1,172,332** | | **$ 657,719** |
| 7. **Actuarial value at end of year** *(1. - 6.f.)* | | | **$ 10,326,272** | | **$ 9,375,780** |
| 8. Approximate return on actuarial value of assets during fiscal year | | | 14.5% | | 6.3% |
| 9. Ratio of actuarial value of assets to market value of assets | | | 0.90 | | 0.93 |

# Membership Data

## Distribution of Active Members

| | Years of Service as of June 30, 2014 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3*** | **3 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25 - 29** | **30 - 34** | **35+** | **Total** |
| < 25 | 1,065 | 22 | 3 | | | | | | | **1,090** |
| Avg. Earnings | 23,493 | 34,815 | 19,265 | | | | | | | **23,710** |
| 25 - 29 | 2,811 | 577 | 443 | 4 | | | | | | **3,835** |
| Avg. Earnings | 33,285 | 40,073 | 42,031 | 45,054 | | | | | | **35,329** |
| 30 - 34 | 2,345 | 739 | 1,729 | 271 | 9 | | | | | **5,093** |
| Avg. Earnings | 37,610 | 42,867 | 46,458 | 48,636 | 52,341 | | | | | **41,989** |
| 35 - 39 | 1,592 | 481 | 1,611 | 917 | 235 | 3 | | | | **4,839** |
| Avg. Earnings | 39,341 | 47,198 | 50,021 | 55,362 | 56,752 | 57,583 | | | | **47,571** |
| 40 - 44 | 1,258 | 444 | 1,352 | 965 | 672 | 109 | 4 | | | **4,804** |
| Avg. Earnings | 40,194 | 48,308 | 52,985 | 56,303 | 62,727 | 59,616 | 46,465 | | | **51,378** |
| 45 - 49 | 1,199 | 435 | 1,279 | 1,032 | 992 | 628 | 241 | 14 | | **5,820** |
| Avg. Earnings | 42,179 | 47,752 | 52,703 | 56,942 | 62,712 | 65,658 | 62,266 | 58,504 | | **54,431** |
| 50 - 54 | 1,196 | 434 | 1,377 | 1,110 | 1,028 | 940 | 1,028 | 558 | 29 | **7,700** |
| Avg. Earnings | 40,278 | 48,504 | 52,342 | 56,658 | 60,507 | 63,426 | 64,740 | 60,626 | 60,476 | **55,603** |
| 55 - 59 | 940 | 387 | 1,203 | 1,086 | 981 | 962 | 1,169 | 1,056 | 589 | **8,373** |
| Avg. Earnings | 40,879 | 47,759 | 51,917 | 55,631 | 60,735 | 62,584 | 64,354 | 61,953 | 59,560 | **56,766** |
| 60 - 64 | 528 | 249 | 775 | 819 | 730 | 674 | 772 | 623 | 911 | **6,081** |
| Avg. Earnings | 38,526 | 46,407 | 51,189 | 57,160 | 58,753 | 61,700 | 62,019 | 62,908 | 63,766 | **57,231** |
| 65 - 69 | 126 | 73 | 245 | 212 | 227 | 202 | 188 | 101 | 298 | **1,672** |
| Avg. Earnings | 29,211 | 37,352 | 49,923 | 56,434 | 60,102 | 59,152 | 65,919 | 66,026 | 65,166 | **56,624** |
| 70+ | 65 | 27 | 46 | 72 | 33 | 39 | 19 | 14 | 41 | **356** |
| Avg. Earnings | 14,864 | 18,661 | 33,191 | 50,822 | 59,543 | 57,343 | 58,323 | 54,505 | 62,536 | **42,956** |
| **Total** | **13,125** | **3,868** | **10,063** | **6,488** | **4,907** | **3,557** | **3,421** | **2,366** | **1,868** | **49,663** |
| **Avg. Earnings** | **36,734** | **45,194** | **50,342** | **55,944** | **60,821** | **62,834** | **63,827** | **62,001** | **62,585** | **50,952** |

* *This exhibit does not reflect service earned in other MSRS or Combined Service Annuity benefits. It should not be relied upon as an indicator of non-vested status.*

In each cell, the top number is the count of active participants for the age/service combination and the bottom number is valuation earnings for the fiscal year ending on the valuation date.

# Membership Data

## Distribution of Service Retirements

| | Years Retired as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <50 | 3 | 17 | 1 | | | | | **21** |
| Avg. Benefit | 6,436 | 4,080 | 5,177 | | | | | **4,469** |
| 50 - 54 | 9 | 18 | | | | | | **27** |
| Avg. Benefit | 10,894 | 8,083 | | | | | | **9,020** |
| 55 - 59 | 374 | 710 | 30 | | | | | **1,114** |
| Avg. Benefit | 16,746 | 15,266 | 11,839 | | | | | **15,671** |
| 60 - 64 | 869 | 2,439 | 1,138 | 16 | | | | **4,462** |
| Avg. Benefit | 19,238 | 20,366 | 16,055 | 12,708 | | | | **19,019** |
| 65 - 69 | 684 | 3,827 | 2,678 | 1,071 | 17 | | | **8,277** |
| Avg. Benefit | 17,916 | 19,283 | 19,607 | 16,210 | 16,907 | | | **18,872** |
| 70 - 74 | 94 | 941 | 2,338 | 2,009 | 636 | 1 | | **6,019** |
| Avg. Benefit | 17,462 | 17,796 | 17,876 | 19,006 | 16,518 | 32,079 | | **18,093** |
| 75 - 79 | 15 | 148 | 441 | 1,722 | 1,226 | 398 | 4 | **3,954** |
| Avg. Benefit | 12,328 | 15,685 | 15,342 | 16,952 | 18,541 | 23,956 | 25,209 | **17,914** |
| 80 - 84 | 5 | 27 | 79 | 263 | 1,160 | 971 | 98 | **2,603** |
| Avg. Benefit | 16,876 | 14,879 | 11,513 | 15,193 | 17,755 | 25,075 | 23,867 | **20,236** |
| 85 - 89 | 1 | 9 | 19 | 53 | 198 | 943 | 494 | **1,717** |
| Avg. Benefit | 910 | 13,495 | 8,245 | 12,303 | 16,843 | 21,159 | 23,191 | **20,777** |
| 90+ | | | 2 | 13 | 21 | 174 | 821 | **1,031** |
| Avg. Benefit | | | 24,544 | 11,940 | 10,168 | 19,830 | 18,626 | **18,584** |
| **Total** | **2,054** | **8,136** | **6,726** | **5,147** | **3,258** | **2,487** | **1,417** | **29,225** |
| **Avg. Benefit** | **18,142** | **18,942** | **17,962** | **17,436** | **17,701** | **23,047** | **20,598** | **18,686** |

In each cell, the top number is the count of retired participants for the age/years retired combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Survivors

| | Years Since Death as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <45 | 9 | 48 | 28 | 6 | | 1 | 1 | **93** |
| Avg. Benefit | 7,188 | 8,899 | 10,870 | 7,014 | | 19,879 | 11,750 | **9,354** |
| 45 - 49 | 4 | 20 | 5 | 5 | 3 | | | **37** |
| Avg. Benefit | 9,222 | 8,572 | 6,539 | 4,559 | 6,736 | | | **7,676** |
| 50 - 54 | 10 | 30 | 24 | 10 | 7 | 3 | | **84** |
| Avg. Benefit | 12,136 | 7,832 | 12,361 | 7,001 | 8,421 | 3,530 | | **9,435** |
| 55 - 59 | 13 | 59 | 46 | 34 | 14 | | 2 | **168** |
| Avg. Benefit | 16,556 | 13,407 | 14,866 | 11,866 | 5,571 | | 7,235 | **13,012** |
| 60 - 64 | 33 | 125 | 105 | 61 | 30 | 6 | 3 | **363** |
| Avg. Benefit | 16,553 | 16,991 | 14,319 | 10,387 | 10,578 | 8,394 | 5,760 | **14,303** |
| 65 - 69 | 40 | 131 | 152 | 88 | 38 | 6 | 4 | **459** |
| Avg. Benefit | 14,582 | 16,722 | 16,158 | 14,244 | 15,486 | 13,948 | 12,150 | **15,695** |
| 70 - 74 | 35 | 147 | 139 | 84 | 52 | 32 | 6 | **495** |
| Avg. Benefit | 20,359 | 16,401 | 13,603 | 13,398 | 16,194 | 14,637 | 13,808 | **15,218** |
| 75 - 79 | 45 | 137 | 142 | 112 | 61 | 42 | 7 | **546** |
| Avg. Benefit | 18,379 | 19,177 | 17,714 | 17,383 | 19,140 | 16,004 | 12,332 | **18,027** |
| 80 - 84 | 39 | 147 | 120 | 105 | 70 | 49 | 31 | **561** |
| Avg. Benefit | 21,949 | 20,203 | 19,019 | 21,689 | 20,402 | 21,198 | 13,607 | **20,097** |
| 85 - 89 | 29 | 112 | 116 | 97 | 71 | 68 | 30 | **523** |
| Avg. Benefit | 18,693 | 20,395 | 22,691 | 20,175 | 22,159 | 21,008 | 13,979 | **20,720** |
| 90+ | 15 | 43 | 95 | 70 | 67 | 46 | 21 | **357** |
| Avg. Benefit | 22,932 | 18,748 | 16,324 | 19,773 | 21,644 | 15,365 | 15,972 | **18,424** |
| **Total** | **272** | **999** | **972** | **672** | **413** | **253** | **105** | **3,686** |
| **Avg. Benefit** | **17,829** | **17,055** | **16,614** | **16,542** | **18,218** | **17,704** | **13,694** | **16,981** |

In each cell, the top number is the count of survivors for the age/years since death combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Disability Retirements

| | Years Disabled as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| < 45 | 1 | 7 | 8 | 3 | | | | **19** |
| Avg. Benefit | 6,505 | 6,811 | 3,782 | 2,579 | | | | **4,852** |
| 45 - 49 | 7 | 18 | 9 | 5 | 2 | | | **41** |
| Avg. Benefit | 8,128 | 7,992 | 7,937 | 7,621 | 8,744 | | | **7,995** |
| 50 - 54 | 17 | 47 | 45 | 22 | 7 | 2 | 2 | **142** |
| Avg. Benefit | 10,626 | 12,589 | 9,440 | 8,335 | 6,923 | 4,574 | 3,105 | **10,171** |
| 55 - 59 | 28 | 99 | 90 | 58 | 29 | 5 | 1 | **310** |
| Avg. Benefit | 15,590 | 16,010 | 13,138 | 9,661 | 10,017 | 10,530 | 7,223 | **13,273** |
| 60 - 64 | 23 | 138 | 161 | 100 | 39 | 12 | 1 | **474** |
| Avg. Benefit | 13,249 | 16,928 | 16,204 | 12,591 | 13,514 | 8,034 | 4,451 | **15,056** |
| 65 - 69 | 4 | 54 | 146 | 130 | 42 | 29 | 5 | **410** |
| Avg. Benefit | 25,496 | 11,734 | 16,051 | 15,851 | 13,235 | 14,651 | 9,908 | **15,049** |
| 70 - 74 | | 1 | 26 | 100 | 63 | 19 | 6 | **215** |
| Avg. Benefit | | 7,978 | 8,907 | 13,835 | 16,727 | 14,721 | 13,906 | **14,139** |
| 75+ | | | | 28 | 69 | 67 | 43 | **207** |
| Avg. Benefit | | | | 13,489 | 16,808 | 14,279 | 13,660 | **14,887** |
| **Total** | **80** | **364** | **485** | **446** | **251** | **134** | **58** | **1,818** |
| **Avg. Benefit** | **13,591** | **14,687** | **14,212** | **13,163** | **14,553** | **13,578** | **12,728** | **13,975** |

In each cell, the top number is the count of disabled participants for the age/years since disability combination and the bottom number is the average annual benefit amount.

# Membership Data

## Reconciliation of Members

| | | Terminated* | | Recipients** | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2013** | **49,121** | **16,062** | **5,574** | **27,654** | **1,802** | **3,830** | **104,043** |
| New Members | 5,326 | 0 | 0 | 0 | 0 | 0 | **5,326** |
| Return to active | 373 | (217) | (156) | 0 | 0 | 0 | **0** |
| Terminated non-vested | (1,589) | 0 | 1,589 | 0 | 0 | 0 | **0** |
| Service retirements | (1,268) | (658) | 0 | 1,926 | 0 | 0 | **0** |
| Unclassified retirements | 0 | 0 | 0 | 44 | 0 | 0 | **44** |
| Terminated deferred | (1,444) | 1,444 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | (692) | (219) | (1,437) | 0 | 0 | 0 | **(2,348)** |
| Deaths | (75) | (27) | (5) | (692) | (60) | (146) | **(1,005)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 272 | **272** |
| Disabled | (67) | 0 | 0 | 0 | 67 | 0 | **0** |
| Unexpected status change | (22) | 87 | 253 | 293 | 9 | (270) | **350** |
| Net change | 542 | 410 | 244 | 1,571 | 16 | (144) | **2,639** |
| **Members on 6/30/2014** | **49,663** | **16,472** | **5,818** | **29,225** | **1,818** | **3,686** | **106,682** |

* *Includes members in the General or Military Affairs Plans.*

** *Includes members in the General, Military Affairs or Unclassified Plans.*

| Terminated Member Statistics on June 30, 2014 | Deferred Retirement | Other Non-Vested | Total |
|---|---|---|---|
| Number | 16,472 | 5,818 | 22,290 |
| Average age | 50.4 | 37.1 | 46.9 |
| Average service | 7.9 | 1.0 | 6.1 |
| Average annual benefit, with augmentation to Normal Retirement Date and 40% CSA load | $15,112 | N/A | $15,112 |
| Average refund value, with 40% CSA load | $36,066 | $2,752 | $27,371 |

# Development of Costs

## Actuarial Valuation Balance Sheet *(Dollars in Thousands)*

The actuarial balance sheet is based on the principle that the long-term projected benefit obligations of the plan should be ideally equal to the long-term resources available to fund those obligations. The resources available to meet projected obligations for current members consist of current fund assets plus the present value of anticipated future contributions intended to fund benefits for current members. In the exhibit below, B.2 is the estimated present value of contributions to fund the normal cost rate for current members until their respective termination dates. Item B.1 is the present value of the total 11.00% statutory contribution net of normal cost and anticipated plan expenses during the period from the valuation date to the statutory unfunded amortization date.

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, 2014 |
|---|---|---|---|
| A. Actuarial Value of Assets | | | $ 10,326,272 |
| B. Expected Future Assets | | | |
| 1. Present value of expected future statutory supplemental contributions | | | 1,365,977 |
| 2. Present value of future normal cost contributions | | | 1,303,399 |
| 3. Total expected future assets: *(1.) + (2.)* | | | $ 2,669,376 |
| C. Total Current and Expected Future Assets | | | $ 12,995,648 |
| D. Current Benefit Obligations* | | | |
| 1. Benefit recipients | **Non-Vested** | **Vested** | **Total** |
| a. Service retirements | $ 0 | $ 5,742,405 | $ 5,742,405 |
| b. Disability retirements | 0 | 234,369 | 234,369 |
| c. Survivors | 0 | 495,224 | 495,224 |
| 2. Deferred retirements with augmentation | 0 | 1,239,741 | 1,239,741 |
| 3. Former members without vested rights** | 5,804 | 0 | 5,804 |
| 4. Active members | 68,601 | 4,130,509 | 4,199,110 |
| 5. Total Current Benefit Obligations | $ 74,405 | $ 11,842,248 | $ 11,916,653 |
| E. Expected Future Benefit Obligations | | | $ 1,831,872 |
| F. Total Current and Expected Future Benefit Obligations*** | | | $ 13,748,525 |
| G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)* | | | $ 1,590,381 |
| H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)* | | | $ 752,877 |
| I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)* | | | 86.65% |
| J. Projected Benefit Funding Ratio: *(C.)/(F.)* | | | 94.52% |

* *Present value of credited projected benefits (projected compensation, current service).*

** *Former members who have not satisfied vesting requirements and have not collected a refund of member contributions as of the valuation date.*

*** *Present value of projected benefits (projected compensation, projected service).*

# Development of Costs

## Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate (*Dollars in Thousands)*

| | Actuarial Present Value of Projected Benefits | Actuarial Present Value of Future Normal Costs | Actuarial Accrued Liability |
|---|---|---|---|
| A. Determination of Actuarial Accrued Liability (AAL) | | | |
| 1. Active members | | | |
| a. Retirement annuities | $ 5,410,189 | $ 904,177 | $ 4,506,012 |
| b. Disability benefits | 216,663 | 71,642 | 145,021 |
| c. Survivor's benefits | 96,602 | 24,069 | 72,533 |
| d. Deferred retirements | 275,055 | 226,070 | 48,985 |
| e. Refunds* | 23,820 | 77,441 | (53,621) |
| f. Total | $ 6,022,329 | $ 1,303,399 | $ 4,718,930 |
| 2. Deferred retirements with future augmentation | 1,239,741 | 0 | 1,239,741 |
| 3. Former members without vested rights | 5,804 | 0 | 5,804 |
| 4. Benefit recipients | 6,471,998 | 0 | 6,471,998 |
| 5. Contingent actuarial accrued liability - UNCL Plan | 8,653 | 0 | 8,653 |
| 6. Total | $ 13,748,525 | $ 1,303,399 | $ 12,445,126 |
| B. Determination of Unfunded Actuarial Accrued Liability (UAAL) | | | |
| 1. Actuarial accrued liability | | | $ 12,445,126 |
| 2. Current assets (AVA) | | | 10,326,272 |
| 3. Unfunded actuarial accrued liability | | | $ 2,118,854 |
| C. Determination of Supplemental Contribution Rate** | | | |
| 1. Present value of future payrolls through the amortization date of June 30, 2041 | | | $ 41,268,188 |
| 2. Supplemental contribution rate: *(B.3.) / (C.1.)* | | | 5.13% *** |

* *Includes non-vested refunds and non-married survivor benefits only.*

** *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.*

*** *The amortization factor as of July 1, 2014 is 15.55314.*

# Development of Costs

## Changes in Unfunded Actuarial Accrued Liability (UAAL) *(Dollars in Thousands)*

| | Year Ending June 30, 2014 | | |
|---|---|---|---|
| | Actuarial Accrued Liability | Current Assets | Unfunded Actuarial Accrued Liability |
| A. Unfunded actuarial accrued liability at beginning of year | $ 11,428,641 | $ 9,375,780 | $ 2,052,861 |
| B. Changes due to interest requirements and current rate of funding | | | |
| 1. Normal cost, including expenses | $ 185,570 | $ 0 | $ 185,570 |
| 2. Benefit payments | (635,928) | (635,928) | 0 |
| 3. Contributions | 0 | 259,070 | (259,070) |
| 4. Interest on A., B.1., B.2. and B.3. | 937,730 | 734,988 | 202,742 |
| 5. Total *(B.1. + B.2. + B.3. + B.4.)* | 487,372 | 358,130 | 129,242 |
| C. Expected unfunded actuarial accrued liability at end of year *(A. + B.5.)* | | | $ 2,182,103 |
| D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected | | | |
| 1. Age and service retirements | | | $ (13,597) |
| 2. Disability retirements | | | 194 |
| 3. Death-in-service benefits | | | 542 |
| 4. Withdrawals | | | 5,558 |
| 5. Salary increases | | | (17,716) |
| 6. Investment income | | | (592,362) |
| 7. Mortality of annuitants | | | 20,793 |
| 8. Other items | | | (47,246) |
| 9. Total | | | (643,834) |
| E. Unfunded actuarial accrued liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.9.)* | | | $ 1,538,269 |
| F. Change in unfunded actuarial accrued liability due to changes in plan provisions | | | 0 |
| G. Change in unfunded actuarial accrued liability due to changes in actuarial assumptions | | | 580,585 |
| H. Change in unfunded actuarial accrued liability due to changes in miscellaneous methodology | | | 0 |
| I. Unfunded actuarial accrued liability at end of year *(E. + F. + G. + H.)** | | | $ 2,118,854 |

** The unfunded actuarial accrued liability on a market value of assets basis is $946,522.*

# Development of Costs

## Determination of Contribution Sufficiency/(Deficiency) *(Dollars in Thousands)*

The required contribution is defined in Minnesota Statutes as the sum of normal cost, a supplemental contribution to amortize the UAAL, and an allowance for expenses.

| | Percent of Payroll | Dollar Amount |
|---|---|---|
| A. Statutory contributions - Chapter 352 | | |
| 1. Employee contributions | 5.50% | $ 145,935 |
| 2. Employer contributions | 5.50% | 145,935 |
| 3. Total | 11.00% | $ 291,870 |
| | | |
| B. Required contributions - Chapter 356 | | |
| 1. Normal cost | | |
| a. Retirement benefits | 5.29% | $ 140,363 |
| b. Disability benefits | 0.38% | 10,083 |
| c. Survivors | 0.14% | 3,715 |
| d. Deferred retirement benefits | 1.14% | 30,248 |
| e. Refunds* | 0.42% | 11,144 |
| f. Total | 7.37% | $ 195,553 |
| | | |
| 2. Supplemental contribution amortization of Unfunded Actuarial Accrued Liability by June 30, 2041 | 5.13% | $ 136,118 |
| | | |
| 3. Allowance for expenses | 0.32% | $ 8,491 |
| | | |
| 4. Total | 12.82% ** | $ 340,162 |
| | | |
| C. Contribution Sufficiency/(Deficiency) *(A.3. - B.4.)* | (1.82%) | $ (48,292) |

Note: Projected annual payroll for fiscal year beginning on the valuation date: $2,653,367.

**Includes non-vested refunds and non-married survivor benefits only.*

*** The required contribution on a market value of assets basis is 9.98% of payroll.*

# Development of Costs

## Special Groups - Military Affairs Calculation

Section 352.85 of Chapter 352 of Minnesota Statutes provides that certain military affairs personnel may retire, with an unreduced benefit, at age 60. In addition, they may receive disability benefits upon being found disqualified for retention in active military duty. To fund these special benefits, employees and employer contribute an extra 1.60% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 60, we have assumed that all military affairs personnel will retire at age 60, or if over age 60, one year from the valuation date.

The unfunded liability for these members, if any, is reflected in the total unfunded liability shown on page 15.

| | **Year Ending June 30, 2014** |
|---|---|
| A. Projected annual earnings | $ 226,495 |
| B. Total normal cost | |
| 1. Dollar amount | $ 22,808 |
| 2. Percent of payroll | 10.07% |
| C. Normal cost of State Employees Retirement Fund (percent of payroll) | 7.37% |
| D. Difference in normal cost *(B. - C., not less than zero)* | 2.70% |

| **Active Military Affairs Statistics** | **Active Members** |
|---|---|
| Number | 4 |
| Average Age, in years | 41.9 |
| Average Service, in years | 9.3 |

# Development of Costs

## Special Groups - Pilots Calculation

Section 352.86 of Chapter 352 of Minnesota Statutes provides that certain transportation department pilots may retire, with an unreduced benefit, at age 62. In addition, they may receive disability benefits upon being found disqualified for retention as pilots. To fund these special benefits, employees and employer contribute an extra 1.60% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 62, we have assumed that all pilots will retire at age 62, or if over age 62, one year from the valuation date.

This group is closed to new entrants effective June 1, 2008.

The unfunded liability for these members, if any, is reflected in the total unfunded liability shown on page 15.

| | Year Ending June 30, 2014 |
|---|---|
| A. Projected annual earnings | $ 185,523 |
| B. Total normal cost | |
| 1. Dollar amount | $ 21,613 |
| 2. Percent of payroll | 11.65% |
| C. Normal cost of State Employees Retirement Fund (percent of payroll) | 7.37% |
| D. Difference in normal cost (B. - C.) | 4.28% |

| Active Pilots Statistics | Active Members |
|---|---|
| Number | 2 |
| Average Age, in years | 68.0 |
| Average Service, in years | 21.7 |

# Development of Costs

## Special Groups - Fire Marshals Calculation

Section 352.87 of Chapter 352 of Minnesota Statutes provides that deputy state fire marshals may retire, with an unreduced benefit (with respect to service after July 1, 1999), at age 55. Credited Service after July 1, 1999 accrues retirement benefits at a rate of 2.00% per year, and disability benefits are based on a minimum of 15 years of service (20 years if duty related). To fund these special benefits, members contribute an extra 2.78% of payroll and employers contribute an extra 4.20% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 55, we have assumed that all fire marshals will retire in accordance with the retirement assumptions which apply to the members of the Correctional Employees Retirement Fund.

The unfunded liability for these members, if any, is reflected in the total unfunded liability shown on page 15.

| | **Year Ending June 30, 2014** |
|---|---|
| A. Projected annual earnings | $ 734,374 |
| B. Total normal cost | |
| 1. Dollar amount | $ 112,065 |
| 2. Percent of payroll | 15.26% |
| C. Normal cost of State Employees Retirement Fund (percent of payroll) | 7.37% |
| D. Difference in normal cost (B. - C.) | 7.89% |

| **Active Fire Marshals Statistics** | **Active Members** |
|---|---|
| Number | 11 |
| Average Age, in years | 53.5 |
| Average Service, in years | 13.6 |

# Development of Costs

## Special Groups - Unclassified Plan Contingent Liability Calculation
*(Dollars in Thousands)*

Section 352D.02 of Chapter 352D of Minnesota Statutes provides that members credited with employee shares in the Unclassified Plan may elect to terminate participation in the Unclassified Plan and be covered by the State Employees Retirement Fund (General Plan) prior to termination of covered employment assuming that the member has acquired at least 10 years of allowable state service if hired prior to July 1, 2010 and has no more than 7 years of service if hired after June 30, 2010. Unclassified Plan members contribute 5.5% of payroll and employers contribute 6% of payroll. Certain members (Judges and Legislators) are not eligible to elect coverage under the State Employees Retirement Fund.

To recognize the effect of the option to elect coverage under the General Plan, we have assumed that all eligible Unclassified Plan members will elect coverage under the General Plan if such election provides the member with a greater economic present value than the accumulated contribution balance under the Unclassified Plan. The liabilities were measured using the actuarial assumptions that are applied to the State Employees Retirement Fund.

| | Year Ending June 30, 2014 |
|---|---|
| A. Number of active eligible members | 1,172 |
| B. Account balances for active members | $ 166,726 |
| C. Accrued liability for active members | $ 175,379 |
| D. Number of inactive members and ineligible active members* | 2,441 |
| E. Account balances for inactive members | $ 158,778 |
| F. Net assets held in trust for Unclassified Plan members | $ 325,737 |
| G. Contingent liability (C. - B.) | $ 8,653 |
| H. Projected annual earnings for active members | $ 92,865 |
| I. Normal cost | |
| 1. Dollar amount | $ 10,714 |
| 2. Percent of payroll | 11.54% |
| J. Normal cost of State Employee Retirement Fund (percent of payroll) | 7.37% |
| K. Difference in normal cost (I.2. - J.) | 4.17% |

** Includes 2,258 terminated members, 172 active Legislators and 11 active Judges that are not eligible to elect coverage.*

| Unclassified Member Statistics | Active Eligible Members |
|---|---|
| Number | 1,172 |
| Average Age, in years | 45.8 |
| Average Service, in years | 10.3 |
| Average Unclassified Account Balance | $ 142,258 |

# Actuarial Basis

## Actuarial Methods

All actuarial methods are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement, or the MSRS Board of Directors. Different methodologies may also be reasonable and results based on other methodologies would be different.

**Actuarial Cost Method**

Actuarial accrued liability and required contributions in this report are computed using the Entry Age Normal Cost method. This method is prescribed by Minnesota Statute. Under this method, a normal cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Age as of the valuation date was calculated based on the dates of birth provided by the Fund. Entry age for valuation purposes was calculated as the age on the valuation date minus the provided years of service on the valuation date.

To the extent that current assets and future normal costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued Liability ("UAAL") develops. The UAAL is amortized over the statutory amortization period using level percent of payroll assuming payroll increases. The total contribution developed under this method is the sum of the normal cost, expenses, and the payment toward the UAAL.

**Select and Ultimate Discount Rate Methodology**

Based on direction from the LCPR's actuary, the select and ultimate discount rate methodology is applied to the entry age normal results as follows:

1. The present value of projected benefits is calculated using the prescribed select and ultimate discount rates.
2. An equivalent single interest rate that produces approximately the same present value of projected benefits is determined.
3. The equivalent single interest rate is used to determine the entry age normal accrued liability and normal cost.

The equivalent single interest rate used in this valuation is 8.40% (8.37% last year).

**Valuation of Future Post-Retirement Benefit Increases**

If the plan has reached the funding ratio threshold required to pay a 2.5% benefit increase, Minnesota Statutes require the 2.5% benefit increase rate to be reflected in the liability calculations. If the plan has not yet reached the funding ratio threshold required to pay a 2.5% benefit increase, Minnesota Statutes require a projection to be performed to determine the expected attainment of the funding ratio threshold, and the expected reversion to a 2.5% benefit increase rate must be reflected in the liability calculations.

# Actuarial Basis

## Actuarial Methods (Concluded)

**Funding Objective**
The fundamental financing objective of the fund is to establish contribution rates which, when expressed as a percentage of active member payroll, will remain approximately level from generation to generation and meet the required deadline for full funding.

**Decrement Timing**
All decrements are assumed to occur mid-fiscal year.

**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; and
- 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.

**Payment on the Unfunded Actuarial Accrued Liability**
Payment equals a level percentage of payroll each year to the statutory amortization date of June 30, 2041 assuming payroll increases of 3.75% per annum. If there is a negative Unfunded Actuarial Accrued Liability, the surplus amount is amortized over 30 years as a level percentage of payroll. If the unfunded liability increases due to changes in benefits, assumptions, or methods, the statutory amortization date will be re-determined. Projected payroll is multiplied by 0.959 in the determination of the present value of future payroll to account for timing differences (as required by the Standards for Actuarial Work).

**Changes in Methods since Prior Valuation**
The methodology for valuing future post-retirement increases was clarified in Minnesota Statutes.

# Actuarial Basis

## Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The assumptions prescribed are based on the last experience study, dated August 2009, prepared by a former actuary.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment.

| | | |
|---|---|---|
| Investment return | Select and Ultimate Rates: | |
| | July 1, 2014 to June 30, 2017 | 8.00% per annum |
| | July 1, 2017 and later | 8.50% per annum |
| Benefit increases after retirement | 2.00% per annum through 2015 and 2.5% per annum thereafter | |
| Salary increases | Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service. | |
| Inflation | 3.00% per year. | |
| Payroll growth | 3.75% per year. | |
| Mortality rates | | |
| Healthy Pre-retirement | RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment, set forward three years for males and set back one year for females. | |
| Healthy Post-retirement | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. | |
| Disabled | RP-2000 disabled mortality table with no setback for males and set forward five years for females. | |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. | |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Withdrawal | Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are:<br><br>**First Year** / **Second Year** / **Third Year**<br>Male: 0.45 / 0.14 / 0.09<br>Female: 0.48 / 0.15 / 0.10 |
| Disability | Age-related rates based on experience; see table of sample rates. |
| Allowance for Combined Service Annuity | Liabilities for active members are increased by 1.20% and liabilities for former members are increased by 40.00% to account for the effect of some participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | Prior year administrative expenses expressed as percentage of prior year projected payroll. |
| Refund of contributions | Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit 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 normal retirement age. |
| Percentage married | 85% of active male members and 70% of female members are assumed to be married. Actual marital status is used 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 two years older. |
| Form of payment | Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows:<br><br>Males: 15% elect 50% Joint & Survivor option<br>10% elect 75% Joint & Survivor option<br>50% elect 100% Joint & Survivor option<br>Females: 15% elect 50% Joint & Survivor option<br>0% elect 75% Joint & Survivor option<br>25% elect 100% Joint & Survivor option<br><br>Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a life annuity. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| 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. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members:</u><br>There were 88 members reported with zero or invalid salary. We used prior year salary (51 members), if available, otherwise, high five salary with a 10% load to account for salary increases (24 members). If neither pay nor high five salary was available, we assumed a value of $35,000 (13 members).<br><br>There were 19 members reported with zero or negative service. Due to the small number of members with zero service, and based on direction from MSRS, we used service of 0 years for these members.<br><br>There were also 33 members reported without a gender and 19 members reported with an invalid date of birth. We assumed a date of birth of July 1, 1976 and female gender.<br><br><u>Data for terminated members:</u><br>There were 708 members reported with a missing or invalid benefit. If available, we calculated benefits for these members using the reported Average Salary, Credited Service and Termination Date provided. If Average Salary was not reported (689 members), we assumed a value of $30,000. If termination date was not reported (15 members), we assumed the member terminated at age 40 (or current age if younger than 40). If credited service was either not reported or invalid (14 members), we assumed a value of 7.5 years.<br><br>There were no members with an invalid gender or date of birth.<br><br><u>Data for members receiving benefits:</u><br>There were 51 members reported without a gender. We assumed female gender for the valuation. No retired members were reported with an invalid date of birth.<br><br>There were 2 members reported without a benefit. In addition, there was 1 member who was reported with a joint & survivor election but was reported without a survivor benefit. Due to the small number of members with missing benefits, we made no adjustment to the reported data for members receiving benefits.<br><br>There were 383 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e., “bounce back”), if applicable. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | Data for members receiving benefits:<br>There were 371 retirees reported with a bounce back annuity but were not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively.<br><br>There were retired members reported with a survivor option and an invalid or missing survivor gender (4,961 members) and/or survivor date of birth (4,465 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.<br><br>At MSRS' direction, we changed the status of 785 members who were reported with a disabled status at the beginning of the year and a retired status at the end of the year back to disabled status. |
| Changes in actuarial assumptions | Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.<br><br>The assumed post-retirement benefit increase rate was changed from 2.0% per year to 2.0% per year through 2015 and 2.5% per year thereafter. See page 4 for additional detail about this assumption. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | Rate (%)* | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality | |
| **Age** | **Male** | **Female** | **Male** | **Female** | **Male** | **Female** |
| 20 | 0.03% | 0.02% | 0.04% | 0.02% | 2.26% | 0.75% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 | 2.26 | 0.75 |
| 30 | 0.04 | 0.03 | 0.05 | 0.02 | 2.26 | 0.75 |
| 35 | 0.06 | 0.05 | 0.08 | 0.04 | 2.26 | 0.75 |
| 40 | 0.09 | 0.06 | 0.11 | 0.06 | 2.26 | 0.75 |
| 45 | 0.13 | 0.10 | 0.17 | 0.09 | 2.26 | 1.15 |
| 50 | 0.60 | 0.24 | 0.24 | 0.15 | 2.90 | 1.65 |
| 55 | 0.54 | 0.35 | 0.35 | 0.22 | 3.54 | 2.18 |
| 60 | 0.66 | 0.56 | 0.56 | 0.34 | 4.20 | 2.80 |
| 65 | 1.16 | 0.91 | 0.85 | 0.54 | 5.02 | 3.76 |
| 70 | 1.93 | 1.52 | 2.67 | 0.82 | 6.26 | 5.22 |

* *Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment, and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates as prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decreased at all ages, we would not expect the valuation results to be materially different.*

** *These rates were adjusted for mortality improvements using projection scale AA.*

| | Withdrawal Rates After Third Year | | Disability Retirement | |
|---|---|---|---|---|
| **Age** | **Male** | **Female** | **Male** | **Female** |
| 20 | 6.90% | 8.55% | 0.01% | 0.01% |
| 25 | 5.90 | 7.80 | 0.01 | 0.01 |
| 30 | 4.90 | 7.05 | 0.01 | 0.01 |
| 35 | 3.90 | 5.10 | 0.03 | 0.03 |
| 40 | 3.20 | 4.38 | 0.08 | 0.08 |
| 45 | 2.70 | 3.75 | 0.13 | 0.13 |
| 50 | 2.20 | 3.05 | 0.29 | 0.29 |
| 55 | 0.00 | 0.00 | 0.50 | 0.43 |
| 60 | 0.00 | 0.00 | 0.78 | 0.62 |
| 65 | 0.00 | 0.00 | 0.00 | 0.00 |

