

**CITY OF BATTLE CREEK POLICE AND FIRE RETIREMENT SYSTEM**  
**FIFTY-THIRD ACTUARIAL VALUATION REPORT - REVISED**  
JUNE 30, 2015

# JUNE 30, 2015 ACTUARIAL VALUATION OUTLINE OF CONTENTS

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| <i>Page</i> | <i>Items</i>  |
|-------------|---|
| 1-2         | Cover Letter  |
|             | <b><i>Valuation Results, Comments, Recommendations and Conclusions</i></b>  |
| A-1         | Financial Objective   |
| A-2         | Computed City Contributions   |
| A-4         | Financial Objective Achievement Tests - Comparative Statements  |
| A-7         | Computed and Actual City Contributions - Comparative Statement  |
| A-8         | Development of Funding Value of Assets  |
| A-9         | Actuarial Balance Sheet   |
| A-11        | Gain (Loss) Development   |
| A-12        | Comments, Recommendations and Conclusions   |
| A-14        | IRC 401(h) Compliance Test  |
|             | <b><i>Summary of Benefit Provisions and Valuation Data</i></b>  |
| B-1         | Summary of Benefit Provisions   |
| B-4         | Reported Asset Information  |
| B-8         | Retired Life Data   |
| B-11        | Active Member Data  |
|             | <b><i>Financial Principles, Actuarial Valuation Process, Actuarial Cost Methods, Actuarial Assumptions and Definitions of Technical Terms</i></b> |
| C-1         | Financial Principles  |
| C-4         | Actuarial Valuation Process   |
| C-5         | Actuarial Cost Methods  |
| C-6         | Amortization Schedule   |
| C-7         | Actuarial Assumptions in the Valuation Process  |
| C-9         | Actuarial Assumptions Used for the Valuation  |
| C-14        | Definitions of Technical Terms  |
| C-16        | Pensions in an Inflationary Environment   |
| C-17        | Miscellaneous and Technical Assumptions   |
|             | <b><i>Financial Reporting</i></b>   |
| D-1         | Statement of System Assets  |
| D-4         | Supplementary Information – Schedule of Funding Progress  |
| D-5         | Schedule of Employer Contributions  |
| D-6         | Summary of Actuarial Methods and Assumptions  |

February 8, 2016 - Revised

The Retirement Board  
City of Battle Creek  
Police and Fire Retirement System  
Battle Creek, Michigan

Dear Board Members:

Submitted in this report are the results of the **revised** Fifty-Third Annual Actuarial Valuation of the assets, actuarial values, and contribution requirements associated with benefits provided by the City of Battle Creek Police and Fire Retirement System, which is based on Act No. 345 of the Public Acts of 1937, as amended. The purpose of the annual valuation is to measure the Retirement System's funding progress and to determine the City's contribution rate for the ensuing fiscal year in accordance with the established funding policy.

Information required by Statement No. 67 of the Governmental Accounting Standards Board ("GASB") that was first effective for fiscal year 2014 is provided in a separate report.

The date of the valuation was June 30, 2015.

This report should not be relied on for any purpose other than those described above. It was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the Retirement System only in its entirety and only with the permission of the Board.

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 the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

The valuation was based upon statistical data furnished by the City Treasurer concerning Retirement System benefits, financial transactions, individual members, terminated members and retirants and beneficiaries. Data was checked for internal and year-to-year consistency, but was not otherwise audited. This information is summarized in Section B.

To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board and in compliance with Act No. 345 of the Public Acts of 1937, as amended. The actuarial assumptions used for the valuation produce results which we believe are reasonable.

Heidi G. Barry is a Member of the American Academy of Actuaries (MAAA) and meets the qualifications of the Academy of Actuaries to render the actuarial opinion contained herein.

The signing actuaries are independent of the plan sponsor.

Respectfully submitted,



Heidi G. Barry, ASA, MAAA



David L. Hoffman



Laura Frankowiak, ASA

ADH:sc

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## **SECTION A**

VALUATION RESULTS, COMMENTS,  
RECOMMENDATIONS AND CONCLUSIONS

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## **FINANCIAL OBJECTIVE**

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The financial objective of the Retirement System is to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year and will not have to be increased for future generations of citizens. This objective meets the requirements of Act No. 345 of the Public Acts of 1937, as amended, and the Michigan constitution.

## **CONTRIBUTION RATES**

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The Retirement System is supported by member contributions, City contributions and investment income from Retirement System assets.

Contributions which are intended to satisfy the financial objective are determined by an annual actuarial valuation and are sufficient to:

- (1) cover the actuarial present value of benefits assigned to the current year by the actuarial cost methods described in Section C (the normal cost); and
- (2) amortize over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

Computed contributions for the fiscal year beginning July 1, 2016 are shown on page A-2.

**CONTRIBUTIONS COMPUTED TO MEET THE FINANCIAL OBJECTIVE  
OF THE RETIREMENT SYSTEM**

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| Contributions for                   | Contributions Expressed<br>as Percents of Payroll |         |
|-------------------------------------|---|---------|
|                                     | 2016  | 2015    |
| <b>Fiscal Year Beginning July 1</b> |   |         |
| Normal Cost                         |   |         |
| Age and service benefits            | 21.02 %   | 22.01 % |
| Death and disability benefits       | 1.44 %  | 1.90 %  |
| Termination benefits                |   |         |
| Deferred age & service benefits     | 1.92 %  | 1.98 %  |
| Refunds of member contributions     | 0.41 %  | 0.40 %  |
| Total Normal Cost                   | 24.79 %   | 26.29 % |
| Amortization Payment/(Credit)       | 12.91 %   | 10.73 % |
| Total Contribution Requirement      | 37.70 %   | 37.02 % |
| Less average member portion         | 7.81 %  | 7.81 %  |
| City portion                        | 29.89 %   | 29.21 % |

Please refer to page C-6 for information on the determination of the amortization payment.

A procedure for determining dollar contribution amounts is described on page A-3.

Comparative contribution amounts for prior fiscal years are shown on page A-7.

## **DETERMINING DOLLAR CONTRIBUTIONS**

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For any period of time, the percent-of-payroll contribution rate needs to be converted to dollar amounts. We recommend the following procedure.

Contribute dollar amounts at the end of each payroll period which are equal to the City's percent-of-payroll contribution requirement 29.89% multiplied by the covered active member payroll for the period. Adjustments should be made as necessary to exclude items of pay that are not covered compensation for Retirement System benefits and to include special payments that are covered compensation (overtime, longevity pay, etc.).

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The above amounts are assumed to be contributed, on average, halfway through the fiscal year. If contributions are made on a later schedule, interest should be added at the rate of 0.57% for each month of delay.



## FINANCIAL OBJECTIVE ACHIEVEMENT TESTS

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The Retirement System's financial objective is to meet long-term benefit promises through contributions that remain approximately level from year-to-year as a percent of active member payroll. If the contributions to the System are level in concept and soundly executed, the System will *pay all promised benefits when due -- the ultimate test of financial soundness*. Testing for level contribution rates is *the long-term solvency test*. Year-by-year computed contribution rates are displayed on page A-7.

There is no single all-encompassing test to measure a Retirement System's funding progress and current funded status.

The following page presents two tests measuring the funding progress of the Retirement System. The two tests are described below.

***TEST 1 - The ratio of valuation assets (VA) to the entry age actuarial accrued liability (EAAL)*** - a plan continuation test. The ratio is expected to gradually increase in the absence of benefit improvements and changes in actuarial assumptions.

***TEST 2 - The ratio of the unfunded actuarial accrued liability (UAAL) to member payroll (MP)*** - a plan continuation test. In a soundly financed retirement system, the amount of the unfunded actuarial accrued liability will be controlled and prevented from increasing in the absence of benefit increases or strengthening of actuarial assumptions. However, in an inflationary environment it is seldom practical to impose this control on dollar amounts which are depreciating in value. The ratio is a relative index of condition where inflation is present in both items. The ratio is expected to gradually decrease in the absence of benefit increases and changes in actuarial assumptions.

**FINANCIAL OBJECTIVE ACHIEVEMENT TESTS  
COMPARATIVE STATEMENT  
(\$ AMOUNTS IN THOUSANDS)**

| Valuation Date<br>June 30 | (1)<br>Valuation<br>Assets | (2)<br>Member<br>Payroll <sup>(a)</sup> | (3)<br>AAL <sup>^</sup> | (4)<br>UAAL <sup>^</sup> | Continuation Tests  |                     |
|---------------------------|----------------------------|---|-------------------------|--------------------------|---------------------|---------------------|
|                           |                            |   |                         |                          | TEST 1<br>(1) / (3) | TEST 2<br>(4) / (2) |
| 1986#                     | \$ 19,878                  | \$ 6,315                                | \$ 28,450               | \$ 8,572                 | 69.9 %              | 135.7 %             |
| 1987*                     | 23,763                     | 6,713                                   | 31,752                  | 7,989                    | 74.8 %              | 119.0 %             |
| 1988                      | 28,235                     | 6,590                                   | 36,351                  | 8,116                    | 77.7 %              | 123.2 %             |
| 1989                      | 31,981                     | 7,298                                   | 39,387                  | 7,406                    | 81.2 %              | 101.5 %             |
| 1990#                     | 35,694                     | 7,727                                   | 42,480                  | 6,786                    | 84.0 %              | 87.8 %              |
| 1991                      | 40,110                     |   | 43,785                  | 3,675                    | 91.6 %              | 47.3 %              |
| 1992*                     | 43,929                     | 8,359                                   | 46,891                  | 2,962                    | 93.7 %              | 35.4 %              |
| 1993                      | 49,549                     | 8,563                                   | 48,691                  | (858)                    | 101.8 %             | +                   |
| 1994@                     | 54,518                     | 8,357                                   | 53,344                  | (1,174)                  | 102.2 %             | +                   |
| 1995#                     | 59,906                     | 9,104                                   | 60,373                  | 467                      | 99.2 %              | 5.1 %               |
| 1996                      | 65,885                     | 9,834                                   | 65,549                  | (336)                    | 100.5 %             | +                   |
| 1997                      | 72,134                     | 10,039                                  | 70,033                  | (2,101)                  | 103.0 %             | +                   |
| 1998                      | 79,796                     | 9,813                                   | 73,270                  | (6,526)                  | 108.9 %             | +                   |
| 1999                      | 87,618                     | 9,750                                   | 76,230                  | (11,388)                 | 114.9 %             | +                   |
| 2000                      | 95,548                     | 11,235                                  | 81,667                  | (13,881)                 | 117.0 %             | +                   |
| 2001                      | 101,191                    | 11,615                                  | 85,536                  | (15,655)                 | 118.3 %             | +                   |
| 2002*                     | 103,951                    | 11,908                                  | 92,955                  | (10,996)                 | 111.8 %             | +                   |
| 2003#                     | 103,656                    | 11,885                                  | 97,858                  | (5,798)                  | 105.9 %             | +                   |
| 2004                      | 103,746                    | 12,114                                  | 101,773                 | (1,973)                  | 101.9 %             | +                   |
| 2005                      | 102,756                    | 12,085                                  | 107,850                 | 5,094                    | 95.3 %              | 42.2 %              |
| 2006                      | 103,283                    | 12,284                                  | 114,501                 | 11,218                   | 90.2 %              | 91.3 %              |
| 2007#                     | 108,245                    | 12,358                                  | 121,823                 | 13,578                   | 88.9 %              | 109.9 %             |
| 2008#                     | 113,286                    | 12,497                                  | 126,752                 | 13,466                   | 89.4 %              | 107.8 %             |
| 2009*                     | 112,094                    | 11,954                                  | 133,053                 | 20,959                   | 84.2 %              | 175.3 %             |
| 2010                      | 112,804                    | 12,383                                  | 137,557                 | 24,753                   | 82.0 %              | 199.9 %             |
| 2011                      | 115,775                    | 12,610                                  | 140,864                 | 25,089                   | 82.2 %              | 199.0 %             |
| 2012                      | 115,083                    | 12,270                                  | 145,541                 | 30,458                   | 79.1 %              | 248.2 %             |
| 2013                      | 117,879                    | 11,701                                  | 149,005                 | 31,126                   | 79.1 %              | 266.0 %             |
| 2014#                     | 125,527                    | 12,656                                  | 154,038                 | 28,511                   | 81.5 %              | 225.3 %             |
| 2015                      | 131,758                    | 13,496                                  | 160,093                 | 28,336                   | 82.3 %              | 210.0 %             |
| 2015*                     | 131,758                    | 13,496                                  | 166,935                 | 35,177                   | 78.9 %              | 260.6 %             |

\* After changes in actuarial assumptions or methods.

# After changes in benefit provisions.

(a) From 1980 to 1986, total payroll for Retirement System purposes was projected to be 107% of reported payroll (base pay). This was done because of the inclusion of overtime and longevity pay in gross pay for Retirement System purposes.

<sup>^</sup> Prior to the 6/30/2006 valuation, actuarial present value of credited projected benefits was used.

+ Retirement System is fully funded on a credited projected benefit basis.

@ Assets shown are net of health assets beginning in 1994.

## SHORT CONDITION TEST - COMPARATIVE STATEMENT

*The Short Condition Test* is another way of looking at a system's progress under its funding program - based on the entry-age accrued liability. In a short condition test, the plan's valuation assets are compared with: 1) Active member contributions on deposit; 2) The liabilities for future benefits to present retired lives; and 3) The liabilities allocated to service already rendered by active members. In a system that has been following the discipline of level percent-of-payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by valuation assets (except in rare circumstances). In addition, the liabilities assigned to service already rendered by active members (liability 3) will be partially covered by the remainder of the valuation assets. The larger the funded portion of liability 3, the stronger the condition of the system. Liability 3 being fully funded is uncommon.

