# Fiscal Year 2017
# Actuarial Valuation Report
for the
# New York City
# Fire Pension Fund

*JUNE 30, 2015 (LAG) ACTUARIAL VALUATION*

prepared by the

New York City

Office of the Actuary

2017

OFFICE OF THE ACTUARY

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SHERRY S. CHAN
CHIEF ACTUARY

June 29, 2018

Board of Trustees
New York City Fire Pension Fund and Group Life Insurance Plan
9 MetroTech Center
Brooklyn, NY 11201

Re: Fiscal Year 2017 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2015 (Lag) actuarial valuation of the benefits under both the New York City Fire Pension Fund (FIRE) and Group Life Insurance Plan (collectively, the Plan). These results form the basis for determining the statutorily-required Contribution (Statutory Contribution) of $1,061,169,993 for Fiscal Year 2017 (i.e. for the period beginning July 1, 2016 and ending June 30, 2017). Calculations made for other purposes may be significantly different than the results shown herein.

All results are based on final SKIM amounts as determined by the Actuary in the letter dated May 12, 2017 to the Boards. Results of the June 30, 2014 (Lag) actuarial valuation are shown in this Report for comparative purposes. Other historical information that the Actuary believes are useful is also included.

The June 30, 2015 (Lag) and June 30, 2014 (Lag) actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employer's payroll facilities. Financial information was provided as of June 30, 2015 and June 30, 2014 by both FIRE and the Office of the Comptroller.

Consistent with Actuarial Standards of Practice, the Office of the Actuary has reviewed census data and financial information for consistency and reasonability but has not audited it. The results and calculations contained in this Report are dependent on the accuracy of this census data and financial information. To the extent any such data or information provided is materially inaccurate or incomplete, the results contained herein will require revision.

A summary of the benefits available under the terms of the Plan, which are unchanged from the prior valuation, is shown in SECTION VIII - SUMMARY OF PLAN PROVISIONS.

The City of New York prepared its Fiscal Year 2016 financial statements in accordance with Government Accounting Standards Board Statement No. 68 (GASB 68). FIRE prepared its Fiscal Year 2016 Comprehensive Annual Financial Report (CAFR) in accordance with GASB Statement No. 67 (GASB 67). The Office of the Actuary published GASB 67 and GASB 68 results for Fiscal Year 2016 in a separate report dated October 11, 2016 which is available on the Office of the Actuary website (www.nyc.gov/actuary). The enclosed report does not address GASB results.

I, Sherry S. Chan, am the Chief Actuary for, and independent of, the New York City Retirement Systems and Pension Funds. I am a Fellow of the Society of Actuaries, an Enrolled Actuary under the Employee Retirement Income and Security Act of 1974 (ERISA), a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. To the best of my knowledge, the results contained herein have been prepared in accordance with generally accepted actuarial principles and procedures and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Best Regards,

Sherry Chan

Sherry S. Chan, FSA, EA, MAAA, FCA
Chief Actuary

SSC/eh

cc:

Mr. Patrick Dunn - New York City Fire Pension Fund
Ms. Marlene Markoe-Boyd - New York City Office of the Actuary
Mr. Sam Rumley - New York City Office of the Actuary
Mr. Michael Samet - New York City Office of the Actuary
Keith Snow, Esq. - New York City Office of the Actuary
Ms. Lei Tian - New York City Fire Pension Fund

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# SECTION I – EXECUTIVE SUMMARY

This actuarial valuation report presents the results of the June 30, 2015 (Lag) actuarial valuation of the New York City Fire Pension Fund (FIRE) and Group Life Insurance Plan (collectively, the Plan).

The purposes of the valuation are:

- To determine the actuarially-required contribution (Actuarial Contribution) and the statutorily-required contribution (Statutory Contribution) for Fiscal Year 2017 (i.e. July 1, 2016 to June 30, 2017),
- To measure the funding progress of the Plan,
- To disclose the census data and financial information used in the valuation, and
- To disclose the actuarial assumptions and actuarial methods used to determine the Actuarial Contribution.

This Report does not provide financial and accounting information needed to meet the current requirements of GASB. That information is provided in a separate report.

All results are based on Final SKIM amounts as determined by the Actuary in the memo dated May 12, 2017 to the Boards. All results are without regard to the Variable Supplements Funds, unless specifically noted.

Future measurements of this information may differ from current measurements for many reasons including, but not limited to, experience differing from economic or demographic assumptions, changes in actuarial assumptions, and changes in applicable statute and plan provisions.

## Table I-1
## Executive Summary

Presented in **Table I-1** are the principal results of the June 30, 2015 (Lag) actuarial valuation and, for comparative purposes, the June 30, 2014 (Lag) actuarial valuation.

NEW YORK CITY FIRE PENSION FUND

SUMMARY OF VALUATION RESULTS

| Valuation Date | June 30, 2015 (Lag) | June 30, 2014 (Lag) |
|---|---|---|
| **Fiscal Year** | **2017** | **2016** |
| **Funded Status** | | |
| 1. Actuarial Accrued Liability | $ 18,688,642,425 | $ 18,028,694,567 |
| 2. Actuarial Value of Assets (AVA)[1] | 10,504,728,000 | 9,808,854,000 |
| 3. Unfunded Actuarial Accrued Liability (AVA Basis) (1. - 2.) | $ 8,183,914,425 | $ 8,219,840,567 |
| 4. Funded Ratio (AVA Basis) (2. / 1.) | 56.2% | 54.4% |
| 5. Market Value of Assets (MVA)[1] | 10,815,330,000 | 10,595,838,000 |
| 6. Unfunded Actuarial Accrued Liability (MVA Basis) (1. - 5.) | $ 7,873,312,425 | $ 7,432,856,567 |
| 7. Funded Ratio (MVA Basis) (5. / 1.) | 57.9% | 58.8% |
| **Contribution**[2] | | |
| 1. Normal Cost | $ 409,404,419 | $ 421,219,767 |
| 2. Amortization of Unfunded Actuarial Accrued Liability | 651,765,574 | 633,257,864 |
| 3. Administrative Expenses | NA | NA |
| 4. Actuarial Contribution (1. + 2. + 3.) | $ 1,061,169,993 | $ 1,054,477,631 |
| 5. Statutory Contribution (4.) | $ 1,061,169,993 | $ 1,054,477,631 |
| **Participant Data** | | |
| 1. Active Members | | |
| a. Number | 10,780 | 10,319 |
| b. Annual Salary[3] | $ 1,164,994,036 | $ 1,150,389,645 |
| c. Average Salary | $ 108,070 | $ 111,483 |
| 2. Active/Inactive Members[4] | 18 | 16 |
| 3. Terminated Vested Members | 32 | 40 |
| 4. Retirees and Beneficiaries | | |
| a. Number | 16,710 | 16,763 |
| b. Total Annual Benefits | $ 1,052,202,954 | $ 1,015,150,510 |
| c. Average Annual Benefit | $ 62,968 | $ 60,559 |

[1] Actuarial Value of Assets and Market Value of Assets are rounded to the nearest thousand.

[2] Including results for Variable Supplements Funds.

[3] Salaries shown are the base salary plus assumed overtime paid and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

[4] Represents members no longer on payroll, but not otherwise classified.