# Actuarial Basis

## Summary of Actuarial Assumptions (Concluded)

| Retirement | | | | Salary Scale | |
|---|---|---|---|---|---|
| **Age** | **Rule of 90 Eligible** | **All Others** | | **Year** | **Increase** |
| 55 | 20% | 5% | | 1 | 10.50% |
| 56 | 15 | 5 | | 2 | 8.10 |
| 57 | 15 | 5 | | 3 | 6.90 |
| 58 | 15 | 5 | | 4 | 6.20 |
| 59 | 20 | 6 | | 5 | 5.70 |
| 60 | 20 | 7 | | 6 | 5.30 |
| 61 | 22 | 12 | | 7 | 5.00 |
| 62 | 40 | 22 | | 8 | 4.70 |
| 63 | 30 | 16 | | 9 | 4.50 |
| 64 | 30 | 18 | | 10 | 4.40 |
| 65 | 40 | 40 | | 11 | 4.20 |
| 66 | 30 | 30 | | 12 | 4.10 |
| 67 | 25 | 25 | | 13 | 4.00 |
| 68 | 25 | 25 | | 14 | 3.80 |
| 69 | 25 | 25 | | 15 | 3.70 |
| 70 | 30 | 30 | | 16 | 3.60 |
| 71+ | 100 | 100 | | 17+ | 3.50 |

# Actuarial Basis

## Summary of Plan Provisions

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| **Plan Year** | July 1 through June 30. |
| **Eligibility** | State employees, non-academic staff of the University of Minnesota and employees of certain Metro level government units, unless excluded by law. |
| **Contributions** | Shown as a percent of salary: |
| Effective date | |
| | **Member** / **Employer** |
| July 1, 2010 to June 30, 2014 | 5.00% / 5.00% |
| July 1, 2014* | 5.50% / 5.50% |
| | Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).<br><br>**Increase is effective the first day of the first full pay period beginning after July 1, 2014.* |
| **Allowable Service** | Service during which member contributions were made. May also include certain leaves of absence, military service and periods while temporary Worker's Compensation is paid. Excludes lump sum vacation and severance pay at termination. |
| **Average Salary** | Average of the five highest successive years of Salary. Average Salary is based on all Allowable Service if less than five years. |
| **Salary** | Includes wages, allowances and fees. Excludes lump sum payments at separation, employer contributions to deferred compensation and tax-sheltered annuity plans and benevolent vacation and sick leave donation programs. |
| **Retirement** | |
| Normal retirement benefit | |
| Age/Service requirement | First hired before July 1, 1989:<br>(a.) Age 65 and three years of Allowable Service.<br>(b.) Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.<br><br>First hired after June 30, 1989:<br>(a.) The greater of age 65 or the age eligible for full Social Security retirement benefits (but not higher than age 66) and three years of Allowable Service (five years if hired after June 30, 2010).<br>(b.) Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service. |
| Amount | 1.70% of Average Salary for each year of Allowable Service. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Retirement** (Continued) | |
| Early retirement | |
| Age/Service requirement | First hired before July 1, 1989:<br>(a.) Age 55 and three years of Allowable Service.<br>(b.) Any age with 30 years of Allowable Service.<br>(c.) Rule of 90: Age plus Allowable Service totals 90.<br><br>First hired after June 30, 1989:<br>(a.) Age 55 and three years (five years if hired after June 30, 2010) of Allowable Service. |
| Amount | First hired before July 1, 1989:<br>The greater of (a) or (b):<br><br>(a.) 1.20% of Average Salary for each of the first ten years of Allowable Service and 1.70% of Average Salary for each subsequent year with reduction of 0.25% for each month the member is under age 65 at time of retirement or under age 62 if 30 or more years of Allowable Service. No reduction if age plus years of Allowable Service totals 90.<br>(b.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the member is under age 65.<br><br>First hired after June 30, 1989:<br><br>1.70% of Average Salary for each year of Allowable Service assuming augmentation to the age eligible for full Social Security retirement benefit (but not higher than age 66) at 3.00% (2.50% if hired after June 30, 2006) per year and actuarial reduction for each month the member is under the normal retirement age. |
| Form of payment | Life annuity with return on death of any balance of member contributions over aggregate monthly payments. Actuarially equivalent options are:<br><br>(a.) 50%, 75%, or 100% Joint and Survivor with bounce back feature without additional reduction.<br>(b.) 15-year Certain and Life. |
| Benefit increases | Since 2011, benefit recipients have received annual 2.0% benefit increases. When the funding ratio reaches 90% (actuarial accrued liability ratio on a Market Value of Assets basis) for two consecutive years, the benefit increase will revert to 2.5%. A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Retirement** (Continued) | |
| Benefit increases (Continued) | Prior to 2002, members who retired under the laws in effect before July 1, 1973 received an additional lump sum payment each year. In 1989, this lump sum payment was the greater of $25 times each full year of Allowable Service or $400 per full year of service less any Social Security benefits received or annuity from a Minnesota public employee pension plan. In each following year, the lump sum payment was increased by the same percentage increase that was applied to regular annuities paid from the Minnesota Post Retirement Investment Fund. Effective January 1, 2002, the annual lump sum payment was divided by 12 and paid as a monthly life annuity in the annuity form elected. |
| **Disability** | |
| Disability benefit | |
| Age/Service requirement | Total and permanent disability before normal retirement age with three years of Allowable Service (five years if hired after June 30, 2010). |
| Amount | Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age.<br><br>Payments stop if disability ceases or death occurs. Payments revert to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment. |
| Retirement after disability | |
| Age/Service requirement | Normal retirement age with continued disability. |
| Amount | Any optional annuity continues. Otherwise, a normal retirement benefit equal to the disability benefit paid before normal retirement age, or an actuarially equivalent optional annuity. |
| Form of payment | Same as for retirement. |
| Benefit Increases | Same as for retirement. |
| **Death** | |
| Surviving spouse optional benefit | |
| Age/Service requirement | Member or former member who dies before retirement or disability benefits commence with three years of Allowable Service (five years if hired after June 30, 2010). If a former member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when the former member would have been age 55. If an active member dies, benefits may commence immediately, regardless of age. |
| Amount | Surviving spouse receives the 100% joint and survivor benefits using the Normal Retirement formula above. If commencement is prior to age 55, the appropriate early retirement formula described above applies except that one-half the monthly reduction factor is used from age 55 to the commencement age and the Rule of 90 does not apply. In lieu of this benefit, the surviving spouse may elect a refund of member contributions with interest or an actuarially equivalent term certain annuity. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Death** (Continued) | |
| Amount (Continued) | If a member dies prior to July 1, 1997 and the beneficiary was not eligible to commence a survivor benefit as of July 1, 1997, 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. |
| <u>Surviving dependent children's benefit</u> | |
| Age/Service requirement | If no surviving spouse, all dependent children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member. |
| Amount | Actuarially equivalent 100% joint and survivor annuity to surviving spouse payable to the later of age 20 or five years. The amount is proportionally divided among surviving children. |
| Benefit increases | Same as for retirement. |
| <u>Refund of contributions</u> | |
| Age/Service requirement | Active member dies and survivor benefits are not payable or a former member dies before annuity begins or former member who is not entitled to an annuity dies. |
| Amount | Member's contributions with 6.00% interest through June 30, 2011 compounded daily. Beginning July 1, 2011, a member's contributions will increase at 4.00% interest compounded daily. |
| Age/Service requirement | Retired or disabled annuitant who did not select an optional annuity dies, or the remaining recipient of an option dies. |
| Amount | The excess of the member's contributions over all benefits paid. |
| **Unclassified Plan Provision** | Eligible members credited with employee shares in the Unclassified Plan may elect to terminate participation in the Unclassified Plan and be covered by the State Employees Retirement Fund prior to termination of covered employment assuming that the member has acquired at least 10 years of allowable state service (no more than seven years of service if hired after June 30, 2010). |
| **Termination** | |
| <u>Refund of contributions</u> | |
| Age/Service requirement | Termination of state service. |
| Amount | Member's contributions with 6.00% interest through June 30, 2011 compounded daily. Beginning July 1, 2011 a member's contributions will increase at 4.00% interest compounded daily. If a member is vested, a deferred annuity may be elected in lieu of a refund. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Termination** (Continued) | |
| Deferred benefit | |
| Age/Service requirement | Three years of Allowable Service if hired prior to June 30, 2010, five years of Allowable Service if hired after June 30, 2010. |
| Amount | Benefit computed under law in effect at termination and increased by the following annual augmentation percentage:<br><br>(a.) 0.00% before July 1, 1971;<br>(b.) 5.00% from July 1, 1971 to January 1, 1981;<br>(c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1 of the year following attainment of age 55 or January 1, 2012, whichever is earlier;<br>(d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012. Amount is payable as a normal or early retirement;<br>(e.) 2.00% from January 1, 2012 thereafter.<br><br>Amount is payable at normal or early retirement.<br><br>If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| **Combined Service Annuity** | Members are eligible for combined service benefits if they:<br><br>(a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement;<br>(b.) Have at least six months of allowable service credit in each plan worked under;<br>(c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year.<br><br>Members who meet the above requirements must have their benefit based on the following:<br><br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement.<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Optional Form Conversion Factors** | Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2025 using scale AA, blended 55% males, and 6.5% interest. |

# Actuarial Basis

## Summary of Plan Provisions (Concluded)

| | |
|---|---|
| **Contribution Stabilizer** | The following is a summary of contribution stabilizer provisions in Minnesota Statute 352.045:<br><br>• If a contribution sufficiency of at least 1.0% has existed for two consecutive years, member and employer contributions are decreased by at most 0.25% to a level that is necessary to maintain a 1.0% sufficiency. A contribution rate decrease under this section must not be made until at least two years have passed since fully implementing a previous decrease.<br><br>• If a contribution deficiency of at least 0.5% has existed for two consecutive years, the member and employer contribution rates are increased as follows:<br><br>o If the contribution deficiency is less than 2.0%, member and employer contributions are each increased by 0.25%.<br><br>o If the contribution deficiency is greater than 1.99% and less than 4.01%, member and employer contributions are each increased by 0.50%.<br><br>o If the contribution deficiency is greater than 4.0%, member and employer contributions are each increased by 0.75%. |
| **Changes in Plan Provisions** | Member and employer contribution rates increased from 5.0% to 5.5% of pay effective the first day of the first full pay period beginning after July 1, 2014.<br><br>Effective July 1, 2014, the funding ratio threshold that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years. |

# Additional Schedules

## Schedule of Funding Progress[1] *(Dollars in Thousands)*

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded (Overfunded) AAL (UAAL) (b) - (a) | Funded Ratio (a)/(b) | Actual Covered Payroll (Previous FY) (c) | UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c) |
|---|---|---|---|---|---|---|
| 7-1-1991 | $ 2,304,311 | $ 2,883,603 | $ 579,292 | 79.91% | $ 1,370,964 | 42.25 % |
| 7-1-1992 | 2,613,472 | 3,125,299 | 511,827 | 83.62 | 1,409,108 | 36.32 |
| 7-1-1993 | 2,905,578 | 3,563,492 | 657,914 | 81.54 | 1,482,005 | 44.39 |
| 7-1-1994 | 3,158,068 | 3,876,584 | 718,516 | 81.47 | 1,536,978 | 46.75 |
| 7-1-1995 | 3,462,098 | 3,795,926 | 333,828 | 91.21 | 1,514,177 | 22.05 |
| 7-1-1996 | 3,975,832 | 4,087,273 | 111,441 | 97.27 | 1,560,369 | 7.14 |
| 7-1-1997 | 4,664,519 | 4,519,542 | (144,977) | 103.21 | 1,568,747 | (9.24) |
| 7-1-1998 | 5,390,526 | 5,005,165 | (385,361) | 107.70 | 1,557,880 | (24.74) |
| 7-1-1999 | 5,968,692 | 5,464,207 | (504,485) | 109.23 | 1,649,469 | (30.58) |
| 7-1-2000 | 6,744,165 | 6,105,703 | (638,462) | 110.46 | 1,733,054 | (36.84) |
| 7-1-2001 | 7,366,673 | 6,573,193 | (793,480) | 112.07 | 1,834,042 | (43.26) |
| 7-1-2002 | 7,673,028 | 7,340,397 | (332,631) | 104.53 | 1,915,350 | (17.37) |
| 7-1-2003 | 7,757,292 | 7,830,671 | 73,379 | 99.06 | 2,009,975 | 3.65 |
| 7-1-2004 | 7,884,984 | 7,878,363 | (6,621) | 100.08 | 1,965,546 | (0.34) |
| 7-1-2005 | 8,081,736 | 8,455,336 | 373,600 | 95.58 | 1,952,320 | 19.14 |
| 7-1-2006 | 8,486,756 | 8,819,161 | 332,405 | 96.23 | 2,016,588 | 16.48 |
| 7-1-2007 | 8,904,517 | 9,627,305 | 722,788 | 92.49 | 2,095,310 | 34.50 |
| 7-1-2008 | 9,013,456 | 9,994,602 | 981,146 | 90.18 | 2,256,528 | 43.48 |
| 7-1-2009 | 9,030,401 | 10,512,760 | 1,482,359 | 85.90 | 2,329,499 | 63.63 |
| 7-1-2010 | 8,960,391 | 10,264,071 | 1,303,680 | 87.30 | 2,327,398 | 56.01 |
| 7-1-2011 | 9,130,011 | 10,576,481 | 1,446,470 | 86.32 | 2,440,580 | 59.27 |
| 7-1-2012 | 9,162,301 | 11,083,227 | 1,920,926 | 82.67 | 2,367,160 [2] | 81.15 |
| 7-1-2013 | 9,375,780 | 11,428,641 | 2,052,861 | 82.04 | 2,483,000 [2] | 82.68 |
| 7-1-2014 | 10,326,272 | 12,445,126 | 2,118,854 | 82.97 | 2,620,660 [2] | 80.85 |

[1] *Information prior to 2012 provided by prior actuaries. See prior reports for additional detail.*
[2] *Assumed equal to actual member contributions divided by 5.00%.*

# Additional Schedules

## Schedule of Contributions from the Employer and Other Contributing Entities[1]

*(Dollars in Thousands)*

| Plan Year Ended June 30 | Actuarially Required Contribution Rate (a) | Actual Covered Payroll (b) | Actual Member Contributions (c) | Annual Required Contributions [(a)x(b)] - (c) = (d) | Actual Employer Contributions[2] (e) | Percentage Contributed (e)/(d) |
|---|---|---|---|---|---|---|
| 1991 | 8.17% | $ 1,370,964 | $ 56,895 | $ 55,113 | $ 57,986 | 105.21% |
| 1992 | 7.86 | 1,409,108 | 58,478 | 52,278 | 59,244 | 113.33 |
| 1993 | 8.27 | 1,482,005 | 59,132 | 63,430 | 58,982 | 92.99 |
| 1994 | 8.93 | 1,536,978 | 62,555 | 74,697 | 60,741 | 81.32 |
| 1995 | 9.15 | 1,514,177 | 61,627 | 76,920 | 63,161 | 82.11 |
| 1996 | 8.05 | 1,560,369 | 63,507 | 62,103 | 65,557 | 105.56 |
| 1997 | 7.21 | 1,568,747 | 63,848 | 49,259 | 66,568 | 135.14 |
| 1998 | 7.13 | 1,557,880 | 62,901 | 48,176 | 62,315 | 129.35 |
| 1999 | 6.48 | 1,649,469 | 66,823 | 40,063 | 65,979 | 164.69 |
| 2000 | 6.12 | 1,733,054 | 70,378 | 35,685 | 69,322 | 194.26 |
| 2001 | 7.12 | 1,834,042 | 74,364 | 56,220 | 73,362 | 130.49 |
| 2002 | 6.79 | 1,915,350 | 79,487 | 50,565 | 76,614 | 151.52 |
| 2003 | 8.34 | 2,009,975 | 83,850 | 83,782 | 80,399 | 95.96 |
| 2004 | 9.43 | 1,965,546 | 82,103 | 103,248 | 78,622 | 76.15 |
| 2005 | 9.33 | 1,952,323 | 83,101 | 99,051 | 80,312 | 81.08 |
| 2006 | 10.55 | 2,016,588 | 85,379 | 127,371 | 82,645 | 64.88 |
| 2007 | 10.11 | 2,095,310 | 89,447 | 122,389 | 86,492 | 70.67 |
| 2008 | 11.76 | 2,256,528 | 99,280 | 166,088 | 96,746 | 58.25 |
| 2009 | 12.39 | 2,329,499 | 108,866 | 179,759 | 107,211 | 59.64 |
| 2010 | 14.85 | 2,327,398 | 115,180 | 230,439 | 113,716 | 49.35 |
| 2011 | 10.99 | 2,440,580 | 122,029 | 146,191 | 118,563 | 81.10 |
| 2012 | 11.03 | 2,367,160 [3] | 118,358 | 142,740 | 115,159 | 80.68 |
| 2013 | 12.32 | 2,483,000 [3] | 124,150 | 181,756 | 121,673 | 66.94 |
| 2014 | 12.45 | 2,620,660 [3] | 131,033 | 195,239 | 128,037 | 65.58 |
| 2015 | 12.82 | N/A | N/A | N/A | N/A | N/A |

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
[2] *Includes contributions from other sources (if applicable).*
[3] *Assumed equal to actual member contributions divided by 5.00%.*

# Glossary of Terms

| | |
|---|---|
| ***Accrued Benefit Funding Ratio*** | The ratio of assets to Current Benefit Obligations. |
| ***Accrued Liability Funding Ratio*** | The ratio of assets to Actuarial Accrued Liability. |
| ***Actuarial Accrued Liability (AAL)*** | The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs. |
| ***Actuarial Assumptions*** | Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items. |
| ***Actuarial Cost Method*** | A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability. |
| ***Actuarial Equivalent*** | Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions. |
| ***Actuarial Present Value (APV)*** | The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made. |
| ***Actuarial Present Value of Projected Benefits*** | The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due. |
| ***Actuarial Valuation*** | The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for developing and monitoring a retirement system's funding policy, such as the Funded Ratio and the Annual Required Contribution (ARC). |
| ***Actuarial Value of Assets*** | The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC). |

# Glossary of Terms (Continued)

| | |
|---|---|
| ***Amortization Method*** | A method for determining the Amortization Payment. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. The stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase. |
| ***Amortization Payment*** | That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability. |
| ***Amortization Period*** | The period used in calculating the Amortization Payment. |
| ***Annual Required Contribution (ARC)*** | The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ARC consists of the Employer Normal Cost and Amortization Payment. |
| ***Augmentation*** | Annual increases to deferred benefits. |
| ***Closed Amortization Period*** | A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. |
| ***Current Benefit Obligations*** | The present value of benefits earned to the valuation date, based on current service and including future salary increases to retirement. |
| ***Employer Normal Cost*** | The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions. |
| ***Expected Assets*** | The present value of anticipated future contributions intended to fund benefits for current members. |
| ***Experience 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 valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected. |

# Glossary of Terms (Concluded)

| | |
|---|---|
| ***GASB*** | Governmental Accounting Standards Board. |
| ***GASB Statements No. 25 and No. 27*** | These are the governmental accounting standards that set the accounting and financial reporting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves. These statements remain in effect only for pension plans that are not administered as trusts or equivalent arrangements. Please refer to the definition of GASB Statements No. 67 and No. 68 below. |
| ***GASB Statement No. 50*** | The accounting standard governing a state or local governmental employer's accounting for pensions. This statement remains in effect only for pension plans that are not administered as trusts. Please refer to the definition of GASB Statements No. 67 and No. 68. |
| ***GASB Statements No. 67 and No. 68*** | Statements No. 67 and No. 68, issued in June 2012, replace the requirements of Statements No. 25, No. 27 and No. 50, respectively, for pension plans administered as trusts. Statement No. 68, effective for the fiscal year beginning July 1, 2014, sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67, effective for the fiscal year beginning July 1, 2013, sets the rules for the systems themselves. Accounting and financial reporting rules information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the June 30, 2014 actuarial valuation. |
| ***Normal Cost*** | The annual cost assigned, under the Actuarial Cost Method, to the current plan year. |
| ***Projected Benefit Funding Ratio*** | The ratio of the sum of Actuarial Value of Assets and Expected Assets to the Actuarial Present Value of Projected Benefits. |
| ***Unfunded Actuarial Accrued Liability*** | The difference between the Actuarial Accrued Liability and Actuarial Value of Assets. |
| ***Valuation Date*** | The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date. |

Gabriel Roeder Smith & Company
Consultants & Actuaries

# MINNESOTA STATE RETIREMENT SYSTEM

# CORRECTIONAL EMPLOYEES RETIREMENT FUND

## ACTUARIAL VALUATION REPORT AS OF JULY 1, 2014

GRS

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December 12, 2014

Minnesota State Retirement System
Correctional Employees Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

The results of the July 1, 2014 annual actuarial valuation of the Correctional Employees Retirement Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by the Board and staff and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety. GRS is not responsible for the consequences of any unauthorized use of this report.

The purpose of the valuation is to measure the Fund's funding progress, to determine the required contribution rate for the fiscal year beginning July 1, 2014. Note that we have not attempted to quantify the impact of GASB Statements No. 67 and No. 68 in this report. Please see the separate report dated December 1, 2014.

The valuation was based upon information furnished by the Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions, active members, terminated members, retirees, and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by MSRS.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Directors. 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. MSRS is solely responsible for communicating to GRS any changes required thereto.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. A revision of ASOP No. 27, applicable to valuation dates on or after September 30, 2014, will guide assumption setting for future valuations. A recent review of inflation and investment return assumptions for accounting and financial reporting purposes developed a recommended range of 6.99% to 7.92% for the assumed investment return. Additional review and discussion will be required before the next valuation.

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 such future measurements.

This report should not be relied on for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.  In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the Correctional Employees Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR.  All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Based on the current statutory contributions, the unfunded liability determined on an actuarial value of asset basis will not be eliminated if all actuarial assumptions are met.

We are available to answer any questions or provide further details.

Respectfully submitted,

Brian B. Murphy

Brian B. Murphy, FSA, EA, MAAA

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA

BBM/BJW:sc

# Contents

# Summary of Valuation Results

## Contributions

The following table summarizes important contribution information as described in the Development of Costs section.

| Contributions | Actuarial Valuation as of July 1, 2014 | Actuarial Valuation as of July 1, 2013 |
|---|---|---|
| Statutory Contributions - Chapter 352.92 (% of Payroll) | 21.95% | 20.70% |
| Required Contributions - Chapter 356 (% of Payroll) | 26.43% | 26.11% |
| Sufficiency / (Deficiency) | (4.48)% | (5.41)% |

The contribution deficiency decreased from (5.41)% of payroll to (4.48)% of payroll. The primary reasons for the decreased contribution deficiency are the recognition of investment gains from prior years in the actuarial value of assets and the increase in member and employer contributions. The 2014 required contribution reflects additional liability due to the assumption change that the post-retirement benefit increase rate will increase from 2.0% to 2.5% in 2034. A significant contribution deficiency remains.

Statutory contributions are not sufficient to fully amortize the unfunded actuarial accrued liability over the statutory amortization period of 24 years. Based on the current member and employer contribution rates, market value of assets, and other methods and assumptions described in this report, the unfunded liability will be eliminated in 47 years. Current contributions are not sufficient to cover interest on the unfunded liability, which will result in the unfunded liability growing in the short-term. On a market value of assets basis, contributions are deficient by 1.86% of payroll.

The Plan Assets section provides detail on the plan assets used for the valuation including a development of the actuarial value of assets (AVA). The market value of assets (MVA) earned approximately 18.6% for the plan year ending June 30, 2014. The AVA earned approximately 13.8% for the plan year ending June 30, 2014 as compared to the assumed rate of 8.0%. This assumed rate is a prescribed assumption mandated by Minnesota Statutes.

Participant reconciliation and statistics are detailed in the Membership Data section. The Actuarial Basis section includes a summary of plan provisions and actuarial methods and assumptions used for the calculations in this report.

Accounting and financial reporting information prepared according to GASB Statements No. 67 and No. 68 was provided to MSRS in a separate report dated December 1, 2014.

# Summary of Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in plan provisions, actuarial assumptions or valuation methods and procedures between the two valuations are described after the summary.

| | Actuarial Valuation as of | |
|---|---|---|
| | **July 1, 2014** | **July 1, 2013** |
| **Contributions** (*% of Payroll*) | | |
| Statutory - Chapter 352 | 21.95% | 20.70% |
| Required - Chapter 356 | 26.43% | 26.11% |
| Sufficiency / (Deficiency) | (4.48)% | (5.41)% |
| **Funding Ratios** (*dollars in thousands*) | | |
| Assets | | |
| - Current assets (AVA) | $ 790,304 | $ 701,091 |
| - Current assets (MVA) | 877,056 | 747,157 |
| Accrued Benefit Funding Ratio | | |
| - Current benefit obligations | $ 1,067,323 | $ 977,652 |
| - Funding ratio (AVA) | 74.05% | 71.71% |
| - Funding ratio (MVA) | 82.17% | 76.42% |
| Accrued Liability Funding Ratio | | |
| - Actuarial accrued liability | $ 1,122,474 | $ 1,026,098 |
| - Funding ratio (AVA) | 70.41% | 68.33% |
| - Funding ratio (MVA) | 78.14% | 72.82% |
| Projected Benefit Funding Ratio | | |
| - Current and expected future assets | $ 1,227,802 | $ 1,083,641 |
| - Current and expected future benefit obligations | 1,376,360 | 1,256,425 |
| - Projected benefit funding ratio (AVA) | 89.21% | 86.25% |
| **Participant Data** | | |
| Active members | | |
| - Number | 4,504 | 4,384 |
| - Projected annual earnings *(000s)* | 227,008 | 212,972 |
| - Average projected annual earnings | 50,401 | 48,579 |
| - Average age | 41.5 | 41.5 |
| - Average service | 8.7 | 8.8 |
| Service retirements | 2,075 | 1,920 |
| Survivors | 174 | 196 |
| Disability retirements | 268 | 258 |
| Deferred retirements | 1,232 | 1,196 |
| Terminated other non-vested | 384 | 413 |
| **Total** | **8,637** | **8,367** |

# Summary of Valuation Results

## Effects of Changes

The following changes in plan provisions, actuarial assumptions, and methods were recognized as of July 1, 2014:

- Effective July 1, 2014, the actuarial accrued liability funding ratio threshold, determined on a market value of assets basis, that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years.
- The methodology for valuing future post-retirement benefit increases was clarified in statutes, and the assumed post-retirement benefit increase rate was changed from 2.0% per year indefinitely to 2.0% per year through 2033 and 2.5% per year thereafter.
- Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.
- Member contribution rates increased from 8.60% to 9.10% of pay and employer contribution rates increased from 12.10% to 12.85% of pay effective the first day of the first full pay period beginning after July 1, 2014.

Refer to the Actuarial Basis section of this report for a complete description of these changes. The combined impact of the above changes was to increase the accrued liability by $31.9 million and increase the required contribution by 0.7% of pay, as follows:

| | **Before Changes** | **Reflecting Plan Changes** | **Reflecting Plan and Assumption Changes** |
|---|---|---|---|
| Normal Cost Rate, % of pay | 15.4% | 15.4% | 16.1% |
| Amortization of UAAL*, % of pay | 9.1% | 9.1% | 10.0% |
| Expenses (% of pay) | 0.3% | 0.3% | 0.3% |
| Total Required Contribution, % of pay | 24.8% | 24.8% | 26.4% |
| Accrued Liability Funding Ratio | 72.5% | 72.5% | 70.4% |
| Projected Benefit Funding Ratio | 89.8% | 92.9% | 89.2% |
| UAAL* (in millions) | $300.3 | $300.3 | $332.2 |

** Unfunded Actuarial Accrued Liability*

# Summary of Valuation Results

## Valuation of Future Annual Post-Retirement Benefit Increases

Benefit recipients receive a future annual compounding 2.0% post-retirement benefit increase. If the funding ratio, determined on a market value of assets basis, reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.5%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns and liability discount rates of 8.00% through June 30, 2017; 8.50% thereafter;
- Open group; stable active population (new member profile based on average new members hired in recent years);
- The post-retirement benefit increase rate is assumed to be 2.0% per year until the funding ratio threshold required to pay a 2.5% post-retirement benefit increase is reached; and
- Current statutory contribution levels (i.e., not including potential contribution increases under the contribution stabilizer statutes).

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay a 2.5% post-retirement benefit increase in the year 2033, and that the plan would begin paying 2.5% benefit increases on January 1, 2034. This assumption is reflected in our calculations. This is only an assumption; actual timing will depend on actual experience.

# Supplemental Information

The remainder of the report includes information supporting the results presented in the previous sections.

- **Plan assets** presents information about the plan's assets as reported by the Minnesota State Retirement System. The assets represent the portion of total fund liabilities that has been funded.
- **Membership data** presents and describes the membership data used in the valuation.
- **Development of costs** shows the liabilities for plan benefits and the derivation of the contribution amount.
- **Actuarial basis** describes the plan provisions, as well as the methods and assumptions used to value the plan. The valuation is based on the premise that the plan is ongoing.
- **Additional Schedules** includes a summary of funding progress over the long term.
- **Glossary** defines the terms used in this report.

# Plan Assets

## Statement of Fiduciary Net Position *(Dollars in Thousands)*

| | Market Value | |
|---|---|---|
| **Assets** | **June 30, 2014** | **June 30, 2013** |
| Cash, equivalents, short term securities | $ 24,460 | $ 20,772 |
| Fixed income | 204,488 | 171,241 |
| Equity | 647,977 | 554,719 |
| Other* | 94,843 | 72,738 |
| **Total cash, investments, and other assets** | **$ 971,768** | **$ 819,470** |
| Amounts Receivable | 1,607 | 1,346 |
| **Total Assets** | **$ 973,375** | **$ 820,816** |
| Amounts Payable* | (96,319) | (73,659) |
| **Net Position Restricted for Pensions** | **$ 877,056** | **$ 747,157** |

** Includes $94,843 in Securities Lending Collateral as of June 30, 2014 and $72,738 as of June 30, 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 the Minnesota State Retirement System for the prior two fiscal years.

| **Change in Assets** | **Market Value** | |
|---|---|---|
| **Year Ending** | **June 30, 2014** | **June 30, 2013** |
| **1. Fund balance at market value at beginning of year** | **$ 747,157** | **$ 659,523** |
| 2. Contributions | | |
| a. Member | 18,855 | 17,561 |
| b. Employer | 26,468 | 24,632 |
| c. Other sources | 0 | 0 |
| d. Total contributions | $ 45,323 | $ 42,193 |
| 3. Investment income | | |
| a. Investment income/(loss) | 138,740 | 94,414 |
| b. Investment expenses | (1,217) | (1,022) |
| c. Net investment income/(loss) | 137,523 | 93,392 |
| 4. Other | 0 | 0 |
| **5. Total income:** *(2.d.) + (3.c.) + (4.)* | **$ 182,846** | **$ 135,585** |
| 6. Benefits Paid | | |
| a. Annuity benefits | (50,842) | (46,226) |
| b. Refunds | (1,447) | (1,032) |
| c. Total benefits paid | (52,289) | (47,258) |
| 7. Expenses | | |
| a. Other | (1) | (1) |
| b. Administrative | (657) | (692) |
| c. Total expenses | (658) | (693) |
| **8. Total disbursements:** *(6.c.) + (7.c.)* | **(52,947)** | **(47,951)** |
| **9. Fund balance at market value at end of year:** *(1.) + (5.) + (8.)* | **$ 877,056** | **$ 747,157** |
| 10. State Board of Investment calculated investment return | 18.6% | 14.2% |

# Plan Assets

## Actuarial Asset Value *(Dollars in Thousands)*

| | June 30, 2014 | June 30, 2013 |
|---|---|---|
| **1. Market value of assets available for benefits** | **$ 877,056** | **$ 747,157** |
| 2. Determination of average balance | | |
| a. Total assets available at beginning of year | 747,157 | 659,523 |
| b. Total assets available at end of year | 877,056 | 747,157 |
| c. Net investment income for fiscal year | 137,523 | 93,392 |
| d. Average balance *[a. + b. - c.] / 2* | 743,345 | 656,644 |
| 3. Expected return *[8.0% x 2.d.]* | 59,468 | 52,532 |
| 4. Actual return | 137,523 | 93,392 |
| 5. Current year asset gain/(loss) *[4. - 3.]* | 78,055 | 40,860 |

6. Unrecognized asset returns

| | Original Amount | Unrecognized Amount % | Unrecognized Amount Dollar | Unrecognized Amount % | Unrecognized Amount Dollar |
|---|---|---|---|---|---|
| a. Year ended June 30, 2014 | $ 78,055 | 80% | $ 62,445 | | N/A |
| b. Year ended June 30, 2013 | 40,860 | 60% | 24,516 | 80% | $ 32,688 |
| c. Year ended June 30, 2012 | (38,907) | 40% | (15,563) | 60% | (23,344) |
| d. Year ended June 30, 2011 | 76,770 | 20% | 15,354 | 40% | 30,708 |
| e. Year ended June 30, 2010 | 30,070 | | N/A | 20% | 6,014 |
| **f. Unrecognized return adjustment** | | | **$ 86,752** | | **$ 46,066** |

| | June 30, 2014 | June 30, 2013 |
|---|---|---|
| 7. **Actuarial value at end of year** *(1. - 6.f.)* | **$ 790,304** | **$ 701,091** |
| 8. Approximate return on actuarial value of assets during fiscal | 13.8% | 6.4% |
| 9. Ratio of actuarial value of assets to market value of assets | 0.90 | 0.94 |

# Membership Data

## Distribution of Active Members

| | Years of Service as of June 30, 2014 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3*** | **3 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25 - 29** | **30 - 34** | **35+** | **Total** |
| < 25 | 121 | 8 | | | | | | | | **129** |
| Avg. Earnings | 30,629 | 38,660 | | | | | | | | **31,127** |
| 25 - 29 | 392 | 67 | 80 | | | | | | | **539** |
| Avg. Earnings | 35,111 | 40,591 | 42,634 | | | | | | | **36,909** |
| 30 - 34 | 240 | 104 | 377 | 50 | | | | | | **771** |
| Avg. Earnings | 35,747 | 42,580 | 45,295 | 49,877 | | | | | | **42,254** |
| 35 - 39 | 131 | 50 | 266 | 147 | 15 | | | | | **609** |
| Avg. Earnings | 36,478 | 44,520 | 46,526 | 53,200 | 59,222 | | | | | **46,123** |
| 40 - 44 | 100 | 29 | 198 | 154 | 120 | 10 | 1 | | | **612** |
| Avg. Earnings | 39,180 | 43,373 | 48,134 | 52,591 | 60,290 | 60,270 | 73,496 | | | **50,190** |
| 45 - 49 | 94 | 40 | 131 | 127 | 131 | 92 | 12 | | | **627** |
| Avg. Earnings | 40,862 | 43,537 | 49,640 | 52,523 | 60,652 | 62,968 | 69,756 | | | **53,160** |
| 50 - 54 | 86 | 27 | 178 | 118 | 105 | 92 | 71 | 20 | | **697** |
| Avg. Earnings | 42,403 | 51,091 | 53,005 | 54,929 | 60,511 | 61,458 | 66,082 | 70,277 | | **56,023** |
| 55 - 59 | 35 | 27 | 119 | 63 | 61 | 33 | 13 | 13 | 2 | **366** |
| Avg. Earnings | 48,787 | 52,841 | 54,081 | 57,039 | 59,555 | 59,826 | 63,936 | 65,921 | 54,844 | **56,197** |
| 60 - 64 | 17 | 8 | 41 | 27 | 21 | 9 | 2 | 3 | | **128** |
| Avg. Earnings | 43,399 | 43,608 | 55,690 | 60,180 | 55,701 | 63,498 | 70,477 | 64,606 | | **55,240** |
| 65 - 69 | 5 | 1 | 7 | 7 | 2 | | | 1 | | **23** |
| Avg. Earnings | 35,573 | 130,805 | 58,442 | 62,861 | 104,340 | | | 61,191 | | **62,072** |
| 70+ | | 1 | 1 | 1 | | | | | | **3** |
| Avg. Earnings | | 14,775 | 59,346 | 67,530 | | | | | | **47,217** |
| **Total** | **1,221** | **362** | **1,398** | **694** | **455** | **236** | **99** | **37** | **2** | **4,504** |
| **Avg. Earnings** | **36,737** | **44,152** | **48,296** | **53,733** | **60,293** | **61,846** | **66,410** | **68,041** | **54,844** | **48,153** |

* *This exhibit does not reflect service earned in other MSRS or Combined Service Annuity benefits. It should not be relied upon as an indicator of non-vested status.*

In each cell, the top number is the count of active participants for the age/service combination and the bottom number is average valuation earnings for the fiscal year ending on the valuation date.