The following schedule illustrates the history of liabilities 1, 2 and 3.

| Val.<br>Date<br>June 30 | Actuarial Accrued Liability <sup>^</sup> |   |  | Valuation<br>Assets | Portion of<br>Present Values<br>Covered by Assets |               |      |
|-------------------------|--|---|--|---------------------|---|---------------|------|
|                         | (1)<br>Active<br>Member<br>Contributions | (2)<br>Retirees<br>and<br>Beneficiaries | (3)<br>Active & Inactive<br>Members<br>(Employer Financed) |                     | (1)   | (2)           | (3)  |
|                         | 1996                                     | \$ 5,992,226                            | \$31,375,781   |                     | \$28,181,070                                      | \$ 65,885,237 | 100% |
| 1997                    | 6,066,802                                | 37,399,338                              | 26,566,522   | 72,134,308          | 100%  | 100%          | 108% |
| 1998                    | 6,324,586                                | 41,008,304                              | 25,936,959   | 79,796,431          | 100%  | 100%          | 125% |
| 1999                    | 6,530,277                                | 45,233,238                              | 24,466,454   | 87,617,793          | 100%  | 100%          | 147% |
| 2000                    | 7,100,050                                | 46,324,310                              | 24,242,251   | 95,548,441          | 100%  | 100%          | 149% |
| 2001                    | 7,271,115                                | 49,610,467                              | 28,654,887   | 101,190,705         | 100%  | 100%          | 155% |
| 2002*                   | 8,349,181                                | 51,343,164                              | 33,262,624   | 103,950,731         | 100%  | 100%          | 133% |
| 2003#                   | 8,560,912                                | 54,767,310                              | 34,529,455   | 103,655,770         | 100%  | 100%          | 117% |
| 2004                    | 9,281,501                                | 56,062,967                              | 36,428,766   | 103,745,735         | 100%  | 100%          | 105% |
| 2005                    | 9,474,647                                | 62,017,507                              | 36,357,438   | 102,755,663         | 100%  | 100%          | 86%  |
| 2006                    | 10,309,119                               | 62,976,517                              | 38,560,107   | 103,283,413         | 100%  | 100%          | 78%  |
| 2007#                   | 10,990,190                               | 67,946,355                              | 42,886,868   | 108,245,308         | 100%  | 100%          | 68%  |
| 2008#                   | 11,173,085                               | 71,090,277                              | 44,488,843   | 113,285,618         | 100%  | 100%          | 70%  |
| 2009*                   | 10,939,230                               | 79,883,240                              | 42,230,347   | 112,094,168         | 100%  | 100%          | 50%  |
| 2010                    | 11,664,234                               | 80,725,431                              | 45,167,594   | 112,804,385         | 100%  | 100%          | 45%  |
| 2011                    | 11,687,246                               | 85,197,066                              | 43,979,382   | 115,774,764         | 100%  | 100%          | 43%  |
| 2012                    | 11,676,628                               | 91,012,108                              | 42,852,215   | 115,083,128         | 100%  | 100%          | 29%  |
| 2013                    | 11,058,220                               | 96,565,549                              | 41,381,230   | 117,879,023         | 100%  | 100%          | 25%  |
| 2014#                   | 11,386,585                               | 98,326,146                              | 44,325,246   | 125,526,809         | 100%  | 100%          | 36%  |
| 2015                    | 11,991,306                               | 100,888,866                             | 47,213,293   | 131,757,916         | 100%  | 100%          | 40%  |
| 2015*                   | 11,991,306                               | 107,510,592                             | 47,433,443   | 131,757,916         | 100%  | 100%          | 26%  |

\* After changes in actuarial assumptions or methods.

# After changes in benefit provisions.

<sup>^</sup> Prior to the 6/30/2006 valuation, present value of credited projected benefits was used.

**TOTAL COMPUTED AND ACTUAL CITY CONTRIBUTIONS  
COMPARATIVE STATEMENT**

| <b>Fiscal Year</b> | <b>Valuation Date June 30</b> | <b>Actual Dollar Contribution @</b> | <b>Valuation Payroll (a)</b> | <b>City's Computed % of Payroll Contributions</b> |
|--------------------|-------------------------------|-------------------------------------|------------------------------|---|
| 1987/88            | 1986 #                        | \$ 1,922,303                        | \$ 6,315,444                 | 26.21%  |
| 1988/89            | 1987 *                        | 1,594,906                           | 6,713,148                    | 25.23%  |
| 1989/90            | 1988                          | 1,719,730                           | 6,590,380                    | 26.08%  |
| 1990/91            | 1989                          | 2,014,154                           | 7,298,136                    | 25.04%  |
| 1991/92            | 1990 #                        | 1,990,000                           | 7,727,204                    | 24.35%  |
| 1992/93            | 1991                          | 1,875,000                           | 7,770,366                    | 21.76%  |
| 1993/94            | 1992 *#                       | 2,278,039                           | 8,359,429                    | 25.85%  |
| 1994/95            | 1993                          | 2,141,014                           | 8,562,961                    | 23.30%  |
| 1995/96            | 1994                          | 2,209,630                           | 8,357,447                    | 23.14%  |
| 1996/97            | 1995                          | 2,447,857                           | 9,103,643                    | 25.09%  |
| 1997/98            | 1996                          | 2,862,874                           | 9,834,167                    | 23.81%  |
| 1998/99            | 1997                          | 2,188,572                           | 10,039,322                   | 21.80%  |
| 1999/00            | 1998                          | 2,005,241                           | 9,813,441                    | 13.65%  |
| 2000/01            | 1999                          | 1,590,027                           | 9,749,682                    | 12.68%  |
| 2001/02            | 2000                          | 1,748,678                           | 11,235,312                   | 13.37%  |
| 2002/03            | 2001                          | 1,571,015                           | 11,615,098                   | 12.12%  |
| 2003/04            | 2002 *                        | 2,720,559                           | 11,907,553                   | 21.54%  |
| 2004/05            | 2003 #                        | 2,922,144                           | 11,885,130                   | 23.70%  |
| 2005/06            | 2004                          | 3,108,229                           | 12,114,360                   | 23.91%  |
| 2006/07            | 2005                          | 3,540,775                           | 12,085,192                   | 26.28%  |
| 2007/08            | 2006 *                        | 3,617,333                           | 12,283,787                   | 23.33%  |
| 2008/09            | 2007#                         | 3,908,721                           | 12,358,265                   | 23.77%  |
| 2009/10            | 2008#                         | 3,622,270                           | 12,497,433                   | 23.93%  |
| 2010/11            | 2009*                         | 4,346,195                           | 11,953,735                   | 26.67%  |
| 2011/12            | 2010                          | 4,159,617                           | 12,383,339                   | 27.85%  |
| 2012/13            | 2011                          | 4,105,429                           | 12,609,794                   | 27.80%  |
| 2013/14            | 2012                          | 4,316,203                           | 12,269,834                   | 30.12%  |
| 2014/15            | 2013                          | 4,612,446                           | 11,700,630                   | 31.10%  |
| 2015/16            | 2014#                         | NA                                  | 12,656,141                   | 29.21%  |
| 2016/17            | 2015                          | NA                                  | 13,495,955                   | 28.72%  |
| 2016/17            | 2015*                         | NA                                  | 13,495,955                   | 29.89%  |

\* After changes in actuarial assumptions or methods.

# After plan amendment.

(a) From 1980 to 1986, total valuation payroll was projected to be 107% of reported payroll (base pay). This was done because of the inclusion of overtime and longevity pay in gross pay for Retirement System purposes.

@ Includes post-retirement health care in 1993/94 through 2013/2014.

## DEVELOPMENT OF FUNDING VALUE OF ASSETS

| Year Ended June 30                                   | 2013                 | 2014                 | 2015                 | 2016         | 2017         | 2018         | 2019        |
|--|----------------------|----------------------|----------------------|--------------|--------------|--------------|-------------|
| A. Funding Value Beginning of Year                   | \$115,083,128        | \$117,879,023        | \$125,526,809        |              |              |              |             |
| B. Market Value End of Year                          | 121,026,984          | 133,938,665          | 133,850,434          |              |              |              |             |
| C. Market Value Beginning of Year                    | 113,297,361          | 121,026,984          | 133,938,665          |              |              |              |             |
| D. Non-Investment Net Cash Flow                      | (3,173,346)          | (4,159,459)          | (4,621,092)          |              |              |              |             |
| E. Investment Income                                 |                      |                      |                      |              |              |              |             |
| E1. Market Total: B - C - D                          | 10,902,969           | 17,071,140           | 4,532,861            |              |              |              |             |
| E2. Amount for Immediate Recognition (7%)            | 7,944,752            | 8,105,951            | 8,625,138            |              |              |              |             |
| E3. Amount for Phased-In Recognition: E1-E2          | 2,958,217            | 8,965,189            | (4,092,277)          |              |              |              |             |
| F. Phased-In Recognition of Investment Income        |                      |                      |                      |              |              |              |             |
| F1. Current Year: 0.20 x E3                          | \$591,643            | 1,793,038            | \$(818,455)          |              |              |              |             |
| F2. First Prior Year                                 | (1,196,059)          | 591,643              | 1,793,038            | \$ (818,455) |              |              |             |
| F3. Second Prior Year                                | 1,856,892            | (1,196,059)          | 591,643              | 1,793,038    | \$ (818,455) |              |             |
| F4. Third Prior Year                                 | 655,780              | 1,856,892            | (1,196,059)          | 591,643      | 1,793,038    | \$ (818,455) |             |
| F5. Fourth Prior Year                                | (3,883,767)          | 655,780              | 1,856,894            | (1,196,061)  | 591,645      | 1,793,037    | \$(818,457) |
| F6. Total Recognized Investment Gain                 | (1,975,511)          | \$3,701,294          | 2,227,061            | 370,165      | 1,566,228    | 974,582      | (818,457)   |
| <b>G. Funding Value End of Year:</b>                 |                      |                      |                      |              |              |              |             |
| G1. Preliminary Funding Value End of Year: A+D+E2+F6 | 117,879,023          | 125,526,809          | 131,757,916          |              |              |              |             |
| G2. Upper Corridor Limit: 120% x B                   | 145,232,381          | 160,726,398          | 160,620,521          |              |              |              |             |
| G3. Lower Corridor Limit: 80% x B                    | 96,821,587           | 107,150,932          | 107,080,347          |              |              |              |             |
| G4. Funding Value End of Year                        | <b>\$117,879,023</b> | <b>\$125,526,809</b> | <b>\$131,757,916</b> |              |              |              |             |
| H. Difference between Market & Funding Value: B-G4   | 3,147,961            | 8,411,856            | 2,092,518            |              |              |              |             |
| I. Recognized Rate of Return                         | 5.26%                | 10.20%               | 8.81%                |              |              |              |             |
| J. Market Rate of Return                             | 9.76%                | 14.35%               | 3.44%                |              |              |              |             |

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. The Funding Value of Assets is **unbiased** with respect to Market Value. At any time it may be either greater or less than Market Value. If actual and assumed rates of investment income are exactly equal for 4 consecutive years, the Funding Value will become equal to Market Value.

## ACTUARIAL BALANCE SHEET - JUNE 30

### *Present Resources and Expected Future Resources*

|   | 2015          | 2014          |
|---|---------------|---------------|
| A. Valuation assets   |               |               |
| 1. Net assets from System financial statements (market value)             | \$133,850,434 | \$133,938,665 |
| 2. Valuation adjustment   | (2,092,518)   | (8,411,856)   |
| 3. Valuation assets   | 131,757,916   | 125,526,809   |
| B. Actuarial present value of expected future employer contributions      |               |               |
| 1. For normal costs   | 23,207,107    | 24,758,169    |
| 2. For unfunded actuarial accrued liabilities                             | 35,177,425    | 28,511,168    |
| 3. Total  | 58,384,532    | 53,269,337    |
| C. Actuarial present value of expected future member contributions        | 10,526,348    | 10,339,984    |
| D. Reserves   | 0             | 0             |
| E. Total Actuarial Present Value of Present and Expected Future Resources | \$200,668,796 | \$189,136,130 |

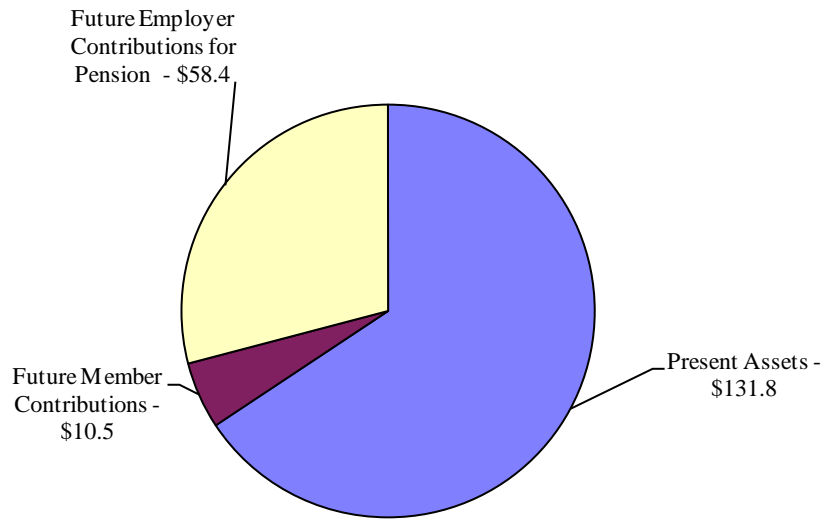
### *Actuarial Present Value of Expected Future Benefit Payments and Reserves*

|   |                |               |
|---|----------------|---------------|
| A. To retirees and beneficiaries  | \$ 107,510,592 | \$ 98,326,146 |
| B. To terminated members  | 2,414,635      | 3,494,723     |
| C. To present active members  |                |               |
| 1. Allocated to service rendered prior to valuation date                          | 57,010,114     | 52,217,108    |
| 2. Allocated to service likely to be rendered after valuation date                | 33,733,455     | 35,098,153    |
| 3. Total  | 90,743,569     | 87,315,261    |
| D. Total Actuarial Present Value of Expected Future Pension Payments              | 200,668,796    | 189,136,130   |
| E. Reserves   |                |               |
| 1. Allocated to retirees and beneficiaries  | 0              | 0             |
| 2. Post-Retirement Health Care  | 0              | 0             |
| 3. Total  | 0              | 0             |
| F. Total Actuarial Present Value of Expected Future Benefit Payments and Reserves | \$200,668,796  | \$189,136,130 |

