# Cavanaugh Macdonald 

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Report on the Annual Valuation of the Mississippi Highway Safety Patrol Retirement System

Prepared as of June 30, 2014


# Cavanaugh Macdonald <br> consulting, llc <br> The experience and dedication you deserve 

October 21, 2014
Board of Trustees
Public Employees' Retirement System of Mississippi
429 Mississippi Street
Jackson, MS 39201-1005
Ladies and Gentlemen:
Presented in this report are the results of the annual actuarial valuation of the Mississippi Highway Safety Patrol Retirement System. The purpose of the valuation was to measure the System's funding progress and to determine the unfunded accrued liability amortization period beginning July 1, 2014. The results may not be applicable for other purposes.

The date of the valuation was June 30, 2014.
The valuation was based upon data, furnished by the Executive Director and the PERS staff, concerning active, inactive and retired members along with pertinent financial information. While not verifying data at the source, the actuary performed tests for consistency and reasonableness. The complete cooperation of the PERS staff in furnishing materials requested is hereby acknowledged with appreciation.

Your attention is directed particularly to the presentation of contribution rates on page 1 and the comments on page 8.

To the best of our knowledge, this report is complete and accurate. The valuation was performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems. The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

The valuation was prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board. We have reviewed the actuarial methods, including the asset valuation method, and continue to believe they are appropriate for the purpose of determining employer contribution levels.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the system's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

## Board of Trustees

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The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the system, and on actuarial assumptions that are, in the aggregate, internally consistent and reasonably based on the actual experience of the system.

Respectfully submitted,


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Edward J. Koebel, FCA, EA, MAAA
Principal and Consulting Actuary


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## TJC/EAM/EJK/JTC:kc

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## REPORT ON THE ANNUAL VALUATION OF THE MISSISSIPPI HIGHWAY SAFETY PATROL RETIREMENT SYSTEM PREPARED AS OF JUNE 30, 2014

## SECTION I - SUMMARY OF PRINCIPAL RESULTS

1. This report, prepared as of June 30, 2014, presents the results of the annual actuarial valuation of the System. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below. The current valuation and reported benefits amount reflect any benefit increases granted to retirees as of July 1, 2014. Based on the funding policy adopted by the Board in 2012, the employer contribution rate is to be set at $37.00 \%$ of annual compensation and the amortization period calculated on an open basis.

SUMMARY OF PRINCIPAL RESULTS


[^0]2. The valuation balance sheet showing the results of the valuation is given in Section III.
3. Comments on the valuation results are given in Section IV, the derivation of the experience gains and losses during the valuation year are given in Section V and the rates of contribution payable by employers are given in Section VI.
4. There were no changes to the actuarial assumptions or methods since the last valuation.
5. There were no changes to the benefit provisions since the last valuation.
6. Due to Senate Bill No. 2659 enacted in 2004 and House Bill No. 1015 enacted April 25, 2013, additional contributions are being made to the System and are expected to continue in the future. We have reduced our expected contributions from these sources from $\$ 4,600,000$ to $\$ 3,400,000$ based on actual monies received for the fiscal year ending June 30, 2014. The employers are also required to contribute $37.00 \%$ of payroll. The funding period of the UAL of 36.5 years shown on the previous page reflects the additional contributions from Senate Bill No. 2659 and House Bill No. 1015. Without these additional contributions, the funding period would have been infinite. If the funding period was kept at 30 years, without the additional contributions the employer contribution rate would have been $48.45 \%$.
7. Schedule A of this report presents the development of the actuarial value of assets. Schedule B details the actuarial assumptions and methods employed. Schedule C gives a summary of the benefit and contribution provisions of the System.
8. The table on page 3 provides a ten-year history of some pertinent figures.
9. The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67) in June 2012 and is effective for plan years beginning after June 15, 2013, which is the year ending June 30, 2014 for the Retirement System. GASB 67 replaces GASB 25 for plans and a separate GASB 67 report will be prepared for the Board. However, GASB 27 is still in effect for employers and we have provided some supplemental disclosure information and tables in Section VIII.

Mississippi Highway Safety Patrol Retirement System

## Comparative Schedule

| Valuation Date June 30 | Active Members |  |  |  | Retired Lives |  |  |  | Valuation Results (\$ thousands) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Number | Payroll (\$ thousands) | Average Salary | \% increase from previous year | Number | Active/ Retired Ratio | Annual Benefits** (\$ thousands) | Benefits as \% of Payroll | Accrued Liability | Valuation Assets | UAAL |
| 2005 | 540 | \$22,343 | \$41,376 | 2.0\% | 621 | 0.9 | \$17,189.8 | 76.9\% | \$335,117 | \$253,477 | \$81,640 |
| 2006 | 564 | 24,499 | 43,438 | 5.0 | 625 | 0.9 | 17,821.8 | 72.7 | 350,638 | 265,637 | 85,001 |
| 2007 | 591 | 27,037 | 45,748 | 5.3 | 638 | 0.9 | 18,722.6 | 69.2 | 371,233 | 284,626 | 86,607 |
| 2008 | 626 | 29,597 | 47,280 | 3.3 | 651 | 1.0 | 19,798.7 | 66.9 | 381,578 | 298,630 | 82,948 |
| 2009 | 570 | 26,390 | 46,298 | (2.1) | 692 | 0.8 | 21,994.1 | 83.3 | 394,630 | 292,322 | 102,308 |
| 2010 | 542 | 26,353 | 48,623 | 5.0 | 696 | 0.8 | 22,899.7 | 86.9 | 411,277 | 281,088 | 130,189 |
| 2011 | 515 | 24,872 | 48,295 | (0.7) | 704 | 0.7 | 23,975.7 | 96.4 | 414,432 | 278,265 | 136,167 |
| 2012 | 547 | 25,670 | 46,929 | (2.8) | 713 | 0.8 | 25,167.9 | 98.0 | 421,415 | 268,424 | 152,991 |
| 2013 | 520 | 25,816 | 49,646 | 5.8 | 713 | 0.7 | 25,835.6 | 100.1 | 431,575 | 271,097 | 160,478 |
| 2014 | 495 | 25,554 | 51,624 | 4.0 | 720 | 0.7 | 26,966.4 | 105.5 | 445,822 | 295,298 | 150,524 |

## SECTION II - MEMBERSHIP DATA

Data regarding the membership of the System for use as a basis for the valuation were furnished by the System's office. The following tables summarize the membership of the System as of June 30, 2014 upon which the valuation was based. Detailed tabulations of the data are given in Schedule D.

Active Members

|  |  |  |  | Group Averages |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Employers | Number of <br> Employers | Number | Payroll | Salary | Age | Benefit <br> Service |  |
| State Agencies | 1 | 495 | $\$ 25,553,765$ | $\$ 51,624$ | 42.3 | 14.0 |  |

Of the 495 active members, 443 are vested and 52 are non-vested.

## Retired Lives

| Type of Benefit <br> Payment | No. | Annual Benefits | Group Averages |  |
| :--- | ---: | ---: | ---: | ---: |
| Benefit | Age |  |  |  |
| Retirement | 516 | $\$ 22,632,674$ | $\$ 43,862$ | 65.7 |
| Disability | 17 | 410,138 | 24,126 | 65.5 |
| Survivor | 187 | $3,923,548$ | 20,982 | 73.7 |
| Total in HSPRS | 720 | $\$ 26,966,360$ | $\$ 37,453$ | 67.8 |

## Deferred Vested/Inactive Lives

| Type of Member | No. | Deferred Benefits | Outstanding Balance |
| :--- | ---: | ---: | ---: |
| Deferred Vested - Benefit Included | 33 | $\$ 464,209$ | N/A |
| Inactive | 25 | N $/$ A | $\$ 79,476$ |
| Total in HSPRS | 58 | $\$ 464,209$ | $\$ 79,476$ |

## SECTION III - VALUATION BALANCE SHEET

The following valuation balance sheet shows the assets and liabilities of the retirement system as of the current valuation date of June 30, 2014 and, for comparison purposes, as of the immediately preceding valuation date of June 30, 2013. The items shown in the balance sheet are present values actuarially determined as of the relevant valuation date. The development of the actuarial value of assets is presented in Schedule A.