# Membership Data

## Distribution of Service Retirements

| | Years Retired as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <50 | | 4 | | | | | | **4** |
| Avg. Benefit | | 5,400 | | | | | | **5,400** |
| 50 - 54 | 24 | 53 | 3 | 1 | | | | **81** |
| Avg. Benefit | 23,071 | 17,268 | 5,371 | 5,418 | | | | **18,400** |
| 55 - 59 | 77 | 305 | 48 | | 1 | | | **431** |
| Avg. Benefit | 24,005 | 24,873 | 25,902 | | 39,068 | | | **24,866** |
| 60 - 64 | 36 | 162 | 327 | 49 | | | | **574** |
| Avg. Benefit | 18,276 | 18,869 | 22,613 | 22,725 | | | | **21,294** |
| 65 - 69 | 7 | 93 | 96 | 299 | 12 | | | **507** |
| Avg. Benefit | 9,959 | 9,284 | 15,364 | 18,100 | 22,461 | | | **15,955** |
| 70 - 74 | 2 | 18 | 48 | 59 | 104 | 1 | | **232** |
| Avg. Benefit | 3,595 | 10,160 | 11,238 | 15,313 | 25,192 | 29,228 | | **18,457** |
| 75 - 79 | 1 | 2 | 10 | 33 | 44 | 44 | | **134** |
| Avg. Benefit | 8,737 | 27,536 | 10,847 | 17,282 | 24,098 | 29,262 | | **23,063** |
| 80 - 84 | | | | 5 | 12 | 15 | 34 | **66** |
| Avg. Benefit | | | | 9,014 | 21,811 | 32,255 | 24,664 | **24,685** |
| 85 - 89 | | | | | 1 | 8 | 18 | **27** |
| Avg. Benefit | | | | | 27,565 | 12,948 | 31,037 | **25,549** |
| 90+ | | | | | | | 19 | **19** |
| Avg. Benefit | | | | | | | 26,949 | **26,949** |
| **Total** | **147** | **637** | **532** | **446** | **174** | **68** | **71** | **2,075** |
| **Avg. Benefit** | **21,399** | **19,908** | **20,257** | **18,048** | **24,587** | **28,002** | **26,891** | **20,600** |

In each cell, the top number is the count of retired participants for the age/years retired combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Survivors

| | Years Since Death as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <45 | 4 | 7 | 1 | 1 | | | | **13** |
| Avg. Benefit | 15,834 | 9,043 | 287 | 7,320 | | | | **10,326** |
| 45 - 49 | 2 | 3 | 3 | 1 | | | | **9** |
| Avg. Benefit | 22,969 | 8,875 | 8,154 | 16,512 | | | | **12,615** |
| 50 - 54 | | 1 | 2 | | | | | **3** |
| Avg. Benefit | | 5,573 | 8,990 | | | | | **7,851** |
| 55 - 59 | 2 | 8 | 8 | 6 | 3 | | | **27** |
| Avg. Benefit | 21,250 | 18,912 | 16,031 | 8,824 | 11,385 | | | **15,153** |
| 60 - 64 | 3 | 7 | 7 | 9 | 2 | 1 | | **29** |
| Avg. Benefit | 25,434 | 16,649 | 9,430 | 14,732 | 2,858 | 9,426 | | **14,020** |
| 65 - 69 | 3 | 7 | 10 | 10 | 7 | | | **37** |
| Avg. Benefit | 17,634 | 17,873 | 15,769 | 11,887 | 15,696 | | | **15,255** |
| 70 - 74 | | 7 | 4 | 2 | 2 | 1 | 1 | **17** |
| Avg. Benefit | | 17,889 | 14,112 | 8,113 | 14,211 | 9,743 | 6,654 | **14,277** |
| 75 - 79 | 1 | 1 | 5 | 3 | 7 | | | **17** |
| Avg. Benefit | 4,676 | 13,747 | 25,724 | 23,062 | 15,773 | | | **19,214** |
| 80 - 84 | | 6 | 1 | 1 | 1 | 1 | 1 | **11** |
| Avg. Benefit | | 20,344 | 37,150 | 24,808 | 8,477 | 13,513 | 6,717 | **19,339** |
| 85 - 89 | 1 | 2 | 2 | 2 | 1 | | | **8** |
| Avg. Benefit | 18,085 | 12,426 | 11,339 | 14,283 | 28,557 | | | **15,342** |
| 90+ | | 1 | | | 1 | | 1 | **3** |
| Avg. Benefit | | 11,787 | | | 1,741 | | 4,064 | **5,864** |
| **Total** | **16** | **50** | **43** | **35** | **24** | **3** | **3** | **174** |
| **Avg. Benefit** | **18,984** | **15,722** | **14,874** | **13,343** | **13,640** | **10,894** | **5,812** | **14,793** |

In each cell, the top number is the count of survivors for the age/years since death combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Disability Retirements

| | Years Disabled as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| < 45 | 1 | 17 | 6 | 7 | | | | **31** |
| Avg. Benefit | 14,507 | 16,094 | 14,649 | 18,113 | | | | **16,219** |
| 45 - 49 | 6 | 8 | 8 | 10 | 1 | | | **33** |
| Avg. Benefit | 14,911 | 17,297 | 17,059 | 18,540 | 30,198 | | | **17,573** |
| 50 - 54 | 4 | 13 | 15 | 9 | 5 | | | **46** |
| Avg. Benefit | 13,843 | 22,942 | 17,769 | 19,483 | 29,768 | | | **20,529** |
| 55 - 59 | 2 | 21 | 16 | 17 | 6 | 2 | | **64** |
| Avg. Benefit | 13,572 | 17,588 | 18,584 | 23,478 | 27,662 | 25,058 | | **20,454** |
| 60 - 64 | 3 | 9 | 13 | 20 | 9 | 1 | | **55** |
| Avg. Benefit | 17,784 | 17,511 | 17,214 | 20,261 | 23,978 | 29,059 | | **19,724** |
| 65 - 69 | | 6 | 3 | 9 | 7 | 1 | | **26** |
| Avg. Benefit | | 17,750 | 19,201 | 15,274 | 17,929 | 22,599 | | **17,295** |
| 70 - 74 | | | 3 | 4 | 2 | | | **9** |
| Avg. Benefit | | | 19,210 | 28,456 | 27,682 | | | **25,202** |
| 75+ | | | | 1 | | 2 | 1 | **4** |
| Avg. Benefit | | | | 20,088 | | 20,564 | 25,255 | **21,618** |
| **Total** | **16** | **74** | **64** | **77** | **30** | **6** | **1** | **268** |
| **Avg. Benefit** | **14,990** | **18,158** | **17,613** | **20,302** | **24,723** | **23,817** | **25,255** | **19,343** |

In each cell, the top number is the count of disabled participants for the age/years since disability combination and the bottom number is the average annual benefit amount.

# Membership Data

## Reconciliation of Members

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2013** | **4,384** | **1,196** | **413** | **1,920** | **258** | **196** | **8,367** |
| New members | 510 | 0 | 0 | 0 | 0 | 0 | **510** |
| Return to active | 32 | (20) | (12) | 0 | 0 | 0 | **0** |
| Terminated non-vested | (99) | 0 | 99 | 0 | 0 | 0 | **0** |
| Service retirements | (115) | (27) | 0 | 142 | 0 | 0 | **0** |
| Terminated deferred | (105) | 105 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | (77) | (18) | (144) | 0 | 0 | 0 | **(239)** |
| Deaths | (9) | (2) | 0 | (21) | (3) | (2) | **(37)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 19 | **19** |
| Disabled | (12) | 0 | 0 | 0 | 12 | 0 | **0** |
| Unexpected status changes | (5) | (2) | 28 | 34 | 1 | (39) | **17** |
| Net change | 120 | 36 | (29) | 155 | 10 | (22) | **270** |
| **Members on 6/30/2014** | **4,504** | **1,232** | **384** | **2,075** | **268** | **174** | **8,637** |

| Terminated Member Statistics | Deferred Retirement | Other Non-Vested | Total |
|---|---|---|---|
| Number | 1,232 | 384 | 1,616 |
| Average age | 45.3 | 37.2 | 43.4 |
| Average service | 5.7 | 0.9 | 4.6 |
| Average annual benefit, with augmentation to Normal Retirement Date and 30% CSA load | $ 11,548 | N/A | $11,548 |
| Average refund value, with 30% CSA load | $ 28,300 | $ 4,405 | $22,622 |

# Development of Costs

## Actuarial Valuation Balance Sheet *(Dollars in Thousands)*

The actuarial balance sheet is based on the principle that the long-term projected benefit obligations of the plan should be ideally equal to the long-term resources available to fund those obligations. The resources available to meet projected obligations for current members consist of current fund assets plus the present value of anticipated future contributions intended to fund benefits for current members. In the exhibit below, B.2 is the estimated present value of contributions to fund the normal cost rate for current members until their respective termination dates. Item B.1 is the present value of the total 21.95% statutory contribution net of normal cost and anticipated plan expenses during the period from the valuation date to the statutory unfunded amortization date.

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, 2014 |
|---|---|---|---|
| A. Actuarial Value of Assets | | | $ 790,304 |
| B. Expected Future Assets | | | |
| 1. Present value of expected future statutory supplemental contributions | | | $ 183,612 |
| 2. Present value of future normal cost contributions | | | 253,886 |
| 3. Total expected future assets: *(1.) + (2.)* | | | 437,498 |
| C. Total Current and Expected Future Assets | | | $ 1,227,802 |
| D. Current Benefit Obligations* | | | |
| 1. Benefit recipients | **Non-Vested** | **Vested** | **Total** |
| a. Service retirements | $ 0 | $ 459,868 | $ 459,868 |
| b. Disability retirements | 0 | 56,434 | 56,434 |
| c. Survivors | 0 | 26,747 | 26,747 |
| 2. Deferred retirements with augmentation | 0 | 104,863 | 104,863 |
| 3. Former members without vested rights** | 902 | 0 | 902 |
| 4. Active members | 14,167 | 404,342 | 418,509 |
| 5. Total Current Benefit Obligations | $ 15,069 | $ 1,052,254 | $ 1,067,323 |
| E. Expected Future Benefit Obligations | | | $ 309,037 |
| F. Total Current and Expected Future Benefit Obligations*** | | | $ 1,376,360 |
| G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)* | | | $ 277,019 |
| H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)* | | | $ 148,558 |
| I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)* | | | 74.05% |
| J. Projected Benefit Funding Ratio: *(C.)/(F.)* | | | 89.21% |

* *Present value of credited projected benefits (projected compensation, current service).*

** *Former members who have not satisfied vesting requirements and have not collected a refund of member contributions as of the valuation date.*

*** *Present value of projected benefits (projected compensation, projected service).*

# Development of Costs

## Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate (*Dollars in Thousands)*

| | Actuarial Present Value of Projected Benefits | Actuarial Present Value of Future Normal Costs | Actuarial Accrued Liability |
|---|---|---|---|
| A. Determination of Actuarial Accrued Liability (AAL) | | | |
| 1. Active members | | | |
| a. Retirement annuities | $ 607,525 | $ 172,374 | $ 435,151 |
| b. Disability benefits | 57,479 | 32,756 | 24,723 |
| c. Survivor's benefits | 8,212 | 2,816 | 5,396 |
| d. Deferred retirements | 51,829 | 36,908 | 14,921 |
| e. Refunds* | 2,501 | 9,032 | (6,531) |
| f. Total | $ 727,546 | $ 253,886 | $ 473,660 |
| 2. Deferred retirements with future augmentation | 104,863 | 0 | 104,863 |
| 3. Former members without vested rights | 902 | 0 | 902 |
| 4. Benefit recipients | 543,049 | 0 | 543,049 |
| 5. Total | $1,376,360 | $ 253,886 | $ 1,122,474 |
| B. Determination of Unfunded Actuarial Accrued Liability (UAAL) | | | |
| 1. Actuarial accrued liability | | | $ 1,122,474 |
| 2. Current assets (AVA) | | | 790,304 |
| 3. Unfunded actuarial accrued liability | | | $ 332,170 |
| C. Determination of Supplemental Contribution Rate** | | | |
| 1. Present value of future payrolls through the amortization date of June 30, 2038 | | | $ 3,314,292 |
| 2. Supplemental contribution rate: *(B.3.) / (C.1.)* | | | 10.02% *** |

* *Includes non-vested refunds and non-married survivor benefits only.*

** *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.*

*** *The amortization factor as of July 1, 2014 is 14.59989.*

# Development of Costs

## Changes in Unfunded Actuarial Accrued Liability (UAAL) *(Dollars in Thousands)*

| | Year Ending June 30, 2014 | | |
|---|---|---|---|
| | **Actuarial Accrued Liability** | **Current Assets** | **Unfunded Actuarial Accrued Liability** |
| A. Unfunded actuarial accrued liability at beginning of year | $ 1,026,098 | $ 701,091 | $ 325,007 |
| B. Changes due to interest requirements and current rate of funding | | | |
| 1. Normal cost, including expenses | $ 33,880 | $ 0 | $ 33,880 |
| 2. Benefit payments | (52,289) | (52,289) | 0 |
| 3. Contributions | 0 | 45,323 | (45,323) |
| 4. Interest on A., B.1., B.2. and B.3. | 85,317 | 55,809 | 29,508 |
| 5. Total *(B.1. + B.2. + B.3. + B.4.)* | 66,908 | 48,843 | 18,065 |
| C. Expected unfunded actuarial accrued liability at end of year *(A. + B.5.)* | | | $ 343,072 |
| D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected | | | |
| 1. Age and Service retirements | | | $ 13 |
| 2. Disability retirements | | | (750) |
| 3. Death-in-Service benefits | | | (105) |
| 4. Withdrawals | | | (1,472) |
| 5. Salary increases | | | 1,933 |
| 6. Investment income | | | (40,370) |
| 7. Mortality of annuitants | | | 1,505 |
| 8. Other items | | | (3,532) |
| 9. Total | | | (42,778) |
| E. Unfunded actuarial accrued liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.9.)* | | | $ 300,294 |
| F. Change in unfunded actuarial accrued liability due to changes in plan provisions | | | 0 |
| G. Change in unfunded actuarial accrued liability due to changes in actuarial assumptions | | | 31,876 |
| H. Change in unfunded actuarial accrued liability due to changes in actuarial methods | | | 0 |
| I. Unfunded actuarial accrued liability at end of year *(E. + F. + G. + H.)** | | | $ 332,170 |

** The unfunded actuarial accrued liability on a market value of assets basis is $245,418.*

# Development of Costs

## Determination of Contribution Sufficiency/(Deficiency) *(Dollars in Thousands)*

The required contribution is defined in Minnesota Statutes as the sum of normal cost, a supplemental contribution to amortize the UAAL, and an allowance for expenses.

| | Percent of Payroll | Dollar Amount |
|---|---|---|
| A. Statutory contributions - Chapter 352 | | |
| 1. Employee contributions | 9.10% | $ 20,658 |
| 2. Employer contributions | 12.85% | 29,171 |
| 3. Total | 21.95% | $ 49,829 |
| | | |
| B. Required contributions - Chapter 356 | | |
| 1. Normal cost | | |
| a. Retirement benefits | 11.17% | $ 25,356 |
| b. Disability benefits | 2.23% | 5,062 |
| c. Survivors | 0.18% | 409 |
| d. Deferred retirement benefits | 1.97% | 4,472 |
| e. Refunds* | 0.55% | 1,249 |
| f. Total | 16.10% | $ 36,548 |
| | | |
| 2. Supplemental contribution amortization of Unfunded Actuarial Accrued Liability by June 30, 2038 | 10.02% | $ 22,746 |
| | | |
| 3. Allowance for expenses | 0.31% | 704 |
| | | |
| 4. Total | 26.43% ** | $ 59,998 |
| | | |
| C. Contribution sufficiency/(deficiency) *(A.3. - B.4.)* | (4.48%) | $ (10,169) |

Note: Projected annual payroll for fiscal year beginning on the valuation date: $227,008.

* *Includes non-vested refunds and non-married survivor benefits only.*

** *The required contribution on a market value of assets basis is 23.81% of payroll.*

# Actuarial Basis

## Actuarial Methods

All actuarial methods are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement, or the MSRS Board of Directors. Different methodologies may also be reasonable and results based on other methodologies would be different.

### Actuarial Cost Method

Actuarial accrued liability and required contributions in this report are computed using the Entry Age Normal Cost method. This method is prescribed by Minnesota Statute. Under this method, a normal cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Age as of the valuation date was calculated based on the dates of birth provided by the Fund. Entry age for valuation purposes was calculated as the age on the valuation date minus the provided years of service on the valuation date.

To the extent that current assets and future normal costs do not support participants' expected future benefits, an unfunded actuarial accrued liability ("UAAL") develops. The UAAL is amortized over the statutory amortization period using level percent of payroll assuming payroll increases. The total contribution developed under this method is the sum of normal cost, expenses, and the payment toward the UAAL.

### Select and Ultimate Discount Rate Methodology

Based on direction from the LCPR's actuary, the select and ultimate discount rate methodology is applied to the entry age normal results as follows:

1. The present value of projected benefits is calculated using the prescribed select and ultimate discount rates.
2. An equivalent single interest rate that produces approximately the same present value of projected benefits is determined.
3. The equivalent single interest rate is used to determine the entry age normal accrued liability and normal cost.

The equivalent single interest rate used in this valuation is 8.41% (8.39% last year).

### Valuation of Future Post-Retirement Benefit Increases

If the plan has reached the funding ratio threshold required to pay a 2.5% benefit increase, Minnesota Statutes require the 2.5% benefit increase rate to be reflected in the liability calculations. If the plan has not yet reached the funding ratio threshold required to pay a 2.5% benefit increase, Minnesota Statutes require a projection to be performed to determine the expected attainment of the funding ratio threshold, and the expected reversion to a 2.5% benefit increase rate must be reflected in the liability calculations.

# Actuarial Basis

## Actuarial Methods (Concluded)

**Funding Objective**
The fundamental financing objective of the fund is to establish contribution rates which, when expressed as a percentage of active member payroll, will remain approximately level from generation to generation and meet the required deadline for full funding.

**Decrement Timing**
All decrements are assumed to occur mid-fiscal year.

**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.

**Payment on the Unfunded Actuarial Accrued Liability**
Payment equals a level percentage of payroll each year to the statutory amortization date of June 30, 2038 assuming payroll increases of 3.75% per annum. If there is a negative Unfunded Actuarial Accrued Liability, the surplus amount is amortized over 30 years as a level percentage of payroll. If the unfunded liability increases due to changes in benefits, assumptions, or methods, the statutory amortization date will be re-determined. Projected payroll is multiplied by 0.959 in the determination of the present value of future payroll to account for timing differences (as required by the Standards for Actuarial Work).

**Changes in Methods since Prior Valuation**
The methodology for valuing future post-retirement increases was clarified in Minnesota Statutes.

# Actuarial Basis

## Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The assumptions prescribed are based on the last experience study, dated February 2012, prepared by a former actuary.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment.

| | |
|---|---|
| Investment return | Select and Ultimate Rates:<br>July 1, 2014 to June 30, 2017 8.00% per annum<br><br>July 1, 2017 and later 8.50% per annum |
| Benefit increases after retirement | 2.00% per annum through 2033 and 2.5% per annum thereafter. |
| Salary increases | Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service. |
| Payroll growth | 3.75% per year. |
| Inflation | 3.00% per year. |
| Mortality rates | |
| Healthy Pre-retirement | RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment. |
| Healthy Post-retirement | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set forward one year for males and set back one year for females.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 120. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. |
| Disabled | RP-2000 disabled mortality table. |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. |
| Withdrawal | Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are:<br>Year — Select Withdrawal Rates<br>1 — 20%<br>2 — 15%<br>3 — 8% |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Disability | Age-related rates based on 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 participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | Prior year administrative expenses expressed as percentage of prior year projected payroll. |
| Refund of contributions | Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit 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 active members are assumed to be married. Actual marital status is used for members in payment status. |
| Age of spouse | Females are assumed to be three years younger than their male spouses. |
| Form of payment | Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows:<br><br>Males: 10% elect 50% Joint & Survivor option<br>10% elect 75% Joint & Survivor option<br>40% elect 100% Joint & Survivor option<br>Females: 10% elect 50% Joint & Survivor option<br>10% elect 75% Joint & Survivor option<br>30% elect 100% Joint & Survivor option<br><br>Remaining married members and unmarried members are assumed to elect the Straight Life option.<br><br>Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity, except that current terminated deferred members who terminated prior to July 1, 1997 are assumed to receive the Level Social Security option to age 62. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| 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. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by MSRS. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members</u>:<br>There were 11 members reported with zero or invalid salary. We used prior year salary (11 members).<br><br>There were no members reported with missing service.<br><br>There were no members reported with missing or invalid gender or birth dates.<br><br><u>Data for terminated members</u>:<br>There were 54 members reported without a benefit. If available, we calculated benefits for these members using the reported Average Salary, Credited Service and Termination Date provided. If Average Salary was not reported (26 members), we assumed a value of $30,000. If Credited Service was not reported (3 members), we assumed a value of 7.5 years. There were no members reported without a Termination Date.<br><br>There were 66 members who terminated after June 30, 1997 and who were reported with a benefit in the Accelerated to Age 62 option. Based on direction from MSRS, we adjusted benefits for these members to reflect the assumed life annuity election.<br><br>There were no members reported with missing or invalid gender or birth dates.<br><br><u>Data for members receiving benefits</u>:<br>There were no members reported with missing or invalid birth dates. There were 5 members reported with an invalid gender. We assumed male gender for the valuation.<br><br>There were retired members reported with a survivor option and an invalid or missing survivor gender (379 members) and/or survivor date of birth (322 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.<br><br>There were 2 members reported without a benefit. Due to the small number of members with missing benefits, we made no adjustment to the reported data for members receiving benefits. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | Data for members receiving benefits:<br>There were 19 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e. "bounce back"), if applicable.<br><br>There were 44 retirees reported with a bounce back annuity but were not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively.<br><br>There was 1 retired member with an accelerated benefit election and an invalid end date. We assumed the benefit ends on the member's 62nd birthday.<br><br>There were no survivors reported on the data file with an expired benefit.<br><br>At MSRS' direction, we changed the status of 40 members who were reported with a disabled status at the beginning of the year and a retired status at the end of the year back to disabled status. |
| Changes in actuarial assumptions | Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.<br><br>The assumed post-retirement benefit increase rate was changed from 2.0% per year to 2.0% per year through 2033 and 2.5% per year thereafter. See page 4 for additional detail about this assumption. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | Rate (%)* | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality | |
| Age | Male | Female | Male | Female | Male | Female |
| 20 | 0.04% | 0.02% | 0.03% | 0.02% | 2.26% | 0.75% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 | 2.26 | 0.75 |
| 30 | 0.04 | 0.02 | 0.04 | 0.03 | 2.26 | 0.75 |
| 35 | 0.06 | 0.04 | 0.06 | 0.05 | 2.26 | 0.75 |
| 40 | 0.10 | 0.06 | 0.09 | 0.06 | 2.26 | 0.75 |
| 45 | 0.15 | 0.09 | 0.13 | 0.10 | 2.26 | 0.75 |
| 50 | 0.60 | 0.15 | 0.20 | 0.16 | 2.90 | 1.15 |
| 55 | 0.54 | 0.32 | 0.27 | 0.24 | 3.54 | 1.65 |
| 60 | 0.73 | 0.51 | 0.43 | 0.38 | 4.20 | 2.18 |
| 65 | 1.30 | 0.82 | 0.67 | 0.59 | 5.02 | 2.80 |
| 70 | 2.14 | 1.37 | 0.98 | 0.88 | 6.26 | 3.76 |

* *Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment, and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates as prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decreased at all ages, we would not expect the valuation results to be materially different.*

*** These rates were adjusted for mortality improvements using projection scale AA.*

| | Withdrawal Rates After Third Year | | Disability Retirement | |
|---|---|---|---|---|
| Age | Male | Female | Male | Female |
| 20 | 13.20% | 8.80% | 0.05% | 0.05% |
| 25 | 8.10 | 7.80 | 0.08 | 0.08 |
| 30 | 5.00 | 7.45 | 0.11 | 0.11 |
| 35 | 3.45 | 7.10 | 0.15 | 0.15 |
| 40 | 2.55 | 5.70 | 0.24 | 0.24 |
| 45 | 1.95 | 3.50 | 0.39 | 0.39 |
| 50 | 0.00 | 0.00 | 0.67 | 0.67 |
| 55 | 0.00 | 0.00 | 1.17 | 1.17 |
| 60 | 0.00 | 0.00 | 1.88 | 1.88 |
| 65 | 0.00 | 0.00 | 0.00 | 0.00 |

# Actuarial Basis

## Summary of Actuarial Assumptions (Concluded)

| Age | Percent Retiring |
|---|---|
| 50 | 5% |
| 51 | 3 |
| 52 | 3 |
| 53 | 3 |
| 54 | 5 |
| 55 | 55 |
| 56 | 12 |
| 57 | 12 |
| 58 | 10 |
| 59 | 10 |
| 60 | 10 |
| 61 | 10 |
| 62 | 30 |
| 63 | 30 |
| 64 | 30 |
| 65 | 50 |
| 66 | 50 |
| 67 | 50 |
| 68 | 50 |
| 69 | 50 |
| 70+ | 100 |

| Salary Scale | |
|---|---|
| Year | Increase |
| 1 | 6.00% |
| 2 | 5.85 |
| 3 | 5.70 |
| 4 | 5.55 |
| 5 | 5.40 |
| 6 | 5.25 |
| 7 | 5.10 |
| 8 | 4.95 |
| 9 | 4.80 |
| 10 | 4.65 |
| 11 | 4.55 |
| 12 | 4.45 |
| 13 | 4.35 |
| 14 | 4.25 |
| 15 | 4.15 |
| 16 | 4.05 |
| 17 | 3.95 |
| 18 | 3.85 |
| 19+ | 3.75 |

# Actuarial Basis

## Summary of Plan Provisions

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | | |
|---|---|---|
| Plan year | July 1 through June 30 | |
| Eligibility | State employees in covered correctional service. Certain state employees with 75 percent working time spent in direct contact with inmates or patients are also eligible. | |
| **Contributions** | Shown as a percent of salary: | |
| Effective date | **Member** | **Employer** |
| July 1, 2010 to June 30, 2014 | 8.60% | 12.10% |
| July 1, 2014* | 9.10% | 12.85% |
| | Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). **Increase is effective the first day of the first full pay period beginning after July 1, 2014.* | |
| Allowable service | Service during which member contributions were made. May also include certain leave of absence, military service and periods while temporary Worker's Compensation is paid. | |
| Salary | Includes wages, allowances and fees. Excludes lump sum payments of separation and reduced salary while receiving Worker's Compensation benefits. | |
| Average salary | Average of the five highest successive years of Salary. Average Salary is based on all Allowable Service if less than five years. | |
| Vesting | Hired before July 1, 2010: | 100% vested after 3 years of Allowable Service. |
| | Hired after June 30, 2010: | 50% vested after 5 years of Allowable Service;<br>60% vested after 6 years of Allowable Service;<br>70% vested after 7 years of Allowable Service;<br>80% vested after 8 years of Allowable Service;<br>90% vested after 9 years of Allowable Service;<br>100% vested after 10 years of Allowable Service. |
| **Retirement** | | |
| Normal retirement benefit | | |
| Age/Service requirement | Age 55 and vested. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service. | |
| Amount | 2.40% (2.20% if first hired after June 30, 2010) of Average Salary for each year of Allowable Service, pro-rata for completed months. | |
| Early retirement | | |
| Age/Service requirement | Age 50 and vested. | |
| Amount | Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date reduced by 2/10% (5/12% if first hired after June 30, 2010 or if hired before July 1, 2010 and retire after June 30, 2015) per month for each month that the member is under age 55. | |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Retirement (Continued)** | |
| Form of payment | Life annuity.<br>Actuarially equivalent options are:<br>50%, 75%, or 100% Joint and Survivor, or 15-year certain. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan. |
| Benefit increases | Since 2011, benefit recipients have received annual 2.0% benefit increases. If the accrued liability funding ratio reaches 90% (actuarial accrued liability ratio on a Market Value of Assets basis) for two consecutive years, the benefit increase will revert to 2.5%. A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase. |
| **Disability** | |
| Duty Disability | |
| Age/Service requirement | Physically or mentally unable to perform normal job duties as a direct result of a disability relating to an incident while performing the duties of the job which present inherent dangers to the employee. Members who become disabled after June 30, 2009 will have disability benefits converted to retirement benefits at age 55 instead of age 65. |
| Amount | 50.00% of Average Salary plus 2.40% (2.20% if first hired after June 30, 2010) of Average Salary for each year in excess of 20 years and 10 months of Allowable Service (pro rata for completed months).<br>Payment begins at disability and ends at age 55 (age 65 if disabled prior to July 1, 2009) or the five-year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability.<br>Member is reclassified from disabled to retired at age 55 (age 65 if disabled prior to July 1, 2009). Optional amount continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option. |
| Regular Disability | |
| Age/Service requirement | At least one year of covered Correctional service for employees hired before July 1, 2009, or a vested Correctional employee hired after June 30, 2009, and the employee is determined to have a regular disability not related to an incident while performing the duties of the job. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Disability** (Continued) | |
| Amount | Normal retirement benefit based on covered Correctional Service (minimum of 15 years if hired prior to July 1, 2009) and Average Salary at disability.<br><br>Payment begins at disability and ends at age 55 (age 65 if disabled prior to July 1, 2009) or the five-year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. Member is reclassified from disabled to retired at age 55 (age 65 if disabled prior to July 1, 2009). Optional amount continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option. |
| <u>Benefit Increases</u> | Same as for retirement. |
| **Death** | |
| <u>Surviving spouse benefit</u> | |
| Age/Service requirement | Member at any age or former member age 50 or older who dies before retirement or disability benefit commences and was vested. If a former member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when the former member would have been age 55. If an active member dies, benefits may commence immediately, regardless of age. |
| Amount | Surviving spouse receives the 100% joint and survivor benefits using the Normal Retirement formula above. If commencement is prior to age 55, the appropriate early retirement formula described above applies except that one-half the monthly reduction factor is used from age 50 to the commencement age and the Rule of 90 does not apply. In lieu of this benefit, the surviving spouse may elect a refund of member contributions with interest or an actuarially equivalent term certain annuity (lump sum payable to estate at death). |
| Benefit increases | Same as for retirement. |
| <u>Surviving dependent children's benefit</u> | |
| Age/service requirement | If no surviving spouse, all dependent children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member. |
| Amount | Actuarially equivalent to surviving spouse 100% joint and survivor annuity payable to the later of age 20 or five years. The amount is to be proportionally divided among surviving children. |
| Benefit increases | Same as for retirement. |
| <u>Refund of contributions with interest</u> | |
| Age/service requirement | Active employee dies and survivor benefits are not payable or a former employee dies before annuity begins. If accumulated member contributions with interest exceed total payments to the surviving spouse and children, then the remainder is paid out. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Death** (Continued) | |
| Amount | Member's contributions with 6.00% interest compounded daily until July 1, 2011 and 4.00% thereafter. |
| **Termination** | |
| Refund of contributions | |
| Age/Service requirement | Termination of state service. |
| Amount | Member's contributions with 6.00% interest through June 30, 2011 compounded daily. Beginning July 1, 2011 a member's contributions increase at 4.00% interest compounded daily. If a member is vested, a deferred annuity may be elected in lieu of a refund. |
| Deferred benefit | |
| Age/service requirement | Partially or fully vested. |
| Amount | Benefit computed under law in effect at termination and increased by the following annual augmentation percentage:<br>(a.) 0.00% before July 1, 1971;<br>(b.) 5.00% from July 1, 1971 to January 1, 1981;<br>(c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1 of the year following attainment of age 55 or January 1, 2012, whichever is earlier;<br>(d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012; and<br>(e.) 2.00% from January 1, 2012 thereafter.<br><br>Amount is payable at normal or early retirement. |
| **Optional form conversion factors** | Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, set forward one year for males and set back one year for females, blended 70% males, and 6.5% interest. |
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br>(a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement;<br>(b.) Have at least six months of allowable service credit in each plan worked under; and<br>(c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year.<br><br>Members who meet the above requirements must have their benefit based on the following:<br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement.<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |

# Actuarial Basis

## Summary of Plan Provisions (Concluded)

| | |
|---|---|
| **Contribution Stabilizer** | The following is a summary of contribution stabilizer provisions in Minnesota Statute 352.045:<br><br>• If a contribution sufficiency of at least 1.0% has existed for two consecutive years, member contributions are decreased by at most 0.25% and employer contributions are decreased by at most 0.375% to a level that is necessary to maintain a 1.0% sufficiency. A contribution rate decrease under this section must not be made until at least two years have passed since fully implementing a previous decrease.<br><br>• If a contribution deficiency of at least 0.5% has existed for two consecutive years, the member and employer contribution rates are increased as follows:<br><br>o If the contribution deficiency is less than 2.0%, member contributions are increased 0.25% and employer contributions are increased by 0.375%.<br><br>o If the contribution deficiency is greater than 1.99% and less than 4.01%, member contributions are increased 0.50% and employer contributions are increased by 0.75%.<br><br>o If the contribution deficiency is greater than 4.0%, member contributions are increased by 0.75% and employer contributions are increased by 1.125%. |
| **Changes in plan provisions** | Member contribution rates increased from 8.60% to 9.10% of pay and employer contribution rates increased from 12.10% to 12.85% of pay effective the first day of the first full pay period beginning after July 1, 2014.<br><br>The funding ratio threshold that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years. |

# Additional Schedules

## Schedule of Funding Progress[1] *(Dollars in Thousands)*

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded (Overfunded) AAL (UAAL) (b) - (a) | Funded Ratio (a)/(b) | Actual Covered Payroll (Previous FY) (c) | UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c) |
|---|---|---|---|---|---|---|
| 7-1-1991 | $ 105,925 | $ 112,171 | $ 6,246 | 94.43% | $ 43,429 | 14.38 % |
| 7-1-1992 | 121,051 | 123,515 | 2,464 | 98.01 | 47,592 | 5.18 |
| 7-1-1993 | 135,939 | 134,280 | (1,659) | 101.24 | 52,122 | (3.18) |
| 7-1-1994 | 148,163 | 152,702 | 4,539 | 97.03 | 54,673 | 8.30 |
| 7-1-1995 | 165,427 | 153,491 | (11,936) | 107.78 | 66,939 | (17.83) |
| 7-1-1996 | 193,833 | 170,959 | (22,874) | 113.38 | 72,959 | (31.35) |
| 7-1-1997 | 241,916 | 212,638 | (29,278) | 113.77 | 112,408 | (26.05) |
| 7-1-1998 | 295,291 | 261,869 | (33,422) | 112.76 | 105,796 | (31.59) |
| 7-1-1999 | 335,408 | 307,408 | (28,000) | 109.11 | 106,131 | (26.38) |
| 7-1-2000 | 386,964 | 359,885 | (27,079) | 107.52 | 112,587 | (24.05) |
| 7-1-2001 | 431,134 | 398,633 | (32,501) | 108.15 | 120,947 | (26.87) |
| 7-1-2002 | 457,416 | 446,426 | (10,990) | 102.46 | 124,373 | (8.84) |
| 7-1-2003 | 470,716 | 484,974 | 14,258 | 97.06 | 131,328 | 10.86 |
| 7-1-2004 | 486,617 | 524,215 | 37,598 | 92.83 | 133,172 | 28.23 |
| 7-1-2005 | 503,573 | 546,118 | 42,545 [2] | 92.21 | 132,335 | 32.15 |
| 7-1-2006 | 535,357 | 647,480 | 112,123 | 82.68 | 145,879 | 76.86 |
| 7-1-2007 | 559,852 | 708,292 | 148,440 | 79.04 | 167,727 | 88.50 |
| 7-1-2008 | 572,719 | 760,363 | 187,644 | 75.32 | 194,391 | 96.53 |
| 7-1-2009 | 590,399 | 821,250 | 230,851 | 71.89 | 193,445 | 119.34 |
| 7-1-2010 | 603,863 | 851,086 | 247,223 | 70.95 | 192,450 | 128.46 |
| 7-1-2011 | 637,027 | 907,012 | 269,985 | 70.23 | 197,702 | 136.56 |
| 7-1-2012 | 663,713 | 968,166 | 304,453 | 68.55 | 200,035 [3] | 152.20 |
| 7-1-2013 | 701,091 | 1,026,098 | 325,007 | 68.33 | 204,198 [3] | 159.16 |
| 7-1-2014 | 790,304 | 1,122,474 | 332,170 | 70.41 | 219,244 [3] | 151.51 |

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*

[2] *Provided by MSRS instead of prior actuary.*

[3] *Assumed equal to actual member contributions divided by 8.60%.*

# Additional Schedules

## Schedule of Contributions from the Employer and Other Contributing Entities[1]

*(Dollars in Thousands)*

| Plan Year Ended June 30 | Actuarially Required Contribution Rate (a) | Actual Covered Payroll (b) | Actual Member Contributions (c) | Annual Required Contributions [(a)x(b)] - (c) = (d) | Actual Employer Contributions (e) | Percentage Contributed (e)/(d) |
|---|---|---|---|---|---|---|
| 1991 | 10.73% | $ 43,429 | $ 2,128 | $ 2,532 | $ 2,731 | 107.86% |
| 1992 | 10.82 | 47,592 | 2,332 | 2,817 | 2,955 | 104.90 |
| 1993 | 11.41 | 52,122 | 2,554 | 3,393 | 3,217 | 94.81 |
| 1994 | 10.97 | 54,673 | 2,679 | 3,319 | 3,355 | 101.08 |
| 1995 | 11.30 | 66,939 | 3,280 | 4,284 | 4,195 | 97.92 |
| 1996 | 11.11 | 72,959 | 3,575 | 4,531 | 4,559 | 100.62 |
| 1997 | 11.21 | 112,408 | 5,508 | 7,093 | 9,129 | 128.70 |
| 1998 | 12.49 | 105,796 | 5,954 | 7,260 | 8,146 | 112.20 |
| 1999 | 12.99 | 106,131 | 6,378 | 7,408 | 8,172 | 110.31 |
| 2000 | 13.66 | 112,587 | 6,526 | 8,853 | 8,984 | 101.48 |
| 2001 | 13.72 | 120,947 | 6,996 | 9,598 | 9,652 | 100.56 |
| 2002 | 13.81 | 124,373 | 7,207 | 9,969 | 9,925 | 99.56 |
| 2003 | 14.73 | 131,328 | 7,610 | 11,735 | 10,480 | 89.31 |
| 2004 | 15.83 | 133,172 | 7,748 | 13,333 | 10,627 | 79.71 |
| 2005 | 17.48 | 132,335 | 7,943 | 15,189 | 11,016 | 72.52 |
| 2006 | 17.71 | 145,879 | 8,964 | 16,871 | 12,152 | 72.03 |
| 2007 | 23.34 | 167,727 | 10,032 | 29,115 | 13,927 | 47.83 |
| 2008 | 24.44 | 194,391 | 12,775 | 34,734 | 18,623 | 53.62 |
| 2009 | 23.66 | 193,445 | 14,031 | 31,738 | 20,126 | 63.41 |
| 2010 | 24.85 | 192,450 | 15,267 | 32,557 | 21,988 | 67.54 |
| 2011 | 25.43 | 197,702 | 17,002 | 33,274 | 23,892 | 71.80 |
| 2012 | 26.00 | 200,035 [2] | 17,203 | 34,806 | 24,188 | 69.49 |
| 2013 | 25.28 | 204,198 [2] | 17,561 | 34,060 | 24,632 | 72.32 |
| 2014 | 26.11 | 219,244 [2] | 18,855 | 38,390 | 26,468 | 68.95 |
| 2015 | 26.43 | N/A | N/A | N/A | N/A | N/A |

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
[2] *Assumed equal to actual member contributions divided by 8.60%.*

# Glossary of Terms

| | |
|---|---|
| ***Accrued Benefit Funding Ratio*** | The ratio of assets to Current Benefit Obligations. |
| ***Accrued Liability Funding Ratio*** | The ratio of assets to Actuarial Accrued Liability. |
| ***Actuarial Accrued Liability (AAL)*** | The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs. |
| ***Actuarial Assumptions*** | Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items. |
| ***Actuarial Cost Method*** | A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability. |
| ***Actuarial Equivalent*** | Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions. |
| ***Actuarial Present Value (APV)*** | The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made. |
| ***Actuarial Present Value of Projected Benefits*** | The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due. |
| ***Actuarial Valuation*** | The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for developing and monitoring a retirement system's funding policy, such as the Funded Ratio and the Annual Required Contribution (ARC). |
| ***Actuarial Value of Assets*** | The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC). |

# Glossary of Terms (Continued)

***Amortization Method*** A method for determining the Amortization Payment. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. The stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase.