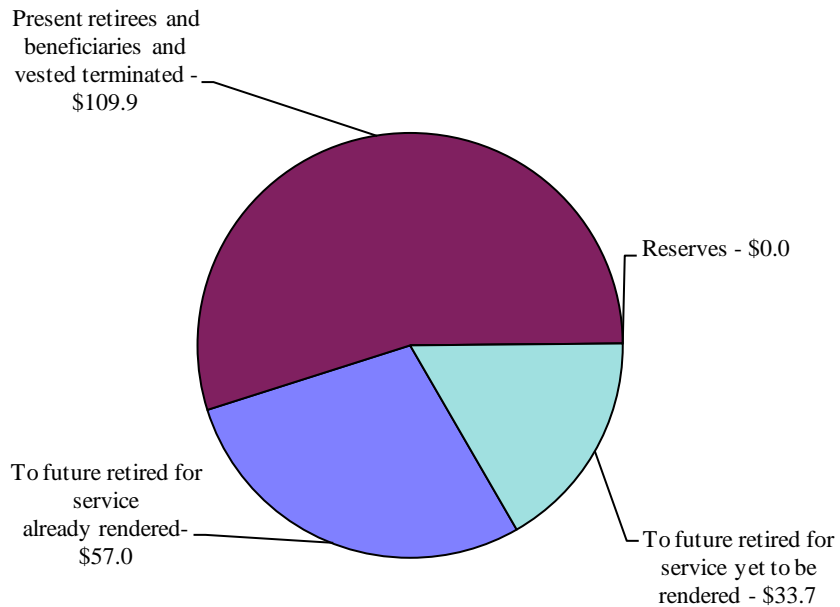
# FINANCING \$200.7 MILLION OF BENEFIT PROMISES JUNE 30, 2015

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## Sources of Funds



## Uses of Funds



**DERIVATION OF ACTUARIAL GAIN (LOSS)  
YEAR ENDED JUNE 30**

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The actuarial gains or losses realized in the operation of the Retirement System provide an experience test. Gains and losses are expected to cancel each other over a period of years (in the absence of double-digit inflation) and sizable year-to-year fluctuations are common. Details of the derivation of the actuarial gain (loss) are shown below, along with a year-by-year comparative schedule.

|   | <b>2015</b>   | <b>2014</b>   |
|---|---------------|---------------|
| (1) UAAL* at start of year  | \$ 28,511,168 | \$ 31,125,976 |
| (2) Employer normal cost  | 2,338,855     | 2,171,637     |
| (3) Actual employer contributions   | 3,594,446     | 3,803,408     |
| (4) Interest accrual  | 1,951,836     | 2,121,706     |
| (5) Expected UAAL before changes:<br>(1) + (2) - (3) + (4)                                      | 29,207,413    | 31,615,911    |
| (6) Changes due to plan amendments  | 0             | (135,876)     |
| (7) Changes due to revised assumptions or methods   | 6,841,876     | 0             |
| (8) Expected UAAL after changes   | 36,049,289    | 31,480,035    |
| (9) Actual UAAL at end of year  | 35,177,425    | 28,511,168    |
| (10) Gain (loss): (8) - (9)   | 871,864       | 2,968,867     |
| (11) Gain (loss) as a percent of actuarial accrued liabilities at start of year (\$154,037,977) | 0.6%          | 2.0%          |

\* *Unfunded actuarial accrued liability.*

| <b>Valuation<br/>Date<br/>June 30</b> | <b>Actuarial Gain (Loss)<br/>as % of Beginning<br/>Accrued Liabilities</b> |
|---------------------------------------|--|
| 2006                                  | (2.9)%   |
| 2007                                  | 1.9 %  |
| 2008                                  | 0.1 %  |
| 2009                                  | (4.7)%   |
| 2010                                  | (2.4)%   |
| 2011                                  | (0.1)%   |
| 2012                                  | (3.5)%   |
| 2013                                  | 0.1 %  |
| 2014                                  | 2.0 %  |
| 2015                                  | 0.6 %  |



## COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

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**Experience:** Investment experience on a market value basis for the year ended June 30, 2015 was unfavorable with a market rate of return of 3.44% (versus the expected return of 7%). On a funding value basis, investment gains as of June 30, 2015 totaled \$2.2 million. Overall experience from 2014-2015 was close to expected.

**Expected Computed Contribution Rates in Future Years:** The method used to derive valuation assets will, over the long-term, produce rates of return equal to those measured on a pure market value basis. This means that over the long-term, total employer contributions are not expected to be impacted by the method used to derive valuation assets. This relationship does not hold over the short-term; valuation assets may drop to 80% of market value or go up to 120% of market value. Valuation assets are now approximately \$2.1 million lower than the market value due to unrecognized investment gains. Recognition of these gains over the next several years is expected to put downward pressure on employer contribution rates.

**Post-Retirement Health Care Benefit:** Contributions made to the retiree health portion of the fund must meet certain requirements specified in IRC 401(h). Page A-14 of this report provides information regarding the required subordination test.

Please note the following:

- Even if contributions equal to the limit are made, they would not be expected to be sufficient to meet the ongoing post-retirement health care costs.
- As long as post-retirement health care payments made from the Retirement System do not exceed the Reserve for Health Care balance, the decision to either levy any money or make any contributions to cover post-retirement health care through the Retirement System remains a policy decision.

## COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

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**Amortization Method:** The current method for amortizing Unfunded Actuarial Accrued Liability (UAAL) is a level percent of pay approach over a closed period of 30 years beginning July 1, 2015 and ending June 30, 2045 (29 years remaining as of the June 30, 2015 valuation, which determines the fiscal year 2017 contribution). Benefit changes and assumption changes are separately amortized over 30 years as they occur. Absent actuarial gains or losses, a closed amortization period is expected to result in UAAL amortization payments that remain level as a percentage of payroll.

**Benefit Changes:** There were no new benefit provisions reported for this valuation.

**Valuation Assumptions:** The Retirement Board approved proposed assumption changes from the 2009-2014 Actuarial Experience Study: These newly approved assumptions are included in this revised valuation report. The changes in assumptions include:

- 6.75% assumed rate of investment return.
- 4.25% assumed rate of payroll growth in addition to reductions in merit and longevity pay increase assumptions.
- RP-2014 Standard Mortality Tables projected to 2019 using the MP-2014 mortality improvement scale.
- Reduction in rates of expected active members to become disabled.

**Conclusion:** The Retirement System's financial objective is to meet long-term benefit obligations through contributions that remain approximately level from year-to-year as a percent of active member payroll. Continued receipt of these contributions is the best guarantee that the Plan will be able to pay all promised benefits when due.

## IRC 401(h) COMPLIANCE TEST

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| Valuation Year | Fiscal Year | (1)<br>Estimated Payroll | (2)<br>PUCNC Pension | (3)<br>Actual \$ Pension | (4)<br>Total Actual PUCNC | (5)<br>Health Contribution | (6)<br>Sum of (4)+(5) | (7)<br>Sum of All Years in (5) | (8)<br>Sum of All Years in (6) | (9)<br>Percentage Health/Total (7)/(8) |
|----------------|-------------|--------------------------|----------------------|--------------------------|---------------------------|----------------------------|-----------------------|--------------------------------|--------------------------------|--|
| 6/07           | 07/08       | \$12,321,026             | 28.42%               | \$3,836,767              | \$3,501,657               | \$ 0                       | \$3,501,657           | \$14,195,387                   | \$60,283,196                   | 23.5%                                  |
| 6/08           | 08/09       | 12,427,849               | 28.51%               | 3,927,200                | 3,542,703                 | 500,000                    | 4,042,703             | 14,695,387                     | 64,325,899                     | 22.8%                                  |
| 6/09           | 09/10       | 12,225,584               | 28.84%               | 4,126,440                | 3,526,273                 | 506,000                    | 4,032,273             | 15,201,387                     | 68,358,172                     | 22.2%                                  |
| 6/10           | 10/11       | 12,658,898               | 28.33%               | 4,877,174                | 3,586,153                 | 500,000                    | 4,086,153             | 15,701,387                     | 72,444,325                     | 21.7%                                  |
| 6/11           | 11/12       | 12,439,814               | 28.22%               | 4,581,734                | 3,510,345                 | 500,000                    | 4,010,345             | 16,201,387                     | 76,454,670                     | 21.2%                                  |
| 6/12           | 12/13       | 11,985,232               | 28.00%               | 4,637,167                | 3,356,361                 | 512,795                    | 3,869,156             | 16,714,182                     | 80,323,826                     | 20.8%                                  |
| 6/13           | 13/14       | 12,178,386               | 28.41%               | 4,787,871                | 3,460,149                 | 512,795                    | 3,972,944             | 17,226,977                     | 84,296,770                     | 20.4%                                  |
| 6/14           | 14/15       | 13,076,048               | 28.43%               | 4,760,687                | 3,718,152                 | 1,018,000                  | 4,736,152             | 18,244,977                     | 89,032,922                     | 20.5%                                  |

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## **SECTION B**

### **SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA**

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**BRIEF SUMMARY OF ACT 345 BENEFIT CONDITIONS EVALUATED  
(UPDATED TO JUNE 30, 2015)**

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**ELIGIBILITY**

**AMOUNT**

**SERVICE RETIREMENT**

The benefit amounts attributable to regular retirements and the conditions under which such benefits may be paid are described in tabular form on page B-2.

**DEFERRED RETIREMENT**

Termination of employment after 10 or more years of service.

Computed as service retirement but based upon service, Average Final Compensation (AFC) and benefit in effect at termination. Benefit begins at date retirement would have occurred had member remained in employment.

**DEATH AFTER RETIREMENT SURVIVOR'S PENSION**

Payable to a surviving spouse, if any, upon the death of a retired member who was receiving a straight life pension which was effective July 1, 1975 or later.

Spouse's pension equals 60% of the straight life pension the deceased retiree was receiving.

**NON-DUTY DEATH-IN-SERVICE SURVIVOR'S PENSION**

Payable to a surviving spouse, if any, upon the death of a member with 20 or more years of service, or a Police member with 10 or more years of service.

Accrued straight life pension actuarially reduced in accordance with an Option I election.

**DUTY DEATH-IN-SERVICE SURVIVOR'S PENSION**

Payable upon the expiration of Worker's Compensation to the survivors of a member who died in the line of duty.

Same amount that was paid by Worker's Compensation.

**NON-DUTY DISABILITY**

Payable upon the total and permanent disability of a member with 5 or more years-of-service.

To age 55: 1.5% of AFC times years of service.  
At age 55: Same as Service Retirement Pension.

**DUTY DISABILITY**

Payable upon the total and permanent disability of a member in the line of duty.

To age 55: 50% of AFC.  
At age 55: Same as Service Retirement Pension with service credit from date of disability to age 55.

**MEMBER CONTRIBUTIONS**

Amounts are described on page B-2.

**SUMMARY OF BENEFIT PROVISIONS  
AS OF JUNE 30, 2015**

| <b>Group</b>     | <b>No. People</b> | <b>GRS Code</b> | <b>Eligibility</b>           | <b>Benefit Multiplier*</b> | <b>Maximum Benefit</b> | <b>Years In FAC</b> | <b>Member Contribution Rate</b> |
|------------------|-------------------|-----------------|------------------------------|----------------------------|------------------------|---------------------|---------------------------------|
| <b>Police:</b>   |                   |                 |                              |                            |                        |                     |                                 |
| Sergeants - POLC | 14                | 91              | 25 yrs. of service or age 60 | 3.0%/1.0%                  | 80% of FAC             | 5                   | 7.75%                           |
| Lieutenants      | 3                 | 90              | 25 yrs. of service or age 60 | 3.0%/1.0%                  | 80% of FAC             | 3                   | 10.00%                          |
| POLC             | 86                | 92              | 25 yrs. of service or age 60 | 3.0%/1.0%                  | 80% of FAC             | 5                   | 7.75%                           |
| Non-Represented  | 6                 | 95,97           | 25 yrs. of service or age 60 | 3.0%/1.0%                  | 80% of FAC             | 3                   | 10.00%                          |
| <b>Fire:</b>     |                   |                 |                              |                            |                        |                     |                                 |
| OSP              | 1                 | 94              | age 50 and 25 yrs. or age 60 | 3.0%/1.0%                  | 80% of FAC             | 5                   | 9.69%                           |
| IAFF             | 77                | 93              | 25 yrs. of service or age 60 | 3.0%/1.0%                  | 80% of FAC             | 5                   | 7.50%                           |
| Non-Represented  | 1                 | 98              | 25 yrs. of service or age 60 | 3.0%/1.0%                  | 80% of FAC             | 3                   | 10.00%                          |
| <b>Total</b>     | <b>188</b>        |                 |                              |                            |                        |                     |                                 |

\* First multiplier applies to the first 25 years-of-service. Second multiplier applies to service greater than 25 years.

Note: None of the above groups are covered by Social Security.