|  | JUNE 30, 2014 |  | JUNE 30, 2013 |  |
| :---: | :---: | :---: | :---: | :---: |
| ASSETS |  |  |  |  |
| Current actuarial value of assets: |  |  |  |  |
| Annuity Savings Account | \$ | 24,410,638 | \$ | 23,706,361 |
| Annuity Reserve |  | 33,700,862 |  | 27,502,961 |
| Employers' Accumulation Account |  | 237,186,500 |  | 219,887,678 |
| Total current assets | \$ | 295,298,000 | \$ | 271,097,000 |
| Future member contributions to Annuity Savings Account | \$ | 16,153,009 | \$ | 16,914,745 |
| Prospective contributions to Employer's Accumulation Account |  |  |  |  |
| Normal contributions | \$ | 35,202,419 | \$ | 37,142,446 |
| Unfunded accrued liability contributions |  | 150,524,072 |  | 160,477,971 |
| Total prospective contributions | \$ | 185,726,491 | \$ | 197,620,417 |
| Total assets | \$ | 497,177,500 | \$ | 485,632,162 |
| LIABILITIES |  |  |  |  |
| Present value of benefits payable on account of present retired members and beneficiaries | \$ | 317,825,045 | \$ | 306,272,996 |
| Present value of benefits payable on account of inactive members for service rendered before the valuation date |  | 3,432,127 |  | 3,805,201 |
| Present value of benefits payable on account of active members $\quad \$ \quad 175,920,328 \quad \$ \quad 175,553,965$ |  |  |  |  |
| Total liabilities |  | 497,177,500 | \$ | 485,632,162 |

## BREAKDOWN OF TOTAL AND ACCRUED LIABILITIES AS OF JUNE 30, 2014

|  | Total Liability |  | Accrued Liability |  |
| :---: | :---: | :---: | :---: | :---: |
| Active Members |  |  |  |  |
| Retirement | \$ | 169,079,181 | \$ | 121,995,968 |
| Death |  | 1,828,817 |  | 745,535 |
| Disability |  | 2,797,782 |  | 983,721 |
| Termination |  | 2,214,548 |  | 839,676 |
| Total | \$ | 175,920,328 | \$ | 124,564,900 |
| Retirees |  |  |  |  |
| Retirement | \$ | 278,314,890 | \$ | 278,314,890 |
| Survivor |  | 35,255,190 |  | 35,255,190 |
| Disability |  | 4,254,965 |  | 4,254,965 |
| Total | \$ | 317,825,045 | \$ | 317,825,045 |
| Deferred Vested Members |  | 3,273,175 |  | 3,273,175 |
| Inactive Members |  | 158,952 |  | 158,952 |
| Total Actuarial Values | \$ | 497,177,500 | \$ | 445,822,072 |
| Actuarial Value of Assets |  |  |  | 295,298,000 |
| Unfunded Actuarial Accrued Liability |  |  | \$ | 150,524,072 |

## SECTION IV - COMMENTS ON VALUATION

The valuation balance sheet gives the following information with respect to the funds of the System as of June 30, 2014.

## Total Assets

The Annuity Savings Account is the fund to which are credited contributions made by members together with interest thereon. When a member retires, the amount of his or her accumulated contributions is transferred from the Annuity Savings Account to the Annuity Reserve. The Employer's Accumulation Account is the fund to which are credited employer contributions and investment income, and from which are paid all employer-provided benefits under the system. The assets credited to the Annuity Savings Account as of the valuation date, which represent the accumulated contributions of members to that date, amounted to $\$ 24,410,638$. The assets credited to the Annuity Reserve were $\$ 33,700,862$ and the assets credited to the Employer's Accumulation Account totaled $\$ 237,186,500$. Current actuarial assets as of the valuation date equaled the sum of these three funds, $\$ 295,298,000$. Future member contributions to the Annuity Savings Account were valued to be $\$ 16,153,009$. Prospective contributions to the Employer's Accumulation Account were calculated to be $\$ 185,726,491$ of which $\$ 35,202,419$ is attributable to service rendered after the valuation date (normal contributions) and $\$ 150,524,072$ is attributable to service rendered before the valuation date (unfunded accrued liability contributions).

Therefore, the balance sheet shows the present value of current and future assets of the System to be $\$ 497,177,500$ as of June 30, 2014.

## Total Liabilities

The present value of benefits payable on account of presently retired members and beneficiaries totaled $\$ 317,825,045$ as of the valuation date. The present value of future benefit payments on behalf of active members amounted to $\$ 175,920,328$. In addition, the present value of benefits for inactive members, due to service rendered before the valuation date, was calculated to be \$3,432,127.

Therefore, the balance sheet shows the present value for all prospective benefit payments under the System to be $\$ 497,177,500$ as of June 30, 2014.

Section 25-11-7 of State law requires that active members contribute the current rate of $7.25 \%$ of annual compensation to the System.

Section 25-11-123(c) requires that the State contribute a certain percentage of the annual compensation of members to cover the normal contributions and a certain percentage to cover the accrued liability contributions of the System. These individual contribution percentages are established in accordance with an actuarial valuation. Based on the funding policy adopted by the Board in October, 2012, the employer rate is set at $37.00 \%$ of annual compensation and the amortization period calculated on an open basis. Therefore, the amortization period for the June 30, 2014 valuation is 36.5 years, compared to 33.0 years for the last valuation.

The primary reason for the increase in the amortization period is the adjustment to expected contributions from Senate Bill No. 2659 and House Bill No. 1015. Previously, we expected $\$ 4.6$ million per year. We lowered our expectation to $\$ 3.4$ million per year based on actual receipts from the fiscal year ending June 30, 2014. This was offset by the recognition of the investment gains from four of the last five fiscal years.

## SECTION V - DERIVATION OF EXPERIENCE GAINS AND LOSSES

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year to year fluctuations are common. Detail on the derivation of the experience gain/(loss) for the year ended June 30, 2014 is shown below.

## \$ Thousands

(1) UAAL* as of June 30, 2013
\$ 160,478.0
(2) Total normal cost from last valuation
5,981.5
(3) Total contributions
15,463.0
(4) Interest accrual: [[(1) + (2)] $\times .08]-[(3) \times .04]$
12,698.2
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)
\$ 163,694.7
(6) Change due to plan amendments 0.0
(7) Change due to actuarial assumptions or methods 0.0
(8) Expected UAAL after changes: $(5)+(6)+(7)$
\$
163,694.7
(9) Actual UAAL as of June 30, 2014
\$
150,524.1
(10) Gain/(loss): (8) - (9)
\$
13,170.7
$\begin{array}{ll}\text { (11) } & \begin{array}{l}\text { Gainh/(loss) as percent of actuarial accrued } \\ \text { liabilities at start of year ( }(\$ 431,575.0)\end{array}\end{array}$
*Unfunded actuarial accrued liability.

|  | Actuarial Gain/(Loss) as a \% of |
| :---: | :---: |
| Beginning Accrued Liabilities |  |

## SECTION VI - REQUIRED CONTRIBUTION RATES

The valuation balance sheet gives the basis for determining the percentage rates for contributions to be made by employers to the Retirement System. The following table shows the rates of contribution payable by employers as determined from the present valuation for the 2015/2016 fiscal year and a comparison to the previous valuation results.

| Contribution for | 2015/2016 Fiscal Year | 2014/2015 Fiscal Year |
| :---: | :---: | :---: |
| Normal Cost: |  |  |
| Service retirement benefits | 21.22\% | 21.21\% |
| Disability benefits | 0.96 | 1.00 |
| Survivor benefits | 0.55 | 0.58 |
| Total | 22.73\% | 22.79\% |
| Member Contributions: | 7.25\% | 7.25\% |
| Less future refunds | (0.32) | (0.38) |
| Available for benefits | 6.93\% | 6.87\% |
| Employer Normal Cost | 15.80\% | 15.92\% |
| Administrative Expense Load | 0.23\% | 0.23\% |
| Unfunded Actuarial Accrued Liabilities (36.5 year level \% of payroll amortization*) | 20.97\% | 20.85\% |
| Total Computed Employer Contribution Rate | 37.00\% | 37.00\% |

*Amortization period a year ago was 33.0 years.