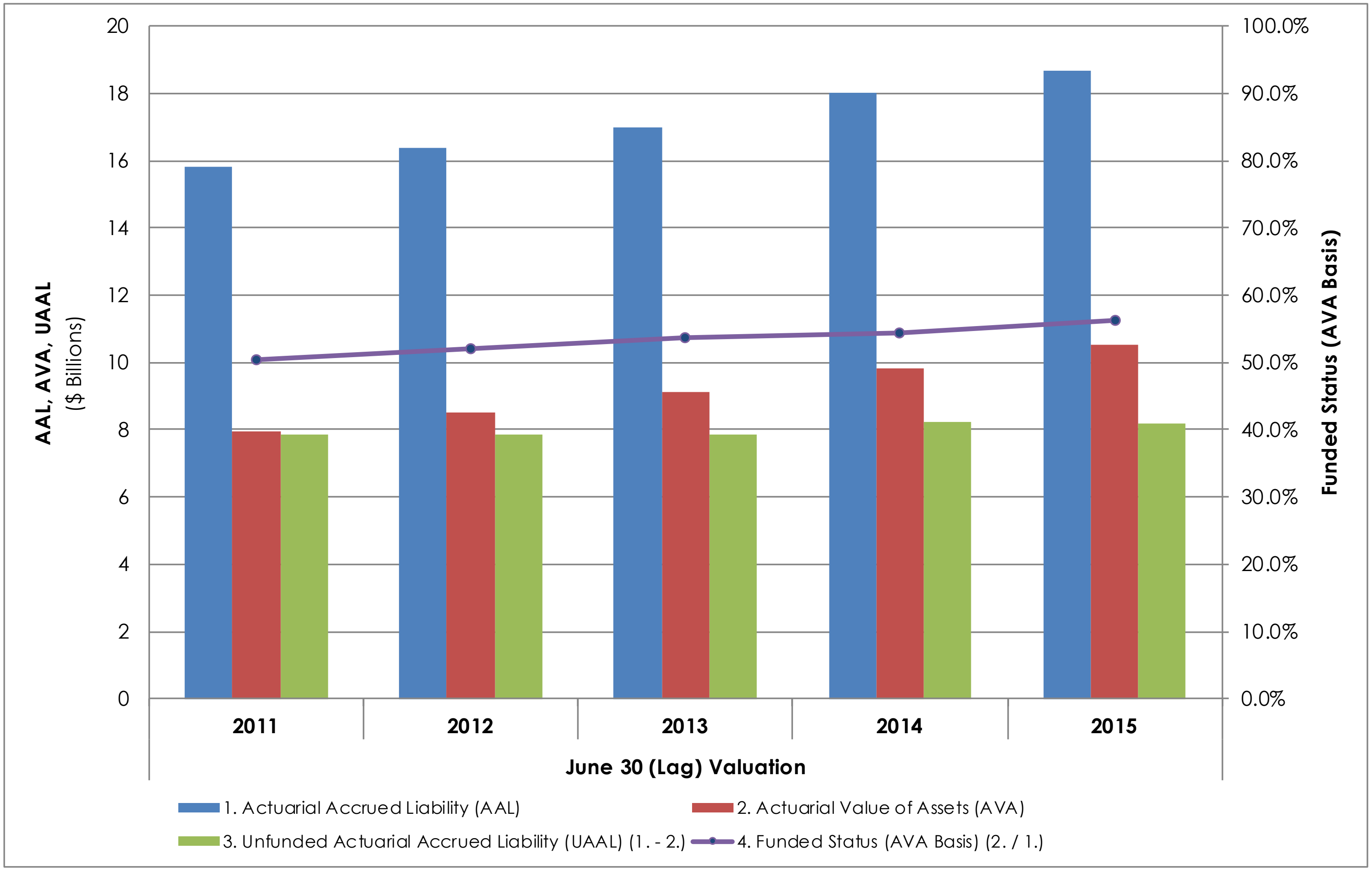
## Table I-2
## Actuarial Liabilities

| NEW YORK CITY FIRE PENSION FUND<br>LIABILITY BY STATUS | | |
|---|---|---|
| **Valuation Date** | **June 30, 2015 (Lag)** | **June 30, 2014 (Lag)** |
| **Fiscal Year** | **2017** | **2016** |
| **Actuarial Accrued Liability** | | |
| 1. Active Members | $ 6,991,286,330 | $ 6,752,131,850 |
| 2. Active/Inactive Members[1] | 7,337,667 | 5,883,166 |
| 3. Terminated Vested Members | 6,069,033 | 7,142,568 |
| 4. Retirees and Beneficiaries | 11,455,492,345 | 11,033,573,133 |
| 5. Actuarial Accrued Liability Pre-Adjustments (1. to 4.) | $ 18,460,185,375 | $ 17,798,730,717 |
| 6. Actuarial Adjustments[2] | 228,457,050 | 229,963,850 |
| 7. Total Actuarial Accrued Liability (AAL) (5. + 6.) | $ 18,688,642,425 | $ 18,028,694,567 |
| **Present Value of Benefits** | | |
| 1. Active Members | $ 10,820,079,982 | $ 10,531,642,579 |
| 2. Active/Inactive Members[1] | 7,337,667 | 5,883,166 |
| 3. Terminated Vested Members | 6,069,033 | 7,142,568 |
| 4. Retirees and Beneficiaries | 11,455,492,345 | 11,033,573,133 |
| 5. Present Value of Benefits (1. to 4.) | $ 22,288,979,027 | $ 21,578,241,446 |
| 6. Actuarial Adjustments[2] | 403,088,369 | 389,237,778 |
| 7. Total Present Value of Benefits (5. + 6.) | $ 22,692,067,396 | $ 21,967,479,224 |

[1] Represents members no longer on payroll, but not otherwise classified.

[2] Includes unfunded VSF liability and other actuarial loading adjustments.

## Graph I-3
## Historical Funded Status



## SECTION II – SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2015 (Lag) and June 30, 2014 (Lag) actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employer's payroll facilities.

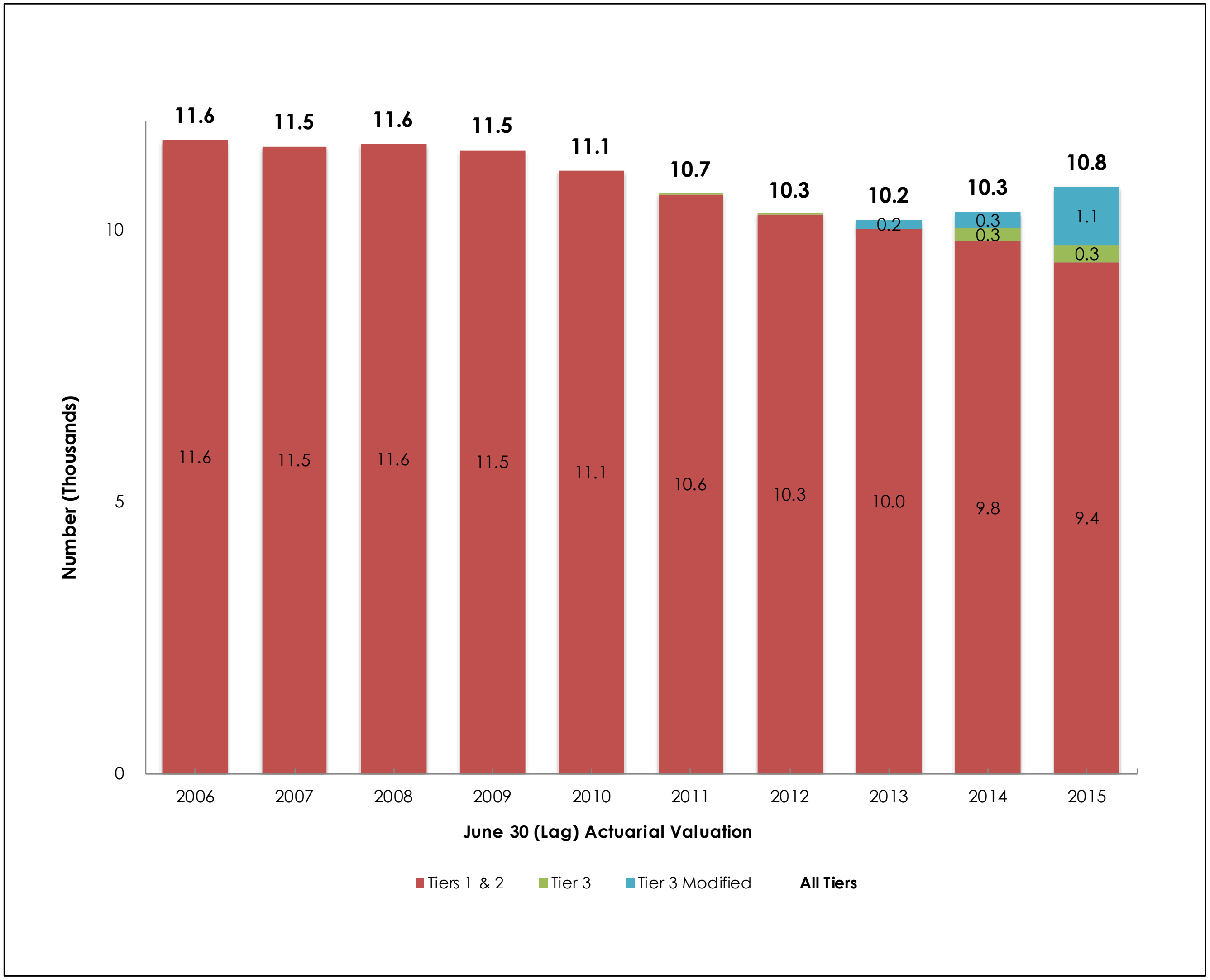
Consistent with Actuarial Standards of Practice, the Office of the Actuary has reviewed census data for consistency and reasonability but has not audited it. The results and calculations contained in this Report are dependent on the accuracy of this census data. To the extent any such data or information provided is materially inaccurate or incomplete, the results contained herein will require revision.