## SAMPLE BENEFIT COMPUTATION

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Assumed data in connection with this sample retirement is shown below:

|    | <b>Data</b> | <b>Description</b>   |
|----|-------------|--|
| A. | \$40,000    | Final Average Compensation   |
| B. | 27          | Years of Credited Service  |
| C. | 50          | Age of Retiree   |
| D. | 60%         | Percentage to continue to spouse after retiree's death (this is automatic) |

| <b>Sample Computation Steps</b>                         | <b>Annual Amount</b> |
|---|----------------------|
| E. Benefit Formula: $0.03 \times 25 \times \$40,000 =$  | \$30,000             |
| $+0.01 \times 2 \times \$40,000 =$                      | <u>800</u>           |
|   | 30,800               |
| F. Maximum Benefit: $0.80 \times \$40,000 =$            | \$32,000             |
| Benefit payable to:                                     |                      |
| G. Retiree while spouse is alive<br>(lesser of E and F) | \$30,800             |
| H. Spouse after retiree's death (D x G)                 | 18,480               |
| I. Retiree after spouse's death                         | \$30,800             |

## ALLOCATION OF EMPLOYER ASSETS BETWEEN PENSION AND HEALTH

|   | <b>Pension</b>       | <b>Health</b> | <b>Total</b>         |
|---|----------------------|---------------|----------------------|
| <b>1) Market Value of Assets 6/30/14</b>                                | <b>\$133,938,665</b> | <b>\$ 0</b>   | <b>\$133,938,665</b> |
| 2) Employer Contrib. (\$) FY 14/15                                      | 3,594,446            | 1,018,000     | 4,612,446            |
| 3) Employee Contrib. (\$) FY 14/15                                      | 1,166,241            | 0             | 1,166,241            |
| 4) Benefits Paid and Refunds FY 14/15                                   | 9,381,779            | 1,018,000     | 10,399,779           |
| 5) Net Cash Flow FY 14/15: (2)+(3)-(4)                                  | (4,621,092)          | 0             | (4,621,092)          |
| 6) Investment Income FY 14/15 (Market Value)                            | 4,532,861            | 0             | 4,532,861            |
| <b>7) Market Value of Assets 6/30/15:</b><br><b>(1)+(2)+(3)-(4)+(6)</b> | <b>\$133,850,434</b> | <b>\$ 0</b>   | <b>\$133,850,434</b> |



## REPORTED FUND BALANCE

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| Reserves for                | Reported Market Values June 30 |                      |
|-----------------------------|--------------------------------|----------------------|
|                             | 2015                           | 2014                 |
| Employees' Contributions    | \$ 26,924,731                  | \$ 24,399,968        |
| Employer Contributions      | 12,282,104                     | 33,898,973           |
| Retired Benefit Payments    | 94,643,599                     | 75,639,724           |
| Post-Retirement Health Care | 0                              | 0                    |
| <b>Total Fund Balance</b>   | <b>\$133,850,434</b>           | <b>\$133,938,665</b> |

Valuation assets are equal to the funding value of assets derived on page A-8.

In financing actuarial accrued liabilities, valuation assets of \$131,757,916 were distributed as follows:

| Reserves for               | Valuation Assets Applied to<br>Actuarial Accrued Liabilities for |                             |                        | Totals               |
|----------------------------|--|-----------------------------|------------------------|----------------------|
|                            | Active<br>Members  | Retirees &<br>Beneficiaries | Health Care<br>Reserve |                      |
| Employees' Contributions   | \$26,924,731   |                             |                        | \$ 26,924,731        |
| Employer Contributions     | (584,889)  | \$ 12,866,993               |                        | 12,282,104           |
| Retired Benefit Payments   |  | 94,643,599                  |                        | 94,643,599           |
| Health Care                |  |                             | \$0                    | 0                    |
| Market Value Adjustment    | (2,092,518)  |                             |                        | (2,092,518)          |
| <b>Total Funding Value</b> | <b>\$24,247,324</b>  | <b>\$107,510,592</b>        | <b>\$0</b>             | <b>\$131,757,916</b> |

**SUMMARY OF CURRENT ASSET INFORMATION  
REPORTED FOR VALUATION**

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*Assets (Market Value)*

|                              | <b>June 30</b>       |                      |
|------------------------------|----------------------|----------------------|
|                              | <b>2015</b>          | <b>2014</b>          |
| Cash & equivalents           | \$ 6,561,103         | \$ 6,069,133         |
| Other short-term investments | 0                    | 0                    |
| Fixed income                 | 60,921,048           | 59,546,922           |
| Stocks                       | 66,299,683           | 68,432,125           |
| Real estate investments      | 463,985              | 310,303              |
| Accounts receivable          | (395,385)            | (419,818)            |
| <b>Total Assets</b>          | <b>\$133,850,434</b> | <b>\$133,938,665</b> |

*Revenues and Expenses*

|                                 | <b>2014-15</b>       | <b>2013-14</b>       |
|---------------------------------|----------------------|----------------------|
| Balance - July 1                | \$133,938,665        | \$121,026,984        |
| Revenues                        |                      |                      |
| Employees' contributions        | 1,166,241            | 984,463              |
| Employer contributions          | 4,612,446            | 4,316,203            |
| Investment income               | 5,204,344            | 17,738,393           |
| Expenses                        |                      |                      |
| Benefit payments                | 9,358,827            | 8,899,974            |
| Refunds of member contributions | 22,952               | 47,356               |
| Administrative expenses         | 671,483              | 667,256              |
| Health insurance premiums       | 1,018,000            | 512,795              |
| Rounding Adjustment             | 0                    | (3)                  |
| <b>Balance - June 30</b>        | <b>\$133,850,434</b> | <b>\$133,938,665</b> |

**ASSET INFORMATION REPORTED FOR VALUATION  
COMPARATIVE STATEMENT**

| Year<br>Ended<br>June 30 | Assets<br>Beginning<br>of Year | Revenues             |                      |                      |                 | Expenses               |                      |                      | Assets<br>Year-End |
|--------------------------|--------------------------------|----------------------|----------------------|----------------------|-----------------|------------------------|----------------------|----------------------|--------------------|
|                          |                                | Employee<br>Contrib. | Employer<br>Contrib. | Investment<br>Income | Misc.<br>Income | Retirement<br>Benefits | Contribs.<br>Refunds | Misc.(*)<br>Expenses |                    |
| 1991                     | \$ 37,304,813                  | \$ 477,755           | \$2,014,154          | \$ 3,496,582         | \$0             | \$ 1,528,383           | \$ 77,999            | \$ 333,704           | \$ 41,353,218      |
| 1992                     | 41,353,218                     | 530,967              | 1,990,000            | 4,276,012            | 0               | 1,508,018              | 28,675               | 380,552              | 46,232,952         |
| 1993                     | 46,232,952                     | 564,523              | 1,875,000            | 6,163,269            | 0               | 1,516,348              | 42,244               | 375,546              | 52,901,606         |
| 1994                     | 52,901,606                     | 652,166              | 2,278,039            | 5,124,539            | 0               | 1,967,395              | 35,812               | 850,623              | 58,102,520         |
| 1995                     | 58,102,520                     | 664,170              | 2,141,014            | 5,142,121            | 0               | 2,321,947              | 1,404                | 1,152,671            | 62,573,803         |
| 1996                     | 62,573,803                     | 758,715              | 2,209,630            | 5,867,205            | 0               | 2,679,317              | 22,840               | 541,958              | 68,165,238         |
| 1997                     | 68,165,238                     | 815,487              | 2,447,587            | 8,245,891            | 0               | 3,193,357              | 37,540               | 985,759              | 75,457,547         |
| 1998                     | 78,893,397                     | 782,573              | 2,862,874            | 16,532,678           | 0               | 3,569,152              | 96,598               | 1,516,407            | 93,889,365         |
| 1999                     | 93,889,365                     | 857,090              | 2,188,572            | 7,562,429            | 0               | 4,245,423              | 153,751              | 1,193,442            | 98,904,840         |
| 2000                     | 98,904,840                     | 860,852              | 2,005,241            | 10,074,744           | 0               | 4,206,891              | 112,149              | 1,327,756            | 106,198,881        |
| 2001                     | 106,198,881                    | 946,812              | 1,590,027            | (508,876)            | 0               | 4,411,998              | 168,781              | 1,691,962            | 101,954,103        |
| 2002                     | 101,954,103                    | 924,388              | 1,748,678            | (5,364,998)          | 0               | 4,556,200              | 34,664               | 1,734,654            | 92,936,653         |
| 2003                     | 92,936,653                     | 964,525              | 1,571,015            | 3,196,673            | 0               | 4,785,350              | 46,812               | 1,991,658            | 91,845,046         |
| 2004                     | 91,845,046                     | 999,306              | 2,720,559            | 8,470,556            | 0               | 4,990,364              | 141,260              | 2,320,746            | 96,583,097         |
| 2005                     | 96,583,097                     | 1,001,337            | 2,922,144            | 4,944,462            | 0               | 5,473,699              | 41,859               | 2,129,549            | 97,805,933         |
| 2006                     | 97,805,933                     | 960,556              | 3,108,229            | 8,955,746            | 0               | 6,166,401              | 105,665              | 2,375,321            | 102,183,077        |
| 2007                     | 102,183,077                    | 943,869              | 3,540,775            | 13,563,262           | 0               | 5,976,094              | 111,456              | 1,733,295            | 112,410,138        |
| 2008                     | 112,410,138                    | 1,057,662            | 3,617,333            | (1,099,790)          | 0               | 6,035,431              | 130,761              | 792,349              | 109,026,802        |
| 2009                     | 109,026,802                    | 1,076,661            | 3,908,721            | (12,529,495)         | 0               | 6,849,499              | 74,325               | 1,147,058            | 93,411,807         |
| 2010                     | 93,411,807                     | 1,010,170            | 3,622,270            | 11,782,723           | 0               | 7,290,810              | 107,078              | 1,277,732            | 101,151,350        |
| 2011                     | 101,151,350                    | 1,030,979            | 4,346,195            | 17,754,126           | 0               | 7,581,972              | 13,464               | 1,168,496            | 115,518,718        |
| 2012                     | 115,518,718                    | 922,117              | 4,159,617            | 2,600,092            | 0               | 8,669,455              | 110,630              | 1,123,098            | 113,297,361        |
| 2013                     | 113,297,361                    | 1,044,533            | 4,105,429            | 11,514,896           | 0               | 7,735,131              | 75,382               | 1,124,722            | 121,026,984        |
| 2014                     | 121,026,984                    | 984,463              | 4,316,203            | 17,738,393           | 0               | 8,899,974              | 47,356               | 1,180,048            | 133,938,665        |
| 2015                     | 133,938,665                    | 1,166,241            | 4,612,446            | 5,204,344            | 0               | 9,358,827              | 22,952               | 1,689,483            | 133,850,434        |

(\*) Misc. expenses include investment expenses and health insurance premiums for retired lives paid after 8/1/1980.

## RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS COMPARATIVE STATEMENT

| Year Ended June 30 | Added to Rolls (Includes Benefit Adjustments) |                 | Removed from Rolls |                 | Rolls End of Year |                 | % Incr. Annual Benefits | Average Annual Benefit | Present Value of Benefits | Expected Removals |
|--------------------|---|-----------------|--------------------|-----------------|-------------------|-----------------|-------------------------|------------------------|---------------------------|-------------------|
|                    | No.   | Annual Benefits | No.                | Annual Benefits | No.               | Annual Benefits |                         |                        |                           |                   |
| 1986               | 2   | \$ 15,320       | 2                  | \$ 10,324       | 83                | \$ 750,843      | 0.7 %                   | \$ 9,046               | \$ 8,369,688              | 2.5               |
| 1987               | 6   | 115,563         | 2                  | 8,204           | 87                | 858,202         | 14.3 %                  | 9,864                  | 9,371,750                 | 2.7               |
| 1988               | 22  | 526,036         | 2                  | 12,896          | 107               | 1,371,342       | 59.8 %                  | 12,816                 | 15,913,118                | 2.7               |
| 1989               | 5   | 86,432          | 5                  | 46,863          | 107               | 1,410,911       | 2.9 %                   | 13,186                 | 16,192,243                | 3.0               |
| 1990#              | 4   | 132,412         | 2                  | 6,821           | 109               | 1,536,502       | 8.9 %                   | 14,096                 | 17,080,913                | 3.1               |
| 1991               | 3   | 17,165          | 3                  | 28,608          | 109               | 1,525,059       | (0.7)%                  | 13,991                 | 16,615,266                | 3.4               |
| 1992               | 3   | 35,744          | 4                  | 40,257          | 108               | 1,520,546       | (0.3)%                  | 14,163                 | 15,355,839                | 3.6               |
| 1993               | 4   | 102,957         | 1                  | 7,200           | 111               | 1,616,303       | 6.3 %                   | 14,561                 | 16,316,103                | 3.5               |
| 1994               | 20  | 592,886         | 5                  | 41,062          | 126               | 2,168,127       | 34.1 %                  | 17,207                 | 23,000,034                | 3.8               |
| 1995#              | 11  | 313,427         | 2                  | 15,728          | 135               | 2,465,826       | 13.7 %                  | 18,265                 | 26,363,115                | 3.9               |
| 1996@              | 9   | 452,213         |                    |                 | 144               | 2,918,042       | 18.3 %                  | 20,264                 | 31,375,781                | 4.3               |
| 1997               | 15  | 564,090         | 5                  | 42,709          | 154               | 3,439,423       | 17.9 %                  | 22,334                 | 37,399,338                | 4.6               |
| 1998               | 11  | 370,753         | 1                  | 11,172          | 164               | 3,799,004       | 10.5 %                  | 23,165                 | 41,008,304                | 5.1               |
| 1999               | 15  | 459,424         | 8                  | 114,372         | 171               | 4,144,056       | 9.1 %                   | 24,234                 | 45,233,238                | 5.2               |
| 2000               | 12  | 274,422         | 7                  | 129,923         | 176               | 4,288,555       | 3.5 %                   | 24,367                 | 46,324,310                | 5.6               |
| 2001               | 16  | 424,378         | 8                  | 134,929         | 184               | 4,578,004       | 6.7 %                   | 24,880                 | 49,610,467                | 5.6               |
| 2002               | 6   | 123,085         | 3                  | 41,718          | 187               | 4,659,371       | 1.8 %                   | 24,916                 | 51,343,164                | 5.1               |
| 2003               | 9   | 352,598         | 3                  | 41,567          | 193               | 4,970,403       | 6.7 %                   | 25,753                 | 54,767,310                | 5.3               |
| 2004               | 5   | 197,292         | 5                  | 55,272          | 193               | 5,112,423       | 2.9 %                   | 26,489                 | 56,062,967                | 5.3               |
| 2005               | 12  | 558,890         | 3                  | 39,781          | 202               | 5,631,532       | 10.2 %                  | 27,879                 | 62,017,507                | 5.3               |
| 2006               | 4   | 168,387         | 2                  | 15,692          | 204               | 5,784,227       | 2.7 %                   | 28,354                 | 62,976,517                | 5.7               |
| 2007#@             | 8   | 641,673         | 4                  | 70,472          | 208               | 6,355,428       | 9.9 %                   | 30,555                 | 67,946,355                | 6.0               |
| 2008#              | 9   | 395,393         | 6                  | 96,022          | 211               | 6,654,800       | 4.7 %                   | 31,539                 | 71,090,277                | 6.5               |
| 2009#              | 17  | 747,839         | 5                  | 95,118          | 223               | 7,307,521       | 9.8 %                   | 32,769                 | 79,883,240                | 6.5               |
| 2010               | 11  | 283,961         | 8                  | 145,046         | 226               | 7,446,436       | 1.9 %                   | 32,949                 | 80,725,431                | 5.9               |
| 2011               | 12  | 508,150         | 5                  | 75,940          | 233               | 7,878,646       | 5.8 %                   | 33,814                 | 85,197,066                | 6.1               |
| 2012               | 13  | 647,101         | 7                  | 148,315         | 239               | 8,377,432       | 6.3 %                   | 35,052                 | 91,012,108                | 6.4               |
| 2013               | 14  | 651,987         | 5                  | 99,636          | 248               | 8,929,783       | 6.6 %                   | 36,007                 | 96,565,549                | 6.2               |
| 2014               | 6   | 319,868         | 3                  | 79,524          | 251               | 9,170,127       | 2.7 %                   | 36,534                 | 98,326,146                | 6.7               |
| 2015               | 9   | 418,887         | 8                  | 148,950         | 252               | 9,440,064       | 2.9 %                   | 37,461                 | 100,888,866               | 7.0               |
| 2015#              | 9   | 418,887         | 8                  | 148,950         | 252               | 9,440,064       | 2.9 %                   | 37,461                 | 107,510,592               | 7.0               |