The components of the change in the computed unfunded accrued liability amortization period from 33.0 years to 36.5 years are as follows:

| Previously Reported Period | 33.0 years |
| :---: | :---: |
| Change due to: |  |
| Normal amortization | $(1.0)$ |
| Actuarial experience | 0.0 |
| Assumption changes | 0.0 |
| Plan amendments | 0.0 |
| Method Change | 13.4 |
| SB 2659 and HB 1015 changes | 3.5 |
| Payroll Growth experience | 36.5 years |
| Computed Period |  |

## SECTION VII - CASH FLOW PROJECTION

Regular actuarial valuations measure the Retirement System's present financial position and contributions adequacy by calculating and financing the liabilities created by the present benefit program. This process involves discounting to present values the future benefit payments on behalf of present active and retired members and their survivors. However, valuations do not produce information regarding future changes in the makeup of the covered group or the amounts of benefits to be paid or investment income to be received - actuarial projections do.

Whereas valuations provide a snapshot of the retirement system as of a given date, projections provide a moving picture. Projected active and retired groups are developed from year to year by the application of assumptions regarding pre-retirement withdrawal from service, retirements, deaths, disabilities, and the addition of new members. Projected information regarding the retired life group leads to assumed future benefit payout. Combining future benefit payments with assumed contributions and expected investment earnings produces the net cash flow of the System each year, and thus end of year asset levels.

Projections are used for many purposes. Among them are (i) developing cash flow patterns for investment policy and asset mix consideration, (ii) exploring the effect of alternative assumptions about future experience, (iii) analyzing the impact on system funding progress of changes in the workforce, and (iv) examining the potential effect of changes in benefits on system financial activity.

Projection results are useful in demonstrating changing relationships among key elements affecting system financial activity. For example: how benefits payable and system assets will grow in future decades. Projections are not predictions of specific future events and do not provide numeric precision in absolute terms. For instance, cash flow projected to occur 10 years in the future will not be exact (except by coincidence), but understanding the changed relationship between future benefit payout and future investment income can be very useful.

The following projections assume an $8.00 \%$ investment return and salary increases of $4.25 \%$ each year in the future. Due to the new funding policy all future contribution rates are assumed to remain at $37.00 \%$ of payroll.

## Mississippi Highway Safety Patrol Retirement System

Twenty-five Year Cash Flow Projection

| Year | Valuation Payroll | Market Value of Assets Balance July 1 | Contributions | Projected <br> Benefit <br> Payments | Expected Investment Return | Cash Flow | Market Value of Assets Balance June 30 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2014 | \$25,553,765 | \$326,032,000 | \$14,707,541 | \$27,801,680 | \$25,558,794 | \$12,464,655 | \$338,496,655 |
| 2015 | 26,639,800 | 338,496,655 | 15,188,112 | 29,010,244 | 26,526,847 | 12,704,715 | 351,201,370 |
| 2016 | 27,771,992 | 351,201,370 | 15,689,106 | 30,323,051 | 27,510,752 | 12,876,807 | 364,078,177 |
| 2017 | 28,952,302 | 364,078,177 | 16,211,394 | 31,491,536 | 28,515,048 | 13,234,906 | 377,313,083 |
| 2018 | 30,182,775 | 377,313,083 | 16,755,878 | 32,754,101 | 29,545,118 | 13,546,895 | 390,859,978 |
| 2019 | 31,465,543 | 390,859,978 | 17,323,503 | 33,961,649 | 30,603,272 | 13,965,127 | 404,825,105 |
| 2020 | 32,802,829 | 404,825,105 | 17,915,252 | 35,075,355 | 31,699,604 | 14,539,501 | 419,364,606 |
| 2021 | 34,196,949 | 419,364,606 | 18,532,150 | 36,196,140 | 32,842,609 | 15,178,618 | 434,543,224 |
| 2022 | 35,650,319 | 434,543,224 | 19,175,266 | 37,386,766 | 34,034,998 | 15,823,497 | 450,366,722 |
| 2023 | 37,165,458 | 450,366,722 | 19,845,715 | 38,591,951 | 35,279,488 | 16,533,252 | 466,899,974 |
| 2024 | 38,744,990 | 466,899,974 | 20,544,658 | 39,720,080 | 36,584,981 | 17,409,559 | 484,309,532 |
| 2025 | 40,391,652 | 484,309,532 | 21,273,306 | 40,851,823 | 37,961,622 | 18,383,105 | 502,692,637 |
| 2026 | 42,108,297 | 502,692,637 | 22,032,921 | 41,959,569 | 39,418,345 | 19,491,697 | 522,184,334 |
| 2027 | 43,897,900 | 522,184,334 | 22,824,821 | 43,167,871 | 40,961,025 | 20,617,975 | 542,802,309 |
| 2028 | 45,763,561 | 542,802,309 | 23,650,376 | 44,547,195 | 42,588,312 | 21,691,493 | 564,493,802 |
| 2029 | 47,708,512 | 564,493,802 | 24,511,017 | 45,882,923 | 44,304,628 | 22,932,722 | 587,426,524 |
| 2030 | 49,736,124 | 587,426,524 | 25,408,235 | 47,183,518 | 46,123,111 | 24,347,828 | 611,774,352 |
| 2031 | 51,849,909 | 611,774,352 | 26,343,585 | 48,535,434 | 48,054,274 | 25,862,425 | 637,636,777 |
| 2032 | 54,053,530 | 637,636,777 | 27,318,687 | 49,592,867 | 50,119,975 | 27,845,795 | 665,482,572 |
| 2033 | 56,350,805 | 665,482,572 | 28,335,231 | 50,519,612 | 52,351,231 | 30,166,849 | 695,649,421 |
| 2034 | 58,745,714 | 695,649,421 | 29,394,978 | 51,339,440 | 54,774,175 | 32,829,713 | 728,479,134 |
| 2035 | 61,242,407 | 728,479,134 | 30,499,765 | 52,275,514 | 57,407,301 | 35,631,552 | 764,110,686 |
| 2036 | 63,845,209 | 764,110,686 | 31,651,505 | 52,943,664 | 60,277,169 | 38,985,009 | 803,095,695 |
| 2037 | 66,558,630 | 803,095,695 | 32,852,194 | 53,382,989 | 63,426,424 | 42,895,629 | 845,991,324 |
| 2038 | 69,387,372 | 845,991,324 | 34,103,912 | 53,596,154 | 66,899,616 | 47,407,375 | 893,398,699 |

* Includes expected administrative expenses.


# Mississippi Highway Safety Patrol Retirement System Twenty-five Year Cash Flow Projection Based on Valuation Assumptions 



Net Change in Asset Values


## SECTION VIII - SUPPLEMENTAL DISCLOSURE INFORMATION

1. Statement Nos. 25 and 27 of the Governmental Accounting Standards Board (GASB) set forth certain items of information to be disclosed in the financial statements of the System and the employer. One such item is a distribution of the number of employees by type of membership, as follows:

NUMBER OF ACTIVE AND RETIRED PARTICIPANTS AS OF JUNE 30, 2014

| GROUP | NUMBER |
| :--- | :---: |
| Retired participants and beneficiaries <br> currently receiving benefits | 720 |
| Terminated participants and beneficiaries <br> entitled to benefits but not yet receiving <br> benefits | 58 |
| Active Participants | $\underline{495}$ |
| Total | 1,273 |

2. Another such item is the schedule of funding progress as shown below.

## SCHEDULE OF FUNDING PROGRESS (\$ Thousands)

|  |  | (2) |  |  |  | (6) <br> Unfunded <br> AAL as a <br> Percentage <br> of Covered <br> Payroll <br> $(4) /(5)$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Plan Year <br> Ended | Actuarial <br> Value of <br> Assets | Actuarial <br> Liability <br> (AAL) <br> Entry Age | Percent <br> Funded <br> $(1) /(2)$ | Unfunded <br> AAL <br> $(2)-(1)$ | (5) <br> Annual <br> Covered <br> Payroll | (3) |
| $06 / 30 / 2005 \#$ | $\$ 253,477$ | $\$ 335,117$ | $75.6 \%$ | $\$ 81,640$ | $\$ 22,343$ | $365.4 \%$ |
| $06 / 30 / 2006$ | 265,637 | 350,638 | 75.8 | 85,001 | 24,499 | 347.0 |
| $06 / 30 / 2007 \#$ | 284,626 | 371,233 | 76.7 | 86,607 | 27,037 | 320.3 |
| $06 / 30 / 2008^{*}$ | 298,630 | 381,578 | 78.3 | 82,948 | 29,597 | 280.3 |
| $06 / 30 / 2009 \#$ | 292,322 | 394,630 | 74.1 | 102,308 | 26,390 | 387.7 |
| $06 / 30 / 2010$ | 281,088 | 411,277 | 68.3 | 130,189 | 26,353 | 494.0 |
| $06 / 30 / 2011 \#$ | 278,265 | 414,432 | 67.1 | 136,167 | 24,872 | 547.5 |
| $06 / 30 / 2012$ | 268,424 | 421,415 | 63.7 | 152,991 | 25,670 | 596.0 |
| $06 / 30 / 2013 \#$ | 271,097 | 431,575 | 62.8 | 160,478 | 25,816 | 621.6 |
| $06 / 30 / 2014$ | 295,298 | 445,822 | 66.2 | 150,524 | 25,554 | 589.0 |

* After change in benefit provisions.
\# After change in actuarial assumptions.