***Amortization Payment*** That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

***Amortization Period*** The period used in calculating the Amortization Payment.

***Annual Required Contribution (ARC)*** The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ARC consists of the Employer Normal Cost and Amortization Payment.

***Augmentation*** Annual increases to deferred benefits.

***Closed Amortization Period*** A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc.

***Current Benefit Obligations*** The present value of benefits earned to the valuation date, based on current service and including future salary increases to retirement.

***Employer Normal Cost*** The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.

***Expected Assets*** The present value of anticipated future contributions intended to fund benefits for current members.

***Experience 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 valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected.

# Glossary of Terms (Concluded)

| | |
|---|---|
| ***GASB*** | Governmental Accounting Standards Board. |
| ***GASB Statements No. 25 and No. 27*** | These are the governmental accounting standards that set the accounting and financial reporting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves. These statements remain in effect only for pension plans that are not administered as trusts or equivalent arrangements. Please refer to the definition of GASB Statements No. 67 and No. 68 below. |
| ***GASB Statement No. 50*** | The accounting standard governing a state or local governmental employer's accounting for pensions. This statement remains in effect only for pension plans that are not administered as trusts. Please refer to the definition of GASB Statements No. 67 and No. 68. |
| ***GASB Statements No. 67 and No. 68*** | Statements No. 67 and No. 68, issued in June 2012, replace the requirements of Statements No. 25, No. 27 and No. 50, respectively, for pension plans administered as trusts. Statement No. 68, effective for the fiscal year beginning July 1, 2014, sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67, effective for the fiscal year beginning July 1, 2013, sets the rules for the systems themselves. Accounting and financial reporting rules information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the June 30, 2014 actuarial valuation. |
| ***Normal Cost*** | The annual cost assigned, under the Actuarial Cost Method, to the current plan year. |
| ***Projected Benefit Funding Ratio*** | The ratio of the sum of Actuarial Value of Assets and Expected Assets to the Actuarial Present Value of Projected Benefits. |
| ***Unfunded Actuarial Accrued Liability*** | The difference between the Actuarial Accrued Liability and Actuarial Value of Assets. |
| ***Valuation Date*** | The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date. |

Gabriel Roeder Smith & Company
Consultants & Actuaries

# MINNESOTA STATE RETIREMENT SYSTEM

# STATE PATROL RETIREMENT FUND

## ACTUARIAL VALUATION REPORT AS OF JULY 1, 2014

GRS

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December 12, 2014

Minnesota State Retirement System
State Patrol Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

The results of the July 1, 2014 annual actuarial valuation of the State Patrol Retirement Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by the Board and staff and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety. GRS is not responsible for the consequences of any unauthorized use of this report.

The purpose of the valuation is to measure the Fund's funding progress, to determine the required contribution rate for the fiscal year beginning July 1, 2014. Note that we have not attempted to quantify the impact of GASB Statements No. 67 and No. 68 in this report. Please see the separate report dated December 1, 2014.

The valuation was based upon information furnished by the Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by MSRS.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Directors. 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. MSRS is solely responsible for communicating to GRS any changes required thereto.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. A revision of ASOP No. 27, applicable to valuation dates on or after September 30, 2014, will guide assumption setting for future valuations. A recent review of inflation and investment return assumptions for accounting and financial reporting purposes developed a recommended range of 6.99% to 7.92% for the assumed investment return. Additional review and discussion will be required before the next valuation.

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 such future measurements.

This report should not be relied on for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the State Patrol Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

We are available to answer any questions or provide further details.

Respectfully submitted,

Brian B. Murphy

Brian B. Murphy, FSA, EA, MAAA

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA

BBM/BJW:sc

# Contents

# Summary of Valuation Results

## Contributions

The following table summarizes important contribution information as described in the Development of Costs section.

| | Actuarial Valuation as of | |
|---|---|---|
| Contributions | July 1, 2014 | July 1, 2013 |
| Statutory Contributions - Chapter 352B (% of Payroll) | 34.98% | 32.56% |
| Required Contributions - Chapter 356 (% of Payroll) | 43.56% | 41.24% |
| Sufficiency / (Deficiency) | (8.58)% | (8.68)% |

The contribution deficiency decreased from (8.68)% of payroll to (8.58)% of payroll. The primary reasons for the decreased contribution deficiency are the greater than expected asset returns and a 2.5% of payroll increase in the statutory contribution rate. The 2014 required contribution reflects additional liability due to the assumption that the post-retirement benefit increase rate will increase from 1.0% to 1.5% in 2018 and from 1.5% to 2.5% in 2033. Member and employer contribution rates are scheduled to increase an additional 2.5% of payroll in total over the next three fiscal years. The annual state contribution of $1 million (1.48% of payroll) is reflected in the statutory contribution rates shown above.

Based on the actuarial value of assets and scheduled contribution rates, statutory contributions are not sufficient to fully amortize the unfunded actuarial accrued liability over the statutory amortization period of 24 years. However, on a market value of assets basis, contributions are deficient by (1.52)%, less than the 2.50% of payroll scheduled increase in future statutory contributions.

The Plan Assets section provides detail on the plan assets used for the valuation including a development of the actuarial value of assets (AVA). The market value of assets (MVA) earned approximately 18.6% for the plan year ending June 30, 2014. The AVA earned approximately 14.7% for the plan year ending June 30, 2014 as compared to the assumed rate of 8.0%. The assumed rate is a prescribed assumption mandated by Minnesota Statutes.

Participant reconciliation and statistics are detailed in the Membership Data section. The Actuarial Basis section includes a summary of plan provisions and actuarial methods and assumptions used for the calculations in this report.

Accounting and financial reporting information prepared according to GASB Statements No. 67 and No. 68 has been provided in a separate report dated December 1, 2014.

# Summary of Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in plan provisions, actuarial assumptions or valuation methods and procedures between the two valuations are described after the summary.

| | Actuarial Valuation as of | |
|---|---|---|
| | July 1, 2014 | July 1, 2013 |
| **Contributions** (*% of Payroll*) | | |
| Statutory - Chapter 352B | 34.98% | 32.56% |
| Required - Chapter 356 | 43.56% | 41.24% |
| Sufficiency / (Deficiency) | (8.58)% | (8.68)% |
| | | |
| **Funding Ratios** (*dollars in thousands*) | | |
| Assets | | |
| - Current assets (AVA) | $ 597,870 | $ 552,319 |
| - Current assets (MVA) | 667,340 | 593,201 |
| Accrued Benefit Funding Ratio | | |
| - Current benefit obligations | $ 777,936 | $ 722,827 |
| - Funding ratio (AVA) | 76.85% | 76.41% |
| - Funding ratio (MVA) | 85.78% | 82.07% |
| Accrued Liability Funding Ratio | | |
| - Actuarial accrued liability | $ 800,421 | $ 741,850 |
| - Funding ratio (AVA) | 74.69% | 74.45% |
| - Funding ratio (MVA) | 83.37% | 79.96% |
| Projected Benefit Funding Ratio | | |
| - Current and expected future assets | $ 848,631 | $ 772,336 |
| - Current and expected future benefit obligations | 933,024 | 853,902 |
| - Projected benefit funding ratio (AVA) | 90.95% | 90.45% |
| | | |
| **Participant Data** | | |
| Active members | | |
| - Number | 858 | 845 |
| - Projected annual earnings *(000s)* | 67,386 | 64,136 |
| - Average projected annual earnings | 78,538 | 75,901 |
| - Average age | 41.8 | 41.9 |
| - Average service | 12.4 | 12.6 |
| Service retirements | 776 | 748 |
| Survivors | 155 | 185 |
| Disability retirements | 54 | 50 |
| Deferred retirements | 44 | 41 |
| Terminated other non-vested | 17 | 18 |
| **Total** | **1,904** | **1,887** |

# Summary of Valuation Results

## Effects of Changes

The following changes in plan provisions, actuarial assumptions, and methods were recognized as of July 1, 2014:

- Effective July 1, 2014, the actuarial accrued liability funding ratio threshold, on a market value of assets basis, that must be attained to pay a 1.5% post-retirement benefit increase to benefit recipients was changed from 85% for one year to 85% for two consecutive years. The funding ratio threshold, on a market value of assets basis, that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years.
- The interest assumption used to determine optional form conversion factors was changed from an actuarial equivalent rate consistent with the post-retirement discount rate to a fixed rate of 6.5%.
- Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.
- The methodology for valuing post-retirement increases was clarified in statutes, and the assumed post-retirement benefit increase rate was changed from 1.0% per year for all years to 1.0% per year through 2017, 1.5% per year from 2018 through 2032, and 2.5% per year thereafter.
- As a result of the additional liability resulting from the change in the assumed post-retirement benefit increase rate, the amortization date was changed from June 30, 2037 to June 30, 2038 per Minnesota Statute 356.215, Subd. 11(c).

Refer to the Actuarial Basis section of this report for a complete description of these changes.

The combined impact of the above changes was to increase the accrued liability by $45.3 million and increase the required contribution by 6.3% of pay, as follows:

| | Before Changes | Reflecting Assumption Changes | Reflecting Assumption and Amortization Changes |
|---|---|---|---|
| Normal Cost Rate, % of Pay | 20.7% | 22.8% | 22.8% |
| Amortization of Unfunded Accrued Liability, % of pay | 16.4% | 21.1% | 20.6% |
| Expenses (% of Pay) | 0.2% | 0.2% | 0.2% |
| Total Required Contribution, % of Pay | 37.3% | 44.1% | 43.6% |
| | | | |
| Accrued Liability Funding Ratio | 79.2% | 74.7% | 74.7% |
| Projected Benefit Funding Ratio | 97.5% | 90.7% | 91.0% |
| | | | |
| Unfunded Accrued Liability (in millions) | $157.3 | $202.6 | $202.6 |

# Summary of Valuation Results

## Valuation of Future Annual Post-Retirement Benefit Increases

Benefit recipients receive a future annual compounding 1.0% post-retirement benefit increase. The funding ratio (assuming 1.5% post-retirement benefit increases in all future years) threshold, determined on a market value of assets basis, that must be attained to pay a 1.5% post-retirement benefit increase to benefit recipients was changed in 2014 from 85% for one year to 85% for two consecutive years. Similarly, the funding ratio (assuming 2.5% post-retirement benefit increases in all future years) threshold, determined on a market value of assets basis, that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed in 2014 from 90% for one year to 90% for two consecutive years.

Minnesota Statutes were revised in 2014 to establish a process for establishing a post-retirement benefit increase assumption for each valuation. If the plan has not yet reached the threshold required to pay a 1.5% or 2.5% benefit increase, a projection must be performed to determine the expected attainment of the threshold, and the expected change to a 1.5% or 2.5% benefit increase rate must be reflected in the liability calculations.

We performed a projection of liabilities and assets, using the 2014 valuation results as a baseline and assuming future experience follows the valuation assumptions. In addition, the projection utilized the following methods and assumptions:

- Future investment returns and liability discount rates of 8.00% through June 30, 2017; 8.50% thereafter;
- Open group; stable active population (new member profile based on average new members hired in recent years);
- The post-retirement benefit increase rate is assumed to be 1.0% per year until the funding ratio threshold required to pay a 1.5% post-retirement benefit increase is reached; and similarly the post-retirement benefit increase is assumed to be 1.5% per year until the funding ratio threshold required to pay a 2.5% post-retirement benefit increase is reached.
- Current statutory contribution levels including scheduled increases through 2016 (i.e., not including potential contribution increases under the contribution stabilizer statutes).

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold to pay the 1.5% benefit increase in approximately 4 years, and the funding ratio threshold to pay the 2.5% benefit increase in approximately 19 years. The liabilities in this report are based on the assumption that the post-retirement benefit increase will equal 1.0% through 2017, 1.5% from 2018 through 2032, and 2.5% for all years thereafter. This assumption is reflected in our calculations. This is only an assumption; actual timing will depend on actual experience.

# Supplemental Information

The remainder of the report includes information supporting the results presented in the previous sections.

- **Plan assets** presents information about the plan's assets as reported by the Minnesota State Retirement System. The assets represent the portion of total fund liabilities that has been funded.
- **Membership data** presents and describes the membership data used in the valuation.
- **Development of costs** shows the liabilities for plan benefits and the derivation of the contribution amount.
- **Actuarial basis** describes the plan provisions, as well as the methods and assumptions used to value the plan. The valuation is based on the premise that the plan is ongoing.
- **Additional Schedules** includes a summary of funding progress and contributions over the long term.
- **Glossary** defines the terms used in this report.

# Plan Assets

## Statement of Fiduciary Net Position *(Dollars in Thousands)*

| | Market Value | |
|---|---|---|
| **Assets** | **June 30, 2014** | **June 30, 2013** |
| Cash, equivalents, short term securities | $ 17,480 | $ 15,451 |
| Fixed income | 155,810 | 136,228 |
| Equity | 493,728 | 441,300 |
| Other* | 72,256 | 57,861 |
| **Total cash, investments, and other assets** | **$ 739,274** | **$ 650,840** |
| Amounts receivable | 701 | 590 |
| **Total Assets** | **$ 739,975** | **$ 651,430** |
| Amounts payable* | (72,635) | (58,229) |
| **Net Position Restricted for Pensions** | **$ 667,340** | **$ 593,201** |

** Includes $72,256 in Securities Lending Collateral as of June 30, 2014 and $57,861 as of June 30, 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 the Minnesota State Retirement System for the Plan's prior two fiscal years.

| **Change in Assets** | **Market Value** | |
|---|---|---|
| **Year Ending** | **June 30, 2014** | **June 30, 2013** |
| **1. Fund balance at market value at beginning of year** | **$ 593,201** | **$ 549,956** |
| 2. Contributions | | |
| a. Member | 7,930 | 7,703 |
| b. Employer | 11,894 | 11,482 |
| c. Other sources - Supplemental State Aid | 1,000 | 0 |
| d. Total contributions | $ 20,824 | $ 19,185 |
| 3. Investment income | | |
| a. Investment income/(loss) | 108,116 | 77,129 |
| b. Investment expenses | (929) | (814) |
| c. Net investment income/(loss) | 107,187 | 76,315 |
| 4. Other | 0 | 0 |
| **5. Total income:** *(2.d.) + (3.c.) + (4.)* | **$ 128,011** | **$ 95,500** |
| 6. Benefits Paid | | |
| a. Annuity benefits | (53,697) | (52,057) |
| b. Refunds | (25) | (7) |
| c. Total benefits paid | (53,722) | (52,064) |
| 7. Expenses | | |
| a. Other | 0 | (1) |
| b. Administrative | (150) | (190) |
| c. Total expenses | (150) | (191) |
| **8. Total disbursements:** *(6.c.) + (7.c.)* | **(53,872)** | **(52,255)** |
| **9. Fund balance at market value at end of year:** *(1.) + (5.) + (8.)* | **$ 667,340** | **$ 593,201** |
| 10. State Board of Investment calculated investment return | 18.6% | 14.2% |

# Plan Assets

## Actuarial Asset Value *(Dollars in Thousands)*

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | **June 30, 2014** | | **June 30, 2013** |
| **1. Market value of assets available for benefits** | | | | **$ 667,340** | | **$ 593,201** |
| 2. Determination of average balance | | | | | | |
| a. Total assets available at beginning of year | | | | 593,201 | | 549,956 |
| b. Total assets available at end of year | | | | 667,340 | | 593,201 |
| c. Net investment income for fiscal year | | | | 107,187 | | 76,315 |
| d. Average balance *[a. + b. - c.] / 2* | | | | 576,677 | | 533,421 |
| 3. Expected return *[8.0% x 2.d.]* | | | | 46,134 | | 42,674 |
| 4. Actual return | | | | 107,187 | | 76,315 |
| 5. Current year asset gain/(loss) *[4. - 3.]* | | | | 61,053 | | 33,641 |
| 6. Unrecognized asset returns | | | | | | |
| | **Original Amount** | **Unrecognized Amount %** | | **$** | **Unrecognized Amount %** | **$** |
| a. Year ended June 30, 2014 | $ 61,053 | 80% | | $ 48,842 | | N/A |
| b. Year ended June 30, 2013 | 33,641 | 60% | | 20,185 | 80% | $ 26,913 |
| c. Year ended June 30, 2012 | (34,239) | 40% | | (13,696) | 60% | (20,543) |
| d. Year ended June 30, 2011 | 70,693 | 20% | | 14,139 | 40% | 28,277 |
| e. Year ended June 30, 2010 | 31,175 | | | N/A | 20% | 6,235 |
| **f. Unrecognized return adjustment** | | | | **$ 69,470** | | **$ 40,882** |
| 7. **Actuarial value at end of year** *(1. - 6.f.)* | | | | **$ 597,870** | | **$ 552,319** |
| 8. Approximate return on actuarial value of assets during fiscal year | | | | 14.7% | | 5.8% |
| 9. Ratio of actuarial value of assets to market value of assets | | | | 0.90 | | 0.93 |

# Membership Data

## Distribution of Active Members

| | Years of Service as of June 30, 2014 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3*** | **3 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25 - 29** | **30 - 34** | **35+** | **Total** |
| < 25 | 13 | | | | | | | | | **13** |
| Avg. Earnings | 36,264 | | | | | | | | | **36,264** |
| 25 - 29 | 38 | 15 | 20 | | | | | | | **73** |
| Avg. Earnings | 49,458 | 63,089 | 64,498 | | | | | | | **56,379** |
| 30 - 34 | 31 | 13 | 43 | 15 | | | | | | **102** |
| Avg. Earnings | 50,610 | 60,753 | 69,465 | 80,061 | | | | | | **64,183** |
| 35 - 39 | 17 | 6 | 54 | 61 | 12 | | | | | **150** |
| Avg. Earnings | 53,347 | 70,276 | 74,368 | 79,447 | 85,368 | | | | | **74,767** |
| 40 - 44 | 9 | 3 | 50 | 48 | 67 | 6 | | | | **183** |
| Avg. Earnings | 48,802 | 62,187 | 77,729 | 77,705 | 82,264 | 82,949 | | | | **77,877** |
| 45 - 49 | 5 | 1 | 16 | 24 | 53 | 27 | 11 | | | **137** |
| Avg. Earnings | 58,229 | 67,735 | 71,832 | 77,979 | 80,894 | 80,809 | 83,766 | | | **78,616** |
| 50 - 54 | 5 | 2 | 9 | 18 | 34 | 28 | 44 | 14 | | **154** |
| Avg. Earnings | 75,721 | 75,349 | 84,599 | 81,500 | 81,974 | 83,586 | 84,114 | 84,870 | | **82,951** |
| 55 - 59 | | 1 | 8 | 4 | 10 | 7 | 6 | 8 | | **44** |
| Avg. Earnings | | 124,282 | 89,478 | 83,895 | 77,423 | 80,706 | 97,746 | 88,796 | | **86,630** |
| 60 - 64 | | | | | 1 | | 1 | | | **2** |
| Avg. Earnings | | | | | 69,240 | | 89,897 | | | **79,569** |
| 65 - 69 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 70+ | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| **Total** | **118** | **41** | **200** | **170** | **177** | **68** | **62** | **22** | | **858** |
| **Avg. Earnings** | **50,302** | **65,538** | **74,029** | **79,124** | **81,662** | **82,131** | **85,465** | **86,298** | | **74,727** |

* *This exhibit does not reflect service earned in other MSRS or Combined Service Annuity benefits. It should not be relied upon as an indicator of non-vested status.*

In each cell, the top number is the count of active participants for the age/service combination and the bottom number is average valuation earnings for the fiscal year ending on the valuation date.

# Membership Data

## Distribution of Service Retirements

| | Years Retired as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <50 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | 8 | 17 | | | | | | **25** |
| Avg. Benefit | 41,646 | 42,210 | | | | | | **42,030** |
| 55 - 59 | 21 | 94 | 21 | | | | | **136** |
| Avg. Benefit | 53,476 | 58,347 | 48,992 | | | | | **56,150** |
| 60 - 64 | 4 | 21 | 94 | 20 | | | | **139** |
| Avg. Benefit | 35,426 | 51,595 | 54,403 | 44,970 | | | | **52,075** |
| 65 - 69 | | | 32 | 113 | 10 | | | **155** |
| Avg. Benefit | | | 45,065 | 58,324 | 52,477 | | | **55,209** |
| 70 - 74 | | | 5 | 27 | 92 | 2 | | **126** |
| Avg. Benefit | | | 44,192 | 50,959 | 65,981 | 57,195 | | **61,758** |
| 75 - 79 | | | | 3 | 29 | 44 | | **76** |
| Avg. Benefit | | | | 54,900 | 70,976 | 65,767 | | **67,325** |
| 80 - 84 | | | | | 1 | 23 | 32 | **56** |
| Avg. Benefit | | | | | 78,206 | 76,462 | 64,788 | **69,822** |
| 85 - 89 | | | | | | 5 | 40 | **45** |
| Avg. Benefit | | | | | | 69,618 | 69,566 | **69,572** |
| 90+ | | | | | | | 18 | **18** |
| Avg. Benefit | | | | | | | 66,372 | **66,372** |
| **Total** | **33** | **132** | **152** | **163** | **132** | **74** | **90** | **776** |
| **Avg. Benefit** | **48,420** | **55,194** | **51,353** | **55,402** | **66,148** | **69,119** | **67,229** | **58,785** |

In each cell, the top number is the count of retired participants for the age/years retired combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Survivors

| | Years Since Death as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <45 | | | 3 | 8 | 1 | | | **12** |
| Avg. Benefit | | | 16,594 | 13,164 | 11,620 | | | **13,893** |
| 45 - 49 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | | | | 2 | 1 | | | **3** |
| Avg. Benefit | | | | 23,886 | 61,123 | | | **36,298** |
| 55 - 59 | | 1 | | 3 | 1 | | | **5** |
| Avg. Benefit | | 26,301 | | 21,809 | 16,067 | | | **21,559** |
| 60 - 64 | 1 | 1 | 6 | | 1 | | | **9** |
| Avg. Benefit | 6,314 | 32,856 | 36,354 | | 48,697 | | | **33,999** |
| 65 - 69 | | 2 | 8 | 7 | 2 | | | **19** |
| Avg. Benefit | | 29,792 | 26,763 | 35,158 | 45,616 | | | **32,159** |
| 70 - 74 | 1 | 5 | 5 | 4 | 6 | | 1 | **22** |
| Avg. Benefit | 26,111 | 35,488 | 51,690 | 43,267 | 36,027 | | 32,115 | **40,152** |
| 75 - 79 | 3 | 4 | 1 | 2 | 1 | 3 | 1 | **15** |
| Avg. Benefit | 28,452 | 49,255 | 31,749 | 26,230 | 25,954 | 16,897 | 40,686 | **32,261** |
| 80 - 84 | 4 | 4 | 5 | 5 | 4 | 2 | | **24** |
| Avg. Benefit | 33,145 | 34,262 | 27,498 | 33,319 | 49,839 | 28,203 | | **34,561** |
| 85 - 89 | 2 | 1 | 9 | 5 | 4 | 7 | 2 | **30** |
| Avg. Benefit | 28,440 | 37,765 | 50,674 | 43,098 | 42,581 | 29,198 | 64,801 | **42,350** |
| 90+ | | 4 | 3 | 3 | 3 | 3 | | **16** |
| Avg. Benefit | | 26,881 | 16,922 | 26,310 | 27,390 | 34,992 | | **26,523** |
| **Total** | **11** | **22** | **40** | **39** | **24** | **15** | **4** | **155** |
| **Avg. Benefit** | **27,931** | **35,252** | **35,413** | **29,517** | **38,446** | **27,764** | **50,601** | **33,497** |

In each cell, the top number is the count of survivors for the age/years since death combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Disability Retirements

| | Years Disabled as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| < 45 | 1 | | 3 | | | | | **4** |
| Avg. Benefit | 36,954 | | 32,512 | | | | | **33,623** |
| 45 - 49 | 2 | 1 | 1 | | | | | **4** |
| Avg. Benefit | 41,272 | 38,543 | 43,254 | | | | | **41,085** |
| 50 - 54 | 1 | 5 | 4 | 1 | | | | **11** |
| Avg. Benefit | 41,762 | 52,601 | 50,144 | 30,355 | | | | **48,700** |
| 55 - 59 | | 2 | 1 | 2 | 2 | | | **7** |
| Avg. Benefit | | 46,483 | 59,149 | 35,102 | 24,691 | | | **38,815** |
| 60 - 64 | | | 3 | 4 | 1 | 2 | | **10** |
| Avg. Benefit | | | 51,194 | 33,753 | 42,759 | 44,814 | | **42,098** |
| 65 - 69 | | | 1 | 5 | 1 | | | **7** |
| Avg. Benefit | | | 48,008 | 40,741 | 49,215 | | | **42,990** |
| 70 - 74 | | | | 1 | | 2 | 3 | **6** |
| Avg. Benefit | | | | 33,428 | | 59,535 | 37,780 | **44,307** |
| 75+ | | | | | | 2 | 3 | **5** |
| Avg. Benefit | | | | | | 62,617 | 47,245 | **53,394** |
| **Total** | **4** | **8** | **13** | **13** | **4** | **6** | **6** | **54** |
| **Avg. Benefit** | **40,315** | **49,314** | **46,316** | **36,362** | **35,339** | **55,655** | **42,513** | **43,721** |

In each cell, the top number is the count of disabled participants for the age/years since disability combination and the bottom number is the average annual benefit amount.

# Membership Data

## Reconciliation of Members

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2013** | **845** | **41** | **18** | **748** | **50** | **185** | **1,887** |
| New Members | 57 | 0 | 0 | 0 | 0 | 0 | **57** |
| Return to active | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Terminated non-vested | (3) | 0 | 3 | 0 | 0 | 0 | **0** |
| Service retirements | (30) | (1) | 0 | 31 | 0 | 0 | **0** |
| Terminated deferred | (6) | 6 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | (1) | 0 | (6) | 0 | 0 | 0 | **(7)** |
| Deaths | 0 | 0 | 0 | (21) | 0 | (25) | **(46)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 11 | **11** |
| Disabled | (4) | 0 | 0 | 0 | 4 | 0 | **0** |
| Unexpected status change | 0 | (2) | 2 | 18 | 0 | (16) | **2** |
| Net change | 13 | 3 | (1) | 28 | 4 | (30) | **17** |
| **Members on 6/30/2014** | **858** | **44** | **17** | **776** | **54** | **155** | **1,904** |

| Terminated Member Statistics on June 30, 2014 | Deferred Retirement | Other Non-Vested | Total |
|---|---|---|---|
| Number | 44 | 17 | 61 |
| Average age | 44.5 | 38.2 | 42.7 |
| Average service | 7.9 | 0.5 | 5.8 |
| Average annual benefit, with augmentation to Normal Retirement Date and 30% CSA load | $ 26,956 | N/A | $26,956 |
| Average refund value, with 30% CSA load | $ 95,947 | $4,329 | $70,414 |

# Development of Costs

## Actuarial Valuation Balance Sheet *(Dollars in Thousands)*

The actuarial balance sheet is based on the principle that the long-term projected benefit obligations of the plan should be ideally equal to the long-term resources available to fund those obligations. The resources available to meet projected obligations for current members consist of current fund assets plus the present value of anticipated future contributions intended to fund benefits for current members. In the exhibit below, B.2 is the estimated present value of contributions to fund the normal cost rate for current members until their respective termination dates. Item B.1 is the present value of the total 34.98% statutory contribution net of normal cost and anticipated plan expenses during the period from the valuation date to the statutory unfunded amortization date.