# After plan amendment and/or changes to actuarial assumptions.

@ Includes correction to data in between valuations (removal of 2 retirees who had died).

**RETIRES AND BENEFICIARIES  
BY TYPE OF BENEFITS BEING PAID**

| <b>Type of Benefit Being Paid</b>                                | <b>No.</b> | <b>Annual Benefits Being Paid</b> | <b>Average Annual Benefit</b> |
|--|------------|-----------------------------------|-------------------------------|
| <b>Age and Service Benefits</b>                                  |            |                                   |                               |
| Straight life benefit - benefit terminating at death of retirant | 49         | \$1,585,123                       | \$32,349                      |
| Automatic 60% survivor benefit to spouse                         | 166        | 7,165,720                         | 43,167                        |
| Option 1 benefit - 100% joint and survivor                       |            |                                   |                               |
| Option 2 benefit - 50% joint and survivor                        | 1          | 14,400                            | 14,400                        |
| Benefit being paid survivor beneficiary of deceased retiree      | 27         | 463,365                           | 17,162                        |
| Total age and service benefits                                   | 243        | 9,228,608                         | 37,978                        |
| <b>Casualty Benefits</b>   |            |                                   |                               |
| Duty disability benefits   | 4          | 111,283                           | 27,821                        |
| Non-duty disability benefits                                     | 1          | 10,942                            | 10,942                        |
| Duty death benefits  | 1          | 34,546                            | 34,546                        |
| Non-duty death benefits  | 3          | 54,685                            | 18,228                        |
| Total casualty benefits  | 9          | 211,456                           | 23,495                        |
| <b>Total Benefits Being Paid</b>                                 | <b>252</b> | <b>\$9,440,064</b>                | <b>\$37,461</b>               |

**RETIREES AND BENEFICIARIES AS OF JUNE 30, 2015**  
**TABULATED BY ATTAINED AGES**

| Attained<br>Ages | Age & Service<br>Retirees |                    | Disability<br>Retirees |                    | Survivor<br>Beneficiaries |                    |
|------------------|---------------------------|--------------------|------------------------|--------------------|---------------------------|--------------------|
|                  | No.                       | Annual<br>Benefits | No.                    | Annual<br>Benefits | No.                       | Annual<br>Benefits |
| 30-34            |                           |                    | 1                      | \$ 28,773          |                           |                    |
| 45-49            | 5                         | \$ 281,531         |                        |                    |                           |                    |
| 50-54            | 18                        | 1,066,657          | 1                      | 10,942             | 2                         | \$ 64,655          |
| 55-59            | 27                        | 1,419,598          |                        |                    | 1                         | 36,478             |
| 60-64            | 49                        | 2,041,594          | 2                      | 73,870             |                           |                    |
| 65-69            | 48                        | 1,981,838          |                        |                    | 4                         | 89,781             |
| 70-74            | 35                        | 1,171,881          |                        |                    | 4                         | 87,570             |
| 75-79            | 16                        | 449,419            |                        |                    | 5                         | 97,400             |
| 80-84            | 5                         | 86,938             | 1                      | 8,640              | 9                         | 112,263            |
| 85-89            | 9                         | 199,175            |                        |                    | 2                         | 29,365             |
| 90-94            | 3                         | 52,212             |                        |                    | 4                         | 35,084             |
| 95-99            | 1                         | 14,400             |                        |                    |                           |                    |
| <b>Totals</b>    | <b>216</b>                | <b>\$8,765,243</b> | <b>5</b>               | <b>\$122,225</b>   | <b>31</b>                 | <b>\$552,596</b>   |

**ACTIVE MEMBERS AS OF JUNE 30, 2015**  
**TABULATED BY VALUATION DIVISIONS**

| Valuation Division | No.        | Annual Payroll      | Average in Years |             | Average Pay     |
|--------------------|------------|---------------------|------------------|-------------|-----------------|
|                    |            |                     | Age              | Service     |                 |
| Police:            |            |                     |                  |             |                 |
| Lieutenants        | 3          | \$ 293,788          | 48.7             | 21.7        | \$97,929        |
| Sergeants (POLC)   | 14         | 1,314,346           | 45.2             | 19.2        | 93,882          |
| Other POLC         | 86         | 5,537,417           | 37.6             | 10.4        | 64,389          |
| Non-Represented    | 6          | 525,058             | 45.9             | 19.7        | 87,510          |
| Fire:              |            |                     |                  |             |                 |
| OSP                | 1          | 99,173              | 52.2             | 19.8        | 99,173          |
| IAFF               | 77         | 5,630,582           | 41.5             | 12.2        | 73,124          |
| Non-Represented    | 1          | 95,591              | 44.4             | 12.5        | 95,591          |
| <b>Totals</b>      | <b>188</b> | <b>\$13,495,955</b> | <b>40.3</b>      | <b>12.3</b> | <b>\$71,787</b> |

**ADDITIONS TO AND REMOVALS FROM ACTIVE MEMBERSHIP**  
**ACTUAL AND EXPECTED NUMBERS**  
**TEN YEAR HISTORICAL SCHEDULE**

| Year Ended<br>June 30 | Number Added |     | Normal Retirement |      | Disability Retirement |     | Died-In-Service |     | Terminations |      | Members End of Year |
|-----------------------|--------------|-----|-------------------|------|-----------------------|-----|-----------------|-----|--------------|------|---------------------|
|                       | A            | E   | A                 | E    | A                     | E   | A               | E   | A            | E    |                     |
| 2006                  | 7            | 6   | 3                 | 2.2  | 0                     | 0.5 | 1               | 0.3 | 2            | 4.8  | 201                 |
| 2007                  | 8            | 8   | 4                 | 4.7  | 1                     | 0.5 | 0               | 0.3 | 3            | 5.5  | 201                 |
| 2008                  | 7            | 11  | 8                 | 5.9  | 0                     | 0.5 | 0               | 0.3 | 3            | 6.4  | 197                 |
| 2009                  | 10           | 19  | 14                | 8.2  | 1                     | 0.5 | 0               | 0.3 | 4            | 4.1  | 188                 |
| 2010                  | 9            | 7   | 5                 | 7.0  | 0                     | 0.4 | 0               | 0.1 | 2            | 3.4  | 190                 |
| 2011                  | 13           | 10  | 7                 | 7.0  | 0                     | 0.5 | 0               | 0.1 | 3            | 3.2  | 193                 |
| 2012                  | 5            | 14  | 10                | 5.8  | 0                     | 0.5 | 0               | 0.1 | 4            | 3.4  | 184                 |
| 2013                  | 13           | 20  | 10                | 7.5  | 0                     | 0.5 | 1               | 0.1 | 9            | 3.1  | 177                 |
| 2014                  | 13           | 7   | 4                 | 4.3  | 0                     | 0.5 | 0               | 0.1 | 3            | 3.1  | 183                 |
| 2015                  | 13           | 8   | 4                 | 2.7  | 1                     | 0.5 | 0               | 0.1 | 3            | 3.3  | 188                 |
| 10-Year Totals        | 98           | 110 | 69                | 55.2 | 3                     | 4.9 | 2               | 1.8 | 36           | 40.2 |                     |

*A* represents actual number.

*E* represents expected number based on assumptions outlined in Section D.

**FINAL AVERAGE COMPENSATION FOR NEW RETIREES  
WITH AND WITHOUT LUMP SUMS  
(COMPARATIVE SCHEDULE)**

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| <b>Year<br/>Ending<br/>June 30</b> | <b>Final Average Compensation</b> |                |              |
|------------------------------------|-----------------------------------|----------------|--------------|
|                                    | <b>With</b>                       | <b>Without</b> | <b>Ratio</b> |
| 2006                               | \$207,226                         | \$198,311      | 1.04         |
| 2007                               | 311,928                           | 294,782        | 1.06         |
| 2008                               | 527,092                           | 515,740        | 1.02         |
| 2009                               | 949,181                           | 921,620        | 1.03         |
| 2010                               | 409,874                           | 369,887        | 1.11         |
| 2011                               | 651,000                           | 618,403        | 1.05         |
| 2012                               | 812,029                           | 648,518        | 1.25         |
| 2013                               | 839,306                           | 779,471        | 1.08         |
| 2014                               | 382,165                           | 323,231        | 1.18         |
| 2015                               | 498,461                           | 466,597        | 1.07         |
| 10-Year Average                    | \$558,826                         | \$513,656      | 1.09         |