As can be seen from the table above, the steady decline in the funded ratio caused by the smoothing of the large asset losses of 2007/2008 and 2008/2009 has ended. The first increase in the funded ratio in six years was primarily because the recognition of those losses has been completed. In addition, estimated projection results using a fixed employer contribution rate of $37.00 \%$ of payroll shows improving funded ratios.
3. The annual required contribution (ARC) of the employer as a percentage of payroll, determined in accordance with the parameters of GASB 25/27, is shown below. The maximum allowable amortization period under GASB 27/27 is 30 years. As a result, the annual required contribution for accounting purposes is different than that for funding purposes. The accrued liability rate is based on amortization of the unfunded actuarial accrued liability of $\$ 150,524,072$ over a period of 30.0 years from the valuation date.

| Annual Required Contribution (ARC) |  |  |
| :--- | :---: | :---: |
| Valuation Date June 30 | 2014 | 2013 |
| For Fiscal Year | $2015 / 2016$ | $2014 / 2015$ |
| Employer contribution rate |  |  |
| Normal Cost |  |  |
| Accrued liability | $16.03 \%$ | $16.15 \%$ |
| Total | $\underline{23.27}$ | $\underline{21.96}$ |
| Anticipated accrued liability payment period | $39.30 \%$ | $38.11 \%$ |

Includes load for administrative expenses. See page 10 for more contribution rate detail.
4. Additional information as of June 30, 2014 follows.

| Valuation date | $6 / 30 / 2014$ |
| :--- | :---: |
| Actuarial cost method | Entry age |
| Amortization method | Level percent open |
| Remaining amortization period | 30.0 years |
| Asset valuation method | 5 -year smoothed market |
| Actuarial assumptions: |  |
| Investment rate of return* | $8.00 \%$ |
| Projected salary increases\# | $5.00 \%-10.52 \%$ |
| Cost-of-living adjustments | $3.00 \%$ |
| ${ }^{*}$ Includes price inflation at | $3.50 \%$ |
| \# Includes wage inflation at | $4.25 \%$ |

## Schedule of Employer Contributions

| Fiscal Year <br> Ending June 30 | Valuation date <br> June 30 | Annual Required <br> Contribution | Percentage <br> Contributed |
| :---: | :---: | :---: | :---: |
| 2006 | 2004 | $\$ 8,691,766^{1}$ | $100.0 \%$ |
| 2007 | 2005 | $10,023,287^{2}$ | 100.0 |
| 2008 | 2006 | $10,492,230^{3}$ | 100.0 |
| 2009 | 2007 | $11,668,004^{4}$ | 100.0 |
| 2010 | 2008 | $11,096,142^{5}$ | 100.0 |
| 2011 | 2009 | $11,385,080^{6}$ | 100.0 |
| 2012 | 2010 | $12,257,461^{7}$ | 100.0 |
| 2013 | 2011 | $13,097,911^{8}$ | 100.0 |
| 2014 | 2012 | $13,594,654^{9}$ | 100.0 |
| 2015 | 2013 | $13,138,540^{10}$ |  |

1 An estimated additional contribution of \$2,400,000 (10.7\% of payroll) was made to the System due to SB 2659

2 An estimated additional contribution of $\$ 2,600,000$ ( $10.6 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 2,300,000$ ( $8.5 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 2,700,000$ ( $9.1 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 3,100,000$ ( $11.7 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 3,400,000$ ( $12.9 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 3,500,000$ ( $14.1 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of \$3,600,000 (14.0\% of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 3,600,000$ ( $14.0 \%$ of payroll) was made to the System due to SB 2659

An estimated additional contribution of $\$ 4,600,000$ ( $18.0 \%$ of payroll) was assumed to be made to the System due to SB 2659 and HB 1015

Solvency Tests
(\$ in Thousands)

| Valuation Date | Actuarial Accrued Liabilities for |  |  |  | Portions of Accrued Liabilities Covered |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | (1) |  | (3) |  |  | (2) | (3) |
|  | Employee | (2) <br> Retirees and | Active and |  |  |  |  |
|  | Allocated | Currently | Employer | Net Assets | (1) |  |  |
|  | Earnings | Benefits | Portion | Benefits |  |  |  |
| 6/30/2004 | \$18,352 | \$201,573 | \$96,645 | \$256,481 | 100\% | 100.0\% | 37.8\% |
| 6/30/2005 | 18,972 | 214,844 | 101,301 | 253,477 | 100 | 100.0 | 19.4 |
| 6/30/2006 | 19,906 | 222,281 | 108,451 | 265,637 | 100 | 100.0 | 21.6 |
| 6/30/2007 | 20,870 | 231,771 | 118,592 | 284,626 | 100 | 100.0 | 27.0 |
| 6/30/2008 | 21,371 | 242,265 | 117,942 | 298,630 | 100 | 100.0 | 29.7 |
| 6/30/2009 | 20,136 | 273,774 | 100,720 | 292,322 | 100 | 99.4 | 0.0 |
| 6/30/2010 | 20,658 | 284,106 | 106,513 | 281,088 | 100 | 91.7 | 0.0 |
| 6/30/2011 | 20,621 | 292,234 | 101,577 | 278,265 | 100 | 88.2 | 0.0 |
| 6/30/2012 | 20,760 | 300,753 | 99,902 | 268,424 | 100 | 82.3 | 0.0 |
| 6/30/2013 | 23,706 | 306,273 | 101,596 | 271,097 | 100 | 80.8 | 0.0 |
| 6/30/2014 | 24,411 | 317,825 | 103,586 | 295,298 | 100 | 85.2 | 0.0 |

Schedule of Active Member Valuation Data

$\left.$|  | Number of <br> Employers | Number |  | Active Members |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Annual Payroll |  |  |  |  |  |  | | Annual |
| :---: |
| Average Pay |$\quad$| \% Increase in |
| :---: |
| Average Pay | \right\rvert\,

Schedule of Number of Retirants Added To and Removed From Rolls Last Ten Fiscal Years

| Item | Fiscal Year Ended June 30 |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Beginning of Year | 605 | 621 | 625 | 638 | 651 | 692 | 696 | 704 | 713 | 713 |
| Added | 33 | 32 | 29 | 42 | 62 | 22 | 32 | 31 | 23 | 28 |
| Removed | (17) | (28) | (16) | (29) | (21) | (18) | (24) | (22) | (23) | (21) |
| End of Year | 621 | 625 | 638 | 651 | 692 | 696 | 704 | 713 | 713 | 720 |

Schedule of Benefit Payments Added To and Removed From Rolls
Last Seven Fiscal Years

| Year Ending | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Beginning of Year | \$18,722,555 | \$19,798,655 | \$21,994,109 | \$22,899,689 | \$23,975,708 | \$25,167,940 | \$25,835,619 |
| Added | 1,341,416 | 2,263,514 | 806,092 | 1,089,231 | 1,157,796 | 642,344 | 1,113,236 |
| Removed | $(739,677)$ | $(556,046)$ | $(450,658)$ | $(609,133)$ | $(574,614)$ | $(596,871)$ | $(661,028)$ |
| Benefit increase due to annual COLA | 474,361 | 487,986 | 550,146 | 595,921 | 609,050 | 622,206 | 678,533 |
| Benefit increase due to plan amendments | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| End of Year | \$19,798,655 | \$21,994,109 | \$22,899,689 | \$23,975,708 | \$25,167,940 | \$25,835,619 | \$26,966,360 |