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, 2014 |
|---|---|---|---|
| A. Actuarial Value of Assets | | | $ 597,870 |
| B. Expected Future Assets | | | |
| 1. Present value of expected future statutory supplemental contributions* | | | 118,158 |
| 2. Present value of future normal cost contributions | | | 132,603 |
| 3. Total expected future assets: *(1.) + (2.)* | | | 250,761 |
| C. Total Current and Expected Future Assets | | | $ 848,631 |
| D. Current Benefit Obligations** | | | |
| 1. Benefit recipients | **Non-Vested** | **Vested** | **Total** |
| a. Service retirements | $ 0 | $ 471,422 | $ 471,422 |
| b. Disability retirements | 0 | 27,906 | 27,906 |
| c. Survivors | 0 | 38,538 | 38,538 |
| 2. Deferred retirements with augmentation | 0 | 7,711 | 7,711 |
| 3. Former members without vested rights*** | 40 | 0 | 40 |
| 4. Active members | 1,395 | 230,924 | 232,319 |
| 5. Total Current Benefit Obligations | $ 1,435 | $ 776,501 | $ 777,936 |
| E. Expected Future Benefit Obligations | | | 155,088 |
| F. Total Current and Expected Future Benefit Obligations**** | | | 933,024 |
| G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)* | | | 180,066 |
| H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)* | | | 84,393 |
| I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)* | | | 76.85% |
| J. Projected Benefit Funding Ratio: *(C.)/(F.)* | | | 90.95% |

* *Includes $1,000,000 state contribution; excludes future scheduled contribution increases*

** *Present value of credited projected benefits (projected compensation, current service)*

*** *Former members who have not satisfied vesting requirements and have not collected a refund of member contributions as of the valuation date*

**** *Present value of projected benefits (projected compensation, projected service)*

# Development of Costs

## Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate (*Dollars in Thousands)*

| | Actuarial Present Value of Projected Benefits | Actuarial Present Value of Future Normal Costs | Actuarial Accrued Liability |
|---|---|---|---|
| A. Determination of Actuarial Accrued Liability (AAL) | | | |
| 1. Active members | | | |
| a. Retirement annuities | $ 358,896 | $ 114,824 | $ 244,072 |
| b. Disability benefits | 19,343 | 10,620 | 8,723 |
| c. Survivor's benefits | 4,697 | 3,166 | 1,531 |
| d. Deferred retirements | 4,154 | 3,481 | 673 |
| e. Refunds* | 317 | 512 | (195) |
| f. Total | $ 387,407 | $ 132,603 | $ 254,804 |
| 2. Deferred retirements with future augmentation | 7,711 | 0 | 7,711 |
| 3. Former members without vested rights | 40 | 0 | 40 |
| 4. Benefit recipients | 537,866 | 0 | 537,866 |
| 5. Total | $ 933,024 | $ 132,603 | $ 800,421 |
| B. Determination of Unfunded Actuarial Accrued Liability (UAAL) | | | |
| 1. Actuarial accrued liability | | | $ 800,421 |
| 2. Current assets (AVA) | | | 597,870 |
| 3. Unfunded actuarial accrued liability | | | $ 202,551 |
| C. Determination of Supplemental Contribution Rate** | | | |
| 1. Present value of future payrolls through the amortization date of June 30, 2038 | | | $ 983,828 |
| 2. Supplemental contribution rate: *(B.3.) / (C.1.)* | | | 20.59% *** |

* *Includes non-vested refunds and non-married survivor benefits only.*

** *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.*

*** *The amortization factor as of June 30, 2014 is 14.59989.*

# Development of Costs

## Changes in Unfunded Actuarial Accrued Liability (UAAL) *(Dollars in Thousands)*

| | Year Ending June 30, 2014 | | |
|---|---|---|---|
| | Actuarial Accrued Liability | Current Assets | Unfunded Actuarial Accrued Liability |
| A. Unfunded Actuarial Accrued Liability at beginning of year | $ 741,850 | $ 552,319 | $ 189,531 |
| B. Changes due to interest requirements and current rate of funding | | | |
| 1. Normal cost, including expenses | $ 13,477 | $ 0 | $ 13,477 |
| 2. Benefit payments | (53,722) | (53,722) | 0 |
| 3. Contributions | 0 | 20,824 | (20,824) |
| 4. Interest on A., B.1., B.2. and B.3. | 60,409 | 42,870 | 17,539 |
| 5. Total *(B.1. + B.2. + B.3. + B.4.)* | 20,164 | 9,972 | 10,192 |
| C. Expected Unfunded Actuarial Accrued Liability at end of year *(A. + B.5.)* | | | $ 199,723 |
| D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected | | | |
| 1. Age and service retirements | | | $ (699) |
| 2. Disability retirements | | | 1,071 |
| 3. Death-in-service benefits | | | (192) |
| 4. Withdrawals | | | 69 |
| 5. Salary increases | | | (2,485) |
| 6. Investment income | | | (35,579) |
| 7. Mortality of annuitants | | | (2,925) |
| 8. Other items | | | (1,710) |
| 9. Total | | | (42,450) |
| E. Unfunded Actuarial Accrued Liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.9.)* | | | $ 157,273 |
| F. Change in Unfunded Actuarial Accrued Liability due to changes in plan provisions | | | 0 |
| G. Change in Unfunded Actuarial Accrued Liability due to changes in actuarial assumptions | | | 45,278 |
| H. Change in Unfunded Actuarial Accrued Liability due to changes in methodology | | | 0 |
| I. Unfunded Actuarial Accrued Liability at end of year *(E. + F. + G. + H.)** | | | $ 202,551 |

** The Unfunded Actuarial Accrued Liability on a market value of assets basis is $133,081.*

# Development of Costs

## Determination of Contribution Sufficiency/(Deficiency) *(Dollars in Thousands)*

The required contribution is defined in Minnesota Statutes as the sum of normal cost, a supplemental contribution to amortize the UAAL, and an allowance for expenses.

| | Percent of Payroll | Dollar Amount |
|---|---|---|
| A. Statutory contributions - Chapter 353E | | |
| 1. Employee contributions | 13.40% | $ 9,030 |
| 2. Employer contributions | 20.10% | 13,545 |
| 3. State contributions*** | 1.48% | 1,000 |
| 4. Total | 34.98% | $ 23,575 |
| B. Required contributions - Chapter 356 | | |
| 1. Normal cost | | |
| a. Retirement benefits | 19.68% | $ 13,261 |
| b. Disability benefits | 1.85% | 1,247 |
| c. Survivors | 0.57% | 384 |
| d. Deferred retirement benefits | 0.55% | 371 |
| e. Refunds* | 0.09% | 61 |
| f. Total | 22.74% | $ 15,324 |
| 2. Supplemental contribution amortization of Unfunded Actuarial Accrued Liability by June 30, 2038 | 20.59% | $ 13,875 |
| 3. Allowance for expenses | 0.23% | $ 155 |
| 4. Total | 43.56% ** | $ 29,354 |
| C. Contribution Sufficiency/(Deficiency) *(A.4. - B.4.)* | (8.58)% | $ (5,779) |

Note: Projected annual payroll for fiscal year beginning on the valuation date: $67,386.

** Includes non-vested refunds and non-married survivor benefits only.*

*** The required contribution on a Market Value of Assets basis is 36.50% of payroll.*

**** Contributions paid until both the Public Employees Retirement Association Police and Fire Plan and the State Patrol Retirement Fund reach 90% funding (on a Market Value of Assets basis).*

# Actuarial Basis

## Actuarial Methods

All actuarial methods are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement, or the MSRS Board of Directors. Different methodologies may also be reasonable and results based on other methodologies would be different.

**Actuarial Cost Method**

Actuarial Accrued Liability and required contributions in this report are computed using the Entry Age Normal Cost Method. This method is prescribed by Minnesota Statute. Under this method, a normal cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Age as of the valuation date was calculated based on the dates of birth provided by the Fund. Entry age for valuation purposes was calculated as the age on the valuation date minus the provided years of service on the valuation date.

To the extent that current assets and future normal costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued Liability ("UAAL") develops. The UAAL is amortized over the statutory amortization period using level percent of payroll assuming payroll increases. The total contribution developed under this method is the sum of normal cost, expenses, and the payment toward the UAAL.

**Select and Ultimate Discount Rate Methodology**

Based on direction from the LCPR's actuary, the select and ultimate discount rate methodology is applied to the entry age normal results as follows:

1. The present value of projected benefits is calculated using the prescribed select and ultimate discount rates.
2. An equivalent single interest rate that produces approximately the same present value of projected benefits is determined.
3. The equivalent single interest rate is used to determine the entry age normal accrued liability and normal cost.

The equivalent single interest rate used in this valuation is 8.40% (8.37% last year).

**Valuation of Future Post-Retirement Benefit Increases**

If the plan has reached the funding ratio threshold required to pay a 1.5% or 2.5% benefit increase, Minnesota Statutes require the 1.5% or 2.5% benefit increase rate to be reflected in the liability calculations. If the plan has not yet reached the funding ratio threshold required to pay a 1.5% or 2.5% benefit increase, Minnesota Statutes require a projection to be performed to determine the expected attainment of the funding ratio thresholds, and the expected payment of 1.5% or 2.5% benefit increases must be reflected in the liability calculations.

# Actuarial Basis

## Actuarial Methods (Concluded)

**Funding Objective**
The fundamental financing objective of the fund is to establish contribution rates which, when expressed as a percentage of active member payroll, will remain approximately level from generation to generation and meet the required deadline for full funding.

**Decrement Timing**
All decrements are assumed to occur mid-fiscal year.

**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; and
- 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.

**Payment on the Unfunded Actuarial Accrued Liability**
Payment equals a level percentage of payroll each year to the statutory amortization date of June 30, 2038 assuming payroll increases of 3.75% per annum. If there is a negative Unfunded Actuarial Accrued Liability, the surplus amount is amortized over 30 years as a level percentage of payroll. If the unfunded liability increases due to changes in benefits, assumptions, or methods, the statutory amortization date will be re-determined. Projected payroll is multiplied by 0.959 in the determination of the present value of future payroll to account for timing differences (as required by the Standards for Actuarial Work).

**Changes in Methods since Prior Valuation**
The methodology for valuing future post-retirement increases was clarified in Minnesota Statutes.

# Actuarial Basis

## Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The assumptions prescribed are based on the last experience study, dated February 2012, prepared by a former actuary.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment.

| | |
|---|---|
| Investment return | Select and Ultimate Rates:<br>July 1, 2014 to June 30, 2017 8.00% per annum<br>July 1, 2017 and later 8.50% per annum |
| Benefit increases after retirement | 1.00% per annum through 2017, 1.50% per annum from 2018 to 2032, and 2.5% per annum thereafter |
| Salary increases | Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service. |
| Inflation | 3.00% per year. |
| Payroll growth | 3.75% per year. |
| Mortality rates | |
| Healthy Pre-retirement | RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment. |
| Healthy Post-retirement | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. |
| Disabled | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females. |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Withdrawal | Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are:<br><br>Year — Select Withdrawal Rates<br>1 — 5%<br>2 — 2%<br>3 — 2% |
| Disability | Age-related rates based on 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 participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | Prior year administrative expenses expressed as percentage of prior year projected payroll. |
| Refund of contributions | All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. Account balances for deferred members accumulate interest until normal retirement date and are discounted back to the valuation date. |
| 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 active members are assumed to be married. Actual marital status is used for members in payment status. |
| Age of spouse | Females are assumed to be two years younger than their spouses, and males are assumed to be two years older than their spouses. |
| Eligible children | Each member may have two dependent children depending on member's age. Assumed first born child born at member's age 28 and second born child at member's age 31. |
| Form of payment | Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows:<br><br>Males: 15% elect 50% Joint & Survivor option<br>25% elect 75% Joint & Survivor option<br>35% elect 100% Joint & Survivor option<br>Females: 25% elect 50% Joint & Survivor option<br>30% elect 75% Joint & Survivor option<br>5% elect 100% Joint & Survivor option<br><br>Remaining married members and unmarried members are assumed to elect the Straight Life option. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| 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. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>There are no members reported with missing gender or birth dates. In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members</u>:<br>There were no members reported with missing salary and no members reported with missing service.<br><br><u>Data for terminated members</u>:<br>There was 1 member reported without a benefit. We calculated benefits for this member using the reported Credited Service and Termination Date. Average Salary was not reported, so we assumed a value of $35,000.<br><br><u>Data for members receiving benefits</u>:<br>There were no members reported without a benefit.<br><br>There were no survivors reported with an expired benefit.<br><br>There were 5 retirees reported with a bounce back annuity but were not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively.<br><br>There were 10 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e. “bounce back”), if applicable.<br><br>For retirees that elected a survivor benefit option, we used the valuation assumptions if the survivor date of birth was missing or invalid (220 members) and/or the survivor gender was missing or invalid (238 members).<br><br>At MSRS' direction, we changed the status of 18 members who were reported with a disabled status at the beginning of the year and a retired status at the end of the year back to disabled status. |
| Changes in actuarial assumptions | Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.<br><br>The assumed post-retirement benefit increase rate was changed from 1.0% per year for all years to 1.0% per year through 2017, 1.5% per year from 2018 through 2032, and 2.5% per year thereafter. See page 4 for additional detail about this assumption. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | Rate (%)* | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality* | |
| **Age** | **Male** | **Female** | **Male** | **Female** | **Male** | **Female** |
| 20 | 0.03% | 0.02% | 0.03% | 0.02% | 0.03% | 0.02% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 | 0.04 | 0.02 |
| 30 | 0.04 | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 |
| 35 | 0.05 | 0.05 | 0.06 | 0.05 | 0.05 | 0.05 |
| 40 | 0.08 | 0.07 | 0.09 | 0.06 | 0.08 | 0.07 |
| 45 | 0.11 | 0.11 | 0.13 | 0.10 | 0.11 | 0.11 |
| 50 | 0.17 | 0.25 | 0.20 | 0.16 | 0.17 | 0.25 |
| 55 | 0.57 | 0.39 | 0.27 | 0.24 | 0.57 | 0.39 |
| 60 | 0.57 | 0.61 | 0.43 | 0.38 | 0.57 | 0.61 |
| 65 | 0.92 | 1.01 | 0.67 | 0.59 | 0.92 | 1.01 |
| 70 | 1.58 | 1.69 | 0.98 | 0.88 | 1.58 | 1.69 |

* *Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment, and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates as prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decreased at all ages, we would not expect the valuation results to be materially different.*

** *These rates were adjusted for mortality improvements using projection scale AA.*

| | Withdrawal Rates After Third Year | | Disability Retirement | |
|---|---|---|---|---|
| **Age** | **Male** | **Female** | **Male** | **Female** |
| 20 | 1.47% | 1.47% | 0.03% | 0.03% |
| 25 | 1.13 | 1.13 | 0.05 | 0.05 |
| 30 | 0.80 | 0.80 | 0.06 | 0.06 |
| 35 | 0.47 | 0.47 | 0.09 | 0.09 |
| 40 | 0.40 | 0.40 | 0.14 | 0.14 |
| 45 | 0.40 | 0.40 | 0.23 | 0.23 |
| 50 | 0.00 | 0.00 | 0.40 | 0.40 |
| 55 | 0.00 | 0.00 | 0.70 | 0.70 |
| 60 | 0.00 | 0.00 | 1.13 | 1.13 |
| 65 | 0.00 | 0.00 | 0.00 | 0.00 |

# Actuarial Basis

## Summary of Actuarial Assumptions (Concluded)

| Age | Retirement | | Salary Scale Year | Salary Scale Increase |
|---|---|---|---|---|
| 50 | 7 % | | 1 | 8.00% |
| 51 | 6 | | 2 | 7.50 |
| 52 | 6 | | 3 | 7.00 |
| 53 | 6 | | 4 | 6.75 |
| 54 | 3 | | 5 | 6.50 |
| 55 | 65 | | 6 | 6.25 |
| 56 | 50 | | 7 | 6.00 |
| 57 | 30 | | 8 | 5.85 |
| 58 | 20 | | 9 | 5.70 |
| 59 | 20 | | 10 | 5.55 |
| 60+ | 100 | | 11 | 5.40 |
| | | | 12 | 5.25 |
| | | | 13 | 5.10 |
| | | | 14 | 4.95 |
| | | | 15 | 4.80 |
| | | | 16 | 4.65 |
| | | | 17 | 4.50 |
| | | | 18 | 4.35 |
| | | | 19 | 4.20 |
| | | | 20 | 4.05 |
| | | | 21+ | 4.00 |

# Actuarial Basis

## Summary of Plan Provisions

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| Plan year | July 1 through June 30 |
| Eligibility | State troopers, conservation officers, certain crime bureau and gambling enforcement officers, and certain other persons listed in Minnesota Statutes 352B.011 subdivision 10. |
| Contributions | Percent of Salary<br>**Effective Date** / **Member** / **Employer**<br>July 1, 2011 – June 30, 2014: 12.40% / 18.60%<br>July 1, 2014 – June 30, 2016: 13.40% / 20.10%<br>July 1, 2016 and later: 14.40% / 21.60%<br>Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). |
| State Contributions | $1 million paid annually on October 1 until both the Public Employees Retirement Association Police and Fire Plan and the State Patrol Retirement Fund become 90% funded (on a Market Value of Assets basis). |
| Allowable service | Service during which member contributions were deducted. Includes period receiving temporary Worker's Compensation and reduced salary from employer. See Normal Retirement benefit definition below for information about service limits. |
| Salary | Salaries excluding lump sum payments at separation. |
| Average salary | Average of the five highest years of Salary. Average Salary is based on all Allowable Service if less than five years. Average Salary is based on all years without regard to any service limits. |
| **Retirement** | |
| Normal retirement benefit | |
| Age/Service requirement | Age 55 and three years (ten years if first hired after June 30, 2013) of Allowable Service. |
| Amount | 3.00% of Average Salary for each year of Allowable Service up to 33 years. Members with at least 28 years of service as of July 1, 2013 are not subject to this service limit. Member contributions made after the service cap will be refunded at retirement. |
| Early retirement benefit | |
| Age/Service requirement | Age 50 and three years (ten years if first hired after June 30, 2013) of Allowable Service. |
| Amount | Normal Retirement Benefit based on Allowable Service and Average Salary at retirement reduced by 1/10% for each month that the member is under age 55. If the effective date of retirement is after June 30, 2015, the reduction is 0.34% for each month that the member is under age 55 at the time of retirement. |
| Form of payment | Life annuity.<br>Actuarially equivalent options are:<br>50%, 75%, or 100% Joint and Survivor, or 15-year certain. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Retirement (Concluded)** | |
| Benefit increases | Since January 1, 2014, benefit recipients receive annual 1.0% benefit increases. When the funding ratio reaches 85% for two consecutive years, the benefit increase will increase to 1.5%; the benefit will revert to 2.5% when the funding ratio reaches 90% for two consecutive years (actuarial accrued liability funding ratio determined using Market Value of Assets). A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase. |
| **Disability** | |
| Occupational disability benefit | |
| Age/Service requirement | Member who cannot perform his duties as a direct result of a disability relating to an act of duty. |
| Amount | 60% of Average Salary plus 3.00% of Average Salary for each year in excess of 20 years of Allowable Service (pro rata for completed months).<br>Payments cease at age 65 or earlier if disability ceases or death occurs.<br>Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. |
| Non-duty disability benefit | |
| Age/Service requirement | At least one year of Allowable Service and disability not related to covered employment. |
| Amount | Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability without reduction for commencement before age 55.<br>Payments cease at age 65 or earlier if disability ceases or death occurs.<br>Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. |
| Retirement after disability | |
| Age/Service requirement | Age 65 with continued disability. |
| Amount | Optional annuity continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option. |
| Form of payment | Same as for retirement. |
| Benefit increases | Same as for retirement. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Death** | |
| Surviving spouse benefit | |
| Age/Service requirement | Member who is active or receiving a disability benefit or former member. |
| Amount | 50% of Average Salary if member was active or occupational disability and either had less than three years (five years if first hired after June 30, 2013) of Allowable Service or was under age 55. Annuity is paid for life.<br><br>Surviving spouse receives the 100% joint and survivor benefit commencing on the member's 55th birthday if member was active or a disability with three years (five years if first hired after June 30, 2013) of Allowable Service. A spouse who had been receiving the 50% benefit shall be entitled to the greater benefit.<br><br>The surviving spouse of a former member receives the 100% joint and survivor benefit commencing on the member's 55th birthday if former member had three years (five years if first hired after June 30, 2013) of Allowable Service. |
| Benefit increases | Same as for retirement. |
| Surviving dependent children's benefit | |
| Age/Service requirement | Member who is active or receiving a disability benefit. Child must be unmarried, under age 18 (or 23 if full-time student) and dependent upon the member. |
| Amount | 10% of Average Salary for each child and $20 per month prorated among all dependent children. Benefit must not be less than 50% nor exceed 70% of Average Salary. |
| Benefit increases | Same as for retirement. |
| Refund of contributions | |
| Age/Service requirement | Member dies before receiving any retirement benefits and survivor benefits are not payable. |
| Amount | Member contributions with 6.00% interest compounded daily until June 30, 2011 and 4.00% thereafter. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Termination** | |
| Refund of contributions | |
| Age/service requirement | Termination of state service. |
| Amount | Member contributions with 6.00% interest compounded daily to June 30, 2011 and 4.00% thereafter.<br><br>If a member is vested, a deferred annuity may be elected in lieu of a refund. |
| Deferred benefit | |
| Age/service requirement | Three years (ten years if first hired after June 30, 2013) of Allowable Service. |
| Amount | Benefit is computed under law in effect at termination and increased by the following annual augmentation percentage:<br><br>(a.) 0.00% before July 1, 1971;<br>(b.) 5.00% from July 1, 1971 to January 1, 1981;<br>(c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1, 2012; and<br>(d.) 2.00% after December 31, 2011 until the annuity begins.<br><br>Amount is payable at normal or early retirement.<br><br>If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| **Optional form conversion factors** | Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, set back two years for males and set forward one year for females, blended 95% males, and 6.5% interest. |
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br><br>(a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement; and<br><br>(b.) Have at least six months of allowable service credit in each plan worked under; and<br><br>(c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year.<br><br>Members who meet the above requirements must have their benefit based on the following:<br><br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement.<br><br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |

# Actuarial Basis

## Summary of Plan Provisions (Concluded)

| | |
|---|---|
| **Contribution stabilizer** | The following is a summary of contribution stabilizer provisions in Minnesota Statute 352.045:<br>• If a contribution sufficiency of at least 1.0% has existed for two consecutive years, member contributions are decreased by at most 0.25% and employer contributions are decreased by at most 0.375% to a level that is necessary to maintain a 2.0% sufficiency. A contribution rate decrease under this section must not be made until at least two years have passed since fully implementing a previous decrease.<br>• If a contribution deficiency of at least 0.5% has existed for two consecutive years, the member and employer contribution rates are increased as follows:<br>o If the contribution deficiency is less than 2.0%, member contributions are increased 0.25% and employer contributions are increased by 0.375%.<br>o If the contribution deficiency is greater than 1.99% and less than 4.01%, member contributions are increased 0.50% and employer contributions are increased by 0.75%.<br>o If the contribution deficiency is greater than 4.0%, member contributions are increased by 0.75% and employer contributions are increased by 1.125%. |
| **Changes in plan provisions** | The funding ratio threshold that must be attained to pay a 1.5% post-retirement benefit increase to benefit recipients was changed from 85% for one year to 85% for two consecutive years. The funding ratio threshold that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years.<br>The interest assumption used to determine optional form conversion factors was changed from an actuarial equivalent rate consistent with the post-retirement discount rate to a fixed rate of 6.5%. |

# Additional Schedules

## Schedule of Funding Progress[1] *(Dollars in Thousands)*

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded (Overfunded) AAL (UAAL) (b) - (a) | Funded Ratio (a)/(b) | Actual Covered Payroll (Previous FY) (c) | UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c) |
|---|---|---|---|---|---|---|
| 7-1-1991 | $ 200,068 | $ 224,033 | $ 23,965 | 89.30% | $ 32,365 | 74.05 % |
| 7-1-1992 | 222,314 | 233,656 | 11,342 | 95.15 | 32,882 | 34.49 |
| 7-1-1993 | 244,352 | 258,202 | 13,850 | 94.64 | 35,765 | 38.73 |
| 7-1-1994 | 262,570 | 275,377 | 12,807 | 95.35 | 35,341 | 36.24 |
| 7-1-1995 | 284,918 | 283,078 | (1,840) | 100.65 | 37,518 | (4.90) |
| 7-1-1996 | 323,868 | 303,941 | (19,927) | 106.56 | 41,476 | (48.04) |
| 7-1-1997 | 375,650 | 332,427 | (43,223) | 113.00 | 41,996 | (102.92) |
| 7-1-1998 | 430,011 | 371,369 | (58,642) | 115.79 | 43,456 | (134.95) |
| 7-1-1999 | 472,687 | 406,215 | (66,472) | 116.36 | 45,333 | (146.63) |
| 7-1-2000 | 528,573 | 458,384 | (70,189) | 115.31 | 48,167 | (145.72) |
| 7-1-2001 | 572,815 | 489,483 | (83,332) | 117.02 | 48,935 | (170.29) |
| 7-1-2002 | 591,383 | 510,344 | (81,039) | 115.88 | 49,278 | (164.45) |
| 7-1-2003 | 591,521 | 538,980 | (52,541) | 109.75 | 54,175 | (96.98) |
| 7-1-2004 | 594,785 | 545,244 | (49,542) | 109.09 | 51,619 | (95.98) |
| 7-1-2005 | 601,220 | 566,764 | (34,456) | 106.08 | 55,142 | (62.49) |
| 7-1-2006 | 618,990 | 641,479 | 22,489 | 96.49 | 57,765 | 38.93 |
| 7-1-2007 | 617,901 | 673,444 | 55,543 | 91.75 | 61,498 | 90.32 |
| 7-1-2008 | 595,082 | 693,686 | 98,604 | 85.79 | 60,029 | 164.26 |
| 7-1-2009 | 584,501 | 725,334 | 140,833 | 80.58 | 61,511 | 228.96 |
| 7-1-2010 | 567,211 | 683,360 | 116,149 | 83.00 | 63,250 | 183.63 |
| 7-1-2011 | 563,046 | 700,898 | 137,852 | 80.33 | 63,250 | 217.95 |
| 7-1-2012 | 554,244 | 760,955 | 206,711 | 72.84 | 62,524 [2] | 330.61 |
| 7-1-2013 | 552,319 | 741,850 | 189,531 | 74.45 | 62,121 [2] | 305.10 |
| 7-1-2014 | 597,870 | 800,421 | 202,551 | 74.69 | 63,952 [2] | 316.72 |

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
[2] *Assumed equal to actual member contributions divided by 12.4%.*

# Additional Schedules

## Schedule of Contributions from the Employer and Other Contributing Entities[1]
*(Dollars in Thousands)*

| Plan Year Ended June 30 | Actuarially Required Contribution Rate (a) | Actual Covered Payroll (b) | Actual Member Contributions (c) | Annual Required Contributions [(a)x(b)] - (c) = (d) | Actual Employer Contributions[2] (e) | Percentage Contributed (e)/(d) |
|---|---|---|---|---|---|---|
| 1991 | 22.15% | $ 32,365 | $ 2,751 | $ 4,418 | $ 4,825 | 109.21% |
| 1992 | 22.58 | 32,882 | 2,795 | 4,630 | 4,893 | 105.68 |
| 1993 | 22.27 | 35,765 | 3,040 | 4,925 | 5,288 | 107.37 |
| 1994 | 21.94 | 35,341 | 3,004 | 4,750 | 5,159 | 108.61 |
| 1995 | 21.79 | 37,518 | 3,189 | 4,986 | 5,583 | 111.97 |
| 1996 | 21.34 | 41,476 | 3,484 | 5,367 | 5,742 | 106.99 |
| 1997 | 21.33 | 41,996 | 3,746 | 5,212 | 6,151 | 118.02 |
| 1998 | 15.67 | 43,456 | 3,634 | 3,176 | 5,475 | 172.39 |
| 1999 | 14.14 | 45,333 | 3,850 | 2,560 | 5,712 | 223.13 |
| 2000 | 15.17 | 48,167 | 4,044 | 3,263 | 6,069 | 185.99 |
| 2001 | 15.48 | 48,935 | 4,145 | 3,430 | 6,166 | 179.77 |
| 2002 | 14.00 | 49,278 | 4,215 | 2,684 | 6,209 | 231.33 |
| 2003 | 14.34 | 54,175 | 4,555 | 3,214 | 6,826 | 212.38 |
| 2004 | 17.81 | 51,619 | 4,493 | 4,700 | 6,504 | 138.39 |
| 2005 | 18.15 | 55,142 | 4,517 | 5,491 | 6,670 | 121.47 |
| 2006 | 19.84 | 57,765 | 4,719 | 6,741 | 7,055 | 104.66 |
| 2007 | 26.69 | 61,498 | 4,987 | 11,427 | 7,461 | 65.30 |
| 2008 | 29.90 | 60,029 | 5,594 | 12,355 | 8,279 | 67.01 |
| 2009 | 34.49 | 61,511 | 6,216 | 14,999 | 9,178 | 61.19 |
| 2010 | 38.16 | 63,250 | 6,726 | 17,410 | 10,104 | 58.04 |
| 2011 | 33.84 | 63,250 | 6,578 | 14,826 | 9,873 | 66.59 |
| 2012 | 36.25 | 62,524 [3] | 7,753 | 14,912 | 11,620 | 77.92 |
| 2013 | 42.52 | 62,121 [3] | 7,703 | 18,711 | 11,482 | 61.37 |
| 2014 | 41.24 | 63,952 [3] | 7,930 | 18,444 | 12,894 | 69.91 |
| 2015 | 43.56 | N/A | N/A | N/A | N/A | N/A |

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
[2] *Includes contributions from other sources (if applicable).*
[3] *Assumed equal to actual member contributions divided by 12.4%.*

# Glossary of Terms

| | |
|---|---|
| ***Accrued Benefit Funding Ratio*** | The ratio of assets to Current Benefit Obligations. |
| ***Accrued Liability Funding Ratio*** | The ratio of assets to Actuarial Accrued Liability. |
| ***Actuarial Accrued Liability (AAL)*** | The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs. |
| ***Actuarial Assumptions*** | Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items. |
| ***Actuarial Cost Method*** | A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability. |
| ***Actuarial Equivalent*** | Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions. |
| ***Actuarial Present Value (APV)*** | The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made. |
| ***Actuarial Present Value of Projected Benefits*** | The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due. |
| ***Actuarial Valuation*** | The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for developing and monitoring a retirement system’s funding policy, such as the Funded Ratio and the Annual Required Contribution (ARC). |
| ***Actuarial Value of Assets*** | The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC). |

# Glossary of Terms (Continued)

| | |
|---|---|
| ***Amortization Method*** | A method for determining the Amortization Payment. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. The stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase. |
| ***Amortization Payment*** | That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability. |
| ***Amortization Period*** | The period used in calculating the Amortization Payment. |
| ***Annual Required Contribution (ARC)*** | The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ARC consists of the Employer Normal Cost and Amortization Payment. |
| ***Augmentation*** | Annual increases to deferred benefits. |
| ***Closed Amortization Period*** | A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. |
| ***Current Benefit Obligations*** | The present value of benefits earned to the valuation date, based on current service and including future salary increases to retirement. |
| ***Employer Normal Cost*** | The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions. |
| ***Expected Assets*** | The present value of anticipated future contributions intended to fund benefits for current members. |
| ***Experience 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 valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected. |

# Glossary of Terms (Concluded)

| | |
|---|---|
| ***GASB*** | Governmental Accounting Standards Board. |
| ***GASB Statements No. 25 and No. 27*** | These are the governmental accounting standards that set the accounting and financial reporting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves. These statements remain in effect only for pension plans that are not administered as trusts or equivalent arrangements. Please refer to the definition for GASB Statements No. 67 and No. 68 below. |
| ***GASB Statement No. 50*** | The accounting standard governing a state or local governmental employer's accounting for pensions. This statement remains in effect for pension plans that are not administered as trusts. Please refer to the definition of GASB Statements No. 67 and No. 68 below. |
| ***GASB Statements No. 67 and No. 68*** | Statements No. 67 and No. 68, issued in June 2012, replace the requirements of Statements No. 25, No. 27 and No. 50, respectively, for pension plans administered as trusts. Statement No. 68 sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves. Accounting and financial reporting information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the June 30, 2014 actuarial valuation. |
| ***Normal Cost*** | The annual cost assigned, under the Actuarial Cost Method, to the current plan year. |
| ***Projected Benefit Funding Ratio*** | The ratio of the sum of Actuarial Value of Assets and Expected Assets to the Actuarial Present Value of Projected Benefits. |
| ***Unfunded Actuarial Accrued Liability*** | The difference between the Actuarial Accrued Liability and Actuarial Value of Assets. |
| ***Valuation Date*** | The date as of which the Actuarial Present Value of Future Benefits is determined. The benefits expected to be paid in the future are discounted to this date. |

Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

# JUDGES RETIREMENT FUND

ACTUARIAL VALUATION REPORT AS OF JULY 1, 2014

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December 12, 2014

Minnesota State Retirement System
Judges Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

The results of the July 1, 2014 annual actuarial valuation of the Judges Retirement Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by the Board and staff and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety. GRS is not responsible for the consequences of any unauthorized use of this report.

The purpose of the valuation is to measure the Fund's funding progress, to determine the required contribution rate for the fiscal year beginning July 1, 2014. Note that we have not attempted to quantify the impact of GASB Statements No. 67 and No. 68 in this report. Please see the separate report dated December 1, 2014.

The valuation was based upon information furnished by the Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by MSRS.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Directors. 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. MSRS is solely responsible for communicating to GRS any changes required thereto.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. A revision of ASOP No. 27, applicable to valuation dates on or after September 30, 2014, will guide assumption setting for future valuations. A recent review of inflation and investment return assumptions for accounting and financial reporting purposes developed a recommended range of 6.99% to 7.92% for the assumed investment return. Additional review and discussion will be required before the next valuation.

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 such future measurements.

This report should not be relied on for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the Judges Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Based on the current statutory contributions, the unfunded liability will not be eliminated if all actuarial assumptions are met.

We are available to answer any questions or provide further details.

Respectfully submitted,

Brian B Murphy

Brian B. Murphy, FSA, EA, MAAA

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA

BBM/BJW:sc

# Contents

# Summary of Valuation Results

## Contributions

The following table summarizes important contribution information as described in the Development of Costs section.

| Contributions for Fiscal Year Beginning | Actuarial Valuation as of July 1, 2014 | Actuarial Valuation as of July 1, 2013 |
|---|---|---|
| Statutory Contributions - Chapter 490* (% of Payroll) | 31.02% | 30.96% |
| Required Contributions - Chapter 356 (% of Payroll) | 41.26% | 42.42% |
| Sufficiency / (Deficiency) | (10.24)% | (11.46)% |

The contribution deficiency decreased from (11.46)% of payroll to (10.24)% of payroll. The primary reason for the decreased contribution deficiency is the greater than expected return on assets. A significant contribution deficiency remains. Without further changes or favorable actuarial experience, the funded status will deteriorate in the future and assets will be depleted. Plan changes affecting members first hired after June 30, 2013 are expected to ultimately reduce the cost of the plan, but have only a small impact on the valuation results in the 2014 valuation. On a market value of assets basis, contributions are deficient by (7.27)% of payroll.

Statutory contributions are not sufficient to fully amortize the unfunded actuarial accrued liability over the statutory amortization period of 25 years. Based on the current member and employer contribution rates and other methods and assumptions described in this report, an infinite number of years would be required to eliminate the unfunded liability (the unfunded liability will never be eliminated). Furthermore, based on current contributions, the payment on the unfunded liability as a percent of pay will increase without limit to an infinite value.

The Plan Assets section provides detail on the plan assets used for the valuation including a development of the actuarial value of assets (AVA). The market value of assets (MVA) earned approximately 18.6% for the plan year ending June 30, 2014. The AVA earned approximately 14.5% for the plan year ending June 30, 2014 as compared to the assumed rate of 8.0%. The assumed rate is a prescribed assumption mandated by Minnesota Statutes.

Participant reconciliation and statistics are detailed in the Membership Data section. The Actuarial Basis section includes a summary of plan provisions and actuarial methods and assumptions used for the calculations in this report.

Accounting and financial reporting information prepared according to GASB Statements No. 67 and No. 68 was provided to MSRS in a separate report dated December 1, 2014.

** Statutory contributions reflect the fact that member contributions for Judges at the maximum benefit level are directed to the Unclassified Employees Retirement Plan. If these contributions were not directed to the Unclassified Employees Retirement Plan, the statutory contribution rate would be 31.36% instead of 31.02% as of July 1, 2014 and 31.50% instead of 30.96% as of July 1, 2013.*

# Summary of Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in plan provisions, actuarial assumptions or valuation methods and procedures between the two valuations are described after the summary.

| | Actuarial Valuation as of | |
|---|---|---|
| | **July 1, 2014** | **July 1, 2013** |
| **Contributions** (*% of Payroll*) | | |
| Statutory - Chapter 490* | 31.02% | 30.96% |
| Required - Chapter 356 | 41.26% | 42.42% |
| Sufficiency / (Deficiency) | (10.24%) | (11.46%) |
| **Funding Ratios** (*dollars in thousands*) | | |
| Assets | | |
| - Current assets (AVA) | $ 157,528 | $ 144,918 |
| - Current assets (MVA) | 175,556 | 155,398 |
| Accrued Benefit Funding Ratio | | |
| - Current benefit obligations | $ 285,139 | $ 274,005 |
| - Funding ratio (AVA) | 55.25% | 52.89% |
| - Funding ratio (MVA) | 61.57% | 56.71% |
| Accrued Liability Funding Ratio | | |
| - Actuarial accrued liability | $ 298,233 | $ 284,513 |
| - Funding ratio (AVA) | 52.82% | 50.94% |
| - Funding ratio (MVA) | 58.87% | 54.62% |
| Projected Benefit Funding Ratio | | |
| - Current and expected future assets | $ 287,376 | $ 266,246 |
| - Current and expected future benefit obligations | 349,492 | 332,430 |
| - Projected benefit funding ratio (AVA) | 82.23% | 80.09% |
| **Participant Data** | | |
| Active Members | | |
| - Number | 316 | 309 |
| - Projected annual earnings *(000s)* | 43,527 | 40,545 |
| - Average projected annual earnings | 137,744 | 131,214 |
| - Average age | 56.8 | 57.1 |
| - Average service | 9.9 | 10.4 |
| Service Retirements | 227 | 210 |
| Survivors | 84 | 98 |
| Disability Retirements | 24 | 24 |
| Deferred Retirements | 16 | 16 |
| Terminated other Non-Vested | 0 | 0 |
| **Total** | **667** | **657** |

* *Statutory contributions reflect the fact that member contributions for Judges at the maximum benefit level are directed to the Unclassified Employees Retirement Plan. If these contributions were not directed to the Unclassified Employees Retirement Plan, the statutory contribution rate would be 31.36% instead of 31.02% as of July 1, 2014 and 31.50% instead of 30.96% as of July 1, 2013.*

# Summary of Valuation Results

## Effects of Changes

The following changes were recognized as of July 1, 2014:

- Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases.

- The actuarial accrued liability funding ratio threshold, on a market value of assets basis, that must be attained to pay a 2.0% post-retirement benefit increase to benefit recipients was changed from 70% for one year to 70% for two consecutive years. The funding ratio threshold that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years.