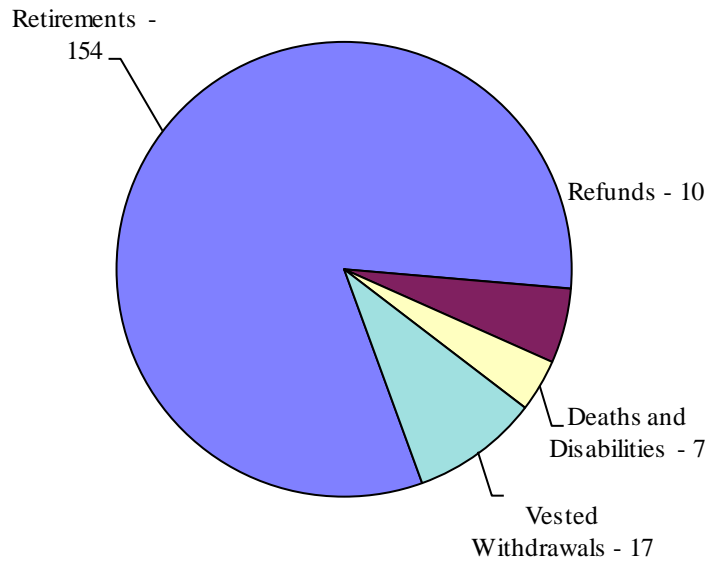
**ACTIVE MEMBERS INCLUDED IN VALUATION  
COMPARATIVE STATEMENT**

| Valuation<br>Date<br>June 30 | Active<br>Members | Vested<br>Term<br>Members | Reported<br>Payroll* | Average |         |          | %<br>Increase |
|------------------------------|-------------------|---------------------------|----------------------|---------|---------|----------|---------------|
|                              |                   |                           |                      | Age     | Service | Pay      |               |
| 1981                         | 164               | 0                         | \$ 3,484,013         | 38.3    | 13.2    | \$21,244 | 10.2 %        |
| 1982                         | 169               | 0                         | 3,904,734            | 38.0    | 12.9    | 23,105   | 8.8 %         |
| 1983                         | 203               | 0                         | 5,078,781            | 38.2    | 13.0    | 25,019   | 8.3 %         |
| 1984                         | 213               | 0                         | 5,410,717            | 37.7    | 11.8    | 25,402   | 1.5 %         |
| 1985                         | 214               | 2                         | 5,534,747            | 38.1    | 12.2    | 25,863   | 1.8 %         |
| 1986                         | 218               | 4                         | 5,902,284            | 38.5    | 12.6    | 27,075   | 4.7 %         |
| 1987                         | 218               | 4                         | 6,713,148            | 38.6    | 12.7    | 30,794   | 13.7 %        |
| 1988                         | 205               | 6                         | 6,590,380            | 37.5    | 11.4    | 32,148   | 4.4 %         |
| 1989                         | 208               | 5                         | 7,298,136            | 38.1    | 11.8    | 35,087   | 9.1 %         |
| 1990                         | 208               | 5                         | 7,727,204            | 38.7    | 12.4    | 37,150   | 5.9 %         |
| 1991                         | 212               | 6                         | 7,770,366            | 39.2    | 13.0    | 36,653   | (1.3)%        |
| 1992                         | 217               | 6                         | 8,359,429            | 39.7    | 13.4    | 38,523   | 5.1 %         |
| 1993                         | 221               | 6                         | 8,562,961            | 40.0    | 13.8    | 38,746   | 0.6 %         |
| 1994                         | 206               | 6                         | 8,357,447            | 39.8    | 13.5    | 40,570   | 4.7 %         |
| 1995                         | 213               | 6                         | 9,103,643            | 39.3    | 12.8    | 42,740   | 5.3 %         |
| 1996                         | 229               | 6                         | 9,834,167            | 38.6    | 11.6    | 42,944   | 0.5 %         |
| 1997                         | 225               | 7                         | 10,039,322           | 38.2    | 11.0    | 44,619   | 3.9 %         |
| 1998                         | 216               | 6                         | 9,813,441            | 38.3    | 11.2    | 45,433   | 1.8 %         |
| 1999                         | 218               | 7                         | 9,749,682            | 38.0    | 10.7    | 44,723   | (1.6)%        |
| 2000                         | 220               | 6                         | 11,235,312           | 38.3    | 10.8    | 51,070   | 14.2 %        |
| 2001                         | 215               | 7                         | 11,615,098           | 38.2    | 10.8    | 54,024   | 5.8 %         |
| 2002                         | 218               | 5                         | 11,907,553           | 38.7    | 11.3    | 54,622   | 1.1 %         |
| 2003                         | 207               | 5                         | 11,885,130           | 39.3    | 12.0    | 57,416   | 5.1 %         |
| 2004                         | 209               | 5                         | 12,114,360           | 39.6    | 12.3    | 57,963   | 1.0 %         |
| 2005                         | 199               | 5                         | 12,085,192           | 39.9    | 12.5    | 60,730   | 4.8 %         |
| 2006                         | 201               | 5                         | 12,283,787           | 40.3    | 13.0    | 61,113   | 0.6 %         |
| 2007                         | 201               | 5                         | 12,358,265           | 40.7    | 13.3    | 61,484   | 0.6 %         |
| 2008                         | 197               | 4                         | 12,497,433           | 40.8    | 13.5    | 63,439   | 3.2 %         |
| 2009                         | 188               | 5                         | 11,953,735           | 40.3    | 13.0    | 63,584   | 0.2 %         |
| 2010                         | 190               | 5                         | 12,383,339           | 40.6    | 13.2    | 65,175   | 2.5 %         |
| 2011                         | 193               | 5                         | 12,609,794           | 40.7    | 13.0    | 65,336   | 0.2 %         |
| 2012                         | 184               | 6                         | 12,269,834           | 41.0    | 13.0    | 66,684   | 2.1 %         |
| 2013                         | 177               | 9                         | 11,700,630           | 40.2    | 12.6    | 66,105   | (0.9)%        |
| 2014                         | 183               | 11                        | 12,656,141           | 40.2    | 12.3    | 69,159   | 4.6 %         |
| 2015                         | 188               | 9                         | 13,495,955           | 40.3    | 12.3    | 71,787   | 3.8 %         |

\* *Reported payroll. Beginning in 1980, payroll was projected by a factor of 1.07 to approximate the relationship between gross payroll and the reported base payroll. Beginning in 1987, gross payroll was reported and no projection was necessary.*

## ACTIVE MEMBERS AS OF JUNE 30, 2015 EXPECTED TERMINATIONS BY TYPE IN FUTURE YEARS

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This chart shows the expected future development of the present population in simplified terms. The Retirement System presently covers 188 active members. 90% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 4% of the present population is expected to die or become disabled and receive a benefit. 5% of the present population is expected to terminate employment and forfeit eligibility for an employer provided benefit.

**ACTIVE MEMBERS AS OF JUNE 30, 2015**  
**BY ATTAINED AGE AND YEARS OF SERVICE**

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| Attained<br>Age | Years of Service to Valuation Date |           |           |           |           |          |         | Totals     |                      |
|-----------------|------------------------------------|-----------|-----------|-----------|-----------|----------|---------|------------|----------------------|
|                 | 0-4                                | 5-9       | 10-14     | 15-19     | 20-24     | 25-29    | 30 Plus | No.        | Valuation<br>Payroll |
| 20-24           | 2                                  |           |           |           |           |          |         | 2          | \$ 104,534           |
| 25-29           | 23                                 | 3         |           |           |           |          |         | 26         | 1,376,310            |
| 30-34           | 11                                 | 11        | 3         |           |           |          |         | 25         | 1,553,184            |
| 35-39           | 4                                  | 9         | 13        | 5         |           |          |         | 31         | 2,311,064            |
| 40-44           | 7                                  | 3         | 7         | 20        | 2         |          |         | 39         | 2,980,319            |
| 45-49           | 1                                  | 2         |           | 16        | 15        |          |         | 34         | 2,700,964            |
| 50-54           | 1                                  | 1         |           | 11        | 8         | 1        |         | 22         | 1,761,611            |
| 55-59           |                                    |           |           | 4         | 4         |          |         | 8          | 607,259              |
| 60              |                                    |           | 1         |           |           |          |         | 1          | 100,710              |
| <b>Totals</b>   | <b>49</b>                          | <b>29</b> | <b>24</b> | <b>56</b> | <b>29</b> | <b>1</b> |         | <b>188</b> | <b>\$13,495,955</b>  |

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

Age: 40.3 years  
Service: 12.3 years  
Annual Pay: \$71,787

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## **SECTION C**

**FINANCIAL PRINCIPLES, ACTUARIAL VALUATION  
PROCESS, ACTUARIAL COST METHODS,  
ACTUARIAL ASSUMPTIONS AND DEFINITIONS OF  
TECHNICAL TERMS**

---

## BASIC FINANCIAL PRINCIPLES AND OPERATION OF THE RETIREMENT SYSTEM

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***Benefit Promises Made Which Must Be Paid For.*** A retirement program is an orderly means of handing out, keeping track of, and financing pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit the member is, in effect, handed an “IOU” which reads: “The Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire.”

The principal related financial question is: When shall the money required to cover the “IOU” be contributed? This year, when the benefit of the member’s service is received? Or, some future year when the “IOU” becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

“Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities.”

This Retirement System meets this requirement by having as its financial objective the establishment and receipt of contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

Normal Cost (the present value of future benefits assigned to members’ service being rendered in the current year)  
... plus ...  
Interest on the Unfunded Actuarial Accrued Liability (the difference between the actuarial accrued liability and current System assets).

The accumulation of invested assets is a by-product of level percent-of-payroll contributions, not the objective. Investment income becomes the third major contributor to the retirement program, and the amount is directly reacted to the amount of contributions and investment performance.

If contributions to the retirement program are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate:

$$\mathbf{B = C + I - E}$$

The aggregate amount of Benefit payments to any group of members and their beneficiaries cannot exceed the sum of:

The aggregate amount of Contributions received on behalf of the group

. . . plus . . .

Investment earnings on contributions received and not required for immediate cash payments of benefits

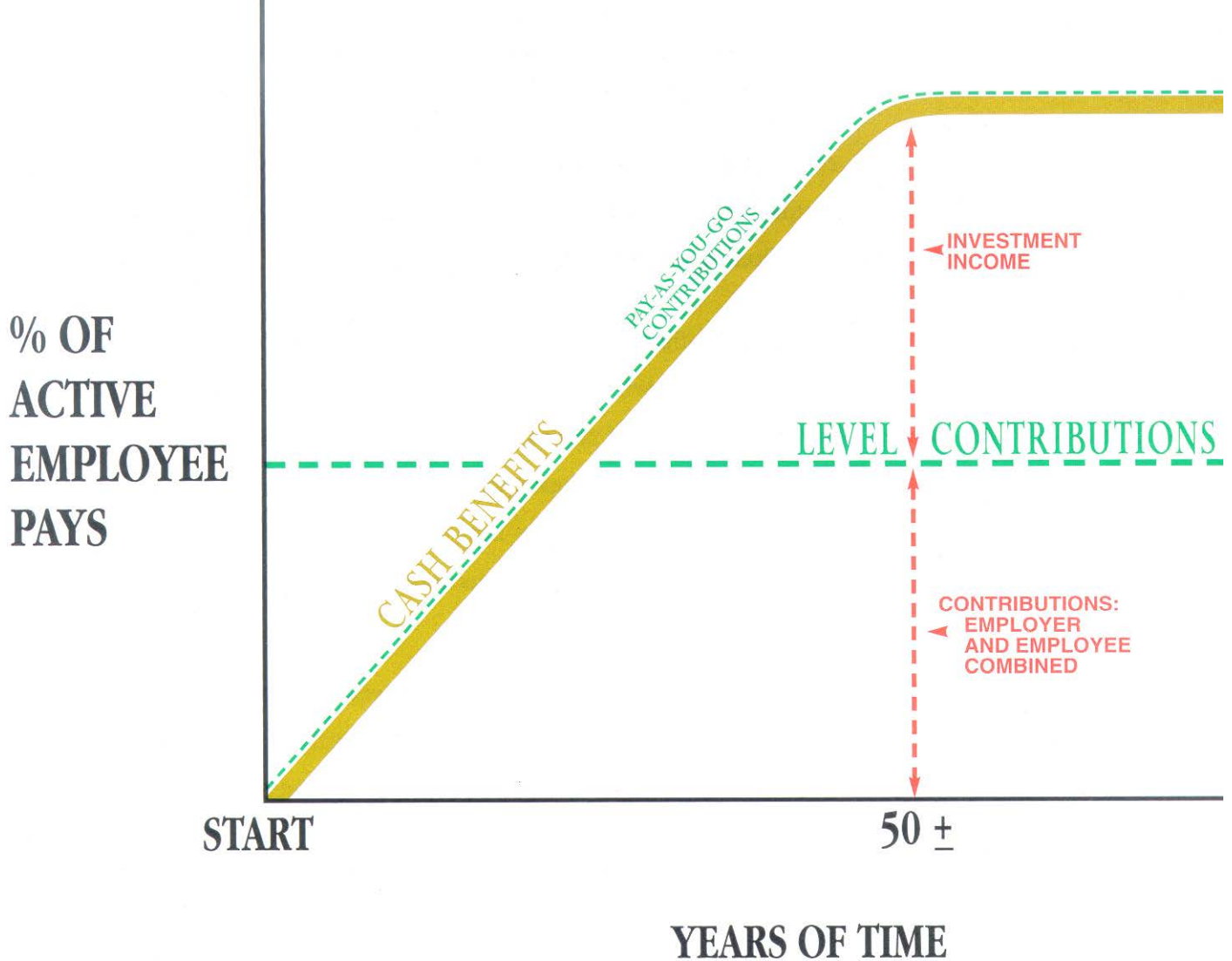
. . . minus . . .

The Expenses of operating the program.

There are retirement programs designed to defer the bulk of contributions far into the future. The present contribution rate for such systems is *artificially low*. The fact that the contribution rate is destined to increase relentlessly to a much higher level, is often ignored.

***This method of financing is prohibited in Michigan by the state constitution.***

***Computed Contribution Rate Needed To Finance Benefits.*** From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rate *by means of an actuarial valuation* -the technique of assigning monetary values to the risks assumed in operating a retirement program.



**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

Economic Risk Areas

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

## THE ACTUARIAL VALUATION PROCESS

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*The financing diagram* on the previous page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is an *increasing contribution method*; and the *level contribution method* which equalizes contributions between the generations.

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*The actuarial valuation* is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

- A. ***Covered Person Data***, furnished by plan administrator
  - Retired lives now receiving benefits
  - Former employees with vested benefits not yet payable
  - Active employees
- B. + ***Asset data*** (cash & investments), furnished by plan administrator
- C. + ***Assumptions concerning future financial experience in various risk areas***, which assumptions are established by the Retirement System after consulting with the actuary
- D. + ***The funding method*** the employer contributions (the long-term, planned pattern for employer contributions)
- E. + ***Mathematically combining the assumptions, the funding method, and the data***
- F. = Determination of:
  - Plan financial position
  - and/or New Employer Contribution Rate



## ACTUARIAL COST METHODS USED FOR THE VALUATION

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Age and Service Benefits. Normal cost and the allocation of actuarial present values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

- (i) the annual normal costs for each individual active member (usually expressed as a percent-of-payroll), payable from the member's date of hire to the member's projected date of retirement, are sufficient to accumulate the actuarial present value of the member's projected benefit at the time of retirement;
- (ii) the actuarial accrued liability under this method is equal to the assets which would have been accumulated had the normal cost contribution been made from the date of entry to the date of the valuation and had all actuarial assumptions been realized.

**Casualty Benefits.** Normal cost contributions were determined using a one year term cost method. This method produces contributions sufficient to fund the value of (i) disability benefits likely to be incurred during the year (net of the member's accrued age and service benefits), and (ii) survivor benefits likely to be incurred during the year because of a member's death while employed.

**Funding Value of Assets.** The funding value of assets is derived as follows: prior year valuation assets are increased by contributions and expected investment income and reduced by refunds and benefit payments. To this amount is added 20% of the difference between expected and actual investment income for each of the previous five years. Funding value of assets may not be less than 80% nor more than 120% of market value.

**Amortization of Unfunded Actuarial Accrued Liabilities.** Unfunded actuarial accrued liabilities were amortized by level percent-of-payroll contributions (principal and interest combined) over periods described on page C-6.

Active member payroll was assumed to increase 4.25% a year for the purpose of determining the level percent contributions. Characteristics of this method of amortization are illustrated on page C-6.