## Schedule of Average Benefit Payments

|  | Years of Credited Service |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 0-4 | 5-9 | 10-15 | 16-20 | 21-24 | 25 | 26-29 | 30 | $31+$ |
| July 1, 2013 to June 30, 2014 |  |  |  |  |  |  |  |  |  |
| Average Monthly Benefit |  |  |  | \$401.76 | \$2,013.42 |  | \$2,756.37 | \$3,898.78 | \$4,528.45 |
| Average Final Salary |  |  |  | \$15,019.06 | \$54,344.38 |  | \$51,232.69 | \$69,760.18 | \$68,010.73 |
| Number of Active Retirants |  |  |  | 1 | 5 |  | 8 | 5 | 9 |
| July 1, 2012 to June 30, 2013 |  |  |  |  |  |  |  |  |  |
| Average Monthly Benefit |  | \$661.61 | \$710.09 |  | \$1,172.98 | \$1,696.31 | \$2,859.71 |  | \$3,269.65 |
| Average Final Salary |  | \$21,843.63 | \$36,998.42 |  | \$31,851.99 | \$28,672.69 | \$54,157.79 |  | \$54,646.02 |
| Number of Active Retirants |  | 1 | 2 |  | 3 | 2 | 11 |  | 4 |
| July 1, 2011 to June 30, 2012 |  |  |  |  |  |  |  |  |  |
| Average Monthly Benefit |  | \$1,648.69 |  | \$2,340.93 | \$982.05 | \$1,568.62 | \$2,267.88 | \$4,335.37 | \$3,798.92 |
| Average Final Salary |  | \$39,568.45 |  | \$58,021.27 | \$39,971.01 | \$28,716.82 | \$46,824.02 | \$71,048.35 | \$62,979.14 |
| Number of Active Retirants |  | 1 |  | 1 | 1 | 1 | $10$ | $5$ | 12 |
| July 1, 2010 to June 30, 2011 |  |  |  |  |  |  |  |  |  |
| Average Monthly Benefit |  |  | \$716.18 | \$1,020.55 | \$2,433.84 | \$1,896.54 | \$2,408.76 | \$3,791.81 | \$3,296.52 |
| Average Final Salary |  |  | \$28,057.78 | \$26,202.46 | \$60,342.83 | \$43,144.33 | \$50,019.57 | \$52,042.20 | \$51,855.68 |
| Number of Active Retirants |  |  | 1 | 2 | 3 | 2 | 11 | 4 | 9 |
| July 1, 2009 to June 30, 2010 |  |  |  |  |  |  |  |  |  |
| Average Monthly Benefit |  |  |  | \$1,405.04 |  | \$3,155.49 | \$3,024.51 | \$3,461.46 | \$2,973.70 |
| Average Final Salary |  |  |  | \$37,962.84 |  | \$59,219.21 | \$47,430.92 | \$30,160.22 | \$41,004.34 |
| Number of Active Retirants |  |  |  | 4 |  | 2 | 5 | 2 | 9 |

## Schedule of Average Benefit Payments



## SCHEDULE A

## Development of Actuarial Value of Assets

(\$ thousands)

| Valuation Date June 30: | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A. Actuarial Value Beginning of Year | \$268,424 | \$271,097 |  |  |  |  |
| B. Market Value End of Year | 287,456 | 326,032 |  |  |  |  |
| C. Market Value Beginning of Year | 265,232 | 287,456 |  |  |  |  |
| D. Cash Flow |  |  |  |  |  |  |
| D1. Contributions | 11,903 | 11,966 |  |  |  |  |
| D2. Other Revenue | 3,414 | 3,497 |  |  |  |  |
| D3. Benefit Payments | $(27,164)$ | $(28,262)$ |  |  |  |  |
| D4. Administrative Expenses | (199) | (200) |  |  |  |  |
| D5. Investment Expenses | (657) | (1079) |  |  |  |  |
| D6. Net | $(12,703)$ | $(14,078)$ |  |  |  |  |
| E. Investment Income |  |  |  |  |  |  |
| E1. Market Total: B.-C.-D6. | 34,927 | 52,654 |  |  |  |  |
| E2. Assumed Rate | 8.00\% | 8.00\% |  |  |  |  |
| E3. Amount for Immediate Recognition | 21,394 | 23,556 |  |  |  |  |
| E4. Amount for Phased-In Recognition | 13,533 | 29,098 |  |  |  |  |
| F. Phased-In Recognition of Investment Income |  |  |  |  |  |  |
| F1. Current Year: $0.20 \times$ E4. | 2,707 | 5,820 |  |  |  |  |
| F2. First Prior Year | $(4,212)$ | 2,707 | 5,820 |  |  |  |
| F3. Second Prior Year | 7,758 | $(4,212)$ | 2,707 | 5,820 |  |  |
| F4. Third Prior Year | 2,650 | 7,758 | (4212) | 2,707 | 5,820 |  |
| F5. Fourth Prior Year | $(14,921)$ | 2,650 | 7,758 | (4,212) | 2,707 | 5,820 |
| F6. Total Recognized Investment Gain | $(6,018)$ | 14,723 | 12,073 | 4,315 | 8,527 | 5,820 |
| G. Actuarial Value End of Year: |  |  |  |  |  |  |
| A.+D6.+E3.+F6. | \$271,097 | \$295,298 |  |  |  |  |
| H. Difference Between Market \& Actuarial Values | \$16,359 | \$30,734 | \$18,661 | \$14,346 | \$5,819 | \$(1) |

The Actuarial Valuation of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased in over a closed 5 year period. During periods when investment performance exceeds the assumed rate, Actuarial Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Actuarial Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, actuarial value will become equal to market value.

|  |  | Asset Summary June 30, 2014 <br> (\$ in Thousands) |  |
| :---: | :---: | :---: | :---: |
|  | Market Value | Book Value | Actuarial Value |
| 1. Assets at June 30, 2013 | \$287,456 | \$243,929 | \$271,097 |
| 2. Contributions and Misc. Revenue | 15,463 | 15,463 | 15,463 |
| 3. Investment Increment | 52,654 | 24,978 | 38,279 |
| 4. Benefit Payments | $(28,262)$ | $(28,262)$ | $(28,262)$ |
| 5. Expenses | $(1,279)$ | $(1,279)$ | $(1,279)$ |
| 6. Assets at June 30, 2014 $(1)+(2)+(3)+(4)+(5)$ | \$326,032 | \$254,829 | \$295,298 |
| 7. Investment Increment/Mean Assets* | 18.8\% | 10.5\% | 14.5\% |

*Based on the approximation formula: $1 /[.5 \times(\mathrm{A}+\mathrm{B}-\mathrm{I})]$, where
| = Investment increment
$A=$ Beginning of year asset value
$B=$ End of year asset value

## SCHEDULE B

## STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

INTEREST RATE: 8.00\% per annum, compounded annually (net of investment expenses only).
SEPARATIONS FROM ACTIVE SERVICE: Representative values of the assumed annual rates of separation from active service are as follows:

|  | Disability |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age | Withdrawal <br> and <br> Vesting | Death | Non-Duty | Duty | Service | Service <br> Retirement |
| 25 | $4.0 \%$ | $.03 \%$ | $.09 \%$ | $.01 \%$ | 5 | $5 \%$ |
| 30 | 3.5 | .04 | .12 | .02 | 10 | $5 \%$ |
| 35 | 2.5 | .05 | .16 | .04 | 15 | $5 \%$ |
| 40 | 1.0 | .07 | .20 | .07 | 20 | $10 \%$ |
| 45 | 1.0 | .11 | .30 | .06 | 25 | $15 \%$ |
| 50 | 0.5 | .16 | .50 | .05 | 30 | $25 \%$ |
| 55 | 0.0 | .21 | .91 | .02 | 35 | $25 \%$ |

* The annual rate of service retirement is $100 \%$ at age 60.

It is assumed that a member will be granted $13 / 4$ years of service credit for unused leave at termination of employment. In addition, it is assumed that, on average, $1 / 4$ year of service credit for peace-time military service will be granted to each member.