## Table II-1
## Summary of Active Membership

| NEW YORK CITY FIRE PENSION FUND<br><br>ACTIVE MEMBERS INCLUDED IN THE<br>JUNE 30, 2015 (LAG) AND THE JUNE 30, 2014 (LAG) ACTUARIAL VALUATIONS | | |
|---|---|---|
| | **June 30, 2015 (Lag)** | **June 30, 2014 (Lag)** |
| Number | | |
| Males | 10,714 | 10,263 |
| Females | 66 | 56 |
| Total | 10,780 | 10,319 |
| Annual Salary[1] | | |
| Males | $ 1,158,561,564 | $ 1,144,651,082 |
| Females | 6,432,472 | 5,738,563 |
| Total | $ 1,164,994,036 | $ 1,150,389,645 |
| Average Salary[1] | | |
| Males | $ 108,135 | $ 111,532 |
| Females | 97,462 | 102,474 |
| Total Average | $ 108,070 | $ 111,483 |
| Average Age | | |
| Males | 40.8 | 41.2 |
| Females | 37.9 | 38.6 |
| Total Average | 40.8 | 41.2 |
| Average Past Service | | |
| Males | 14.2 | 14.6 |
| Females | 9.2 | 9.7 |
| Total Average | 14.1 | 14.6 |

[1] Salaries shown are the base salary plus assumed overtime paid and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

Graph II-2
Active Membership by Tier



## Table II-3
## Summary of Pensioner Membership

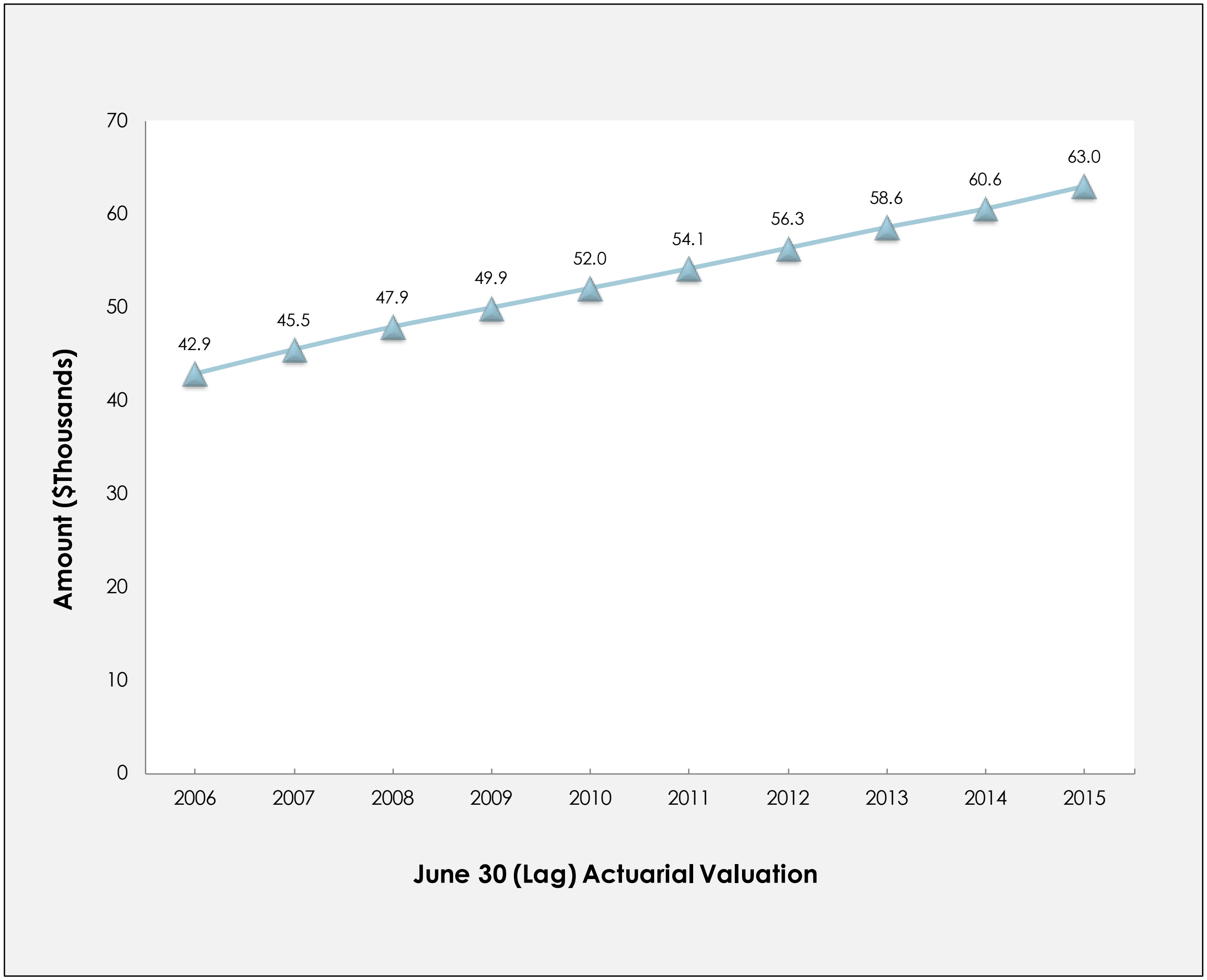
| Group | June 30, 2015 (Lag) | | | | June 30, 2014 (Lag) | | | |
|---|---|---|---|---|---|---|---|---|
| | | Annual Amounts Payable | | | | Annual Amounts Payable | | |
| | Number | Plan Benefit | Supplementation | Total | Number | Plan Benefit | Supplementation | Total |
| Service Pensioners | **5,305** | $ 218,515,679 | $ 25,155,143 | **$ 243,670,822** | **5,427** | $ 216,213,356 | $ 26,148,396 | **$ 242,361,752** |
| Ordinary Disability Pensioners | **904** | 40,244,492 | 5,912,827 | **46,157,319** | **959** | 42,367,081 | 6,275,332 | **48,642,413** |
| Accidental Disability Pensioners | **9,390** | 690,738,217 | 38,878,694 | **729,616,911** | **9,223** | 652,673,511 | 39,447,087 | **692,120,598** |
| Beneficiaries of Members Killed in the Line-of-Duty | **635** | 21,611,545 | 2,466,987 | **24,078,532** | **626** | 20,847,722 | 2,449,336 | **23,297,058** |
| Other Beneficiaries | **476** | 7,318,079 | 1,361,291 | **8,679,370** | **528** | 7,234,172 | 1,494,517 | **8,728,689** |
| Total | **16,710** | **$ 978,428,012** | **$ 73,774,942** | **$ 1,052,202,954** | **16,763** | **$ 939,335,842** | **$ 75,814,668** | **$ 1,015,150,510** |