**SCHEDULE OF AMORTIZATIONS FOR  
DEVELOPMENT OF EMPLOYER CONTRIBUTION RATES  
ATTRIBUTABLE TO ACTUARIAL GAINS AND LOSSES AND CHANGES**

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| <b>Year<br/>Established</b>                      | <b>Initial<br/>Years</b> | <b>Years<br/>Remaining</b> | <b>Initial<br/>Amount</b> | <b>Previous<br/>Amount</b> | <b>Current<br/>Amount</b> | <b>Amortization<br/>Factor</b> | <b>Payment</b> | <b>Previous<br/>Payment</b> | <b>Percent-of-<br/>Payroll</b> |
|--|--------------------------|----------------------------|---------------------------|----------------------------|---------------------------|--------------------------------|----------------|-----------------------------|--------------------------------|
| <b><u>Initial Unfunded</u></b>                   |                          |                            |                           |                            |                           |                                |                |                             |                                |
| 2015   |                          | 29                         |                           |                            | \$21,210,505              | 19.9405                        | \$1,063,687    |                             | 7.56%                          |
| <b><u>Benefit Changes</u></b>                    |                          |                            |                           |                            |                           |                                |                |                             |                                |
| 2007   | 30                       | 22                         | \$4,422,379               | \$4,969,186                | 5,020,848                 | 16.4056                        | 306,045        | \$286,274                   | 2.18%                          |
| 2008   | 30                       | 23                         | 390,603                   | 433,582                    | 438,899                   | 16.9509                        | 25,892         | 24,196                      | 0.18%                          |
| 2009   | 30                       | 24                         | 121,354                   | 132,850                    | 134,707                   | 17.4821                        | 7,705          | 7,194                       | 0.05%                          |
| 2014   | 30                       | 29                         | (135,876)                 | (135,876)                  | (138,701)                 | 19.9405                        | (6,956)        | (6,463)                     | (0.05)%                        |
| <b><u>Actuarial Cost Methods/Assumptions</u></b> |                          |                            |                           |                            |                           |                                |                |                             |                                |
| 2009   | 30                       | 24                         | 1,503,821                 | 1,646,279                  | 1,669,291                 | 17.4821                        | 95,486         | 89,143                      | 0.68%                          |
| 2015   | 30                       | 30                         | 6,841,876                 | 0                          | 6,841,876                 | 21.0320                        | 325,308        | 0                           | 2.31%                          |

This schedule is maintained to arrive at the amortization amount shown on page A-2.

## ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS

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Contribution requirements and actuarial present values for a retirement system are computed by applying actuarial assumptions to the benefit provisions and member data of the system, using the actuarial cost methods described on page C-5.

The principal areas of risk which require assumptions about future experience are:

- (i) long-term rates of investment return to be generated by the assets of the system.
- (ii) patterns of pay increases to members.
- (iii) rates of mortality among members, retirees and beneficiaries.
- (iv) rates of withdrawal of active members.
- (v) rates of disability among active members.
- (vi) the age patterns of actual retirements.

In making a valuation, the monetary effect of each assumption is computed for as long as a present covered person survives - - - a period of time which can be as long as a century.

---

The employer contribution rate has been computed to remain level from year-to-year so long as benefits and the basic experience and make-up of members do not change. Examples of favorable experience which would tend to reduce the employer contribution rate are:

- (1) Investment returns in excess of 6.75% per year.
- (2) Member non-vested terminations at a higher rate than outlined on page C-11.
- (3) Mortality among retirees and beneficiaries at a higher rate than indicated by the RP-2014 Standard Mortality Tables Projected to 2019 using the MP-2014 mortality improvement scale.
- (4) Increases in the number of active members.

Examples of unfavorable experience which would tend to increase the employer contribution rate are:

- (1) Pay increases in excess of the rates outlined on page C-9.
- (2) An increase in the rate of retirement over the rates outlined on page C-12.
- (3) A pattern of hiring employees at older ages than in the past.

## **ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS (CONCLUDED)**

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Actual experience of the System will not coincide exactly with assumed experience, regardless of the choice of the assumptions, the skill of the actuary and the precision of the calculations. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time-to-time one or more of the assumptions is modified to reflect experience trends (but not random or temporary year-to-year fluctuations).

## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

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**Investment Return** (net of administrative expenses).

6.75% per year, compounded annually. This rate consists of a real rate of return of 2.50% a year plus a long-term rate of wage growth of 4.25% a year. There is no specific assumption about price inflation needed for this valuation. The assumptions made would be consistent with a price inflation assumption in the 3% to 3.5% area.

This assumption is used to equate the value of payments due at different points in time and was first used for the June 30, 2015 valuation. Approximate rates of investment return, for the purpose of comparisons with assumed rates, are shown below:

|  | Year Ended June 30        |       |        |       |       |
|--|---------------------------|-------|--------|-------|-------|
|  | 2015                      | 2014  | 2013   | 2012  | 2011  |
|  | Rate of Investment Return | 8.8 % | 10.2 % | 5.3 % | 3.1 % |

The nominal rate of return was computed using the approximate formula  $i = I$  divided by  $1/2 (A + B - D)$ , where  $I$  is recognized investment income net of expenses,  $A$  is the beginning of year asset value, and  $B$  is the end of year asset value.

These rates of return should not be used for measurement of an investment advisor's performance or for comparisons with other systems -- *to do so will mislead*.

**Pay Projections.** These assumptions are used to project current pays to those upon which benefits will be based. The assumptions were first used for the June 30, 2015 valuation.

| Sample Years of Service at Beginning of the Year | Annual Rate of Pay Increase for Sample Years of Service |                   |        |
|--|---|-------------------|--------|
|  | Base (Economic)   | Merit & Longevity | Total  |
| 0  | 4.25%   | 12.00%            | 16.25% |
| 1  | 4.25%   | 9.00%             | 13.25% |
| 2  | 4.25%   | 4.30%             | 8.55%  |
| 3  | 4.25%   | 3.50%             | 7.75%  |
| 4  | 4.25%   | 2.30%             | 6.55%  |
| 5  | 4.25%   | 2.00%             | 6.25%  |
| 6  | 4.25%   | 1.00%             | 5.25%  |
| 7  | 4.25%   | 1.00%             | 5.25%  |
| 8  | 4.25%   | 1.00%             | 5.25%  |
| 9 and over                                       | 4.25%   | 0.50%             | 4.75%  |
| Ref.   |   | 299               |        |

**ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION  
(CONTINUED)**

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If the number of active members remains constant, the total active member payroll and the average pay will increase 4.25% annually, the base portion of the individual pay increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

Changes actually experienced in average pay and total payroll have been as follows:

|               | Year Ended June 30 |       |        |        |       | 3-Year<br>Average | 5-Year<br>Average |
|---------------|--------------------|-------|--------|--------|-------|-------------------|-------------------|
|               | 2015               | 2014  | 2013   | 2012   | 2011  |                   |                   |
| Average Pay   | 3.8 %              | 4.6 % | (0.9)% | 2.1 %  | 0.2 % | 2.5 %             | 2.0 %             |
| Total Payroll | 6.6 %              | 8.2 % | (4.6)% | (2.7)% | 1.8 % | 3.2 %             | 1.7 %             |

**Mortality Table.** The RP-2014 Healthy Annuitant Mortality Table projected to 2019 using the MP-2014 mortality improvement scale. Sample values follow:

| Sample<br>Attained<br>Ages | Single Life Retirement Values            |             |                                   |       |
|----------------------------|--|-------------|-----------------------------------|-------|
|                            | Present Value of \$1<br>Monthly for Life |             | Future Life<br>Expectancy (years) |       |
|                            | Men                                      | Women       | Men                               | Women |
|                            | 50                                       | \$154.56    | \$159.36                          | 33.25 |
| 55                         | 147.07                                   | 152.60      | 28.92                             | 31.44 |
| 60                         | 138.03                                   | 144.03      | 24.73                             | 27.02 |
| 65                         | 126.97                                   | 133.41      | 20.70                             | 22.74 |
| 70                         | 113.74                                   | 120.63      | 16.85                             | 18.67 |
| 75                         | 98.40                                    | 105.77      | 13.26                             | 14.86 |
| 80                         | 81.43                                    | 89.16       | 10.01                             | 11.41 |
| Ref:                       | 1208 x 1.00                              | 1209 x 1.00 |                                   |       |

**ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION  
(CONTINUED)**

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*Mortality Table.* The RP-2014 Disabled Retirees projected to 2019 using the MP-2014 mortality improvement scale. This table was first used for the June 30, 2015 valuation. Sample values follow:

| Sample<br>Attained<br>Ages | Single Life Retirement Values            |             |                                   |       |
|----------------------------|--|-------------|-----------------------------------|-------|
|                            | Present Value of \$1<br>Monthly for Life |             | Future Life<br>Expectancy (years) |       |
|                            | Men                                      | Women       | Men                               | Women |
| 50                         | \$128.62                                 | \$140.66    | 23.75                             | 28.16 |
| 55                         | 121.95                                   | 133.96      | 20.96                             | 24.79 |
| 60                         | 114.37                                   | 126.13      | 18.26                             | 21.51 |
| 65                         | 105.27                                   | 116.26      | 15.56                             | 18.23 |
| 70                         | 94.54                                    | 104.25      | 12.93                             | 15.02 |
| 75                         | 82.24                                    | 90.80       | 10.41                             | 12.06 |
| 80                         | 68.84                                    | 76.96       | 8.08                              | 9.45  |
| Ref:                       | 1258 x 1.00                              | 1259 x 1.00 |                                   |       |

*Mortality Table.* The RP-2014 Mortality Table for Employees projected to 2019 using the MP-2014 mortality improvement scale. This table was first used for the June 30, 2015 valuation. Sample values follow:

| Sample<br>Attained<br>Ages | Single Life Retirement Values            |             |                                   |       |
|----------------------------|--|-------------|-----------------------------------|-------|
|                            | Present Value of \$1<br>Monthly for Life |             | Future Life<br>Expectancy (years) |       |
|                            | Men                                      | Women       | Men                               | Women |
| 50                         | \$159.31                                 | \$165.76    | 35.05                             | 39.48 |
| 55                         | 151.58                                   | 160.00      | 30.36                             | 34.71 |
| 60                         | 141.93                                   | 152.53      | 25.81                             | 30.01 |
| 65                         | 130.25                                   | 142.80      | 21.48                             | 25.39 |
| 70                         | 116.57                                   | 130.35      | 17.41                             | 20.87 |
| 75                         | 100.72                                   | 114.87      | 13.64                             | 16.54 |
| 80                         | 82.81                                    | 95.84       | 10.20                             | 12.42 |
| Ref:                       | 1158 x 1.00                              | 1159 x 1.00 |                                   |       |

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement.

## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION (CONTINUED)

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**Rates of separation** from active membership. The rates do not apply to members eligible to retire and do not include separation on account of death or disability. This assumption measures the probabilities of members separating from employment. Fire rates were first used for the June 30, 2002 valuation. Police rates were first used for the June 30, 2009 valuation.

| Sample<br>Ages | % of Active Members<br>Separating Within Next Year |        |
|----------------|--|--------|
|                | Police   | Fire   |
| 30             | 3.68%  | 2.90%  |
| 35             | 3.16%  | 1.50%  |
| 40             | 1.88%  | 0.60%  |
| 45             | 1.40%  | 0.50%  |
| 50             | 1.40%  | 0.50%  |
| 55             | 0.40%  | 0.50%  |
| 60             | 0.40%  | 0.50%  |
| Ref.           | 235 x 0.8  | 54 x 1 |

**Rates of Disability.** These assumptions represent the probabilities of active members becoming disabled.

These rates were first used for the June 30, 2015 valuation.

| Sample<br>Ages | % of Active Members Becoming<br>Disabled Within Next Year |        |
|----------------|---|--------|
|                | Male  | Female |
| 20             | 0.06%   | 0.08%  |
| 25             | 0.06%   | 0.08%  |
| 30             | 0.06%   | 0.08%  |
| 35             | 0.06%   | 0.08%  |
| 40             | 0.15%   | 0.27%  |
| 45             | 0.20%   | 0.30%  |
| 50             | 0.37%   | 0.43%  |
| 55             | 0.67%   | 0.57%  |
| 60             | 1.06%   | 0.76%  |
| Ref.           | 9   | 10     |



## ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION (CONCLUDED)

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**Rates of Retirement.** These rates are used to measure the probabilities of an eligible member retiring during the next year.

| Percent of Active<br>Members Retiring Within Next Year |        |      |      |
|--|--------|------|------|
| Retirement<br>Ages                                     | Police | Fire |      |
|  |        | IAAF | OSP  |
| 50   |        |      | 20%  |
| 51   |        |      | 15%  |
| 52-56  |        |      | 10%  |
| 57   |        |      | 15%  |
| 58   |        |      | 25%  |
| 59   |        |      | 30%  |
| 60-65  | 35%    | 20%  | 100% |
| 66   | 25%    | 15%  | 100% |
| 67   | 20%    | 10%  | 100% |
| 68-71  | 15%    | 10%  | 100% |
| 72   | 15%    | 15%  | 100% |
| 73   | 25%    | 25%  | 100% |
| 74   | 30%    | 30%  | 100% |
| 75 & Over  | 100%   | 100% | 100% |
| Ref  | 552    | 553  | 24   |

| Percent of Active<br>Members Retiring Within Next Year |        |           |
|--|--------|-----------|
| Service  | Police | Fire IAAF |
| 25   | 60%    | 60%       |
| 26   | 30%    | 35%       |
| 27   | 30%    | 35%       |
| 28   | 30%    | 20%       |
| 29   | 20%    | 20%       |
| 30   | 20%    | 20%       |
| 31   | 20%    | 20%       |
| 32   | 20%    | 20%       |
| 33   | 20%    | 20%       |
| 34   | 20%    | 20%       |
| 35 & Over  | 100%   | 100%      |
| Ref  | 1788   | 821       |

Fire (OSP) members were assumed to be eligible for retirement after attaining age 50 with 25 or more years of service, or age 60 with 10 or more years of service. All others are eligible with 25 years of service at any age or at age 60 regardless of service.