SALARY INCREASES: Representative values of the assumed annual rates of salary increases are as follows:

|  | Annual Rates of |  |  |
| :---: | :---: | :---: | :---: |
| Age | Merit \& Seniority | Base (Economy) | Increase Next Year |
| 20 | $5.59 \%$ | $4.25 \%$ | $9.84 \%$ |
| 25 | 2.32 | 4.25 | 6.57 |
| 30 | 1.50 | 4.25 | 5.75 |
| 35 | 1.50 | 4.25 | 5.75 |
| 40 | 1.50 | 4.25 | 5.75 |
| 45 | 1.00 | 4.25 | 5.25 |
| 50 | 0.50 | 4.25 | 4.75 |
| 55 | 0.50 | 4.25 | 4.75 |

PAYROLL GROWTH: 4.25\% per annum, compounded annually.

PRICE INFLATION: $3.50 \%$ per annum, compounded annually.

ADMINISTRATIVE EXPENSES: $0.23 \%$ of payroll.

## TIMING OF DECREMENT AND PAY INCREASES: Middle of Year.

DEATH AFTER RETIREMENT: The mortality table, for post-retirement mortality, used in evaluating allowances to be paid was the RP-2000 Combined Mortality Table Projected to 2025 by Scale AA (set forward 2 years for males). The RP-2000 Disabled Mortality Table (set back 3 years for males and set forward 2 years for females) was used for the period after disability retirement. This assumption is used to measure the probabilities of each benefit payment being made after retirement. Mortality improvement is anticipated under this assumption as recent mortality experience shows actual deaths $7 \%$ greater than expected under selected table.

MARRIAGE ASSUMPTION: $100 \%$ married with the husband three years older than his wife.

VALUATION METHOD: The valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at retirement, disability or death. The calculations are based on the member's age, years of service, sex, compensation, expected future salary increases, and an assumed future interest earnings rate (currently 8.00\%). The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service, disability, or survivor's benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members and survivors.

The employer contributions required to support the benefits of HSPRS are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the HSPRS. The accrued liability contribution amortizes the balance of the unfunded accrued liability over a period of years from the valuation date.

ASSET VALUATION METHOD: Actuarial value, as developed in Schedule A. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected market value of assets, based on the assumed valuation rate of return. The amount recognized each year is $20 \%$ of the difference between market value and expected market value.

## SCHEDULE C

## SUMMARY OF MAIN BENEFIT AND CONTRIBUTION PROVISIONS

The following summary presents the main benefit and contribution provisions of the System in effect June 30, 2014, as interpreted in preparing the actuarial valuation.

## DEFINITIONS

| Average Compensation | Average annual covered earnings of an employee during the four |
| :--- | :--- |
| highest consecutive years of service. |  |

The maximum covered earnings for employers and employees over the years are as follows:

## EMPLOYER AND EMPLOYEE RATES OF CONTRIBUTION AND MAXIMUM COVERED EARNINGS

| Fiscal <br> Date From | Fiscal <br> Date To | Employer Rate | Maximum <br> Covered <br> Earnings* | Maximum <br> Employee <br> Rate |
| :---: | :---: | :---: | :---: | :---: |
| $7 / 1 / 1958$ | $6 / 30 / 1968$ | $13.33 \%$ |  | Covered <br> Earnings* |
| $7 / 1 / 1968$ | $6 / 30 / 1971$ | 15.33 | $5.00 \%$ |  |
| $7 / 1 / 1971$ | $6 / 30 / 1973$ | 18.59 | 5.00 |  |
| $7 / 1 / 1973$ | $6 / 30 / 1975$ | 20.77 | 5.00 |  |
| $7 / 1 / 1975$ | $6 / 30 / 1978$ | 24.65 | 5.00 |  |
| $7 / 1 / 1978$ | $6 / 30 / 1980$ | 26.16 | 6.00 |  |
| $7 / 1 / 1980$ | $6 / 30 / 1989$ | 26.16 | 6.00 |  |
| $7 / 1 / 1989$ | $6 / 30 / 1990$ | 27.97 | 6.50 |  |
| $7 / 1 / 1990$ | $6 / 30 / 2003$ | 26.16 | 6.50 |  |
| $7 / 1 / 2003$ | $6 / 30 / 2006$ | 28.16 | 6.50 |  |
| $7 / 1 / 2006$ | $6 / 30 / 2008$ | 30.30 |  | 7.25 |
| $7 / 1 / 2008$ | $12 / 31 / 2011$ | 30.30 |  | 7.25 |
| $7 / 1 / 2012$ | $6 / 30 / 2012$ | 35.21 |  |  |
| $7 / 1 / 2012$ | $6 / 30 / 2015$ | 37.00 |  |  |
|  |  |  |  |  |

*Maximum covered earnings equal wages paid, not to exceed wages paid to the Commissioner of the Department of Public Safety (currently $\$ 146,850$ ).

Effective July 1, 2014, additional contributions from SB 2659 and HB 1015 are estimated to be $\$ 3,400,000$ combined.

## BENEFITS

## Superannuation Retirement

Condition for Retirement

Amount of Allowance
(a) A retirement allowance is payable to any member who retires and has attained age 55 and completed at least five years of membership service, or has attained age 45 and completed at least 20 years of creditable service, or has completed 25 years of creditable service regardless of age.

Any member who has attained age 63 shall be retired forthwith. Effective July 1, 2011, the Commissioner of Public Safety is authorized to allow a member who has attained age 63 to continue in active service. Such continued service may be authorized annually until the member attains age 65.
(b) Any member who withdraws from service prior to his or her attainment of age 55 but after having completed five or more years of creditable service is entitled to receive, in lieu of a refund of his or her accumulated contributions, a retirement allowance commencing at age 55 .

The annual retirement allowance payable to a retired member is equal to:

1. A member's annuity which is the actuarial equivalent of the member's accumulated contributions at the time of his or her retirement, plus
2. An employer's annuity which, together with the member's annuity, is equal to $2-1 / 2 \%$ of his or her average compensation for each year of membership service, plus
3. A prior service annuity equal to $2-1 / 2 \%$ of average compensation for each year of prior service.

The aggregate amounts of (2) and (3) above shall not exceed $100 \%$ of average compensation, regardless of service, for retirements on or after January 1, 2000; 85\% for retirements prior to January 1, 2000.

The minimum allowance for both service and disability retirement based on the following table for each year of creditable service, reduced if necessary as indicated below.

| Service | Monthly Benefit |
| :--- | :---: |
| Less than 10 years | $\$ 250$ |
| $10-15$ years | $\$ 300$ |
| 15 or more years | $\$ 500$ |

The annual retirement allowance payable to a member who retires under condition (a) above prior to age 55 is computed in accordance with the above formula except that the employer's annuity and prior service annuity are reduced $3 \%$ for each year of age below age 55 , or $3 \%$ for each year of service below 25 years of creditable service, whichever is less.

## Disability Retirement

Condition for Retirement

Amount of Allowance

## Death Prior to Retirement

A retirement allowance is payable to any member who is not eligible for a service retirement benefit but who becomes totally and permanently disabled, either physically or mentally, regardless of creditable service, if the disability is due to causes in the performance of duty. If the disability is not in the performance of duty, the member must have completed at least 5 years of membership service to be eligible for retirement.

The annual disability retirement allowance payable is equal to the greater of $50 \%$ of his or her average salary for the 2 years immediately preceding retirement, or a retirement allowance as calculated under the provisions for superannuation retirement.

Upon the death of a highway patrolman who is eligible for service retirement, family benefits are payable equal to those which would have been payable had he been retired on his or her date of death.

Upon the death of a highway patrolman either in the line of duty or as a result of an accident occurring in the line of duty, the following benefits are payable:
a) a benefit to the spouse equal to one-half the member's average compensation.
b) a benefit to a dependent child payable to age 19 (23 if a full-time student) equal to one-fourth of the member's average compensation for one child or one-half for two or more children.

Upon the death of a highway patrolman who has retired for service or disability and who has not elected any other optional form of benefit, his widow or her widower is eligible for a benefit equal to $50 \%$ of his or her retirement allowance and each child (but not more than 2) who has not attained age 19 ( 23 if a full-time student) is eligible for a benefit equal to $25 \%$ of his or her retirement allowance. The benefit to the widow is payable for life and to children until they attain age 19 ( 23 if a full-time student) or for life if they are totally and permanently disabled.