- The 10-year certain and life thereafter optional form of payment is no longer available.

The combined impact of the above changes was to increase the accrued liability by $1.6 million and increase the required contribution by 0.3% of pay, as follows:

| | Before Assumption Changes | Reflecting Assumption Changes |
|---|---|---|
| Normal Cost Rate, % of Pay | 17.9% | 17.9% |
| Amortization of UAAL*, % of pay | 22.9% | 23.2% |
| Expenses (% of Pay) | 0.1% | 0.1% |
| Total Required Contribution, % of Pay | 40.9% | 41.2% |
| | | |
| Accrued Liability Funding Ratio | 53.1% | 52.8% |
| Projected Benefit Funding Ratio | 82.5% | 82.2% |
| | | |
| UAAL* (in millions) | $139.1 | $140.7 |

**Unfunded Actuarial Accrued Liability.*

Refer to the Actuarial Basis section of this report for a complete description of these changes.

# Summary of Valuation Results

## Valuation of Future Annual Post-Retirement Benefit Increases

A very important assumption affecting the valuation results is the expectation of future annual post-retirement benefit increases. The plan's accrued liability funding ratio (on a market value of assets basis and assuming 1.75% post-retirement benefit increases in all future years) is currently 58.9%. The funding ratio (assuming 2.0% post-retirement benefit increases in all future years) threshold that must be attained to pay a 2.0% post-retirement benefit increase to benefit recipients was changed in 2014 from 70% for one year to 70% for two consecutive years. Similarly, the funding ratio (assuming 2.5% post-retirement benefit increases in all future years) threshold that must be attained to pay a 2.5% postretirement benefit increase to benefit recipients was changed in 2014 from 90% for one year to 90% for two consecutive years.

Minnesota Statutes were revised in 2014 to establish a process for establishing a post-retirement benefit increase assumption for each valuation. If the plan has not yet reached the threshold required to pay a 2.0% or 2.5% benefit increase, a projection must be performed to determine the expected attainment of the threshold, and the expected change to a 2.0% or 2.5% benefit increase rate must be reflected in the liability calculations.

We performed a projection of liabilities and assets, using the 2014 valuation results as a baseline and assuming future experience follows the valuation assumptions (including future investment returns of 8.0% for three years and 8.5% thereafter). In addition, the projection utilized the following methods and assumptions:

- Future investment returns of 8.00% through June 30, 2017; 8.50% thereafter;
- Open group; stable active population (new member profile based on average new members hired in recent years);
- The post-retirement benefit increase rate is assumed to be 1.75% per year until the funding ratio threshold required to pay a 2.00% post-retirement benefit increase is reached and is assumed to be 2.00% per year until the threshold required to pay a 2.50% post-retirement benefit increase is reached; and
- Current statutory contributions as directed by MSRS.

Based on these assumptions and methods, the projection indicates that the funded status of this plan is not expected to improve from the current level of 58.9% and therefore the plan is expected to pay 1.75% post-retirement benefit increases until assets are depleted. This assumption is reflected in our calculations.

# Supplemental Information

The remainder of the report includes information supporting the results presented in the previous sections.

- **Plan assets** presents information about the plan's assets as reported by the Minnesota State Retirement System. The assets represent the portion of total fund liabilities that has been funded.
- **Membership data** presents and describes the membership data used in the valuation.
- **Development of costs** shows the liabilities for plan benefits and the derivation of the contribution amount.
- **Actuarial basis** describes the plan provisions, as well as the methods and assumptions used to value the plan. The valuation is based on the premise that the plan is ongoing.
- **Additional Schedules** includes a summary of funding progress and contributions over the long term.
- **Glossary** defines the terms used in this report.

# Plan Assets

## Statement of Fiduciary Net Position *(Dollars in Thousands)*

| | Market Value | |
|---|---|---|
| **Assets** | **June 30, 2014** | **June 30, 2013** |
| Cash, equivalents, short term securities | $ 5,198 | $ 4,504 |
| Fixed income | 40,879 | 35,620 |
| Equity | 129,536 | 115,388 |
| Other* | 18,963 | 15,131 |
| **Total cash, investments, and other assets** | **$ 194,576** | **$ 170,643** |
| Amounts Receivable | 60 | 7 |
| **Total Assets** | **$ 194,636** | **$ 170,650** |
| Amounts Payable* | (19,080) | (15,252) |
| **Net Position Restricted for Pensions** | **$ 175,556** | **$ 155,398** |

** Includes $18,963 in Securities Lending Collateral as of June 30, 2014 and $15,131 as of June 30, 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 the Minnesota State Retirement System for the prior two fiscal years.

| **Change in Assets** | | **Market Value** | |
|---|---|---|---|
| **Year Ending** | | **June 30, 2014** | **June 30, 2013** |
| **1.** | **Fund balance at market value at beginning of year** | **$ 155,398** | **$ 144,086** |
| 2. | Contributions | | |
| | a. Member | 3,578 | 3,037 |
| | b. Employer | 9,426 | 8,177 |
| | c. Other sources | 0 | 0 |
| | d. Total contributions | $ 13,004 | $ 11,214 |
| 3. | Investment income | | |
| | a. Investment income/(loss) | 28,255 | 20,156 |
| | b. Investment expenses | (244) | (213) |
| | c. Net investment income/(loss) | 28,011 | 19,943 |
| 4. | Other | 0 | 0 |
| **5.** | **Total income:** *(2.d.) + (3.c.) + (4.)* | **$ 41,015** | **$ 31,157** |
| 6. | Benefits Paid | | |
| | a. Annuity benefits | (20,802) | (19,772) |
| | b. Refunds | 0 | 0 |
| | c. Total benefits paid | (20,802) | (19,772) |
| 7. | Expenses | | |
| | a. Other | 0 | (1) |
| | b. Administrative | (55) | (72) |
| | c. Total expenses | (55) | (73) |
| **8.** | **Total disbursements:** *(6.c.) + (7.c.)* | **(20,857)** | **(19,845)** |
| **9.** | **Fund balance at market value at end of year:** *(1.) + (5.) + (8.)* | **$ 175,556** | **$ 155,398** |
| 10. | State Board of Investment calculated return on investments | 18.6% | 14.2% |

# Plan Assets

## Actuarial Asset Value *(Dollars in Thousands)*

| | June 30, 2014 | June 30, 2013 |
|---|---|---|
| **1. Market value of assets available for benefits** | **$ 175,556** | **$ 155,398** |
| 2. Determination of average balance | | |
| a. Total assets available at beginning of year | 155,398 | 144,086 |
| b. Total assets available at end of year | 175,556 | 155,398 |
| c. Net investment income for fiscal year | 28,011 | 19,943 |
| d. Average balance *[a. + b. - c.] / 2* | 151,472 | 139,771 |
| 3. Expected return *[8.0% x 2.d.]* | 12,118 | 11,182 |
| 4. Actual return | 28,011 | 19,943 |
| 5. Current year asset gain/(loss) *[4. - 3.]* | 15,893 | 8,761 |
| 6. Unrecognized asset returns | | |

| | Original Amount | Unrecognized Amount % | Unrecognized Amount Dollar | Unrecognized Amount % | Unrecognized Amount Dollar |
|---|---|---|---|---|---|
| a. Year ended June 30, 2014 | $ 15,893 | 80% | $ 12,715 | | N/A |
| b. Year ended June 30, 2013 | 8,761 | 60% | 5,257 | 80% | $ 7,009 |
| c. Year ended June 30, 2012 | (8,952) | 40% | (3,581) | 60% | (5,371) |
| d. Year ended June 30, 2011 | 18,186 | 20% | 3,637 | 40% | 7,274 |
| e. Year ended June 30, 2010 | 7,838 | | N/A | 20% | 1,568 |
| **f. Unrecognized return adjustment** | | | **$ 18,028** | | **$ 10,480** |
| 7. **Actuarial value at end of year** *(1. - 6.f.)* | | | **$ 157,528** | | **$ 144,918** |
| 8. Approximate return on actuarial value of assets during fiscal year | | | 14.5% | | 6.1% |
| 9. Ratio of actuarial value of assets to market value of assets | | | 0.90 | | 0.93 |

# Membership Data

## Distribution of Active Members*

| | Years of Service as of June 30, 2014 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3**** | **3 - 4**** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25 - 29** | **30 - 34** | **35+** | **Total** |
| < 25 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 25 - 29 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 30 - 34 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 35 - 39 | 4 | 1 | | | | | | | | **5** |
| Avg. Earnings | 119,193 | 134,289 | | | | | | | | **122,212** |
| 40 - 44 | 11 | 4 | 2 | | | | | | | **17** |
| Avg. Earnings | 123,199 | 138,672 | 134,289 | | | | | | | **128,144** |
| 45 - 49 | 16 | 7 | 14 | | | | | | | **37** |
| Avg. Earnings | 127,287 | 134,289 | 134,915 | | | | | | | **131,498** |
| 50 - 54 | 15 | 6 | 21 | 9 | | 1 | | | | **52** |
| Avg. Earnings | 126,826 | 134,289 | 136,813 | 136,983 | | 134,289 | | | | **133,622** |
| 55 - 59 | 10 | 6 | 14 | 21 | 10 | 3 | | | | **64** |
| Avg. Earnings | 130,985 | 134,289 | 134,769 | 135,541 | 137,385 | 134,289 | | | | **134,772** |
| 60 - 64 | 10 | 6 | 19 | 19 | 18 | 13 | 3 | | | **88** |
| Avg. Earnings | 133,976 | 134,289 | 134,289 | 136,164 | 134,514 | 136,154 | 134,289 | | | **134,980** |
| 65 - 69 | 1 | | 12 | 9 | 11 | 9 | 6 | 2 | | **50** |
| Avg. Earnings | 134,289 | | 136,480 | 134,289 | 136,307 | 136,237 | 134,289 | 134,289 | | **135,609** |
| 70+ | | | 2 | | | 1 | | | | **3** |
| Avg. Earnings | | | 118,794 | | | 134,289 | | | | **123,959** |
| **Total** | **67** | **30** | **84** | **58** | **39** | **27** | **9** | **2** | | **316** |
| **Avg. Earnings** | **127,684** | **134,873** | **135,048** | **135,775** | **135,756** | **135,836** | **134,289** | **134,289** | | **133,732** |

* *Includes 15 Tier 1 Judges who have reached the maximum benefit formula (member contributions are directed to the Unclassified Employees Retirement Plan) and 25 Tier 2 Judges.*

** *This exhibit does not reflect service earned in other MSRS or Combined Service Annuity benefits. It should not be relied upon as an indicator of non-vested status.*

In each cell, the top number is the count of active participants for the age/service combination and the bottom number is average valuation earnings for the fiscal year ending on the valuation date.

# Membership Data

## Distribution of Service Retirements

| | Years Retired as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <50 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 55 - 59 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 60 - 64 | 2 | 7 | | | | | | **9** |
| Avg. Benefit | 27,912 | 51,808 | | | | | | **46,497** |
| 65 - 69 | 14 | 47 | 6 | | | | | **67** |
| Avg. Benefit | 69,039 | 66,345 | 42,633 | | | | | **64,785** |
| 70 - 74 | 3 | 25 | 24 | 2 | | | | **54** |
| Avg. Benefit | 82,394 | 61,685 | 71,216 | 41,827 | | | | **66,336** |
| 75 - 79 | | 1 | 18 | 19 | 1 | | | **39** |
| Avg. Benefit | | 77,257 | 62,434 | 59,434 | 83,109 | | | **61,883** |
| 80 - 84 | | | | 11 | 15 | 1 | | **27** |
| Avg. Benefit | | | | 54,550 | 86,504 | 51,493 | | **72,189** |
| 85 - 89 | | | | | 10 | 10 | 1 | **21** |
| Avg. Benefit | | | | | 62,015 | 82,297 | 77,928 | **72,431** |
| 90+ | | | | | | 4 | 6 | **10** |
| Avg. Benefit | | | | | | 89,627 | 70,325 | **78,046** |
| **Total** | **19** | **80** | **48** | **32** | **26** | **15** | **7** | **227** |
| **Avg. Benefit** | **66,818** | **63,753** | **64,350** | **56,655** | **76,955** | **82,198** | **71,411** | **66,102** |

In each cell, the top number is the count of retired participants for the age/years retired combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Survivors

| | Years Since Death as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <45 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 45 - 49 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 55 - 59 | | | | 1 | | | | **1** |
| Avg. Benefit | | | | 29,883 | | | | **29,883** |
| 60 - 64 | | 1 | 3 | 1 | 2 | | 1 | **8** |
| Avg. Benefit | | 25,430 | 52,442 | 43,609 | 48,986 | | 56,935 | **47,659** |
| 65 - 69 | 1 | 1 | 6 | 2 | | | 2 | **12** |
| Avg. Benefit | 36,943 | 66,051 | 39,443 | 38,499 | | | 69,418 | **46,291** |
| 70 - 74 | | 1 | 3 | 1 | 1 | | | **6** |
| Avg. Benefit | | 63,639 | 42,312 | 75,981 | 48,565 | | | **52,520** |
| 75 - 79 | 1 | 8 | 1 | | 2 | | 2 | **14** |
| Avg. Benefit | 43,546 | 48,349 | 62,804 | | 68,510 | | 49,130 | **52,030** |
| 80 - 84 | | 2 | 2 | 2 | 2 | 1 | | **9** |
| Avg. Benefit | | 34,916 | 68,179 | 41,344 | 26,026 | 67,559 | | **45,388** |
| 85 - 89 | | 3 | 2 | 5 | 6 | 1 | 2 | **19** |
| Avg. Benefit | | 62,399 | 41,012 | 30,127 | 52,686 | 60,965 | 40,932 | **46,253** |
| 90+ | 1 | 3 | 1 | 5 | 2 | 1 | 2 | **15** |
| Avg. Benefit | 10,850 | 74,213 | 41,470 | 48,754 | 59,658 | 36,674 | 68,939 | **54,173** |
| **Total** | **3** | **19** | **18** | **17** | **15** | **3** | **9** | **84** |
| **Avg. Benefit** | **30,446** | **53,767** | **46,866** | **41,386** | **51,403** | **55,066** | **57,086** | **48,929** |

In each cell, the top number is the count of survivors for the age/years since death combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Disability Retirements

| | Years Disabled as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| < 45 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 45 - 49 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 55 - 59 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 60 - 64 | | | 2 | | | | | **2** |
| Avg. Benefit | | | 50,324 | | | | | **50,324** |
| 65 - 69 | | | 4 | 2 | | | | **6** |
| Avg. Benefit | | | 70,949 | 63,418 | | | | **68,439** |
| 70 - 74 | | | 3 | 2 | | | | **5** |
| Avg. Benefit | | | 61,781 | 56,722 | | | | **59,757** |
| 75+ | | | | 4 | 3 | 2 | 2 | **11** |
| Avg. Benefit | | | | 69,367 | 109,845 | 101,718 | 88,243 | **89,720** |
| **Total** | | | **9** | **8** | **3** | **2** | **2** | **24** |
| **Avg. Benefit** | | | **63,310** | **64,718** | **109,845** | **101,718** | **88,243** | **74,875** |

In each cell, the top number is the count of disabled participants for the age/years since disability combination and the bottom number is the average annual benefit amount.

# Membership Data

## Reconciliation of Members

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives* | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2013** | **309** | **16** | **0** | **210** | **24** | **98** | **657** |
| New members | 25 | 0 | 0 | 0 | 0 | 0 | **25** |
| Return to active | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Terminated non-vested | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Service retirements | (16) | (2) | 0 | 18 | 0 | 0 | **0** |
| Terminated deferred | (2) | 2 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Deaths | 0 | 0 | 0 | (8) | 0 | (6) | **(14)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 3 | **3** |
| Disabled | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Unexpected status changes | 0 | 0 | 0 | 7 | 0 | (11) | **(4)** |
| Net change | 7 | 0 | 0 | 17 | 0 | (14) | **10** |
| **Members on 6/30/2014** | **316** | **16** | **0** | **227** | **24** | **84** | **667** |

| Terminated Member Statistics | Deferred Retirement | Other Non-Vested | Total |
|---|---|---|---|
| Number | 16 | 0 | 16 |
| Average age | 57.3 | N/A | 57.3 |
| Average service | 9.9 | N/A | 9.9 |
| Average annual benefit at Normal Retirement Date | $ 37,290 | N/A | $ 37,290 |
| Average refund value | $150,050 | N/A | $150,050 |

* *Includes active Judges who have reached the maximum benefit formula (employee contributions are directed to the Unclassified Employees Retirement Plan)*

# Development of Costs

## Actuarial Valuation Balance Sheet *(Dollars in Thousands)*

The actuarial balance sheet is based on the principle that the long-term projected benefit obligations of the plan should be ideally equal to the long-term resources available to fund those obligations. The resources available to meet projected obligations for current members consist of current fund assets plus the present value of anticipated future contributions intended to fund benefits for current members. In the exhibit below, B.2 is the estimated present value of contributions to fund the normal cost rate for current members until their respective termination dates. Item B.1 is the present value of the total 31.02% statutory contribution net of normal cost and anticipated plan expenses during the period from the valuation date to the statutory unfunded amortization date.

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, 2014 |
|---|---|---|---|
| A. Actuarial Value of Assets | | | $ 157,528 |
| B. Expected Future Assets | | | |
| 1. Present value of expected future statutory supplemental contributions* | | | 78,589 |
| 2. Present value of future normal cost contributions | | | 51,259 |
| 3. Total expected future assets: *(1.) + (2.)* | | | $ 129,848 |
| C. Total Current and Expected Future Assets | | | $ 287,376 |
| D. Current Benefit Obligations** | | | |
| 1. Benefit recipients | **Non-Vested** | **Vested** | **Total** |
| a. Service retirements | $ 0 | $ 142,442 | $ 142,442 |
| b. Disability retirements | 0 | 16,603 | 16,603 |
| c. Survivors | 0 | 31,525 | 31,525 |
| 2. Deferred retirements with augmentation | 0 | 3,684 | 3,684 |
| 3. Former members without vested rights*** | 0 | 0 | 0 |
| 4. Active members | 3,256 | 87,629 | 90,885 |
| 5. Total Current Benefit Obligations | $ 3,256 | $ 281,883 | $ 285,139 |
| E. Expected Future Benefit Obligations | | | $ 64,353 |
| F. Total Current and Expected Future Benefit Obligations**** | | | $ 349,492 |
| G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)* | | | $ 127,611 |
| H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)* | | | $ 62,116 |
| I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)* | | | 55.25% |
| J. Projected Benefit Funding Ratio: *(C.)/(F.)* | | | 82.23% |

* *Based on a blended Tier 1 and Tier 2 member contribution rate and normal cost.*

** *Present value of credited projected benefits (projected compensation, current service).*

*** *Former members who have not satisfied vesting requirements and have not collected a refund of member contributions as of the valuation date.*

*****Present value of projected benefits (projected compensation, projected service).*

# Development of Costs

## Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate (*Dollars in Thousands)*

| | Actuarial Present Value of Projected Benefits | Actuarial Present Value of Future Normal Costs | Actuarial Accrued Liability |
|---|---|---|---|
| A. Determination of Actuarial Accrued Liability (AAL) | | | |
| 1. Active members | | | |
| a. Retirement annuities | $ 147,194 | $ 46,655 | $ 100,539 |
| b. Disability benefits | 3,649 | 2,146 | 1,503 |
| c. Survivor's benefits | 4,185 | 2,371 | 1,814 |
| d. Deferred retirements | 0 | 0 | 0 |
| e. Refunds* | 210 | 87 | 123 |
| f. Total | $ 155,238 | $ 51,259 | $ 103,979 |
| 2. Deferred retirements with future augmentation | 3,684 | 0 | 3,684 |
| 3. Former members without vested rights | 0 | 0 | 0 |
| 4. Benefit recipients | 190,570 | 0 | 190,570 |
| 5. Total | $ 349,492 | $ 51,259 | $ 298,233 |
| B. Determination of Unfunded Actuarial Accrued Liability (UAAL) | | | |
| 1. Actuarial accrued liability | | | $ 298,233 |
| 2. Current assets (AVA) | | | 157,528 |
| 3. Unfunded actuarial accrued liability | | | $ 140,705 |
| C. Determination of Supplemental Contribution Rate** | | | |
| 1. Present value of future payrolls through the amortization date of June 30, 2039 | | | $ 606,395 |
| 2. Supplemental contribution rate: *(B.3.) / (C.1.)* | | | 23.20% *** |

* *Includes non-vested refunds and non-married survivor benefits only.*

** *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.*

*** *The amortization factor as of July 1, 2014 is 13.93147.*

# Development of Costs

## Changes in Unfunded Actuarial Accrued Liability (UAAL) *(Dollars in Thousands)*

| | Year Ending June 30, 2014 | | |
|---|---|---|---|
| | Actuarial Accrued Liability | Current Assets | Unfunded Actuarial Accrued Liability |
| A. At beginning of year | $ 284,513 | $ 144,918 | $ 139,595 |
| B. Changes due to interest requirements and current rate of funding | | | |
| 1. Normal cost and expenses | $ 7,382 | $ 0 | $ 7,382 |
| 2. Benefit payments | (20,802) | (20,802) | 0 |
| 3. Contributions | 0 | 13,004 | (13,004) |
| 4. Interest on A., B.1., B.2., and B.3. | 23,197 | 11,282 | 11,915 |
| 5. Total *(B.1. + B.2. + B.3. + B.4.)* | 9,777 | 3,484 | 6,293 |
| C. Expected unfunded actuarial accrued liability at end of year *(A. + B.5.)* | | | $ 145,888 |
| D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected | | | |
| 1. Age and Service Retirements | | | $ 751 |
| 2. Disability Retirements | | | (122) |
| 3. Death-in-Service Benefits | | | (97) |
| 4. Withdrawals | | | (392) |
| 5. Salary increases | | | 760 |
| 6. Investment income | | | (9,126) |
| 7. Mortality of annuitants | | | (1,072) |
| 8. Other items | | | 2,494 |
| 9. Total | | | $ (6,804) |
| E. Unfunded actuarial accrued liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.9.)* | | | $ 139,084 |
| F. Change in unfunded actuarial accrued liability due to changes in plan provisions | | | $ 0 |
| G. Change in unfunded actuarial accrued liability due to changes in actuarial assumptions | | | $ 1,621 |
| H. Change in unfunded actuarial accrued liability due to changes in methodology | | | $ 0 |
| I. Unfunded actuarial accrued liability at end of year *(E. + F. + G. + H.)** | | | $ 140,705 |

** The unfunded actuarial accrued liability on a market value of assets basis is $122,677.*

# Development of Costs

## Determination of Contribution Sufficiency/(Deficiency) *(Dollars in Thousands)*

The required contribution is defined in Minnesota Statutes as the sum of normal cost, a supplemental contribution to amortize the UAAL, and an allowance for expenses.

| | Percent of Payroll | Dollar Amount |
|---|---|---|
| A. Statutory contributions - Chapter 490 | | |
| 1. Employee contributions* | 8.52% | $ 3,709 |
| 2. Employer contributions | 22.50% | 9,794 |
| 3. Total | 31.02% | $ 13,503 |
| | | |
| B. Required contributions - Chapter 356 | | |
| 1. Normal cost | | |
| a. Retirement benefits | 16.33% | $ 7,108 |
| b. Disability benefits | 0.73% | 318 |
| c. Survivors | 0.83% | 361 |
| d. Deferred retirement benefits | 0.00% | 0 |
| e. Refunds** | 0.03% | 13 |
| f. Total | 17.92% | $ 7,800 |
| | | |
| 2. Supplemental contribution amortization of Unfunded Actuarial Accrued Liability by June 30, 2039 | 23.20% | $ 10,098 |
| | | |
| 3. Allowance for expenses | 0.14% | $ 61 |
| | | |
| 4. Total | 41.26% *** | $ 17,959 |
| | | |
| C. Contribution Sufficiency/(Deficiency) *(A.3. - B.4.)* | (10.24)% | $ (4,456) |

Note: Projected annual payroll for fiscal year beginning on the valuation date: $43,527.

* *For Tier I Judges who have reached the maximum benefit amount, member contributions equal to 9% of pay are directed to the Unclassified Employees Retirement Plan. The member contribution amount of $3,709 shown above is equal to 9% of a Tier 1 payroll amount of $38,908 (which excludes the payroll for Tier 1 Judges at the maximum level) and 7% of a Tier 2 payroll amount of $2,975 for Tier 2 Judges.*

** *Includes non-vested refunds and non-married survivor benefits only.*

*** *The required contribution on a market value of assets basis is 38.29% of payroll.*

# Actuarial Basis

## Actuarial Methods

All actuarial methods are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement, or the MSRS Board of Directors. Different methodologies may also be reasonable and results based on other methodologies would be different.

**Actuarial Cost Method**

Actuarial Accrued Liability and required contributions in this report are computed using the Entry Age Normal Cost Method. This method is prescribed by Minnesota Statute. An actuarial cost method is a set of techniques used by the actuary to develop contribution levels under a retirement plan. The actuarial cost method used in this valuation for all purposes is the Entry Age Actuarial Cost Method. Under this method, a normal cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Age as of the valuation date was calculated based on the dates of birth provided by the Fund. Entry age for valuation purposes was calculated as the age on the valuation date minus the provided years of service on the valuation date.

To the extent that current assets and future normal costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued Liability ("UAAL") develops. The UAAL is amortized over the statutory amortization period using level percent of payroll assuming payroll increases. The total contribution developed under this method is the sum of normal cost, expenses, and the payment toward the UAAL.

**Select and Ultimate Discount Rate Methodology**

Based on direction from the LCPR's actuary, the select and ultimate discount rate methodology is applied to the entry age normal results as follows:

1. The present value of projected benefits is calculated using the prescribed select and ultimate discount rates.
2. An equivalent single interest rate that produces approximately the same present value of projected benefits is determined.
3. The equivalent single interest rate is used to determine the entry age normal accrued liability and normal cost.

The equivalent single interest rate used in this valuation is 8.38% (8.35% last year).

**Valuation of Future Post-Retirement Benefit Increases**

If the plan has reached the funding ratio threshold required to pay a 2.0% or 2.5% benefit increase, Minnesota Statutes require the 2.0% or 2.5% benefit increase rate to be reflected in the liability calculations. If the plan has not yet reached the funding ratio threshold required to pay a 2.0% or 2.5% benefit increase, Minnesota Statutes require a projection to be performed to determine the expected attainment of the funding ratio thresholds, and the expected payment of 2.0% or 2.5% benefit increases must be reflected in the liability calculations.

# Actuarial Basis

## Actuarial Methods (Concluded)

**Funding Objective**
The fundamental financing objective of the fund is to establish contribution rates which, when expressed as a percentage of active member payroll, will remain approximately level from generation to generation and meet the required deadline for full funding.

**Decrement Timing**
All decrements are assumed to occur mid-fiscal year.

**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; and
- 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.

**Payment on the Unfunded Actuarial Accrued Liability**
Payment equals a level percentage of payroll each year to the statutory amortization date of June 30, 2039 assuming payroll increases of 3.00% per annum. If there is a negative Unfunded Actuarial Accrued Liability, the surplus amount is amortized over 30 years as a level percentage of payroll. If the unfunded liability increases due to changes in benefits, assumptions, or methods, the statutory amortization date will be re-determined. Projected payroll is multiplied by 0.959 in the determination of the present value of future payroll to account for timing differences (as required by the Standards for Actuarial Work).

**Changes in Methods since Prior Valuation**
The methodology for valuing future post-retirement increases was clarified in Minnesota Statutes.

# Actuarial Basis

## Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The assumptions prescribed are based on the last experience study, dated February 2012, prepared by a former actuary.

| | | |
|---|---|---|
| Investment return | Select and Ultimate Rates:<br>July 1, 2014 to June 30, 2017<br><br>July 1, 2017 and later | <br>8.00% per annum<br><br>8.50% per annum |
| Benefit increases after retirement | 1.75% per annum. | |
| Salary increases | 3.00% per year. | |
| Payroll growth | 3.00% per year. | |
| Inflation | 3.00% per year. | |
| Mortality rates | | |
| Healthy pre-retirement | RP-2000 employee generational mortality table projected using mortality improvement scale AA, white collar adjustment. | |
| Healthy post-retirement | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back one year for males and set back two years for females.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. | |
| Disabled | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back one year for males and set back two years for females. | |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. | |
| Withdrawal | None. | |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Disability | Age-related rates based on experience; see table of sample rates. |
| Administrative expenses | Prior year administrative expenses expressed as percentage of prior year projected payroll. |
| Refund of contributions | Account balances for deferred members accumulate interest until normal retirement date and are discounted back to the valuation date. |
| Commencement of deferred benefits | Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 65. |
| Percentage married | Marital status as indicated by data. |
| Age of spouse | Females are assumed to be three years younger than their male spouses. |
| Form of payment | Members are assumed to elect a life annuity. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| 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. |
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members:</u><br>There were 15 members who have reached the 24-year service cap; 5 of these were reported as terminated members. These members are reflected as active members in this valuation. We assumed these members earned the greater of the salary reported under the Unclassified Employees Retirement Plan or $134,289 for the July 1, 2013 to June 30, 2014 plan year.<br><br>There was 1 member reported without pay who was not in the group mentioned above. We assumed an annualized pay of $134,289 for the July 1, 2013 to June 30, 2014 period.<br><br>There were no members reported with missing service.<br><br>There were no members reported with missing or invalid birth dates. There was 1 member reported with an invalid gender. We assumed the member was male.<br><br><u>Data for terminated members:</u><br>There was 1 member reported without a benefit. We calculated the benefit for this member using the reported Average Salary, Credited Service and Termination Date provided. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | Data for members receiving benefits:<br>There were no members reported without a benefit.<br><br>There were no members reported with missing or invalid birth dates or gender.<br><br>There were retired members reported with a survivor option and an invalid or missing survivor gender (56 members) and/or survivor date of birth (43 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.<br><br>There were 4 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e., "bounce back"), if applicable.<br><br>There was 1 retiree reported with a bounce back annuity but was not reported with a reasonable reduction factor. A factor of 0.80 was assumed for the 100% joint and survivor annuity.<br><br>There were no survivors reported on the data file with an expired benefit.<br><br>At MSRS' direction, we changed the status of 22 members who were reported with a disabled status at the beginning of the year and a retired status at the end of the year back to disabled status. |
| Changes in actuarial assumptions | Separate pre-retirement and post-retirement investment return rates which implicitly valued the post-retirement benefit increases were changed to a single investment return assumption and an explicit assumption for post-retirement benefit increases. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Concluded)

| | Rate (%) * | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality** | |
| Age | Male | Female | Male | Female | Male | Female |
| 20 | 0.03% | 0.02% | 0.03% | 0.02% | 0.03% | 0.02% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 | 0.04 | 0.02 |
| 30 | 0.04 | 0.02 | 0.04 | 0.03 | 0.04 | 0.02 |
| 35 | 0.05 | 0.04 | 0.06 | 0.05 | 0.05 | 0.04 |
| 40 | 0.08 | 0.06 | 0.09 | 0.06 | 0.08 | 0.06 |
| 45 | 0.12 | 0.08 | 0.13 | 0.10 | 0.12 | 0.08 |
| 50 | 0.18 | 0.13 | 0.20 | 0.16 | 0.18 | 0.13 |
| 55 | 0.56 | 0.29 | 0.27 | 0.24 | 0.56 | 0.29 |
| 60 | 0.61 | 0.47 | 0.43 | 0.38 | 0.61 | 0.47 |
| 65 | 1.04 | 0.74 | 0.67 | 0.59 | 1.04 | 0.74 |
| 70 | 1.74 | 1.24 | 0.98 | 0.88 | 1.74 | 1.24 |

** Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment, and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates as prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decreased at all ages, we would not expect the valuation results to be materially different.*

*** These rates were adjusted for mortality improvements using projection scale AA.*

| | Disability Retirement | |
|---|---|---|
| Age | Male | Female |
| 20 | 0.00% | 0.00% |
| 25 | 0.00 | 0.00 |
| 30 | 0.00 | 0.00 |
| 35 | 0.01 | 0.00 |
| 40 | 0.01 | 0.01 |
| 45 | 0.02 | 0.03 |
| 50 | 0.07 | 0.05 |
| 55 | 0.17 | 0.12 |
| 60 | 0.38 | 0.31 |
| 65 | 0.00 | 0.00 |
| 70 | 0.00 | 0.00 |

| Age | Retirement |
|---|---|
| 60 | 0% |
| 61 | 0 |
| 62 | 8 |
| 63 | 5 |
| 64 | 8 |
| 65 | 25 |
| 66 | 20 |
| 67 | 10 |
| 68 | 30 |
| 69 | 10 |
| 70 | 100 |

# Actuarial Basis

## Summary of Plan Provisions

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| **Plan year** | July 1 through June 30. |
| **Eligibility** | A judge or justice of any court. If the member was active prior to January 1, 1974, benefits may be computed according to provisions of the prior plan. |
| **Tier 1 / Tier 2 Member** | Tier 1 includes judges or justices first appointed or elected before July 1, 2013 and Tier 2 includes judges or justices first appointed or elected after June 30, 2013. A judge or justice with less than five years of service as of December 30, 2013 may make a one-time irrevocable election into Tier 2. For the purpose of this valuation, we have assumed no Tier 1 members elected Tier 2 benefits as of the valuation date. |
| **Contributions** | |
| Member | 9.00% of salary for Tier 1 members, 7.00% of salary for Tier 2 members. Tier 1 member contributions after maximum benefit is reached are redirected to the Unclassified Employees Retirement Plan. |
| Employer | 22.50% of salary.<br><br>Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). |
| **Allowable service** | Service as a judge. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made. |
| **Salary** | Salary set by law. |
| **Average salary** | Average of the five highest years of salary of the last 10 years prior to termination of judicial service. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Retirement** | |
| Normal retirement benefit | |
| Age/Service requirement | First appointed as a judge before July 1, 2013 (Tier 1):<br>(a.) Age 65 and five years of Allowable Service<br>(b.) Age 70 (mandatory retirement age)<br><br>First appointed as a judge after June 30, 2013 (Tier 2):<br>(a.) Age 66 and five years of Allowable Service<br>(b.) Age 70 (mandatory retirement age)<br><br>Judges appointed before July 1, 2013 with less than five years of allowable service on or before December 31, 2013 may make a one-time election for the Tier 2 benefit package. |
| Amount | First appointed as a judge before July 1, 2013 (Tier 1): 2.70% of Average Salary for each year of Allowable Service prior to July 1, 1980 and 3.20% of Average Salary for each year of Allowable Service after June 30, 1980. Maximum benefit equal to 76.80% of Average Salary.<br><br>First appointed as a judge after June 30, 2013 (Tier 2): 2.50% of Average Salary for each year of Allowable Service.<br><br>Tier 1 who elected into Tier 2: 3.20% of Average Salary for each year of Allowable Service prior to January 1, 2014 plus 2.50% of Average Salary for each year of Allowable Service after December 31, 2013. |
| Early retirement | |
| Age/Service requirement | Age 60 and five years of Allowable Service. |
| Amount | Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.50% for each month the member is under Normal Retirement Age at time of retirement. |
| Form of payment | Life annuity. Actuarially equivalent options are:<br>(a.) 50%,75% or 100% joint and survivor with no bounce back feature<br>(b.) 50%, 75% or 100% bounce back feature<br>(c.) 15-year certain and life thereafter |
| Benefit increases | Since January 1, 2014, benefit recipients receive annual 1.75% benefit increases. If the accrued liability funding ratio reaches 70% for two consecutive years (on a Market Value of Assets basis), the benefit increase will revert to 2.0%. If the accrued liability funding ratio reaches 90% for two consecutive years (on a Market Value of Assets basis), the benefit increase will revert to 2.5%.<br><br>A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase. |