These rates were first used for the June 30, 2009 valuation.

**Lump sum payments** included in the calculation of the average pay upon which benefits are computed were assumed to increase benefits by the following percents.

Unused Vacation time: 5% for Represented groups and 8% for Police Lieutenants

**Active Member Group Size.** The number of active members was assumed to remain constant. This assumption is unchanged from previous valuations.

## DEFINITIONS OF TECHNICAL TERMS

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***Accrued Service.*** Service credited under the system which was rendered before the date of the actuarial valuation.

***Actuarial Accrued Liability.*** The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as “past service liability.”

***Actuarial Assumptions.*** Estimates of future 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 benefit” between future normal cost and actuarial accrued liabilities. Sometimes referred to as the “actuarial funding method.”

***Actuarial Equivalent.*** One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

***Actuarial Gain (Loss).*** The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

***Actuarial Present Value.*** The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

## DEFINITIONS OF TECHNICAL TERMS (CONCLUDED)

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**Actuary.** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation A.S.A., and ultimately to Fellowship with the designation of F.S.A.

**Amortization.** Paying off an interest-discounted amount with periodic payments of interest and (generally) principal -- as opposed to paying it off with a lump sum payment.

**Credited Projected Benefit.** The portion of a member's projected benefit attributable to service before the valuation date - allocated based on the ratio of accrued service to projected total service and based on anticipated future compensation.

**Normal Cost.** The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as "current service cost."

**Unfunded Actuarial Accrued Liabilities.** The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as "unfunded past service liability" or "unfunded supplemental present value."

Most retirement systems have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs.

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

**Valuation Assets.** The value of cash, investments and other property belonging to a pension plan, as used for the purpose of an actuarial valuation.

## PENSIONS IN AN INFLATIONARY ENVIRONMENT

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**Value of \$1,000/month Retirement Benefit  
to an Individual Who Retires at Age 55  
in an Environment of 3.25% Price Inflation**

| Age | COLA Rate |         |
|-----|-----------|---------|
|     | 2.5%      | 0%      |
| 55  | \$1,000   | \$1,000 |
| 56  | 993       | 969     |
| 57  | 986       | 938     |
| 58  | 978       | 909     |
| 59  | 971       | 880     |
| 60  | 964       | 852     |
| 65  | 930       | 726     |
| 70  | 896       | 619     |
| 75  | 864       | 527     |
| 80  | 833       | 450     |
| 85  | 804       | 383     |

The life expectancy of a 60-year-old male is to age 85. The life expectancy for a 60-year-old female is to age 87. Half of the people will outlive their life expectancy. The effects of even moderate amounts of inflation can be significant for those who live to an advanced age.

## MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

### JUNE 30, 2015

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|                                    |   |
|------------------------------------|---|
| <b>Marriage Assumption:</b>        | 100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. 80% of retirees are assumed to have a spouse eligible for the 60% death after retirement survivor benefit. |
| <b>Pay Increase Timing:</b>        | Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.  |
| <b>Decrement Timing:</b>           | All decrements are assumed to occur at the middle of the year.  |
| <b>Eligibility Testing:</b>        | Eligibility for benefits is determined using the age nearest birthday and the service nearest whole year on the date the decrement is assumed to occur.   |
| <b>Decrement Relativity:</b>       | Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.   |
| <b>Decrement Operation:</b>        | Disability and mortality decrements do not operate during the first 5 years of service. Disability also does not operate during retirement eligibility.   |
| <b>Normal Form of Benefit:</b>     | The assumed normal form of benefit is the 60% joint and survivor form.  |
| <b>Incidence of Contributions:</b> | Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.   |
| <b>Approximation:</b>              | Liabilities were adjusted by 5.0% (8% for Police Lieutenants and 0% for Non-Represented) to allow for lump sums included in final average pay at retirement.  |

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## **SECTION D**

### **FINANCIAL REPORTING**

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**This information is presented in draft form for review by the System's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the System's financial statements.**

**STATEMENT OF SYSTEM ASSETS  
AS OF JUNE 30, 2015 AND 2014**

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|  | <b>2015</b>   | <b>2014</b>   |
|--|---------------|---------------|
| Assets   |               |               |
| Cash and Short-Term Investments                          | \$ 6,141,722  | \$ 5,646,051  |
| Depository Receipts                                      | 0             | 0             |
| Money Markets  | 0             | 0             |
| Receivables  |               |               |
| Accrued Interest and Dividends                           | 419,381       | 423,082       |
| Investments  |               |               |
| U.S. Government Bonds                                    | 2,927,774     | 3,627,184     |
| Corporate Bonds  | 15,463,201    | 12,990,023    |
| Common Stocks  | 66,299,683    | 68,432,125    |
| Real Estate  | 463,985       | 310,303       |
| Other  | 42,530,073    | 42,929,715    |
|  | 127,684,716   | 128,289,350   |
| Accounts Receivable                                      | (395,385)     | (419,818)     |
| Net assets held in trust for pension and health benefits | \$133,850,434 | \$133,938,665 |

**STATEMENT OF CHANGES IN SYSTEM ASSETS  
FOR THE FISCAL YEARS ENDED JUNE 30, 2015 AND JUNE 30, 2014**

---

|  | <b>June 30, 2015 @</b> | <b>June 30, 2014 @</b> |
|--|------------------------|------------------------|
| <b>Additions</b>   |                        |                        |
| Contributions  |                        |                        |
| Employer   | \$ 3,594,446           | \$ 3,803,408           |
| Plan members   | 1,166,241              | 984,463                |
| Total contributions                                      | 4,760,687              | 4,787,871              |
| Investment Income  | 4,532,861              | 17,071,140             |
| <b>Total additions</b>                                   | <b>9,293,548</b>       | <b>21,859,011</b>      |
| <b>Deductions</b>  |                        |                        |
| Benefits   | 9,358,827              | 8,899,974              |
| Refunds of contributions                                 | 22,952                 | 47,356                 |
| Health insurance premiums                                | 0                      | 0                      |
| <b>Total deductions</b>                                  | <b>9,381,779</b>       | <b>8,947,330</b>       |
| <b>Net Increase</b>                                      | <b>(88,231)</b>        | <b>12,911,681</b>      |
| <b>Net assets held in trust<br/>for pension benefits</b> |                        |                        |
| Beginning of year  | 133,938,665            | 121,026,984            |
| End of year  | \$133,850,434          | \$133,938,665          |

@ Net of health reserve.

The calculation of realized gains and losses is independent of the calculation of appreciation (depreciation) in the fair value of plan investments. Unrealized gains and losses in investments sold in the current year that had been held for more than one year were included in the net appreciation (depreciation) reported in the prior years and the current year.



**Plan Description.** The City of Battle Creek Police and Fire Retirement System is a single-employer defined benefit pension plan that covers the Police and Fire employees of the City of Battle Creek.

The plan provides retirement, disability, and death benefits to plan members and their beneficiaries.

**Contributions.** Plan member contributions are in accordance with the schedule on page B-2.

The employer's funding policy provides for periodic employer contributions based upon a *fundamental financial objective of having rates of contribution which remain relatively level from generation to generation of the City of Battle Creek citizens.* To determine the employer contribution rates and to assess the extent to which the fundamental financial objective is being achieved, the System has actuarial valuations prepared annually. In preparing those valuations, the entry age actuarial cost method is used to determine normal cost and actuarial accrued liabilities.

Unfunded actuarial accrued liabilities (full funding credit) are amortized by level percent-of-payroll contributions over a period of future years as outlined on page C-6.

On the basis of the June 30, 2015 actuarial valuation, the employer rates were determined to be as follows:

| <b>Contributions for</b>   | <b>Percents of Active Member Payroll</b> |
|----------------------------|--|
| Normal Cost                | 16.98 %                                  |
| Accrued Liabilities        | 12.91 %                                  |
| <b>Total Employer Rate</b> | <b>29.89 %</b>                           |

**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF FUNDING PROGRESS**

| <b>Actuarial Valuation Date</b> | <b>Actuarial Value of Assets (a)</b> | <b>Actuarial Accrued Liability (AAL) Entry-Age (b)</b> | <b>Unfunded AAL (UAAL) (b)-(a)</b> | <b>Funded Ratio (a)/(b)</b> | <b>Covered Payroll (c)</b> | <b>UAAL as a Percent of Covered Payroll [(b)-(a)]/(c)</b> |
|---------------------------------|--------------------------------------|--|------------------------------------|-----------------------------|----------------------------|---|
| 6/30/96                         | \$ 65,885,237                        | \$ 66,859,894  | \$ 974,657                         | 98.5 %                      | \$ 9,834,167               | 9.9 %   |
| 6/30/97                         | 72,134,308                           | 71,456,325   | (677,983)                          | 100.8 %                     | 10,039,322                 | (6.0)%  |
| 6/30/98                         | 79,796,431                           | 74,796,184   | (5,000,247)                        | 106.7 %                     | 9,813,441                  | (51.0)%   |
| 6/30/99                         | 87,617,793                           | 78,285,848   | (9,331,945)                        | 111.9 %                     | 9,749,682                  | (95.7)%   |
| 6/30/00                         | 95,548,441                           | 83,980,778   | (11,567,663)                       | 113.8 %                     | 11,235,312                 | (103.0)%  |
| 6/30/01                         | 101,190,705                          | 87,909,496   | (13,281,209)                       | 115.1 %                     | 11,615,098                 | (114.3)%  |
| 6/30/02*                        | 103,950,731                          | 95,368,883   | (8,581,848)                        | 109.0 %                     | 11,907,553                 | (72.1)%   |
| 6/30/03#                        | 103,655,770                          | 100,346,606  | (3,309,164)                        | 103.3 %                     | 11,885,130                 | (27.8)%   |
| 6/30/04                         | 103,745,735                          | 104,336,169  | 590,434                            | 99.4 %                      | 12,114,360                 | 4.9 %   |
| 6/30/05                         | 102,755,663                          | 110,487,311  | 7,731,648                          | 93.0 %                      | 12,085,192                 | 64.0 %  |
| 6/30/06                         | 103,283,413                          | 114,501,359  | 11,217,946                         | 90.2 %                      | 12,283,787                 | 91.3 %  |
| 6/30/07#                        | 108,245,308                          | 121,823,413  | 13,578,105                         | 88.9 %                      | 12,358,265                 | 109.9 %   |
| 6/30/08#                        | 113,285,618                          | 126,752,205  | 13,466,587                         | 89.4 %                      | 12,497,433                 | 107.8 %   |
| 6/30/09*                        | 112,094,168                          | 133,052,817  | 20,958,649                         | 84.2 %                      | 11,953,735                 | 175.3 %   |
| 6/30/10                         | 112,804,385                          | 137,557,259  | 24,752,874                         | 82.0 %                      | 12,383,339                 | 199.9 %   |
| 6/30/11                         | 115,774,764                          | 140,863,694  | 25,088,930                         | 82.2 %                      | 12,609,794                 | 199.0 %   |
| 6/30/12                         | 115,083,128                          | 145,540,951  | 30,457,823                         | 79.1 %                      | 12,269,834                 | 248.2 %   |
| 6/30/13                         | 117,879,023                          | 149,004,999  | 31,125,976                         | 79.1 %                      | 11,700,630                 | 266.0 %   |
| 6/30/14#                        | 125,526,809                          | 154,037,977  | 28,511,168                         | 81.5 %                      | 12,656,141                 | 225.3 %   |
| 6/30/15                         | 131,757,916                          | 160,093,465  | 28,335,549                         | 82.3 %                      | 13,495,955                 | 210.0 %   |
| 6/30/15*                        | 131,757,916                          | 166,935,341  | 35,177,425                         | 78.9 %                      | 13,495,955                 | 260.7 %   |

\* Revised actuarial assumptions.

# Plan amendment.

## SCHEDULE OF EMPLOYER CONTRIBUTIONS

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| Year Ended<br>June 30 | Annual Recommended<br>Contribution |
|-----------------------|------------------------------------|
| 1996                  | \$1,451,506                        |
| 1997                  | 1,672,926                          |
| 1998                  | 1,908,106                          |
| 1999                  | 1,337,217                          |
| 2000                  | 1,059,168                          |
| 2001                  | 732,366                            |
| 2002                  | 622,529                            |
| 2003                  | 468,005                            |
| 2004                  | 1,268,053                          |
| 2005                  | 1,824,879                          |
| 2006                  | 2,458,298                          |
| 2007                  | 2,990,893                          |
| 2008                  | 3,617,333                          |
| 2009                  | 3,408,721                          |
| 2010                  | 3,116,270                          |
| 2011                  | 3,846,195                          |
| 2012                  | 3,659,617                          |
| 2013                  | 3,592,634                          |
| 2014                  | 3,803,408                          |
| 2015                  | 3,594,446                          |

This information is presented in draft form for review by the City's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the City's financial statements.

## SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

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

|                                   |   |
|-----------------------------------|---|
| Valuation date                    | June 30, 2015   |
| Actuarial cost method             | Entry-age actuarial cost method   |
| Amortization method               | Level percent-of-payroll  |
| Remaining amortization period     | 30-year closed for benefit improvements<br>and assumption changes<br>29-year closed for all other liabilities |
| Asset valuation method            | 5-year smoothed market with 20%<br>corridor   |
| Actuarial assumptions:            |   |
| Investment rate of return         | 6.75%   |
| Projected salary increases        | 4.75% - 16.25%  |
| Assumed rate of payroll growth    | 4.25%   |
| Assumed rate of membership growth | 0%  |
| Cost-of-living adjustments        | N/A   |