## Refund of Contributions

## Normal Form of Benefit

## Optional Benefits

Upon a member's termination of employment for any reason before retirement, his or her accumulated contributions, together with regular interest thereon, are refunded. Upon the death of a member who is not eligible for any other death benefit, his or her accumulated contributions, together with regular interest thereon, are paid to his or her beneficiary.

Interest is currently credited to the member's account at $3.50 \%$ per annum.

The normal form of benefit is an allowance payable during the life of the member. Upon death the benefits described above are payable.

A member upon retirement may elect to receive his allowance in one of the following forms which are computed to be actuarially equivalent to the applicable retirement allowance.

Option 1. Reduced allowance with the provision that if the pensioner dies before he receives the value of the member's annuity as it was at the time of retirement, the balance shall be paid to his or her beneficiary.

Option 2. Upon his or her death, his or her reduced retirement allowance shall be continued throughout the life of, and paid to, his or her beneficiary.

Option 3. Upon his or her death, $50 \%$ of his or her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary and the other $50 \%$ of his or her reduced retirement allowance to some other designated beneficiary.

Option 4. Upon his or her death, $75 \%$ of his or her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary.

Option 4A. Upon his or her death, $50 \%$ of his or her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary.

Option 4B. A reduced retirement allowance shall be continued throughout the life of the pensioner, but with the further guarantee of payment to the pensioner or his or her beneficiary for a specified number of years certain.

Option 4C. A member may elect any option with the added provision that the member shall receive, so far as possible, the same total amount annually (considering both HSPRS and Social Security benefits) before and after the earliest age at which the member becomes eligible for a Social Security benefit. This option was only available to those who retired prior to July 1, 2004.

A member who elects Option 2, Option 4, or Option 4A, at retirement may revert to the normal form of benefit if the designated beneficiary predeceases the retired member or if the retired member divorces the designated beneficiary. A member who elects the normal form of benefit or Option 1 at retirement may select Option 2, Option 4, or Option 4A to provide beneficiary protection to a new spouse if married after retirement.

A member who qualifies for an unreduced retirement allowance may select a partial lump-sum option at retirement. Under this option, the retiree has the option of taking a partial lump-sum distribution equal to either 12, 24 , or 36 times the base maximum monthly benefit. With each lump-sum amount, the base maximum monthly benefit will be actuarially reduced. A member selecting this option may also select any of the regular options except Option 1, the prorated single-life annuity, and Option 4-C, the Social Security leveling provision. The benefit is then calculated using the new reduced maximum benefit as a starting point in applying the appropriate option factors for the reduction.

## Post-Retirement Adjustments In Allowances

The allowances of retired members are adjusted annually by an amount equal to (a) 3\% of the annual retirement allowance for each full fiscal year of retirement prior to the year in which the member reaches age $60^{*}$, plus (b) $3 \%$ compounded for each year thereafter beginning with the fiscal year in which the member turns age $60^{*}$.

A prorated portion of the annual adjustment will be paid to the member, beneficiary, or estate of any member or beneficiary who is receiving the annual adjustment in a lump sum, but whose benefits are terminated between July 1 and December 1.

Those members who retired on or before July 1, 1999 received an ad hoc benefit increase in the amount of $\$ 3.50$ per month per each full fiscal year of retirement through June 30, 1999 plus $\$ 1.00$ per month for each year of credited service. The benefits were increased on July 1, 1999.
*this age will be reduced in five phases to age 55 if the actuary certifies that reducing the age will not result in the amortization period of the unfunded accrued liability exceeding 20 years.

Members contribute $7.25 \%$ of compensation and the employer contributes $37.00 \%$ of compensation. Funds from SB 2659 and HB 1015 are also provided.

## SCHEDULE D

## DETAILED TABULATIONS OF THE DATA

Retirants \& Beneficiaries as of June 30, 2014
Tabulated by Year of Retirement

| Year of Retirement | No. | Total Annual Benefits, excluding COLA | COLA | Total Annual Benefits | Average Monthly Total Benefit |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 2014 | 7 | \$368,491 | \$0 | \$368,491 | \$4,387 |
| 2013 | 21 | 839,273 | 0 | 839,273 | 3,330 |
| 2012 | 17 | 735,320 | 18,715 | 754,035 | 3,696 |
| 2011 | 24 | 1,010,651 | 54,192 | 1,064,843 | 3,697 |
| 2010 | 16 | 661,458 | 58,523 | 719,981 | 3,750 |
| 2009 | 52 | 2,217,592 | 265,635 | 2,483,227 | 3,980 |
| 2008 | 20 | 790,917 | 117,259 | 908,176 | 3,784 |
| 2007 | 16 | 629,117 | 114,239 | 743,356 | 3,872 |
| 2006 | 21 | 720,355 | 145,604 | 865,959 | 3,436 |
| 2005 | 16 | 511,047 | 123,532 | 634,579 | 3,305 |
| 2004 | 27 | 934,644 | 260,775 | 1,195,419 | 3,690 |
| 2003 | 11 | 291,495 | 86,963 | 378,458 | 2,867 |
| 2002 | 25 | 707,184 | 250,630 | 957,814 | 3,193 |
| 2001 | 22 | 646,003 | 238,108 | 884,111 | 3,349 |
| 2000 | 15 | 487,448 | 197,717 | 685,165 | 3,806 |
| 1999 | 15 | 396,632 | 177,340 | 573,972 | 3,189 |
| 1998 | 20 | 570,039 | 275,376 | 845,415 | 3,523 |
| 1997 | 27 | 761,488 | 387,881 | 1,149,369 | 3,547 |
| 1996 | 33 | 902,382 | 507,727 | 1,410,109 | 3,561 |
| 1995 | 24 | 584,902 | 344,174 | 929,076 | 3,226 |
| 1994 | 9 | 231,886 | 151,512 | 383,398 | 3,550 |
| 1993 | 15 | 319,386 | 204,602 | 523,988 | 2,911 |
| 1992 | 14 | 301,053 | 208,411 | 509,464 | 3,033 |
| 1991 | 4 | 71,467 | 58,431 | 129,898 | 2,706 |
| 1990 | 12 | 193,701 | 158,717 | 352,418 | 2,447 |
| 1989 | 4 | 67,140 | 59,253 | 126,393 | 2,633 |
| 1988 | 6 | 98,282 | 90,857 | 189,139 | 2,627 |
| 1987 | 3 | 34,604 | 28,526 | 63,130 | 1,754 |
| 1986 | 118 | 2,110,991 | 2,054,029 | 4,165,020 | 2,941 |
| 1985 | 4 | 57,273 | 63,281 | 120,554 | 2,512 |
| 1984 | 13 | 177,669 | 206,125 | 383,794 | 2,460 |
| 1983 | 6 | 60,208 | 69,882 | 130,090 | 1,807 |
| 1982 | 13 | 136,224 | 182,325 | 318,549 | 2,042 |
| 1981 | 12 | 100,986 | 124,944 | 225,930 | 1,569 |
| 1980 | 12 | 112,339 | 168,950 | 281,289 | 1,953 |
| 1979 | 9 | 68,853 | 95,649 | 164,502 | 1,523 |
| 1978 \& Prior | 37 | 180,173 | 327,803 | 507,976 | 1,144 |
| TOTAL | 720 | \$19,088,673 | \$7,877,687 | \$26,966,360 | \$3,121 |

## Schedule of Retired Members by Type of Retirement

Benefits Payable June 30, 2014

| Amount of Monthly Benefit | Number of Rets. | Ret Type <br> 1* | Ret Type 2* | Ret Type 3* |
| :---: | :---: | :---: | :---: | :---: |
| \$1-\$100 | 1 |  |  | 1 |
| 101-200 | 4 |  |  | 4 |
| 201-300 | 5 |  |  | 5 |
| 301-400 | 22 | 1 |  | 21 |
| 401-500 | 13 |  | 3 | 10 |
| 501-600 | 19 | 3 |  | 16 |
| 601-700 | 15 | 2 |  | 13 |
| 701-800 | 21 | 2 | 1 | 18 |
| 801-900 | 26 | 3 |  | 23 |
| 901-1,000 | 23 | 1 | 1 | 21 |
| Over 1,000 | 571 | 504 | 12 | 55 |
| Totals | 720 | 516 | 17 | 187 |

*Type of Retirement
1 - Retirement for Age \& Service
2 - Disability Retirement
3 - Survivor Payment