# Actuarial Basis

## Summary of Plan Provisions (Continued)

| | |
|---|---|
| **Disability** | |
| Disability benefit | |
| Age/Service requirement | Permanent inability to perform the function of judge. |
| Amount | No benefit is paid by the Fund. Instead salary is continued for one year but not beyond age 70. Employee contributions continue and Allowable Service is earned. If disability continues after the first year (or at age 70 if earlier), the larger of 25.00% of Average Salary or the Normal Retirement Benefit, without reduction. |
| Retirement after disability | |
| Age/Service requirement | Member is still disabled after salary payments cease after one year or at age 70, if earlier. |
| Amount | No change in disability benefit amount from pre-retirement computed benefit amount. |
| Form of payment | Same as for retirement. |
| Benefit increases | Same as for retirement. |
| **Death** | |
| Survivor's benefit | |
| Age/service requirement | Active or disabled member dies before retirement or a former member eligible for a deferred annuity dies. |
| Amount | Larger of 25% of Average Salary or 60% of Normal Retirement Benefit earned at date of death. If member dies after age 60 with five or more years of service, spouse may receive the 100% joint and survivor benefit the member had earned as of date of death.<br><br>Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full-time student). |
| Benefit increases | Same as for retirement. |
| Refund of contributions | |
| Age/service requirement | Member dies prior to retirement or former member eligible for a deferred annuity dies and survivors' benefits are not payable. |
| Amount | Member contributions with 6.00% annual interest compounded daily until June 30, 2011 and 4.00% thereafter. |

# Actuarial Basis

## Summary of Plan Provisions (Concluded)

| | |
|---|---|
| **Termination** | |
| Refund of contributions | |
| Age/Service requirement | Termination of service as a judge. |
| Amount | Member contributions with 6.00% annual interest compounded daily until June 30, 2011, 4.00% thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund. |
| Deferred benefit | |
| Age/service requirement | Five years of Allowable Service. |
| Amount | Benefit computed under law in effect at termination. Amount is payable at normal or early retirement.<br><br>If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, 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 2022 using scale AA, set back one year for males and set back two years for females, blended 80% males, and 6.5% interest. |
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br>(a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement;<br>(b.) Have at least six months of allowable service credit in each plan worked under; and<br>(c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year.<br><br>Members who meet the above requirements must have their benefit based on the following:<br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement; and<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Changes in plan provisions** | The funding ratio threshold that must be attained to pay a 2.0% post-retirement benefit increase to benefit recipients was changed from 70% for one year to 70% for two consecutive years. The funding ratio threshold that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years.<br><br>The 10-year certain and life thereafter optional form of payment is no longer available. |

# Additional Schedules

## Schedule of Funding Progress[1] *(Dollars in Thousands)*

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded (Overfunded) AAL (UAAL) (b) - (a) | Funded Ratio (a)/(b) | Actual Covered Payroll (Previous FY) (c) | UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c) |
|---|---|---|---|---|---|---|
| 7-1-1991 | $ 33,559 | $ 78,429 | $ 44,870 | 42.79% | $ 18,410 | 243.73 % |
| 7-1-1992 | 37,768 | 83,969 | 46,201 | 44.98 | 22,765 | 202.95 |
| 7-1-1993 | 44,156 | 90,509 | 46,353 | 48.79 | 22,084 | 209.89 |
| 7-1-1994 | 50,428 | 98,313 | 47,885 | 51.29 | 22,264 | 215.08 |
| 7-1-1995 | 56,813 | 102,238 | 45,425 | 55.57 | 22,877 | 198.56 |
| 7-1-1996 | 64,851 | 108,150 | 43,299 | 59.96 | 22,421 | 193.12 |
| 7-1-1997 | 74,681 | 117,714 | 43,033 | 63.44 | 22,909 | 187.84 |
| 7-1-1998 | 86,578 | 130,727 | 44,149 | 66.23 | 24,965 | 176.84 |
| 7-1-1999 | 97,692 | 139,649 | 41,957 | 69.96 | 32,940 | 127.37 |
| 7-1-2000 | 111,113 | 153,660 | 42,547 | 72.31 | 26,315 | 161.68 |
| 7-1-2001 | 123,589 | 165,244 | 41,655 | 74.79 | 28,246 | 147.47 |
| 7-1-2002 | 131,379 | 171,921 | 40,542 | 76.42 | 31,078 | 130.45 |
| 7-1-2003 | 134,142 | 176,291 | 42,149 | 76.09 | 33,771 | 124.81 |
| 7-1-2004 | 138,948 | 190,338 | 51,390 | 73.00 | 34,683 | 148.17 |
| 7-1-2005 | 144,465 | 191,414 | 46,949 | 75.47 | 35,941 | 130.63 |
| 7-1-2006 | 151,850 | 202,301 | 50,451 | 75.06 | 36,529 | 138.11 |
| 7-1-2007 | 153,562 | 214,297 | 60,735 | 71.66 | 36,195 | 167.80 |
| 7-1-2008 | 147,542 | 231,623 | 84,081 | 63.70 | 38,296 | 219.56 |
| 7-1-2009 | 147,120 | 241,815 | 94,695 | 60.84 | 39,444 | 240.07 |
| 7-1-2010 | 144,728 | 240,579 | 95,851 | 60.16 | 39,291 | 243.95 |
| 7-1-2011 | 145,996 | 248,630 | 102,634 | 58.72 | 40,473 | 253.59 |
| 7-1-2012 | 144,898 | 281,576 | 136,678 | 51.46 | 38,644 [2] | 353.69 |
| 7-1-2013 | 144,918 | 284,513 | 139,595 | 50.94 | 39,888 [2] | 349.97 |
| 7-1-2014 | 157,528 | 298,233 | 140,705 | 52.82 | 41,893 [3] | 335.86 |

[1] *Information prior to 2012 provided by prior actuaries. See prior reports for additional detail.*
[2] *Assumed equal to actual employer contribution divided by 20.50%.*
[3] *Assumed equal to actual employer contribution divided by 22.50%.*

# Additional Schedules

## Schedule of Contributions from the Employer and Other Contributing Entities[1]
*(Dollars in Thousands)*

| Plan Year Ended June 30 | Actuarially Required Contribution Rate (a) | Actual Covered Payroll (b) | Actual Member Contributions (c) | Annual Required Contributions [(a)x(b)] - (c) = (d) | Actual Employer Contributions[2] (e) | Percentage Contributed (e)/(d) |
|---|---|---|---|---|---|---|
| 1991 | 23.59% | $ 18,410 | $ 799 | $ 3,544 | $ 0 | 0.00 % |
| 1992 | 25.10 | 22,765 | 988 | 4,726 | 4,722 | 99.92 |
| 1993 | 26.59 | 22,084 | 1,409 | 4,463 | 4,845 | 108.56 |
| 1994 | 26.29 | 22,264 | 1,416 | 4,437 | 4,912 | 110.71 |
| 1995 | 28.27 | 22,877 | 1,455 | 5,012 | 5,162 | 102.99 |
| 1996 | 27.32 | 22,421 | 1,426 | 4,699 | 4,972 | 105.81 |
| 1997 | 27.01 | 22,909 | 1,457 | 4,731 | 6,632 | 140.18 |
| 1998 | 27.60 | 24,965 | 1,570 | 5,320 | 7,129 | 134.00 |
| 1999 | 27.32 | 32,940 | 2,069 | 6,930 | 7,051 | 101.75 |
| 2000 | 26.75 | 26,315 | 2,107 | 4,932 | 7,298 | 147.97 |
| 2001 | 24.58 | 28,246 | 2,162 | 4,781 | 7,793 | 163.00 |
| 2002 | 26.72 | 31,078 | 2,345 | 5,959 | 8,369 | 140.44 |
| 2003 | 26.82 | 33,771 | 2,574 | 6,483 | 6,923 | 106.79 |
| 2004 | 26.73 | 34,683 | 2,643 | 6,628 | 7,110 | 107.27 |
| 2005 | 29.42 | 35,941 | 2,662 | 7,912 | 7,225 | 91.32 |
| 2006 | 29.14 | 36,529 | 2,866 | 7,779 | 7,336 | 94.30 |
| 2007 | 30.73 | 36,195 | 2,792 | 8,331 | 7,572 | 90.88 |
| 2008 | 33.70 | 38,296 | 2,861 | 10,045 | 7,936 | 79.00 |
| 2009 | 30.33 | 39,444 | 2,978 | 8,985 | 8,219 | 91.47 |
| 2010 | 31.53 | 39,291 | 2,988 | 9,400 | 8,283 [3] | 88.12 |
| 2011 | 31.66 | 40,473 | 3,010 | 9,804 | 8,297 | 84.63 [3] |
| 2012 | 33.15 | 38,644 [4] | 2,931 | 9,879 | 7,922 | 80.19 |
| 2013 | 41.52 | 39,888 [4] | 3,037 | 13,524 | 8,177 | 60.46 |
| 2014 | 42.42 | 41,893 [5] | 3,578 | 14,193 | 9,426 | 66.41 |
| 2015 | 41.26 | N/A | N/A | N/A | N/A | N/A |

*[1] Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
*[2] Includes contributions from other sources (if applicable).*
*[3] Provided by MSRS instead of prior actuary.*
*[4] Assumed equal to actual employer contribution divided by 20.50%.*
*[5] Assumed equal to actual employer contribution divided by 22.50%.*

# Glossary of Terms

| | |
|---|---|
| ***Accrued Benefit Funding Ratio*** | The ratio of assets to Current Benefit Obligations. |
| ***Accrued Liability Funding Ratio*** | The ratio of assets to Actuarial Accrued Liability. |
| ***Actuarial Accrued Liability (AAL)*** | The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs. |
| ***Actuarial Assumptions*** | Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items. |
| ***Actuarial Cost Method*** | A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability. |
| ***Actuarial Equivalent*** | Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions. |
| ***Actuarial Present Value (APV)*** | The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made. |
| ***Actuarial Present Value of Projected Benefits*** | The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due. |
| ***Actuarial Valuation*** | The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for developing and monitoring a retirement system's funding policy, such as the Funded Ratio and the Annual Required Contribution (ARC). |
| ***Actuarial Value of Assets*** | The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC). |

# Glossary of Terms (Continued)

| | |
|---|---|
| ***Amortization Method*** | A method for determining the Amortization Payment. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. The stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase. |
| ***Amortization Payment*** | That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability. |
| ***Amortization Period*** | The period used in calculating the Amortization Payment. |
| ***Annual Required Contribution (ARC)*** | The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ARC consists of the Employer Normal Cost and Amortization Payment. |
| ***Augmentation*** | Annual increases to deferred benefits. |
| ***Closed Amortization Period*** | A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. |
| ***Current Benefit Obligations*** | The present value of benefits earned to the valuation date, based on current service and including future salary increases to retirement. |
| ***Employer Normal Cost*** | The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions. |
| ***Expected Assets*** | The present value of anticipated future contributions intended to fund benefits for current members. |
| ***Experience 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 valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected. |

# Glossary of Terms (Concluded)

| | |
|---|---|
| ***GASB*** | Governmental Accounting Standards Board. |
| ***GASB Statements No. 25 and No. 27*** | These are the governmental accounting standards that set the accounting and financial reporting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves. These statements remain in effect only for pension plans that are not administered as trusts or equivalent arrangements. Please refer to the definition of GASB Statements No. 67 and No. 68 below. |
| ***GASB Statement No. 50*** | The accounting standard governing a state or local governmental employer's accounting for pensions. This statement remains in effect only for pension plans that are not administered as trusts. Please refer to the definition of GASB Statements No. 67 and No. 68. |
| ***GASB Statements No. 67 and No. 68*** | Statements No. 67 and No. 68, issued in June 2012, replace the requirements of Statements No. 25, No. 27 and No. 50, respectively, for pension plans administered as trusts. Statement No. 68, effective for the fiscal year beginning July 1, 2014, sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67, effective for the fiscal year beginning July 1, 2013, sets the rules for the systems themselves. Accounting and financial reporting rules information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the June 30, 2014 actuarial valuation. |
| ***Normal Cost*** | The annual cost assigned, under the Actuarial Cost Method, to the current plan year. |
| ***Projected Benefit Funding Ratio*** | The ratio of the sum of Actuarial Value of Assets and Expected Assets to the Actuarial Present Value of Projected Benefits. |
| ***Unfunded Actuarial Accrued Liability*** | The difference between the Actuarial Accrued Liability and Actuarial Value of Assets. |
| ***Valuation Date*** | The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date. |

Gabriel Roeder Smith & Company
Consultants & Actuaries

# MINNESOTA STATE RETIREMENT SYSTEM

# LEGISLATORS RETIREMENT FUND

## ACTUARIAL VALUATION REPORT AS OF JULY 1, 2014

GRS

Gabriel Roeder Smith & Company
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December 12, 2014

Minnesota State Retirement System
Legislators Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

The results of the July 1, 2014 annual actuarial valuation of the Legislators Retirement Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by the Board and staff and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety. GRS is not responsible for the consequences of any unauthorized use of this report.

The Elective State Officers Retirement Fund (ESORF) was administratively consolidated with the Legislators Retirement Fund (LRF) on July 1, 2013. This change first affects financial reporting for the fiscal year ending June 30, 2014. The current actuarial valuation includes a separate calculation of the ESORF actuarial accrued liabilities. Exhibits that include results from July 1, 2013 valuations show both ESORF and LRF combined.

The purpose of the valuation is to measure the Fund's funding progress, to determine the required contribution rate for the fiscal year beginning July 1, 2014. Note that we have not attempted to quantify the impact of GASB Statements No. 67 and No. 68 in this report. Please see the separate report dated December 1, 2014.

The valuation was based upon information furnished by the Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by MSRS.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Directors. 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. MSRS is solely responsible for communicating to GRS any changes required thereto.

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 such future measurements.

This report should not be relied on for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the Legislators Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

We are available to answer any questions or provide further details.

Respectfully submitted,

Brian B Murphy

Brian B. Murphy, FSA, EA, MAAA

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA

BBM/BJW:bd

# Contents

# Summary of Valuation Results

## Contributions

The following table summarizes important contribution information as described in the Development of Costs section.

| **Contributions** *(dollars in thousands)* | Actuarial Valuation as of July 1, 2014 | Actuarial Valuation as of July 1, 2013* |
|---|---|---|
| Statutory Contributions** - Chapter 3A | $ 85 | $ 89 |
| Required Contributions - Chapter 356 | $ 21,548 | $ 19,652 |
| Sufficiency / (Deficiency) | $ (21,463) | $ (19,563) |

* *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund; combined results are shown here.*
** *Active member contributions from the Legislators Retirement Plan are equal to 9% of payroll.*

The Minnesota Statutes Chapter 356 Required Contribution shown above represents the estimated annual contribution amount that would be needed for this plan to attain 100% funding by July 1, 2026, based upon the prescribed assumptions. The Required Contribution includes not only the expected benefit payments for the year, but also amounts intended to pre-fund future benefit payments. Actual contributions have been less than the Required Contribution amount since 1999. The funding target identified by Chapter 356 will not be met given the history of actual contributions made to the Fund.

This plan is currently funded on a pay-as-you-go basis by annual appropriations from the state's General Fund. For the fiscal year ending June 30, 2014, total contributions were $3.5 million and total benefit payments were $8.5 million. As of July 1, 2014, $8.3 million in assets will cover approximately 11 months of future benefit payments. Therefore, the ability of the fund to pay benefits in the future is critically dependent upon timely receipt of the contributions from the state's General Fund. The actuary cannot judge the probability that such payments will, in fact, be made. The expected benefit payments for the next 10 years, based on current data, methods, and assumptions, are:

| **Fiscal Year Ending** | **(000s) Expected Annual Benefit Payments** |
|---|---|
| 2015 | $ 8,926 |
| 2016 | 9,316 |
| 2017 | 9,639 |
| 2018 | 9,674 |
| 2019 | 9,723 |
| 2020 | 9,775 |
| 2021 | 9,810 |
| 2022 | 9,755 |
| 2023 | 9,684 |
| 2024 | 9,551 |

# Summary of Valuation Results

Participant reconciliation and statistics are detailed in the *Membership Data* section. The *Actuarial Basis* section includes a summary of plan provisions and actuarial methods and assumptions used for the calculations in this report.

Accounting information prepared according to GASB Statements No. 67 and No. 68 has been provided in a separate report dated December 1, 2014.

# Summary of Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in plan provisions, actuarial assumptions or valuation methods and procedures between the two valuations are described after the summary.

| | Actuarial Valuation as of | | | |
|---|---|---|---|---|
| | July 1, 2014 | | July 1, 2013** | |
| **Assumptions** | | | | |
| - Pre-retirement discount rate | 0.0% | | 0.0% | |
| - Post-retirement discount rate | 0.0% | | 0.0% | |
| - Post-retirement annual benefit increase*** | 2.0% | | 2.0% | |
| **Contributions** (*dollars in thousands*) | | | | |
| Statutory - Chapter 3A | $ 85 | | $ 89 | |
| Required - Chapter 356 | 21,548 | * | 19,652 | |
| Sufficiency / (Deficiency) | (21,463) | * | (19,563) | |
| **Funding Ratios** (*dollars in thousands*) | | | | |
| Accrued Liability Funding Ratio | | | | |
| - Current assets (AVA) | $ 8,258 | | $ 11,493 | |
| - Actuarial accrued liability | 250,860 | | 244,472 | |
| - Funding ratio | 3.29% | | 4.70% | |
| Projected Benefit Funding Ratio | | | | |
| - Current and expected future assets | $ 8,862 | | $ 12,289 | |
| - Current and expected future benefit obligations | 256,270 | | 250,346 | |
| - Projected benefit funding ratio | 3.46% | | 4.91% | |
| **Participant Data** | | | | |
| Active Members | | | | |
| - Number | 24 | | 24 | |
| - Projected annual earnings *(000s)* | 942 | | 984 | |
| - Average projected annual earnings | 39,250 | | 41,000 | |
| - Average age | 66.6 | | 65.6 | |
| - Average service | 26.8 | | 25.8 | |
| Service Retirements | 301 | | 297 | |
| Survivors | 74 | | 79 | |
| Disability Retirements | 0 | | 0 | |
| Deferred Retirements | 63 | | 71 | |
| Terminated other Non-Vested | 0 | | 1 | |
| **Total** | **462** | | **472** | |

* *Expected benefit payments for the fiscal year are $8,926. The Required Contribution also includes amounts intended to pre-fund future benefit payments.*

** *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund; combined results are shown here.*

****Effective with the July 1, 2014 valuation the assumed post-retirement benefit increase is expected to be 2.5% beginning January 1, 2016.*

# Summary of Valuation Results

## Effects of Changes

The following changes in plan provisions, actuarial assumptions, and methods were recognized as of July 1, 2014:

- The Elective State Officers Retirement Fund (ESORF) was administratively consolidated with the Legislators Retirement Fund (LRF) on July 1, 2013. This change first affects financial reporting for the fiscal year ending June 30, 2014. The current actuarial valuation includes a separate calculation of the ESORF actuarial accrued liabilities. Benefit provisions for both retirement plans are unaffected by the merger.
- Effective July 1, 2014, the funding ratio threshold that must be attained in the State Employees Retirement Fund to pay a 2.5% post-retirement benefit increase to benefit recipients in this plan was changed from 90% for one year to 90% for two consecutive years.
- The methodology for valuing future post-retirement increases was clarified in statutes, and the assumed post-retirement benefit increase rate was changed from 2.0% per year indefinitely to 2.0% per year through 2015 and 2.5% per year thereafter (assumption is based on the State Employees Retirement Fund; see next page for details).

Refer to the Actuarial Basis section of this report for a complete description of these changes.

The combined impact of the above changes was to increase the unfunded actuarial accrued liability by $22 million and increase the required contribution by $1.9 million, as follows:

| | (000s) | | |
|---|---|---|---|
| | Before Changes | Reflecting Assumption Changes | Consolidation of Elective State Officers |
| Normal Cost | $ 1,228 | $ 1,297 | $ 1,297 |
| Amortization of UAAL* | 18,347 | 19,553 | 20,217 |
| Expenses | 34 | 34 | 34 |
| Total Required Contribution | 19,609 | 20,884 | 21,548 |
| | | | |
| Accrued Liability Funding Ratio | 3.6% | 3.4% | 3.3% |
| Projected Benefit Funding Ratio | 3.8% | 3.6% | 3.5% |
| | | | |
| UAAL* | $220,177 | $ 234,658 | $ 242,602 |

** Unfunded Actuarial Accrued Liability*

# Summary of Valuation Results

## Valuation of Future Annual Post-Retirement Benefit Increases

Benefit recipients receive a future annual 2.0% post-retirement benefit increase. If the actuarial accrued liability funding ratio, determined on a market value of assets basis, of the State Employees Retirement Fund (SERF) reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase in Legislators Retirement Fund will revert to 2.5%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of SERF liabilities and assets. See the 2014 valuation report for SERF for additional detail. The projection indicates that this plan is expected to begin paying 2.5% benefit increases on January 1, 2016. This assumption is reflected in our calculations.

# Supplemental Information

The remainder of the report includes information supporting the results presented in the previous sections.

- **Plan assets** presents information about the plan's assets as reported by the Minnesota State Retirement System. The assets represent the portion of total fund liabilities that has been funded.
- **Membership data** presents and describes the membership data used in the valuation.
- **Development of costs** shows the liabilities for plan benefits and the derivation of the contribution amount.
- **Actuarial basis** describes the plan provisions, as well as the methods and assumptions used to value the plan. The valuation is based on the premise that the plan is ongoing.
- **Additional schedules** includes a summary of funding progress over the long term.
- **Glossary** defines the terms used in this report.

# Plan Assets

## Statement of Fiduciary Net Position *(Dollars in Thousands)*

| | Market Value | |
|---|---|---|
| **Assets** | **June 30, 2014** | **June 30, 2013 *** |
| Cash, equivalents, short term securities | $ 571 | $ 1,874 |
| Fixed income | 1,962 | 2,659 |
| Equity | 6,218 | 8,615 |
| Other* | 909 | 1,129 |
| **Total cash, investments, and other assets** | **$ 9,660** | **$ 14,277** |
| Amounts Receivable | 2 | 2 |
| **Total Assets** | **$ 9,662** | **$ 14,279** |
| Amounts Payable** | (1,404) | (2,786) |
| **Net Position Restricted for Pensions** | **$ 8,258** | **$ 11,493** |

* *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund; combined results are shown here.*

** *Includes $909 in Securities Lending Collateral as of June 30, 2014 and $1,129 in Securities Lending Collateral as of June 30, 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 the Minnesota State Retirement System for the prior two fiscal years.

| **Change in Assets** | | **Market Value** | |
|---|---|---|---|
| **Year Ending** | | **June 30, 2014** | **June 30, 2013 *** |
| **1.** | **Fund balance at market value at beginning of year** | **$ 11,493** | **$ 15,523** |
| 2. | Contributions | | |
| | a. Member | 101 | 111 |
| | b. Employer | 0 | 0 |
| | c. Other sources (annual appropriations from state's General Fund) | 3,436 | 3,869 |
| | d. Total contributions | $ 3,537 | $ 3,980 |
| 3. | Investment income | | |
| | a. Investment income/(loss) | 1,762 | 1,783 |
| | b. Investment expenses | (12) | (20) |
| | c. Net investment income/(loss) | 1,750 | 1,763 |
| 4. | Other | 0 | 0 |
| **5.** | **Total income:** *(2.d.) + (3.c.) + (4.)* | **$ 5,287** | **$ 5,743** |
| 6. | Benefits paid | | |
| | a. Annuity benefits | (8,407) | (8,295) |
| | b. Refunds | (79) | (101) |
| | c. Total benefits paid | (8,486) | (8,396) |
| 7. | Expenses | | |
| | a. Other | 0 | (1,338) |
| | b. Administrative | (36) | (39) |
| | c. Total expenses | (36) | (1,377) |
| **8.** | **Total disbursements:** *(6.c.) + (7.c.)* | **(8,522)** | **(9,773)** |
| **9.** | **Fund balance at market value at end of year:** *(1.) + (5.) + (8.)* | **$ 8,258** | **$ 11,493** |
| 10. | State Board of Investment calculated investment return | 18.6% | 14.2% |

* *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund; combined results are shown here.*

# Plan Assets

## Actuarial Asset Value

The Actuarial Value of Assets (AVA) is equal to the Market Value of Assets (consistent with valuations since July 1, 2000).

# Membership Data

## Distribution of Active Members

| | Years of Service as of June 30, 2014 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3*** | **3 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25 - 29** | **30 - 34** | **35+** | **Total** |
| < 25 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 25 - 29 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 30 - 34 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 35 - 39 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 40 - 44 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 45 - 49 | | | | | 1 | | | | | **1** |
| Avg. Earnings | | | | | 38,310 | | | | | **38,310** |
| 50 - 54 | | | | | | | | | | |
| Avg. Earnings | | | | | | | | | | |
| 55 - 59 | | | | | | 2 | 2 | | | **4** |
| Avg. Earnings | | | | | | 36,619 | 37,744 | | | **37,181** |
| 60 - 64 | | | | | 3 | | 1 | | | **4** |
| Avg. Earnings | | | | | 38,554 | | 36,685 | | | **38,087** |
| 65 - 69 | | | | | | | 1 | 2 | | **3** |
| Avg. Earnings | | | | | | | 38,793 | 37,406 | | **37,868** |
| 70+ | | | | | 3 | 1 | 3 | 1 | 4 | **12** |
| Avg. Earnings | | | | | 36,663 | 36,685 | 37,108 | 38,374 | 36,964 | **37,019** |
| **Total** | | | | | **7** | **3** | **7** | **3** | **4** | **24** |
| **Avg. Earnings** | | | | | **37,709** | **36,641** | **37,470** | **37,729** | **36,964** | **37,384** |

* *This exhibit does not reflect service earned in other MSRS or Combined Service Annuity benefits. It should not be relied upon as an indicator of non-vested status.*

In each cell, the top number is the count of active participants for the age/service combination and the bottom number is average valuation earnings for the fiscal year ending on the valuation date.

# Membership Data

## Distribution of Service Retirements

| | Years Retired as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <50 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 55 - 59 | | 1 | | | | | | **1** |
| Avg. Benefit | | 13,359 | | | | | | **13,359** |
| 60 - 64 | 6 | 10 | 4 | | | | | **20** |
| Avg. Benefit | 23,107 | 28,659 | 16,900 | | | | | **24,642** |
| 65 - 69 | 1 | 23 | 20 | 10 | | | | **54** |
| Avg. Benefit | 18,907 | 22,728 | 17,543 | 14,438 | | | | **19,202** |
| 70 - 74 | 1 | 6 | 28 | 32 | 1 | | | **68** |
| Avg. Benefit | 23,679 | 21,338 | 19,835 | 18,323 | 18,387 | | | **19,291** |
| 75 - 79 | | 6 | 8 | 18 | 21 | 1 | | **54** |
| Avg. Benefit | | 28,995 | 17,963 | 22,615 | 22,818 | 30,062 | | **22,851** |
| 80 - 84 | | 1 | 3 | 8 | 26 | 22 | | **60** |
| Avg. Benefit | | 23,806 | 22,232 | 31,956 | 30,732 | 23,838 | | **27,827** |
| 85 - 89 | | 1 | 1 | 1 | 9 | 13 | 9 | **34** |
| Avg. Benefit | | 11,741 | 31,698 | 21,858 | 33,084 | 31,691 | 21,892 | **28,590** |
| 90+ | | 1 | | | 1 | 1 | 7 | **10** |
| Avg. Benefit | | 28,229 | | | 34,141 | 15,274 | 28,599 | **27,783** |
| **Total** | **8** | **49** | **64** | **69** | **58** | **37** | **16** | **301** |
| **Avg. Benefit** | **22,653** | **24,254** | **18,999** | **20,511** | **28,077** | **26,534** | **24,826** | **23,284** |

In each cell, the top number is the count of retired participants for the age/years retired combination and the bottom number is the average annual benefit amount.

# Membership Data

## Distribution of Survivors

| | Years Since Death as of June 30, 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **<1** | **1 - 4** | **5 - 9** | **10 - 14** | **15 - 19** | **20 - 24** | **25+** | **Total** |
| <45 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 45 - 49 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 50 - 54 | | | | | | | | |
| Avg. Benefit | | | | | | | | |
| 55 - 59 | | 1 | 1 | | | | | **2** |
| Avg. Benefit | | 6,427 | 12,959 | | | | | **9,693** |
| 60 - 64 | | | | | 1 | | | **1** |
| Avg. Benefit | | | | | 7,071 | | | **7,071** |
| 65 - 69 | 2 | 1 | 1 | 2 | | | | **6** |
| Avg. Benefit | 24,895 | 36,842 | 36,793 | 24,294 | | | | **28,669** |
| 70 - 74 | 1 | 3 | 2 | | 1 | | 1 | **8** |
| Avg. Benefit | 13,955 | 10,837 | 12,645 | | 11,607 | | 57,999 | **17,670** |
| 75 - 79 | 1 | 3 | 4 | 1 | | 2 | 1 | **12** |
| Avg. Benefit | 17,140 | 25,163 | 14,682 | 7,746 | | 9,730 | 13,753 | **16,026** |
| 80 - 84 | 1 | 4 | 3 | 2 | 3 | 3 | | **16** |
| Avg. Benefit | 7,446 | 14,797 | 30,938 | 38,274 | 39,296 | 13,426 | | **24,635** |
| 85 - 89 | 4 | 7 | 1 | 1 | 2 | 2 | 1 | **18** |
| Avg. Benefit | 15,141 | 11,777 | 22,557 | 4,036 | 31,760 | 12,477 | 4,393 | **14,582** |
| 90+ | | 3 | 4 | | | 2 | 2 | **11** |
| Avg. Benefit | | 21,680 | 11,306 | | | 17,689 | 9,012 | **14,879** |
| **Total** | **9** | **22** | **16** | **6** | **7** | **9** | **5** | **74** |
| **Avg. Benefit** | **16,544** | **16,270** | **18,398** | **22,820** | **28,583** | **13,341** | **18,834** | **18,276** |

In each cell, the top number is the count of survivors for the age/years since death combination and the bottom number is the average annual benefit amount.

# Membership Data

## Reconciliation of Members

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2013** | **24** | **70** | **1** | **287** | **0** | **75** | **457** |
| Additions | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Return to active | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Terminated non-vested | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Service retirements | 0 | (7) | 0 | 7 | 0 | 0 | **0** |
| Terminated deferred | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | 0 | (1) | (1) | 0 | 0 | 0 | **(2)** |
| Deaths | 0 | 0 | 0 | (11) | 0 | (2) | **(13)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 3 | **3** |
| Disabled | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Unexpected status changes | 0 | 0 | 0 | 8 | 0 | (6) | **2** |
| Net change | 0 | (8) | (1) | 4 | 0 | (5) | **(10)** |
| Addition of ESO members* | 0 | 1 | 0 | 10 | 0 | 4 | **15** |
| **Members on 6/30/2014** | **24** | **63** | **0** | **301** | **0** | **74** | **462** |

* *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund.*

| Terminated Member Statistics on June 30, 2014 | Deferred Retirement | Other Non-Vested | Total |
|---|---|---|---|
| Number | 63 | 0 | 63 |
| Average age | 58.6 | N/A | 58.6 |
| Average service | 11.9 | N/A | 11.9 |
| Average annual benefit, with augmentation to Normal Retirement Date and 30% CSA load | $29,645 | N/A | $29,645 |
| Average refund value, with 30% CSA load | $93,773 | N/A | $93,773 |

# Development of Costs

## Actuarial Valuation Balance Sheet *(Dollars in Thousands)*

The actuarial balance sheet is based on the principle that the long-term projected benefit obligations of the plan should be ideally equal to the long-term resources available to fund those obligations. The resources available to meet projected obligations for current members consist of current fund assets plus the present value of anticipated future contributions intended to fund benefits for current members. In the exhibit below, B.2 is the estimated present value of contributions to fund the normal cost rate for current members until their respective termination dates. Since statutory contributions are less than normal cost, B.2. is equal to the statutory contribution rate, minus expenses, times the present value of future payroll and Item B.1 is zero.

| | | | **June 30, 2014** |
|---|---|---|---|
| A. Actuarial Value of Assets | | | $ 8,258 |
| B. Expected Future Assets | | | |
| 1. Present value of expected future statutory supplemental contributions | | | 0 |
| 2. Present value of future normal cost contributions | | | 604 |
| 3. Total expected future assets: *(1.) + (2.)* | | | $ 604 |
| C. Total Current and Expected Future Assets | | | $ 8,862 |
| D. Current Benefit Obligations* | | | |
| 1. Benefit recipients | **Non-Vested** | **Vested** | **Total** |
| a. Service retirements | $ 0 | $ 144,591 | $ 144,591 |
| b. Disability retirements | 0 | 0 | 0 |
| c. Survivors | 0 | 18,347 | 18,347 |
| 2. Deferred retirements with augmentation | 0 | 70,532 | 70,532 |
| 3. Former members without vested rights | 0 | 0 | 0 |
| 4. Active members | 0 | 19,502 | 19,502 |
| 5. Total Current Benefit Obligations | $ 0 | $ 252,972 | $ 252,972 |
| E. Expected Future Benefit Obligations | | | $ 3,298 |
| F. Total Current and Expected Future Benefit Obligations** | | | $ 256,270 |
| G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)* | | | $ 244,714 |
| H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)* | | | $ 247,408 |
| I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)* | | | 3.26% |
| J. Projected Benefit Funding Ratio: *(C.)/(F.)* | | | 3.46% |

* *Present value of credited projected benefits (projected compensation, current service).*

** *Present value of projected benefits (projected compensation, projected service).*

# Development of Costs

## Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate (*Dollars in Thousands)*

| | Actuarial Present Value of Projected Benefits | Actuarial Present Value of Future Normal Costs | Actuarial Accrued Liability |
|---|---|---|---|
| A. Determination of Actuarial Accrued Liability (AAL) | | | |
| 1. Active members | | | |
| a. Retirement annuities | $ 22,279 | $ 5,112 | $ 17,167 |
| b. Disability benefits | 0 | 0 | 0 |
| c. Survivor's benefits | 521 | 171 | 350 |
| d. Deferred retirements | 0 | 112 | (112) |
| e. Refunds* | 0 | 15 | (15) |
| f. Total | $ 22,800 | $ 5,410 | $ 17,390 |
| 2. Deferred retirements with future augmentation | 70,532 | 0 | 70,532 |
| 3. Former members without vested rights | 0 | 0 | 0 |
| 4. Benefit recipients | 162,938 | 0 | 162,938 |
| 5. Total | $ 256,270 | $ 5,410 | $ 250,860 |
| | | | |
| B. Determination of Unfunded Actuarial Accrued Liability (UAAL) | | | |
| 1. Actuarial accrued liability | | | $ 250,860 |
| 2. Current assets (AVA) | | | 8,258 |
| 3. Unfunded actuarial accrued liability | | | $ 242,602 |
| | | | |
| C. Determination of Supplemental Contribution Rate | | | |
| 1. Current unfunded actuarial accrued liability to be amortized by June 30, 2026 | | | $ 242,602 |
| 2. Supplemental contribution amount | | | $ 20,217 ** |

* *Includes non-vested refunds and non-married survivor benefits only.*
** *The amortization factor as of July 1, 2014 is 12.0000.*

# Development of Costs

## Changes in Unfunded Actuarial Accrued Liability (UAAL) *(Dollars in Thousands)*

| | Year Ending June 30, 2014 |
|---|---|
| A. Unfunded actuarial accrued liability at beginning of year | $ 224,384 |
| B. Changes due to interest requirements and current rate of funding | |
| 1. Normal cost, including expenses | 1,326 |
| 2. Contributions | (3,537) |
| 3. Interest on A., B.1. and B.2. | 0 |
| 4. Total *(B.1. + B.2. + B.3.)* | (2,211) |
| C. Expected unfunded actuarial accrued liability at end of year *(A. + B.4.)* | 222,173 |
| D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected | |
| 1. Age and service retirements | (133) |
| 2. Disability retirements | 0 |
| 3. Death-in-service benefits | 28 |
| 4. Withdrawals | 0 |
| 5. Salary increases | (781) |
| 6. Investment income | (1,714) |
| 7. Mortality of annuitants | 18 |
| 8. Other items | 586 |
| 9. Total | (1,996) |
| E. Unfunded actuarial accrued liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.9.)* | 220,177 |
| F. Change in unfunded actuarial accrued liability due to changes in plan provisions | 0 |
| G. Change in unfunded actuarial accrued liability due to changes in actuarial assumptions | 14,481 |
| H. Change in unfunded actuarial accrued liability due to changes in actuarial methods | 0 |
| I. Administrative consolidation of Elective State Officers Retirement Fund | 7,944 |
| J. Unfunded actuarial accrued liability at end of year *(E. + F. + G. + H. + I.)* | $ 242,602 |

# Development of Costs

## Determination of Contribution Sufficiency/(Deficiency)*

The required contribution is defined in Minnesota Statutes as the sum of normal cost, a supplemental contribution to amortize the UAAL, and an allowance for expenses.

| | Percent of Payroll | Dollar Amount (000s) |
|---|---|---|
| A. Statutory Contributions - Chapter 352 | | |
| 1. Employee Contributions | 9.00% | $ 85 |
| 2. Employer contributions | 0.00% | 0 |
| 3. Total | 9.00% | $ 85 |
| | | |
| B. Required Contributions - Chapter 356 | | |
| 1. Normal cost | | |
| a. Retirement benefits | 128.53% | $ 1,211 |
| b. Disability benefits | 0.00% | 0 |
| c. Survivors | 4.72% | 44 |
| d. Deferred retirement benefits | 3.85% | 36 |
| e. Refunds | 0.64% | 6 |
| f. Total | 137.74% | $ 1,297 |
| | | |
| 2. Supplemental contribution amortization of Unfunded Actuarial Accrued Liability by June 30, 2026 | 2,146.18% | $ 20,217 |
| | | |
| 3. Allowance for expenses | 3.66% | $ 34 |
| | | |
| 4. Total | 2,287.58% * | $ 21,548 |
| | | |
| C. Contribution Sufficiency/(Deficiency) *(A.3. - B.4.)* | (2,278.58%) | $ (21,463) |

** Plan is funded by annual appropriations from the state's General Fund. Estimated benefit payments of $8,926 are expected to be paid during the upcoming fiscal year.*

Note: Projected annual payroll for fiscal year beginning on the valuation date: $942.