## Table II-4
## Distribution of Pensioners and Benefits at June 30, 2015

| | MALE | | | FEMALE | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|
| AGE | NUMBER | BENEFITS | AVERAGE | NUMBER | BENEFITS | AVERAGE | NUMBER | BENEFITS | AVERAGE |
| *SERVICE RETIREMENT:* | | | | | | | | | |
| UNDER 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 TO 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 TO 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 TO 44 | 10 | 585,699 | 58,570 | 1 | 67,118 | 67,118 | 11 | 652,817 | 59,347 |
| 45 TO 49 | 73 | 4,709,862 | 64,519 | 0 | 0 | 0 | 73 | 4,709,862 | 64,519 |
| 50 TO 54 | 193 | 12,358,458 | 64,033 | 0 | 0 | 0 | 193 | 12,358,458 | 64,033 |
| 55 TO 59 | 666 | 39,758,290 | 59,697 | 3 | 151,228 | 50,409 | 669 | 39,909,518 | 59,655 |
| 60 TO 64 | 603 | 33,610,840 | 55,739 | 2 | 65,478 | 32,739 | 605 | 33,676,318 | 55,663 |
| 65 TO 69 | 640 | 32,182,892 | 50,286 | 1 | 33,011 | 33,011 | 641 | 32,215,903 | 50,259 |
| 70 TO 74 | 828 | 36,938,243 | 44,611 | 0 | 0 | 0 | 828 | 36,938,243 | 44,611 |
| 75 TO 79 | 1,015 | 39,876,008 | 39,287 | 1 | 34,580 | 34,580 | 1,016 | 39,910,588 | 39,282 |
| 80 TO 84 | 701 | 24,627,947 | 35,133 | 0 | 0 | 0 | 701 | 24,627,947 | 35,133 |
| 85 TO 89 | 360 | 12,080,053 | 33,556 | 0 | 0 | 0 | 360 | 12,080,053 | 33,556 |
| 90 & UP | 208 | 6,591,115 | 31,688 | 0 | 0 | 0 | 208 | 6,591,115 | 31,688 |
| **TOTAL** | **5,297** | **243,319,407** | **45,935** | **8** | **351,415** | **43,927** | **5,305** | **243,670,822** | **45,932** |
| *ORDINARY DISABILITY:* | | | | | | | | | |
| UNDER 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 TO 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 TO 39 | 3 | 77,397 | 25,799 | 0 | 0 | 0 | 3 | 77,397 | 25,799 |
| 40 TO 44 | 3 | 79,401 | 26,467 | 0 | 0 | 0 | 3 | 79,401 | 26,467 |
| 45 TO 49 | 8 | 299,621 | 37,453 | 0 | 0 | 0 | 8 | 299,621 | 37,453 |
| 50 TO 54 | 14 | 419,738 | 29,981 | 0 | 0 | 0 | 14 | 419,738 | 29,981 |
| 55 TO 59 | 42 | 1,103,872 | 26,283 | 1 | 28,788 | 28,788 | 43 | 1,132,660 | 26,341 |
| 60 TO 64 | 47 | 1,278,206 | 27,196 | 0 | 0 | 0 | 47 | 1,278,206 | 27,196 |
| 65 TO 69 | 57 | 3,379,057 | 59,282 | 0 | 0 | 0 | 57 | 3,379,057 | 59,282 |
| 70 TO 74 | 118 | 7,047,723 | 59,726 | 0 | 0 | 0 | 118 | 7,047,723 | 59,726 |
| 75 TO 79 | 226 | 13,569,177 | 60,041 | 0 | 0 | 0 | 226 | 13,569,177 | 60,041 |
| 80 TO 84 | 211 | 10,986,772 | 52,070 | 0 | 0 | 0 | 211 | 10,986,772 | 52,070 |
| 85 TO 89 | 115 | 5,360,943 | 46,617 | 0 | 0 | 0 | 115 | 5,360,943 | 46,617 |
| 90 & UP | 59 | 2,526,624 | 42,824 | 0 | 0 | 0 | 59 | 2,526,624 | 42,824 |
| **TOTAL** | **903** | **46,128,531** | **51,084** | **1** | **28,788** | **28,788** | **904** | **46,157,319** | **51,059** |
| *ACCIDENTAL DISABILITY:* | | | | | | | | | |
| UNDER 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 TO 34 | 19 | 1,565,317 | 82,385 | 1 | 70,266 | 70,266 | 20 | 1,635,583 | 81,779 |
| 35 TO 39 | 132 | 10,836,482 | 82,095 | 0 | 0 | 0 | 132 | 10,836,482 | 82,095 |
| 40 TO 44 | 360 | 29,901,349 | 83,059 | 1 | 79,069 | 79,069 | 361 | 29,980,418 | 83,048 |
| 45 TO 49 | 719 | 62,997,208 | 87,618 | 1 | 86,066 | 86,066 | 720 | 63,083,274 | 87,616 |
| 50 TO 54 | 1,308 | 118,699,163 | 90,749 | 1 | 103,572 | 103,572 | 1,309 | 118,802,735 | 90,758 |
| 55 TO 59 | 1,878 | 171,071,768 | 91,093 | 8 | 716,367 | 89,546 | 1,886 | 171,788,135 | 91,086 |
| 60 TO 64 | 1,336 | 117,876,370 | 88,231 | 4 | 315,062 | 78,766 | 1,340 | 118,191,432 | 88,203 |
| 65 TO 69 | 865 | 65,650,180 | 75,896 | 4 | 351,808 | 87,952 | 869 | 66,001,988 | 75,952 |
| 70 TO 74 | 863 | 55,167,470 | 63,925 | 0 | 0 | 0 | 863 | 55,167,470 | 63,925 |
| 75 TO 79 | 945 | 49,869,373 | 52,772 | 1 | 66,334 | 66,334 | 946 | 49,935,707 | 52,786 |
| 80 TO 84 | 598 | 28,405,833 | 47,501 | 0 | 0 | 0 | 598 | 28,405,833 | 47,501 |
| 85 TO 89 | 241 | 11,005,909 | 45,668 | 0 | 0 | 0 | 241 | 11,005,909 | 45,668 |
| 90 & UP | 105 | 4,781,945 | 45,542 | 0 | 0 | 0 | 105 | 4,781,945 | 45,542 |
| **TOTAL** | **9,369** | **727,828,367** | **77,685** | **21** | **1,788,544** | **85,169** | **9,390** | **729,616,911** | **77,701** |

| | MALE | | | FEMALE | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|
| AGE | NUMBER | BENEFITS | AVERAGE | NUMBER | BENEFITS | AVERAGE | NUMBER | BENEFITS | AVERAGE |
| *ACCIDENTAL DEATH:* | | | | | | | | | |
| UNDER 30 | 2 | 68,422 | 34,211 | 4 | 118,621 | 29,655 | 6 | 187,043 | 31,174 |
| 30 TO 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 TO 39 | 0 | 0 | 0 | 9 | 349,369 | 38,819 | 9 | 349,369 | 38,819 |
| 40 TO 44 | 0 | 0 | 0 | 54 | 2,056,801 | 38,089 | 54 | 2,056,801 | 38,089 |
| 45 TO 49 | 0 | 0 | 0 | 84 | 3,311,134 | 39,418 | 84 | 3,311,134 | 39,418 |
| 50 TO 54 | 0 | 0 | 0 | 106 | 4,274,578 | 40,326 | 106 | 4,274,578 | 40,326 |
| 55 TO 59 | 0 | 0 | 0 | 108 | 4,665,676 | 43,201 | 108 | 4,665,676 | 43,201 |
| 60 TO 64 | 3 | 112,054 | 37,351 | 56 | 2,432,028 | 43,429 | 59 | 2,544,082 | 43,120 |
| 65 TO 69 | 0 | 0 | 0 | 48 | 1,968,092 | 41,002 | 48 | 1,968,092 | 41,002 |
| 70 TO 74 | 0 | 0 | 0 | 48 | 1,635,125 | 34,065 | 48 | 1,635,125 | 34,065 |
| 75 TO 79 | 1 | 38,561 | 38,561 | 46 | 1,363,834 | 29,649 | 47 | 1,402,395 | 29,838 |
| 80 TO 84 | 0 | 0 | 0 | 39 | 1,041,257 | 26,699 | 39 | 1,041,257 | 26,699 |
| 85 TO 89 | 0 | 0 | 0 | 11 | 275,594 | 25,054 | 11 | 275,594 | 25,054 |
| 90 & UP | 0 | 0 | 0 | 16 | 367,386 | 22,962 | 16 | 367,386 | 22,962 |
| **TOTAL** | **6** | **219,037** | **36,506** | **629** | **23,859,495** | **37,932** | **635** | **24,078,532** | **37,919** |
| *OTHER BENEFICIARIES:* | | | | | | | | | |
| UNDER 30 | 0 | 0 | 0 | 3 | 183,009 | 61,003 | 3 | 183,009 | 61,003 |
| 30 TO 34 | 0 | 0 | 0 | 3 | 162,531 | 54,177 | 3 | 162,531 | 54,177 |
| 35 TO 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 TO 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 TO 49 | 0 | 0 | 0 | 5 | 319,531 | 63,906 | 5 | 319,531 | 63,906 |
| 50 TO 54 | 2 | 86,051 | 43,026 | 10 | 511,004 | 51,100 | 12 | 597,055 | 49,755 |
| 55 TO 59 | 0 | 0 | 0 | 17 | 673,853 | 39,638 | 17 | 673,853 | 39,638 |
| 60 TO 64 | 0 | 0 | 0 | 18 | 607,232 | 33,735 | 18 | 607,232 | 33,735 |
| 65 TO 69 | 0 | 0 | 0 | 29 | 1,036,297 | 35,734 | 29 | 1,036,297 | 35,734 |
| 70 TO 74 | 0 | 0 | 0 | 33 | 1,067,478 | 32,348 | 33 | 1,067,478 | 32,348 |
| 75 TO 79 | 0 | 0 | 0 | 48 | 1,290,112 | 26,877 | 48 | 1,290,112 | 26,877 |
| 80 TO 84 | 0 | 0 | 0 | 46 | 771,290 | 16,767 | 46 | 771,290 | 16,767 |
| 85 TO 89 | 0 | 0 | 0 | 67 | 808,552 | 12,068 | 67 | 808,552 | 12,068 |
| 90 & UP | 0 | 0 | 0 | 195 | 1,162,430 | 5,961 | 195 | 1,162,430 | 5,961 |
| **TOTAL** | **2** | **86,051** | **43,026** | **474** | **8,593,319** | **18,129** | **476** | **8,679,370** | **18,234** |
| *ALL PENSIONERS AND BENEFICIARIES:* | | | | | | | | | |
| UNDER 30 | 2 | 68,422 | 34,211 | 7 | 301,630 | 43,090 | 9 | 370,052 | 41,117 |
| 30 TO 34 | 19 | 1,565,317 | 82,385 | 4 | 232,797 | 58,199 | 23 | 1,798,114 | 78,179 |
| 35 TO 39 | 135 | 10,913,879 | 80,844 | 9 | 349,369 | 38,819 | 144 | 11,263,248 | 78,217 |
| 40 TO 44 | 373 | 30,566,449 | 81,948 | 56 | 2,202,988 | 39,339 | 429 | 32,769,437 | 76,386 |
| 45 TO 49 | 800 | 68,006,691 | 85,008 | 90 | 3,716,731 | 41,297 | 890 | 71,723,422 | 80,588 |
| 50 TO 54 | 1,517 | 131,563,410 | 86,726 | 117 | 4,889,154 | 41,788 | 1,634 | 136,452,564 | 83,508 |
| 55 TO 59 | 2,586 | 211,933,930 | 81,954 | 137 | 6,235,912 | 45,518 | 2,723 | 218,169,842 | 80,121 |
| 60 TO 64 | 1,989 | 152,877,470 | 76,861 | 80 | 3,419,800 | 42,748 | 2,069 | 156,297,270 | 75,542 |
| 65 TO 69 | 1,562 | 101,212,129 | 64,796 | 82 | 3,389,208 | 41,332 | 1,644 | 104,601,337 | 63,626 |
| 70 TO 74 | 1,809 | 99,153,436 | 54,811 | 81 | 2,702,603 | 33,365 | 1,890 | 101,856,039 | 53,892 |
| 75 TO 79 | 2,187 | 103,353,119 | 47,258 | 96 | 2,754,860 | 28,696 | 2,283 | 106,107,979 | 46,477 |
| 80 TO 84 | 1,510 | 64,020,552 | 42,398 | 85 | 1,812,547 | 21,324 | 1,595 | 65,833,099 | 41,275 |
| 85 TO 89 | 716 | 28,446,905 | 39,730 | 78 | 1,084,146 | 13,899 | 794 | 29,531,051 | 37,193 |
| 90 & UP | 372 | 13,899,684 | 37,365 | 211 | 1,529,816 | 7,250 | 583 | 15,429,500 | 26,466 |
| **TOTAL** | **15,577** | **1,017,581,393** | **65,326** | **1,133** | **34,621,561** | **30,557** | **16,710** | **1,052,202,954** | **62,968** |