Benefits Payable June 30, 2014

| Amount of Monthly Benefit | Number of Rets. | Life | Option 1 | Option 2 | $\begin{aligned} & \text { Option } \\ & \hline \end{aligned}$ | Option <br> 4 | Option 4A | Option 4B | Option $4 C^{* *}$ | $\begin{gathered} \text { Option } \\ 5 \end{gathered}$ | $\begin{gathered} \text { PLSO** } \\ 1 \text { Year } \end{gathered}$ | $\begin{aligned} & \text { PLSO** } \\ & 2 \text { Years } \end{aligned}$ | PLSO** <br> 3 Years |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$1-\$100 | 1 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 101-200 | 4 | 4 |  |  |  |  |  |  |  |  |  |  |  |
| 201-300 | 5 | 5 |  |  |  |  |  |  |  |  |  |  |  |
| 301-400 | 22 | 21 |  | 1 |  |  |  |  |  |  |  |  |  |
| 401-500 | 13 | 10 |  |  |  |  | 3 |  |  |  |  |  |  |
| 501-600 | 19 | 16 |  |  |  |  | 3 |  |  |  |  |  |  |
| 601-700 | 15 | 13 |  |  |  |  | 2 |  |  |  |  |  |  |
| 701-800 | 21 | 18 |  |  |  |  | 3 |  | 1 |  |  |  |  |
| 801-900 | 26 | 23 |  |  | 1 |  | 2 |  |  |  |  | 1 |  |
| 901-1,000 | 23 | 21 |  |  |  |  | 2 |  |  |  |  |  |  |
| Over 1,000 | 571 | 61 | 2 | 45 | 3 |  | 445 | 15 | 10 |  | 37 | 20 | 107 |
| Totals | 720 | 193 | 2 | 46 | 4 | 0 | 460 | 15 | 11 | 0 | 37 | 21 | 107 |

Option Selected

| Life | - | Return of Contributions |
| :---: | :---: | :---: |
| Opt. 1 | - | Return of Member's Annuity |
| Opt. 2 | - | 100\% Survivorship |
| Opt. 3 | - | 50\%/50\% Dual Survivorship |
| Opt. 4 | - | 75\% Survivorship |
| Opt. 4A | - | 50\% Survivorship |
| Opt. 4B | - | Years Certain \& Life |
| Opt. 4C | - | Social Security Leveling** |
| Opt. 5 | - | Pop-Up |
| PLSO | - | Partial Lump Sum** (Reflects reduced monthly benefit) |

**Included in other options

Mississippi Highway Safety Patrol Retirement System
Retirant and Beneficiary Information June 30, 2014

| Attained Age | Service Retirement |  | Disability Retirement |  | Survivors and Beneficiaries |  | Total |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | No. | Annual Benefits | No. | Annual Benefits | No. | Annual <br> Benefits | No. | Annual Benefits |
| Under 20 |  |  |  |  | 6 | \$42,784 | 6 | \$42,784 |
| 20-24 |  |  |  |  | 1 | 9,597 | 1 | 9,597 |
| 25-29 |  |  |  |  | 1 | 15,698 | 1 | 15,698 |
| 30-34 |  |  |  |  | 1 | 20,213 | 1 | 20,213 |
| 35-39 |  |  |  |  |  |  |  |  |
| 40-44 |  |  |  |  | 4 | 89,341 | 4 | 89,341 |
| 45-49 | 3 | \$127,675 | 2 | \$62,120 | 2 | 41,725 | 7 | 231,520 |
| 50-54 | 49 | 1,941,123 | 3 | 71,665 | 2 | 76,207 | 54 | 2,088,995 |
| 55-59 | 112 | 5,035,116 |  |  | 4 | 101,953 | 116 | 5,137,069 |
| 60-64 | 98 | 4,276,787 | 4 | 108,932 | 10 | 212,262 | 112 | 4,597,981 |
| 65-69 | 99 | 4,414,199 | 1 | 29,397 | 21 | 547,350 | 121 | 4,990,946 |
| 70-74 | 77 | 3,310,300 | 3 | 71,526 | 36 | 874,232 | 116 | 4,256,058 |
| 75-79 | 40 | 1,771,770 | 2 | 40,313 | 23 | 458,062 | 65 | 2,270,145 |
| 80-84 | 25 | 1,119,075 | 2 | 26,185 | 39 | 764,313 | 66 | 1,909,573 |
| 85-89 | 11 | 559,076 |  |  | 18 | 364,957 | 29 | 924,033 |
| 90-94 | 2 | 77,553 |  |  | 16 | 247,114 | 18 | 324,667 |
| 95 |  |  |  |  | 2 | 36,922 | 2 | 36,922 |
| 96 |  |  |  |  | 1 | 20,818 | 1 | 20,818 |
| 97 |  |  |  |  |  |  |  |  |
| 98 |  |  |  |  |  |  |  |  |
| 99 |  |  |  |  |  |  |  |  |
| 100 \& Over |  |  |  |  |  |  |  |  |
| Totals | 516 | \$22,632,674 | 17 | \$410,138 | 187 | \$3,923,548 | 720 | \$26,966,360 |

[^1]Mississippi Highway Safety Patrol Retirement System
Total Active Member Data as of June 30, 2014
Tabulated by Attained Ages and Years of Service

| Attained Age | Years of Service to Valuation Date |  |  |  |  |  |  | Totals |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30+ | No. | Valuation Payroll |
| Under 20 |  |  |  |  |  |  |  |  |  |
| 20-24 | 2 |  |  |  |  |  |  | 2 | \$75,058 |
| 25-29 | 20 | 13 |  |  |  |  |  | 33 | 1,319,058 |
| 30-34 | 22 | 55 | 4 |  |  |  |  | 81 | 3,513,580 |
| 35-39 | 3 | 41 | 36 | 7 |  |  |  | 87 | 4,164,702 |
| 40-44 | 3 | 26 | 36 | 42 | 12 |  |  | 119 | 6,180,926 |
| 45-49 | . | 5 | 15 | 21 | 28 | 4 |  | 74 | 4,127,440 |
| 50-54 | 1 | 1 | 4 | 12 | 11 | 23 | 6 | 58 | 3,487,384 |
| 55-59 |  |  | 1 | 3 | 1 | 15 | 15 | 35 | 2,289,034 |
| 60-64 |  | 1 |  |  |  | 3 | 2 | 6 | 396,583 |
| 65-69 |  |  |  |  |  |  |  |  |  |
| 70-74 |  |  |  |  |  |  |  |  |  |
| 75-79 |  |  |  |  |  |  |  |  |  |
| Totals | 52 | 142 | 96 | 85 | 52 | 45 | 23 | 495 | \$25,553,765 |

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age:
Service:
Annual Pay:
42.3 years
14.0 years
\$51,624

## SCHEDULE E

MISSISSIPPI HSPRS
ANALYSIS OF FINANCIAL EXPERIENCE

> Gains \& Losses in Accrued Liabilities
> Resulting from Difference Between Assumed Experience \& Actual Experience (\$ Thousands)

## \$ Gain (or Loss) For <br> Year Ending <br> 6/30/2014

\$ Gain (or Loss) For
Year Ending 6/30/2013

Age \& Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.

Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.

Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.

Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.

Pay Increases. If there are smaller pay increases than
assumed, there is a gain. If greater increases, a loss.

New Members. Additional unfunded accrued liability will produce a loss.

Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.

Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.

Other. Miscellaneous gains and losses resulting from changes in valuation software, data adjustments, timing of financial transactions, etc.

Gain (or Loss) During Year From Financial Experience

Non-Recurring Items. Adjustments for plan amendments, assumption changes, or method changes.

Composite Gain (or Loss) During Year

3,256.1
\$ 13,170.7
927.9
(2,209.7)
\$ 13,170.7
\$ (3,753.2)
0.0
$(1,121.6)$
$\$ \quad(4,874.8)$

## SCHEDULE F

## GLOSSARY

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability".

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method".

Actuarial Equivalent. A series of payments is called on actuarial equivalent of another series of payments if the two series have the same actuarial present value.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

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 valuation dates, in accordance with the actuarial cost method being used.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability".

Valuation Assets. The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.


[^0]:    * Includes load for administrative expenses. See page 10 for more contribution rate detail.

[^1]:    Average Age:
    Average Age at Retirement:
    67.8 years
    49.9 years