# Development of Costs

## Elective State Officers Retirement Plan *(Dollars in Thousands)*

The Elective State Officers Retirement Plan was consolidated with the Legislators Retirement Plan on July 1, 2013, per 2013 legislation. These liabilities are included in the Unfunded Actuarial Accrued Liabilities on page 15 of this report.

**Year Ending June 30, 2014**

| Group | Number | Annual Benefits | Average Age | Actuarial Accrued Liability |
|---|---|---|---|---|
| Deferred, Vested | 1 | $ 32 | 68.5 | $ 871 |
| Service Retirements | 10 | 355 | 79.1 | 5,322 |
| Survivors | 4 | 128 | 81.2 | 1,751 |
| **Total** | **15** | **$ 514** | **79.0** | **$ 7,944** |

# Actuarial Basis

## Actuarial Methods

All actuarial methods are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement, or the MSRS Board of Directors. Different methodologies may also be reasonable and results based on other methodologies would be different.

**Actuarial Cost Method**

Actuarial accrued liability and required contributions in this report are computed using the Entry Age Normal Cost method. This method is prescribed by Minnesota Statute. Under this method, a normal cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Age as of the valuation date was calculated based on the dates of birth provided by the Fund. Entry age for valuation purposes was calculated as the age on the valuation date minus the provided years of service on the valuation date.

To the extent that current assets and future normal costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued Liability ("UAAL") develops. The UAAL is amortized over the statutory amortization period using level dollar. The total contribution developed under this method is the sum of normal cost, expenses, and the payment toward the UAAL.

**Decrement Timing**

All decrements are assumed to occur mid-fiscal year.

**Asset Valuation Method**

Market Value (consistent with valuations since July 1, 2000).

**Payment on the Unfunded Actuarial Accrued Liability**

The unfunded liability is amortized as a level dollar each year to the statutory amortization date of June 30, 2026. If the Unfunded Actuarial Accrued Liability is negative, the surplus amount shall be amortized over 30 years as a level dollar amount. If the unfunded liability increases due to changes in benefits, assumptions, or methods, the statutory amortization date will be re-determined.

**Valuation of Future Post-Retirement Benefit Increases**

If the State Employees Retirement Fund (SERF) has reached the funding ratio threshold required to pay a 2.5% benefit increase in this plan, Minnesota Statutes require the 2.5% benefit increase rate to be reflected in the liability calculations. If the SERF has not yet reached the funding ratio threshold required to pay a 2.5% benefit increase, Minnesota Statutes require a projection to be performed to determine the expected attainment of the threshold, and the expected reversion to a 2.5% benefit increase rate must be reflected in the liability calculations.

**Funding Objective**

This plan is primarily funded on a pay-as-you-go basis, offset by active Legislators Retirement Fund member contributions and annual appropriations from the state's General Fund.

**Changes in Methods since Prior Valuation**

The methodology for valuing future post-retirement increases was clarified in Minnesota Statutes.

# Actuarial Basis

## Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The assumptions prescribed are based on the last assumption review, dated January 2012, prepared by a former actuary, and are consistent with the *Alternate Assumptions* used in the 2011 valuation.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment.

| | |
|---|---|
| Investment return | 0.00% per annum post-retirement;<br>0.00% per annum pre-retirement. |
| Benefit increases after retirement | 2.00% per annum through 2015 and 2.50% thereafter. |
| Salary increases | 5.00% annually. |
| Inflation | 3.00% annually. |
| Mortality rates | |
| Healthy Pre-retirement | RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment, set forward three years for males and set back one year for females. |
| Healthy Post-retirement | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 120. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. |
| Disabled | N/A |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. |
| Withdrawal | Ultimate rates based on actual experience. Rates are shown in rate table. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Disability | None. |
| Allowance for combined service annuity | Liabilities for former members are increased by 30.00% to account for the effect of some participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | Prior year administrative expenses expressed as percentage of prior year projected payroll. |
| Refund of contributions | Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit 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 62. |
| Percentage married | 85% of active members are assumed to be married. Legislators in payment status are assumed to be 100% married for purposes of a death benefit, except if reported with a joint & survivor benefit. 100% of Elective State Officers members are assumed to be eligible for the automatic survivor benefit. |
| Age of spouse | Females are assumed to be three years younger than their spouses, and males are assumed to be three years older than their spouses. |
| Eligible children | Each member may have two dependent children depending on member’s age. Assumed first born child born at member’s age 28 and second born child at member’s age 31. |
| Form of payment | Active married members are assumed to elect 50% joint and survivor annuity. Active single members and deferred members are assumed to elect a life annuity. Unless reported with a joint & survivor option, retired members are assumed to have a spouse that is eligible for the automatic survivor benefit. Deferred Elective State Officers Retirement Fund members are assumed to elect a life annuity with automatic survivor benefits. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| 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. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br>**Legislators Retirement Plan**<br><br><u>Data for active members:</u><br>There were no members reported with zero or invalid salary.<br><br>There were no members reported with missing service.<br><br>There were no members reported with missing or invalid gender or birth dates.<br><br><u>Data for terminated members:</u><br>There were 11 members reported without a benefit. If available, we calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was also not reported (10 members), we assumed a value of $30,000. There were no members reported without credited service or a termination date.<br><br>There were no members reported with missing or invalid gender or birth dates.<br><br><u>Data for members receiving benefits:</u><br>There were no members reported with missing or invalid birth dates. There was one survivor reported with an invalid gender. We assumed female gender for the valuation.<br><br>There were 291 retired members reported:<br>▪ 111 members were reported with the 75% or 100% joint and survivor option. These members were valued as indicated by the option elected.<br>▪ 180 members were reported with a life annuity or the 50% joint and survivor option. All of these members were valued as a 50% joint and survivor annuity per MSRS' direction.<br><br>Of the 291 retired members, 164 members had an invalid or missing survivor gender and 156 members had a missing or invalid survivor date of birth. We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.<br><br>There was 1 retiree reported with a bounce back annuity but was not reported with a reasonable reduction factor. A factor of 0.80 was assumed for the 100% joint and survivor annuity.<br><br>There were no survivors reported on the data file with an expired benefit. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Continued)

| | |
|---|---|
| Unknown data for certain members | **Elective State Officers Retirement Plan**<br><br>There were no members reported with missing gender, birth dates or benefit amounts.<br><br><u>Data for members receiving benefits:</u><br>Unless reported with the 100% joint & survivor option, all retired and deferred members were assumed to have a spouse that is eligible for the automatic survivor benefit. Valuation assumptions were used if the survivor gender or date of birth were missing. |
| Changes in actuarial assumptions | The assumed post-retirement benefit increase rate was changed from 2.0% per year to 2.0% per year through 2015 and 2.5% thereafter. See page 5 for additional detail about this assumption. |

# Actuarial Basis

## Summary of Actuarial Assumptions (Concluded)

| | Rate (%)* | | | |
|---|---|---|---|---|
| | Healthy Pre-Retirement Mortality** | | Healthy Post-Retirement Mortality** | |
| Age | Male | Female | Male | Female |
| 20 | 0.04% | 0.02% | 0.03% | 0.02% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 |
| 30 | 0.05 | 0.02 | 0.04 | 0.03 |
| 35 | 0.08 | 0.04 | 0.06 | 0.05 |
| 40 | 0.11 | 0.06 | 0.09 | 0.06 |
| 45 | 0.17 | 0.09 | 0.13 | 0.10 |
| 50 | 0.24 | 0.15 | 0.60 | 0.24 |
| 55 | 0.35 | 0.22 | 0.54 | 0.35 |
| 60 | 0.56 | 0.34 | 0.66 | 0.56 |
| 65 | 0.85 | 0.54 | 1.16 | 0.91 |
| 70 | 2.67 | 0.82 | 1.93 | 1.52 |

* *Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decrease at all ages, we would not expect the valuation results to be materially different.*

** *These rates were adjusted for mortality improvements using projection scale AA.*

| Age | Percent Retiring |
|---|---|
| 60 | 0.00% |
| 61 | 0.00 |
| 62 | 40.00 |
| 63 | 30.00 |
| 64 | 30.00 |
| 65 | 40.00 |
| 66 | 30.00 |
| 67 | 25.00 |
| 68 | 25.00 |
| 69 | 25.00 |
| 70 | 30.00 |
| 71+ | 100.00 |

| | Withdrawal | |
|---|---|---|
| Service | House | Senate |
| 1 | 0.0% | 0.0% |
| 2 | 30.0 | 0.0 |
| 3 | 0.0 | 0.0 |
| 4 | 20.0 | 25.0 |
| 5 | 0.0 | 0.0 |
| 6 | 10.0 | 0.0 |
| 7 | 0.0 | 0.0 |
| 8 | 5.0 | 10.0 |
| 9+ | 0.0 | 0.0 |

# Actuarial Basis

## Summary of Plan Provisions – Legislators Retirement Plan

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| Plan year | July 1 through June 30. |
| Eligibility | Members of the State Legislature first elected to office before July 1, 1997 and who elect to retain coverage under this plan (i.e., do not elect Social Security coverage). |
| Contributions | |
| Member | 9.00% of salary which must be paid to the state's General Fund. |
| Employer | Plan is funded by annual appropriations from the state's General Fund. Employee contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). |
| Allowable service | Service while in an eligible position. |
| Salary | Compensation received for service as a member of the legislature. Salary includes the monthly compensation paid to a legislator and the per diem payments paid during a regular or special session. Salary does not include additional compensation attributable to a leadership position. |
| Average salary | Average of the five highest successive years of salary. |
| **Retirement** | |
| Normal retirement benefit | |
| Age/Service requirements | Age 62 and either six full years of service or service during all or part of four regular legislative sessions. For eligibility purposes, service does not include credit for time not served when a member does not serve a full term of office. |
| Amount | A percentage of Average Salary for each year of service as follows:<br>First elected prior to January 1, 1979:<br>(a) 5.00% for the first eight years of service prior to January 1, 1979; and<br>(b) 2.50% for subsequent years.<br>Elected after December 31, 1978:<br>(a) 2.50%. |

# Actuarial Basis

## Summary of Plan Provisions – Legislators Retirement Plan (Continued)

| | |
|---|---|
| **Retirement (Continued)** | |
| Early retirement benefit | |
| Age/service requirements | Age 55 and either six full years of Service or Service during all or part of four regular legislative sessions. |
| Amount | Normal retirement benefit based on service and Average Salary at retirement date and actuarially reduced for each month the member is under age 62 assuming augmentation to age 62 at 3.00% per year. |
| Form of payment | Paid as a 50% joint and survivor annuity to member, spouse and dependent children. Annuitants may elect 100% joint and survivor bounce back annuity, life annuity, or a term certain and life annuity on an actuarially equivalent basis. |
| Benefit increases | Benefit recipients receive future annual 2.0% benefit increases. When the funding ratio of the State Employees Retirement Fund reaches 90% for two consecutive years (actuarial accrued liability ratio on a Market Value of Assets basis), the benefit increase will revert to 2.5%.<br>A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase. |
| **Disability** | No additional benefits provided beyond standard plan. Treated as retirement or termination, depending on age and service at termination. |
| **Death** | |
| Surviving spouse benefit | |
| Age/Service requirement | Death while active, or after termination if service requirements for a normal retirement benefit is met but payments have not begun. |
| Amount | Survivor payments of 50% of the retirement benefit of the member assuming the member had attained normal retirement age and had a minimum of eight years of service. Benefit is paid for life. A former member's benefit is augmented as a Deferred Annuity to date of death before determining the portion payable to the spouse. If the legislator was at least age 60 at death, the surviving spouse may elect an optional joint and survivor annuity. If a deferred benefit was not eligible to be in pay status before July 1, 1997, 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. |

# Actuarial Basis

## Summary of Plan Provisions – Legislators Retirement Plan (Continued)

| | |
|---|---|
| **Death (Continued)** | |
| Surviving dependent children's benefit | |
| Age/Service requirement | Same as spouse's benefit. |
| Amount | Benefit for first child is 25.00% of the retirement benefit (computed as for surviving spouse) with 12.50% for each additional child. Maximum payable (including spouse) is 100.00% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full-time student). |
| Benefit increases | Same as retirement. |
| Refund of contributions | |
| Age/Service requirement | Member dies before receiving any retirement benefits and survivor benefits are not payable. |
| Amount | Member's contributions with 6.00% annual interest compounded daily until June 30, 2011, 4.00% thereafter. |
| **Termination** | |
| Refund of contributions | |
| Age/Service requirement | Termination of service. |
| Amount | Member's contributions with 6.00% annual interest compounded daily until June 30, 2011, 4.00% thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund. |
| Deferred benefit | |
| Age/service requirement | Same service requirements as for normal retirement. |
| Amount | Benefit computed under law in effect at termination and increased by the following annual augmentation percentage:<br>(a.) 0.00% before July 1, 1973;<br>(b.) 5.00% from July 1, 1973 to January 1, 1981;<br>(c.) 3.00% until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012;<br>(d.) 5.00% until the earlier of January 1, 2012 and when the annuity begins; and<br>(e.) 2.00% from January 1, 2012 forward.<br>Amount is payable at normal or early retirement.<br>For members who terminated prior to July 1, 1997 but were not eligible to commence their pensions before July 1, 1997, the benefit shall be increased to reflect the actuarial equivalent change in post-retirement interest rate from 5.00% to 6.00%. |
| **Adjustments for benefits not in pay status** | Benefits are adjusted on an actuarial equivalent basis to reflect the 1997 change in post-retirement interest rate assumption from 5.0% to 6.0%. |

# Actuarial Basis

## Summary of Plan Provisions – Legislators Retirement Plan (Concluded)

| | |
|---|---|
| **Optional form conversion factors** | Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2025 using Scale AA, blended 55% males, and 6.5% interest. |
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br>(a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement;<br>(b.) Have at least six months of allowable service credit in each plan worked under; and<br>(c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year.<br>Members who meet the above requirements must have their benefit based on the following:<br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement.<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Changes in Plan Provisions** | Effective July 1, 2014, the funding ratio threshold that must be attained by the State Employees Retirement Fund to pay a 2.5% post-retirement benefit increase to benefit recipients in this plan was changed from 90% for one year to 90% for two consecutive years. |

# Actuarial Basis

## Summary of Plan Provisions – Elective State Officers Retirement Plan

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| Plan year | July 1 through June 30 |
| Eligibility | Must be employed as a "Constitutional Officer" first elected prior to July 1, 1997 and must elect to retain coverage under this plan (i.e., does not elect Social Security coverage). Plan is closed to new members since July 1, 1997. |
| Contributions | Plan is funded by annual appropriations from the State's General Fund. |
| Allowable service | Service while in an eligible position as a constitution officer. |
| Salary | Salary upon which Elective State Officers Retirement Fund contributions have been made. |
| Average salary | Average of the five highest successive years of Salary. |
| **Retirement** | |
| Normal retirement benefit | |
| Age/Service requirements | Age 62 and eight years of Allowable Service. |
| Amount | 2.50% of Average Salary for each year of Allowable Service. For members who terminated service after June 30, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Early retirement benefit | |
| Age/Service requirement | Age 60 and eight years of Allowable Service. |
| Amount | Normal retirement benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.50% for each month the member is under age 62 at the time of retirement. |
| Form of Payment | Life annuity. |
| Benefit increases | Since 2011, benefit recipients have received annual 2.0% benefit increases. When the funding ratio of the State Employees Retirement Fund reaches 90% for two consecutive years (actuarial accrued liability ratio on a Market Value of Assets basis), the benefit increase will revert to 2.5%.<br><br>A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase. |
| **Disability** | No additional benefits provided beyond standard plan. Treated as retirement or termination, depending on age and Allowable Service as of disablement. |

# Actuarial Basis

## Summary of Plan Provisions – Elective State Officers Retirement Plan (Continued)

| | |
|---|---|
| **Death** | |
| Surviving spouse benefit | |
| Age/Service requirement | Death while active, or after retirement, or after termination but prior to retirement with at least eight years of Allowable Service. |
| Amount | Survivor payments of 50% of the retirement benefit of the member assuming the member had attained age 62 and had a minimum of eight years of Allowable Service. A former member's benefit is augmented as a Deferred Annuity to date of death before determining the portion payable to the spouse.<br><br>If a member dies prior to July 1, 1997 and the beneficiary was not eligible to commence a survivor benefit as of July 1, 1997, 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 | Same as spouse's benefit. |
| Amount | Benefit for first child is 25.00% of the retirement benefit (computed as for surviving spouse) with 12.50% for each additional eligible child. Maximum payable (including spouse) is 100.00% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full-time student). |
| Benefit increases | Same as for retirement. |
| **Termination** | |
| Refund of contributions | |
| Age/Service requirement | Termination of service. |
| Amount | Member's contributions with 6.00% interest compounded daily to July 1, 2011 and 4.00% compounded daily thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund. |
| Deferred benefit | |
| Age/service requirement | Eight years of Allowable Service. |

# Actuarial Basis

## Summary of Plan Provisions – Elective State Officers Retirement Plan (Concluded)

| | |
|---|---|
| **Termination** (Continued)<br>Deferred benefit<br>Amount | Benefit computed under law in effect at termination and increased by the following annual augmentation percentage:<br><br>(a.) 0.00% before July 1, 1979;<br>(b.) 5.00% from July 1, 1979 to January 1, 1981;<br>(c.) 3.00% until age 55, or until January 1, 2012, whichever is earlier;<br>(d.) 5.00% thereafter until the annuity begins but prior to January 1, 2012; and<br>(e.) 2.00% from January 1, 2012 thereafter.<br><br>Amount is payable at normal or early retirement.<br><br>If a member terminated prior to July 1, 1997 but was not eligible to commence his or her pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br><br>(a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement;<br>(b.) Have at least six months of allowable service credit in each plan worked under; and<br>(c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year.<br><br>Members who meet the above requirements must have their benefit based on the following:<br><br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement.<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Optional Form Conversion Factors** | Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2025 using scale AA, blended 55% males, and 6.5% interest. |
| **Changes in Plan Provisions** | Effective July 1, 2014, the funding ratio threshold that must be attained by the State Employees Retirement Fund to pay a 2.5% post-retirement benefit increase to benefit recipients in this plan was changed from 90% for one year to 90% for two consecutive years. |

# Additional Schedules

## Schedule of Funding Progress[1] *(Dollars in Thousands)*

## Legislators Retirement Fund

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded (Overfunded) AAL (UAAL) (b)-(a) | Funded Ratio (a)/(b) | Actual Covered Payroll (Previous FY) (c) | UAAL as a Percentage of Covered Payroll (b)-(a) / (c) |
|---|---|---|---|---|---|---|
| 07/01/1991 | $ 14,694 | $ 30,403 | $ 15,709 | 48.33% | $ 7,078 | 221.94% |
| 07/01/1992 | 15,160 | 33,224 | 18,064 | 45.63 | 6,556 | 275.53 |
| 07/01/1993 | 17,169 | 36,801 | 19,632 | 46.65 | 7,322 | 268.12 |
| 07/01/1994 | 18,738 | 45,448 | 26,710 | 41.23 | 6,589 | 405.37 |
| 07/01/1995 | 21,213 | 50,255 | 29,042 | 42.21 | 7,056 | 411.59 |
| 07/01/1996 | 22,532 | 54,225 | 31,693 | 41.55 | 6,267 | 505.71 |
| 07/01/1997 | 25,678 | 60,055 | 34,377 | 42.76 | 7,767 | 442.60 |
| 07/01/1998 | 31,212 | 62,928 | 31,716 | 49.60 | 6,802 | 466.27 |
| 07/01/1999 | 33,474 | 66,418 | 32,944 | 50.40 | 7,490 | 439.84 |
| 07/01/2000 | 37,265 | 69,364 | 32,099 | 53.72 | 5,808 | 552.67 |
| 07/01/2001 | 42,608 | 75,072 | 32,464 | 56.76 | 5,858 | 554.18 |
| 07/01/2002 | 45,501 | 78,070 | 32,569 | 58.28 | 5,089 | 639.99 |
| 07/01/2003[2] | - | - | - | - | - | - |
| 07/01/2004 | 46,155 | 83,197 | 37,042 | 55.48 | 3,815 | 970.89 |
| 07/01/2005 | 45,523 | 81,836 | 36,314 | 55.63 | 3,014 | 1,204.84 |
| 07/01/2006 | 48,504 | 81,361 | 32,858 | 59.62 | 2,894 | 1,135.45 |
| 07/01/2007 | 44,869 | 86,449 | 41,580 | 51.90 | 2,380 | 1,747.42 |
| 07/01/2008 | 39,209 | 86,131 | 46,922 | 45.52 | 1,993 | 2,354.34 |
| 07/01/2009 | 28,663 | 90,431 | 61,768 | 31.70 | 1,963 | 3,146.61 |
| 07/01/2010 | 26,821 | 86,236 | 59,415 | 31.10 | 1,877 | 3,165.42 |
| 07/01/2011[3] | 19,140 | 216,559 | 197,419 | 8.84 | 1,774 | 11,128.47 |
| 07/01/2012 | 15,523 | 247,657 | 232,134 | 6.27 | 1,378 [4] | 16,845.72 |
| 07/01/2013 | 11,493 | 235,877 | 224,384 | 4.87 | 1,233 [4] | 18,198.22 |
| 07/01/2014[5] | 8,258 | 250,860 | 242,602 | 3.29 | 1,122 [4] | 21,622.28 |

[1] *Information prior to 2012 provided by prior actuaries. See prior reports for additional detail.*
[2] *An actuarial valuation was not completed as of July 1, 2003.*
[3] *Based on the alternate assumptions, including an investment return assumption of 0%.*
[4] *Assumed equal to actual member contributions divided by 9%.*
[5] *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund, first combined as of July 1, 2014 in this exhibit.*

# Additional Schedules

## Schedule of Funding Progress[1] *(Dollars in Thousands)*

## Elective State Officers Retirement Fund

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded (Overfunded) AAL (UAAL) (b) - (a) | Funded Ratio (a)/(b) | Actual Covered Payroll (Previous FY) (c) | UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c) |
|---|---|---|---|---|---|---|
| 7-1-1991 | $ 308 | $ 2,249 | $ 1,941 | 13.69% | $ 422 | 459.95 % |
| 7-1-1992 | 334 | 2,380 | 2,046 | 14.03 | 378 | 541.27 |
| 7-1-1993 | 322 | 2,689 | 2,367 | 11.97 | 500 | 473.40 |
| 7-1-1994 | 361 | 2,848 | 2,487 | 12.68 | 411 | 605.11 |
| 7-1-1995 | 378 | 2,948 | 2,570 | 12.82 | 422 | 609.00 |
| 7-1-1996 | 412 | 2,983 | 2,571 | 13.81 | 456 | 563.82 |
| 7-1-1997 | 456 | 3,214 | 2,758 | 14.19 | 467 | 590.58 |
| 7-1-1998 | 500 | 3,369 | 2,869 | 14.84 | 461 | 622.34 |
| 7-1-1999 | 198 | 3,373 | 3,175 | 5.87 | 291 | 1091.07 |
| 7-1-2000 | 199 | 3,535 | 3,336 | 5.63 | 0 | N/A |
| 7-1-2001 | 201 | 3,775 | 3,574 | 5.32 | 0 | N/A |
| 7-1-2002 | 201 | 4,075 | 3,874 | 4.93 | 0 | N/A |
| 7-1-2003 [2] | | | | - | - | - |
| 7-1-2004 | 204 | 4,002 | 3,798 | 5.09 | 0 | N/A |
| 7-1-2005 | 204 | 4,065 | 3,861 | 5.03 | 0 | N/A |
| 7-1-2006 | 207 | 3,970 | 3,763 | 5.22 | 0 | N/A |
| 7-1-2007 | 212 | 3,969 | 3,757 | 5.33 | 0 | N/A |
| 7-1-2008 | 212 | 3,908 | 3,696 | 5.43 | 0 | N/A |
| 7-1-2009 | 213 | 3,886 | 3,673 | 5.49 | 0 | N/A |
| 7-1-2010 | 214 | 3,782 | 3,568 | 5.66 | 0 | N/A |
| 7-1-2011 [3] | 0 | 7,610 | 7,610 | 0.00 | 0 | N/A |
| 7-1-2012 | 0 | 8,907 | 8,907 | 0.00 | 0 | N/A |
| 7-1-2013 | 0 | 8,595 | 8,595 | 0.00 | 0 | N/A |
| 7-1-2014 [4] | | | | | | |

[1] *Information prior to 2012 provided by prior actuaries. See prior reports for additional detail.*
[2] *An actuarial valuation was not completed as of July 1, 2003.*
[3] *Based on the alternate assumptions, including an investment return assumption of 0%.*
[4] *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund. Effective July 1, 2014 combined results are shown with the Legislators Retirement Fund exhibit.*

# Additional Schedules

## Schedule of Contributions from the Employer and Other Contributing Entities[1]

*(Dollars in Thousands)*

## Legislators Retirement Fund

| Plan Year Ended June 30 | Actuarially Required Contribution Rate (a) | Actual Covered Payroll (b) | Actual Member Contributions (c) | Annual Required Contributions [(a)x(b)] - (c) = (d) | Actual Employer Contributions[3] (e) | Percentage Contributed (e)/(d) |
|---|---|---|---|---|---|---|
| 1991 | 32.62 % | $ 7,078 | $ 637 | $ 1,672 | $ 1,889 | 112.98 % |
| 1992 | 27.67 | 6,556 | 590 | 1,224 | 601 | 49.10 |
| 1993 | 30.49 | 7,322 | 659 | 1,573 | 2,284 | 145.20 |
| 1994 | 32.12 | 6,589 | 593 | 1,457 | 1,618 | 111.05 |
| 1995 | 38.34 | 7,056 | 635 | 2,070 | 2,938 | 141.93 |
| 1996 | 41.54 | 6,267 | 564 | 2,039 | 1,511 | 74.10 |
| 1997 | 43.96 | 7,767 | 699 | 2,715 | 3,176 | 116.98 |
| 1998 | 48.03 | 6,802 | 612 | 2,655 | 5,199 | 195.82 |
| 1999 | 47.19 | 7,490 | 674 | 2,861 | 2,091 | 73.09 |
| 2000 | 52.72 | 5,808 | 523 | 2,539 | 3,192 | 125.72 |
| 2001 | 47.26 | 5,858 | 527 | 2,241 | 5,039 | 224.85 |
| 2002 | 60.14 | 5,089 | 458 | 2,603 | 4,135 | 158.86 |
| 2003 [4] | 63.12 | - | - | - | - | - |
| 2004 | 63.12 | 3,815 | 343 | 2,065 | 425 | 20.58 |
| 2005 | 104.72 | 3,014 | 384 | 2,773 | 1,822 | 65.71 |
| 2006 | 112.64 | 2,894 | 264 | 2,995 | 5,684 | 189.78 |
| 2007 | 111.24 | 2,380 | 239 | 2,408 | 1,772 | 73.59 |
| 2008 | 171.10 | 1,993 | 180 | 3,230 | 2,217 | 68.64 |
| 2009 | 243.21 | 1,963 | 248 | 4,526 | 1,269 | 28.04 |
| 2010 | 413.00 | 1,877 | 170 | 7,582 | 1,975 | 26.05 |
| 2011 | 432.92 | 1,774 | 160 | 7,520 | 2,805 | 37.30 |
| 2012 [5] | 1,320.95 | 1,378 [6] | 124 | 18,079 | 3,935 | 21.77 |
| 2013 | 1,340.00 | 1,233 [6] | 111 | 16,411 | 3,399 | 20.71 |
| 2014 [7] | 1,887.98 | 1,122 [6] | 101 | 21,082 | 3,436 | 16.30 |
| 2015 | 2,287.58 | N/A | N/A | N/A | N/A | N/A |

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
[2] *Includes contributions from other sources (if applicable). Information for 2004 to 2012 provided by MSRS.*
[3] *An actuarial valuation for this fiscal year was not completed.*
[4] *Based on the alternate assumptions, including an investment return assumption of 0%.*
[5] *Assumed equal to actual member contributions divided by 9%.*
[6] *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund, first combined for plan year ending June 30, 2014 in this exhibit.*

# Additional Schedules

## Schedule of Contributions from the Employer and Other Contributing Entities[1]
*(Dollars in Thousands)*

## Elective State Officers Retirement Fund

| Plan Year Ended June 30 | Actuarially Required Contribution Rate/Amount[2] (a) | Actual Covered Payroll (b) | Actual Member Contributions (c) | Annual Required Contributions[3] [(a)x(b)] - (c) = (d) | Actual Employer Contributions (e) | Percentage Contributed (e)/(d) |
|---|---|---|---|---|---|---|
| 1991 | 34.84% | $ 422 | $ 38 | $ 109 | $ 40 | 36.70% |
| 1992 | 33.28 | 378 | 34 | 92 | 111 | 120.65 |
| 1993 | 36.23 | 500 | 45 | 136 | 88 | 64.71 |
| 1994 | 38.64 | 411 | 37 | 122 | 164 | 134.43 |
| 1995 | 42.00 | 422 | 38 | 139 | 165 | 118.71 |
| 1996 | 43.58 | 456 | 41 | 158 | 151 | 95.57 |
| 1997 | 43.49 | 467 | 42 | 161 | 167 | 103.73 |
| 1998 | 51.07 | 461 | 42 | 193 | 175 | 90.67 |
| 1999 | 51.66 | 291 | 26 | 124 | 40 | 32.26 |
| 2000 | $ 321 | 0 | 0 | 321 | 306 | 95.33 |
| 2001 | 340 | 0 | 0 | 340 | 330 | 97.06 |
| 2002 | 371 | 0 | 0 | 371 | 354 | 95.42 |
| 2003 | 412 | 0 | 0 | 412 | 371 | 90.12 |
| 2004 | 412 | 0 | 0 | 412 | 383 | 92.88 |
| 2005 | 437 | 0 | 0 | 437 | 395 | 90.37 |
| 2006 | 465 | 0 | 0 | 465 | 417 | 89.66 |
| 2007 | 477 | 0 | 0 | 477 | 427 | 89.57 |
| 2008 | 506 | 0 | 0 | 506 | 435 | 85.92 |
| 2009 | 558 | 0 | 0 | 558 | 442 | 79.28 |
| 2010 | 601 | 0 | 0 | 601 | 453 | 75.37 |
| 2011 | 644 | 0 | 0 | 644 | 460 | 71.54 |
| 2012[4] | 1,269 | 0 | 0 | 1,269 | 466 | 36.73 |
| 2013[5] | 991 | 0 | 0 | 991 | 470 | 47.43 |

*[1] Information prior to 2012 provided by prior actuaries. See prior reports for additional detail.*
*[2] Shown as a percent of payroll for years before 2000.*
*[3] For years after 1999, the Annual Required Contribution is the dollar amount shown in (a).*
*[4] Based on the alternate assumptions, including an investment return assumption of 0%.*
*[5] Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund. Effective July 1, 2014 combined results are shown with the Legislators Retirement Fund exhibit.*

# Glossary of Terms

| | |
|---|---|
| ***Accrued Benefit Funding Ratio*** | The ratio of assets to Current Benefit Obligations. |
| ***Accrued Liability Funding Ratio*** | The ratio of assets to Actuarial Accrued Liability. |
| ***Actuarial Accrued Liability (AAL)*** | The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs. |
| ***Actuarial Assumptions*** | Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items. |
| ***Actuarial Cost Method*** | A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability. |
| ***Actuarial Equivalent*** | Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions. |
| ***Actuarial Present Value (APV)*** | The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made. |
| ***Actuarial Present Value of Projected Benefits*** | The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due. |
| ***Actuarial Valuation*** | The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for developing and monitoring retirement system's funding policy, such as the Funded Ratio and the Annual Required Contribution (ARC). |
| ***Actuarial Value of Assets*** | The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC). |

# Glossary of Terms (Continued)

| | |
|---|---|
| ***Amortization Method*** | A method for determining the Amortization Payment. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. The stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase. |
| ***Amortization Payment*** | That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability. |
| ***Amortization Period*** | The period used in calculating the Amortization Payment. |
| ***Annual Required Contribution (ARC)*** | The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ARC consists of the Employer Normal Cost and Amortization Payment. |
| ***Augmentation*** | Annual increases to deferred benefits. |
| ***Closed Amortization Period*** | A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. |
| ***Current Benefit Obligations*** | The present value of benefits earned to the valuation date, based on current service and including future salary increases to retirement. |
| ***Employer Normal Cost*** | The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions. |
| ***Expected Assets*** | The present value of anticipated future contributions intended to fund benefits for current members. |
| ***Experience 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 valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected. |

# Glossary of Terms (Concluded)

| | |
|---|---|
| ***GASB*** | Governmental Accounting Standards Board. |
| ***GASB Statements No. 25 and No. 27*** | These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves. These statements remain in effect only for pension plans that are not administered as trusts or equivalent arrangements. Please refer to the definition for GASB Statements No. 67 and No. 68 below. |
| ***GASB Statement No. 50*** | The accounting standard governing a state or local governmental employer's accounting for pensions. This statement remains in effect for pension plans that are not administered as trusts. Please refer to the definition of GASB Statements No. 67 and No. 68 below. |
| ***GASB Statements No. 67 and No. 68*** | Statements No. 67 and No. 68, issued in June 2012, replace the requirements of Statements No. 25, No. 27, and No. 50, respectively for pension plans administered as trusts. Statement No. 68, effective for the fiscal year beginning July 1, 2014, sets the accounting and financial reporting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67, effective for the fiscal year beginning July 1, 2013, sets the rules for the systems themselves. Accounting and financial reporting information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the June 30, 2014 actuarial valuation. |
| ***Normal Cost*** | The annual cost assigned, under the Actuarial Cost Method, to the current plan year. |
| ***Projected Benefit Funding Ratio*** | The ratio of the sum of Actuarial Value of Assets and Expected Assets to the Actuarial Present Value of Projected Benefits. |
| ***Unfunded Actuarial Accrued Liability*** | The difference between the Actuarial Accrued Liability and Actuarial Value of Assets. |
| ***Valuation Date*** | The date as of which the Actuarial Present Value of Future Benefits is determined. The benefits expected to be paid in the future are discounted to this date. |