## Graph II-5
## Pensioner Average Benefits

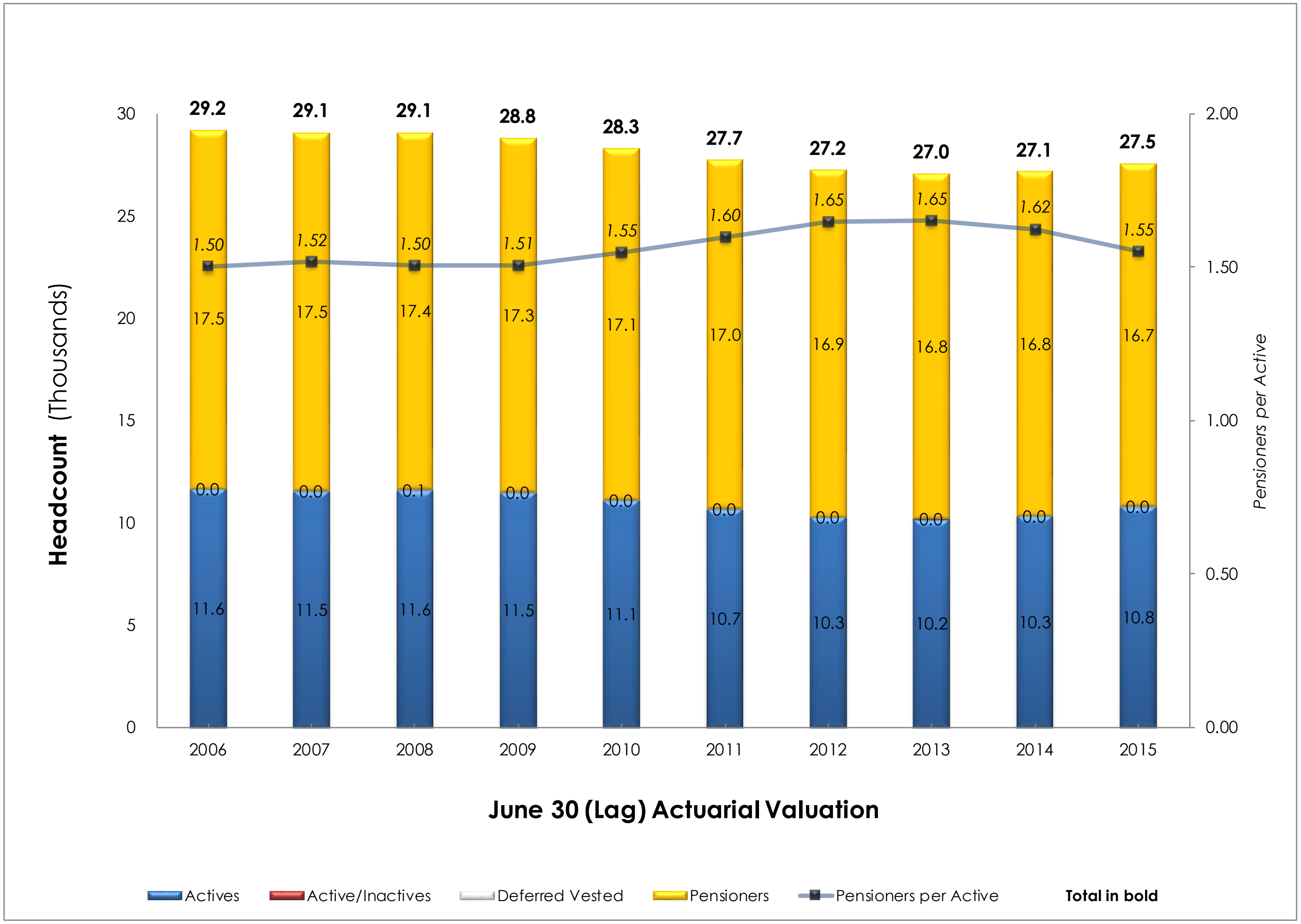


## Table II-6
## Status Reconciliation

| CHANGES IN THE NUMBER OF MEMBERS AND PENSIONERS DURING THE YEAR CLASSIFIED BY STATUS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Status** | **(1) Active Members** | **(2) Service Pension** | **(3) Ordinary Disability** | **(4) Accidental Disability** | **(5) Accidental Death** | **(6) Other Beneficiary** | **(7) Pensioners Subtotal (2) to (6)** | **(8) Grand Total (1) + (7)** |
| **1. Number at June 30, 2014** | **10,319** | 5,427 | 959 | 9,223 | 626 | 528 | **16,763** | **27,082** |
| 2. Additions during the Fiscal Year: | | | | | | | | |
| a. New Entrants | **913** | 110 | 2 | 309 | 7 | 1 | **429** | **1,342** |
| b. Transfer of Category[1] | **0** | 2 | 0 | 46 | 10 | 13 | **71** | **71** |
| c. Change in Payroll Status | **7** | 0 | 0 | 0 | 0 | 0 | **0** | **7** |
| d. Total Additions during the Year | **920** | 112 | 2 | 355 | 17 | 14 | **500** | **1,420** |
| 3. Separations during the Year: | | | | | | | | |
| a. Resignation or Dismissal | **33** | 0 | 0 | 0 | 0 | 0 | **0** | **33** |
| b. Retirement for Service | **103** | 0 | 0 | 0 | 0 | 0 | **0** | **103** |
| c. Retirement for Accidental Dis. | **306** | 0 | 0 | 0 | 0 | 0 | **0** | **306** |
| d. Retirement for Ordinary Dis. | **1** | 0 | 0 | 0 | 0 | 0 | **0** | **1** |
| e. Accidental Death | **3** | 0 | 0 | 0 | 0 | 0 | **0** | **3** |
| f. Ordinary Death | **4** | 184 | 54 | 170 | 8 | 66 | **482** | **486** |
| g. Transfer to Other System | **0** | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| h. Transfer of Category* | **0** | 50 | 3 | 18 | 0 | 0 | **71** | **71** |
| i. Change in Payroll Status | **9** | 0 | 0 | 0 | 0 | 0 | **0** | **9** |
| j. By Vested Termination | **0** | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| k. Other | **0** | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| l. Total Seperations during the Year | **459** | 234 | 57 | 188 | 8 | 66 | **553** | **1,012** |
| **4. Number at June 30, 2015** | **10,780** | 5,305 | 904 | 9,390 | 635 | 476 | **16,710** | **27,490** |

[1] Includes penioners changing retirement causes.

## Graph II-7
## Headcount Summary by Status



## Table II- 8
## Historical Active Member Salary Data

| June 30 (Lag) Actuarial Valuation | Number | Annual Salary | Average Annual Salary | Percentage Increase/ (Decrease) In Avg. Salary |
|---|---|---|---|---|
| 2006 | 11,641 | $932,730,174 | $80,125 | 1.2% |
| 2007 | 11,528 | 1,000,383,326 | 86,779 | 8.3% |
| 2008 | 11,574 | 1,051,591,517 | 90,858 | 4.7% |
| 2009 | 11,460 | 1,079,682,340 | 94,213 | 3.7% |
| 2010 | 11,080 | 1,138,187,795 | 102,725 | 9.0% |
| 2011 | 10,650 | 1,125,459,668 | 105,677 | 2.9% |
| 2012 | 10,267 | 1,106,113,386 | 107,735 | 1.9% |
| 2013 | 10,182 | 1,129,706,314 | 110,951 | 3.0% |
| 2014 | 10,319 | 1,150,389,645 | 111,483 | 0.5% |
| 2015 | 10,780 | 1,164,994,036 | 108,070 | -3.1% |

Annualized covered payrolls used for the Fiscal Year 2012 and subsequent years' employer contributions are based on revised actuarial assumptions enacted by Chapter 3/13 (i.e. the 2012 A&M) and unchanged in the 2016 A&M.

Salaries shown are the base salary plus assumed overtime paid and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

# Table II-9

## Distribution of Active Members and Salary Data at June 30, 2015

| | SERVICE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **AGE** | **UNDER 5** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30-34** | **35-39** | **40 & UP** | **ALL YEARS** |
| *COUNT:* | | | | | | | | | | |
| UNDER 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 20 TO 24 | 217 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **217** |
| 25 TO 29 | 740 | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **850** |
| 30 TO 34 | 409 | 1,062 | 488 | 5 | 0 | 0 | 0 | 0 | 0 | **1,964** |
| 35 TO 39 | 50 | 559 | 1,543 | 221 | 3 | 0 | 0 | 0 | 0 | **2,376** |
| 40 TO 44 | 2 | 140 | 968 | 764 | 168 | 1 | 0 | 0 | 0 | **2,043** |
| 45 TO 49 | 0 | 6 | 123 | 760 | 525 | 104 | 2 | 0 | 0 | **1,520** |
| 50 TO 54 | 1 | 0 | 2 | 212 | 411 | 372 | 112 | 2 | 0 | **1,112** |
| 55 TO 59 | 0 | 0 | 1 | 2 | 62 | 166 | 237 | 69 | 0 | **537** |
| 60 TO 64 | 0 | 1 | 0 | 2 | 1 | 19 | 67 | 56 | 11 | **157** |
| 65 TO 69 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | **3** |
| 70 & UP | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **1** |
| **TOTAL** | **1,419** | **1,878** | **3,125** | **1,967** | **1,172** | **662** | **419** | **127** | **11** | **10,780** |
| *TOTAL SALARY:* | | | | | | | | | | |
| UNDER 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 20 TO 24 | 10,164,194 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **10,164,194** |
| 25 TO 29 | 36,521,349 | 8,066,859 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **44,588,208** |
| 30 TO 34 | 20,202,158 | 109,895,390 | 52,859,263 | 555,611 | 0 | 0 | 0 | 0 | 0 | **183,512,422** |
| 35 TO 39 | 2,532,270 | 59,060,891 | 171,720,229 | 25,456,863 | 336,729 | 0 | 0 | 0 | 0 | **259,106,982** |
| 40 TO 44 | 174,210 | 14,952,402 | 108,321,248 | 92,357,003 | 20,997,109 | 133,515 | 0 | 0 | 0 | **236,935,487** |
| 45 TO 49 | 0 | 708,274 | 13,712,965 | 91,858,289 | 69,763,235 | 13,832,468 | 217,101 | 0 | 0 | **190,092,332** |
| 50 TO 54 | 143,833 | 0 | 259,855 | 24,896,922 | 53,316,809 | 50,365,642 | 15,662,439 | 239,757 | 0 | **144,885,257** |
| 55 TO 59 | 0 | 0 | 151,169 | 239,224 | 7,948,277 | 20,741,090 | 33,223,044 | 10,832,526 | 0 | **73,135,330** |
| 60 TO 64 | 0 | 150,124 | 0 | 291,119 | 152,714 | 2,548,619 | 8,853,731 | 8,278,720 | 1,715,608 | **21,990,635** |
| 65 TO 69 | 0 | 0 | 0 | 151,473 | 153,263 | 0 | 125,803 | 0 | 0 | **430,539** |
| 70 & UP | 0 | 0 | 0 | 0 | 152,650 | 0 | 0 | 0 | 0 | **152,650** |
| **TOTAL** | **69,738,014** | **192,833,940** | **347,024,729** | **235,806,504** | **152,820,786** | **87,621,334** | **58,082,118** | **19,351,003** | **1,715,608** | **1,164,994,036** |
| *AVERAGE SALARY:* | | | | | | | | | | |
| UNDER 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 20 TO 24 | 46,840 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **46,840** |
| 25 TO 29 | 49,353 | 73,335 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **52,457** |
| 30 TO 34 | 49,394 | 103,480 | 108,318 | 111,122 | 0 | 0 | 0 | 0 | 0 | **93,438** |
| 35 TO 39 | 50,645 | 105,655 | 111,290 | 115,189 | 112,243 | 0 | 0 | 0 | 0 | **109,052** |
| 40 TO 44 | 87,105 | 106,803 | 111,902 | 120,886 | 124,983 | 133,515 | 0 | 0 | 0 | **115,974** |
| 45 TO 49 | 0 | 118,046 | 111,488 | 120,866 | 132,882 | 133,005 | 108,551 | 0 | 0 | **125,061** |
| 50 TO 54 | 143,833 | 0 | 129,928 | 117,438 | 129,725 | 135,392 | 139,843 | 119,879 | 0 | **130,292** |
| 55 TO 59 | 0 | 0 | 151,169 | 119,612 | 128,198 | 124,946 | 140,182 | 156,993 | 0 | **136,192** |
| 60 TO 64 | 0 | 150,124 | 0 | 145,560 | 152,714 | 134,138 | 132,145 | 147,834 | 155,964 | **140,068** |
| 65 TO 69 | 0 | 0 | 0 | 151,473 | 153,263 | 0 | 125,803 | 0 | 0 | **143,513** |
| 70 & UP | 0 | 0 | 0 | 0 | 152,650 | 0 | 0 | 0 | 0 | **152,650** |
| **TOTAL** | **49,146** | **102,680** | **111,048** | **119,881** | **130,393** | **132,359** | **138,621** | **152,370** | **155,964** | **108,070** |

## Table II-10

## Reconciliation of Pensioner and Beneficiary Data

| SCHEDULE OF PENSIONERS AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| June 30 (Lag) Actuarial Valuation | Added to Rolls | | Removed from Rolls | | End of Year Rolls | | % Increase In Annual Allowances | Average Annual Allowances |
| | Number | Annual Allowances[1] | Number | Annual Allowances | Number | Annual Allowances | | |
| 2006 | 756 | $55,145,645 | 714 | $21,537,865 | 17,485 | $749,064,090 | 4.7% | $42,840 |
| 2007 | 777 | 71,664,072 | 783 | 26,221,335 | 17,479 | 794,506,827 | 6.1% | 45,455 |
| 2008 | 616 | 62,100,681 | 691 | 23,260,349 | 17,404 | 833,347,159 | 4.9% | 47,883 |
| 2009 | 476 | 49,098,185 | 617 | 20,247,862 | 17,263 | 862,197,482 | 3.5% | 49,945 |
| 2010 | 556 | 54,883,701 | 679 | 25,161,316 | 17,140 | 891,919,867 | 3.4% | 52,037 |
| 2011 | 653 | 64,843,804 | 776 | 35,553,289 | 17,017 | 921,210,382 | 3.3% | 54,135 |
| 2012 | 538 | 58,288,645 | 638 | 26,379,782 | 16,917 | 953,119,245 | 3.5% | 56,341 |
| 2013 | 453 | 54,522,199 | 563 | 23,448,369 | 16,807 | 984,193,075 | 3.3% | 58,559 |
| 2014 | 490 | 54,256,974 | 534 | 23,299,539 | 16,763 | 1,015,150,510 | 3.1% | 60,559 |
| 2015 | 500 | 59,578,951 | 553 | 22,526,507 | 16,710 | 1,052,202,954 | 3.6% | 62,968 |

[1]Includes post-retirement adjustments in benefits for those on the rolls as of the end of the previous year.

# SECTION III - MARKET AND ACTUARIAL VALUES OF ASSETS

Information on the Market Value of Assets (MVA) of the Plan is provided by the Office of the Comptroller. An Actuarial Asset Valuation Method (AAVM) is used to determine the Actuarial Value of Assets (AVA) of the Plan.

The Actuary reset the AVA to the market value as of June 30, 2011. Beginning with the June 30, 2012 (Lag) actuarial valuation, the AAVM recognizes investment returns greater or less than expected over a period of six years. In accordance with this AAVM, actual Unexpected Investment Returns (UIR) are phased into the AVA at rates of 15%, 15%, 15%, 15%, 20%, and 20% per year (i.e. UIR is recognized at cumulative rates of 15%, 30%, 45%, 60%, 80%, and 100% over a period of six years).

UIR is defined as the excess of net investment return over the Expected Investment Return (EIR) based on the Actuarial Interest Rate (AIR) and the AVA, where EIR equals the sum of beginning-of-fiscal-year AVA plus one-half of net cash flow, multiplied by the AIR.

Beginning with the June 30, 2014 (Lag) actuarial valuation, the AVA is further constrained to be within a corridor of 80% to 120% of the market value.

# Table III-1
## Statement of Plan Net Assets as of June 30, 2015 and June 30, 2014

($ Thousands)

| | June 30, 2015 | June 30, 2014 |
|---|---|---|
| **ASSETS** | | |
| Cash | $ 8,375 | $ 9,801 |
| Receivables | | |
| Investment Securities Sold | $ 178,385 | $ 225,735 |
| Member Loans | 29,124 | 28,434 |
| FY14 Transferrable earnings due from QPP to VSFs | (12,000) | 0 |
| Accrued Interest and Dividends | 18,568 | 18,907 |
| Total Receivables | $ 214,077 | $ 273,076 |
| **INVESTMENTS AT FAIR VALUE** | | |
| Short-Term Investments | | |
| Commercial Paper | $ 300,618 | $ 168,171 |
| Short-Term Investment Fund | 211,956 | 161,633 |
| U.S. Treasury Bills | 182,521 | 168,060 |
| Discount Notes | 0 | 0 |
| Debt Securities | | |
| U.S. Government and Agency | 0 | 859,362 |
| Corporate and Other | 2,463,809 | 1,114,610 |
| Equity Securities | 1,943,618 | 2,403,634 |
| Alternative Investments | 1,887,226 | 1,761,800 |
| Collective Trust Funds | | |
| Fixed Income | 394,772 | 386,024 |
| Domestic Equity | 1,516,030 | 1,516,964 |
| International Equity | 2,022,335 | 2,051,440 |
| Mortgage Debt Security | 72,185 | 64,999 |
| Treasury Inflation Protected Securities | 300,374 | 305,321 |
| Promissory Notes | 0 | 0 |
| Collateral From Securities Lending | 795,944 | 990,167 |
| Total Investments at Fair Value | $ 12,091,388 | $ 11,952,185 |
| **OTHER ASSETS** | 5,596 | 5,246 |
| TOTAL ASSETS | $ 12,319,436 | $ 12,240,308 |
| **LIABILITIES** | | |
| Accounts Payable | $ 74,788 | $ 45,749 |
| Payable for Investment Securities Purchased | 574,447 | 472,882 |
| Accrued Benefits Payable | 18,927 | 14,966 |
| Accrued Transfers to VSFs | 40,000 | 120,000 |
| Security Lending | 795,944 | 990,873 |
| TOTAL LIABILITIES | $ 1,504,106 | $ 1,644,470 |
| **PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS** | $ 10,815,330 | $ 10,595,838 |

# Table III-2
## Statement of Changes in Plan Net Assets

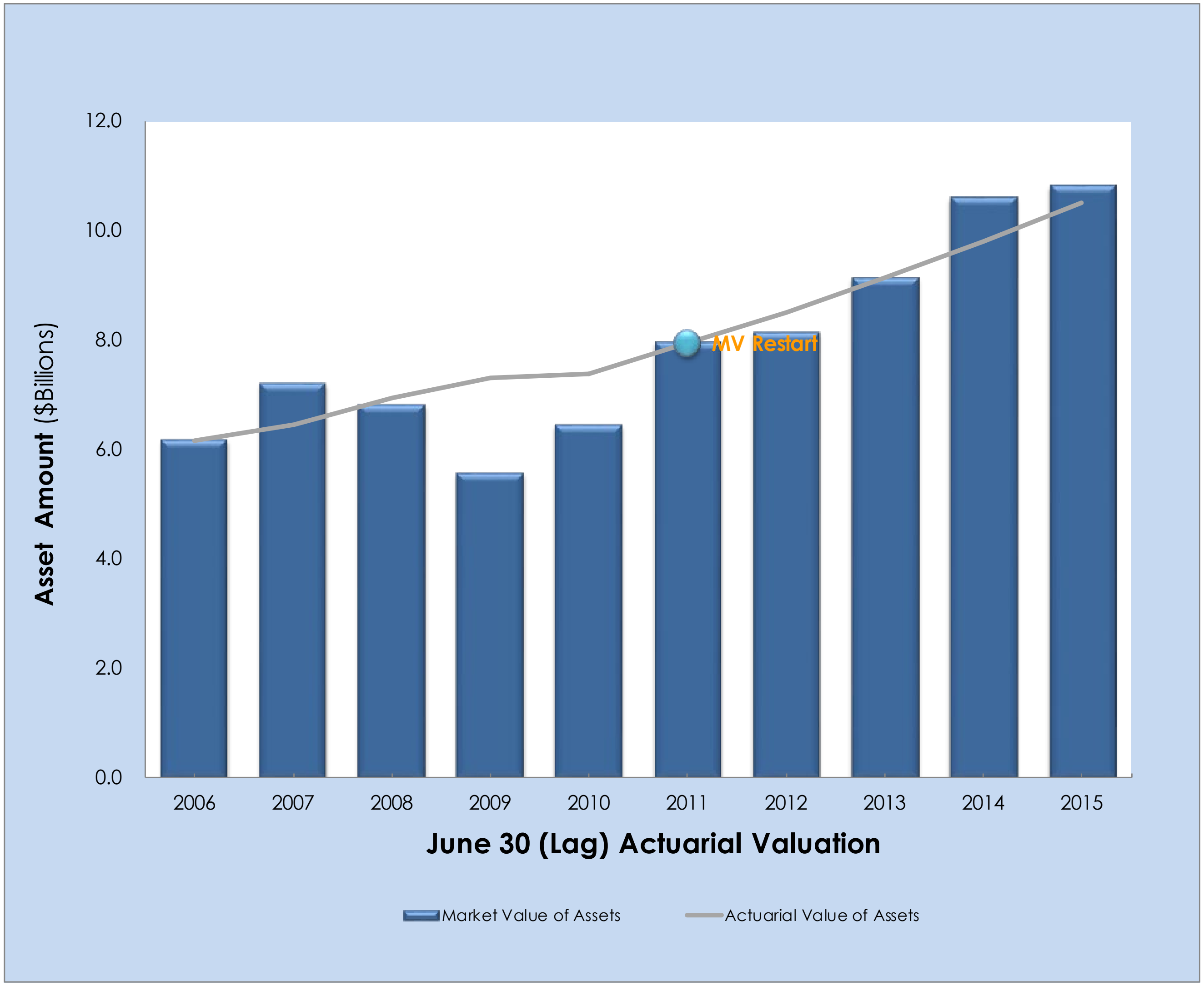
| ($ Thousands) | June 30, 2015 | June 30, 2014 |
|---|---|---|
| **ADDITIONS** | | |
| Contributions | | |
| Member Contributions | $ 108,582 | $ 108,859 |
| Employer Contributions | 988,784 | 969,956 |
| ***Total Contributions*** | $ 1,097,366 | $ 1,078,815 |
| Investment Income (Loss) | | |
| Interest Income | $ 115,571 | $ 118,699 |
| Dividend Income | 227,390 | 141,157 |
| Net Appreciation (Depreciation) in Fair Value | $ (8,490) | 1,352,930 |
| Total Investment Income (Loss) | $ 334,471 | $ 1,612,786 |
| Less Investment Expenses | 68,027 | 42,803 |
| Net Income (Loss) | $ 266,444 | $ 1,569,983 |
| Securities Lending Transactions | | |
| Securities Lending Income | $ 5,332 | $ 4,171 |
| Securities Lending Fees | (346) | (5,141) |
| Net Securities Lending Income (Loss) | $ 4,986 | $ (970) |
| ***Net Investment Income (Loss)*** | $ 271,430 | $ 1,569,013 |
| Other | | |
| ***Net Receipts from Other Retirement Systems*** | 40,737 | 39,581 |
| ***Litigation Income*** | 464 | 399 |
| ***TOTAL ADDITIONS*** | $ 1,409,997 | $ 2,687,808 |
| **DEDUCTIONS** | | |
| Benefit Payments and Withdrawls | 1,150,505 | 1,099,162 |
| Accrued Transfers to VSFs | 40,000 | 120,000 |
| ***TOTAL DEDUCTIONS*** | $ 1,190,505 | $ 1,219,162 |
| **NET INCREASE (DECREASE) IN PLAN NET ASSETS** | $ 219,492 | $ 1,468,646 |
| **PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS** | | |
| Beginning of Year | $ 10,595,838 | $ 9,127,192 |
| End of Year | $ 10,815,330 | $ 10,595,838 |

## Table III–3

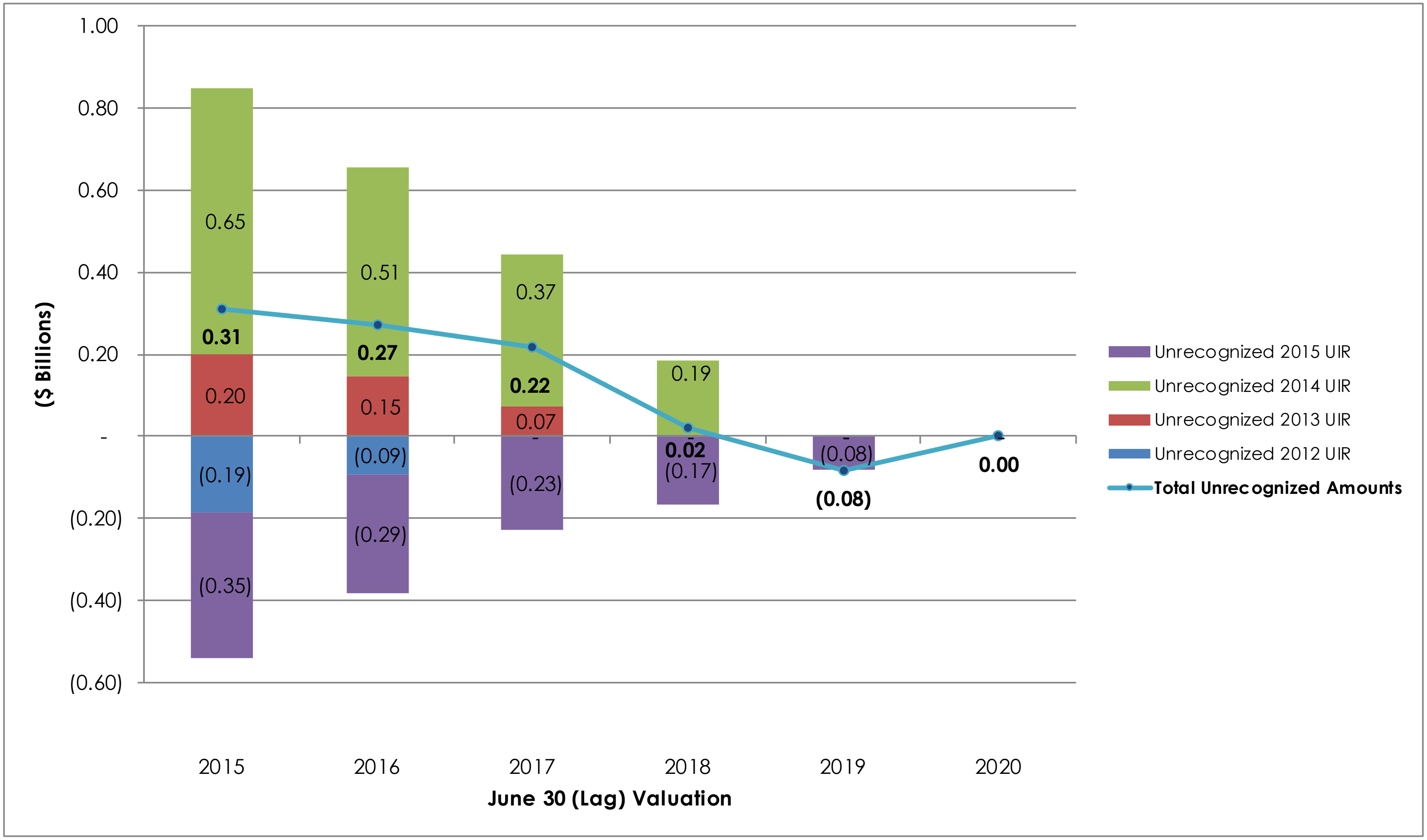
## Development of Actuarial Value of Assets as of June 30, 2015

| ($ Thousands) | | |
|---|---|---|
| 1. Market Value of Assets (MVA) | | |
| a. Beginning of Year (BOY) | $ | 10,595,838 |
| b. End of Year (EOY) | $ | 10,815,330 |
| 2. Contributions | | |
| a. Employee | $ | 108,582 |
| b. Employer | | 988,784 |
| c. Total Contributions | $ | 1,097,366 |
| 3. Cash Flow (Other) | $ | (1,109,304) |
| 4. Preliminary SKIM from FIRE to VSFs - EOY | $ | (40,000) |
| 5. Net Cash Flow (2.c. + 3. + 4.) | $ | (51,938) |
| 6. Net Investment Income | | |
| a. Investment Income | $ | 339,457 |
| b. Investment Expenses | | (68,027) |
| c. Total Net Investment Income | $ | 271,430 |
| 7. Average invested assets | | |
| a. AAV @ BOY | $ | 9,808,854 |
| b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2) | | (5,969) |
| c. Total | $ | 9,802,885 |
| 8. Expected Rate of Return (AIR) | | 7.00% |
| 9. Expected Investment Return (EIR) (7.c. x 8.) | $ | 686,202 |
| 10. Unexpected Investment Return (UIR) (6.c. - 9.) | $ | (414,772) |
| 11. AAV @ EOY | | |
| a. AAV @ BOY | $ | 9,808,854 |
| b. Net Cash Flow (4.) | | (51,938) |
| c. Expected Investment Return (9.) | | 686,202 |
| d. Phase in of UIR | | |
| 15% * UIR | | (62,216) |
| 15% * UIR | | 139,231 |
| 15% * UIR | | 54,494 |
| 15% * UIR | | (69,899) |
| 20% * UIR | | 0 |
| 20% * UIR | | 0 |
| Total | $ | 61,610 |
| e. AAV (11.a. + 11.b. + 11.c. + 11.d.) | $ | 10,504,728 |
| 12. Corridor | | |
| a. 80% of MVA | $ | 8,652,264 |
| b. 120% of MVA | $ | 12,978,396 |
| **13. Final AVA at EOY (11e. bounded by 12.)** | **$** | **10,504,728** |

## Graph III-4
## Historical Market and Actuarial Asset Values



## Graph III-5
## Future Recognition of Unexpected Investment Return



# SECTION IV – CONTRIBUTION DEVELOPMENT AND HISTORY

## Table IV-1
## Statutory Contributions

**Table IV-1** shows the components of the Fiscal Year 2017 and the Fiscal Year 2016 Statutory Contributions.

| COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS | | |
|---|---|---|
| **Valuation Date** | **June 30, 2015 (Lag)** | **June 30, 2014 (Lag)** |
| **Fiscal Year** | **2017** | **2016** |
| Normal Cost[1] | $ 409,404,419 | $ 421,219,767 |
| Unfunded Actuarial Accrued Liability Contribution | | |
| - Initial UAAL | 618,040,269 | 600,039,096 |
| - 2011 (Gain)/Loss | (19,908,798) | (19,908,798) |
| - 2012 (Gain)/Loss | 3,110,478 | 3,110,478 |
| - 2013 (Gain)/Loss | 7,251,935 | 7,251,935 |
| - 2014 (Gain)/Loss | 9,980,736 | 9,980,736 |
| - 2014 Assumption Changes | 32,784,417 | 32,784,417 |
| - 2015 (Gain)/Loss | 506,537 | NA |
| - Total | 651,765,574 | 633,257,864 |
| Administrative Expense Contribution | NA | NA |
| **Total Amount from City to the New York Fire City Pension Fund** | **$ 1,061,169,993** | **$ 1,054,477,631** |

[1] Includes amounts necessary, if any, to provide for financing of the Excess Benefit Plan established by Chapter 623/04. Also includes $462,587 and $450,067, respectively, for the Group Life Insurance Plan and amounts attributable to Variable Supplements Funds.

# Table IV-2
## Development of Statutory Employer Normal Cost

**Table IV-2** shows the development of the Fiscal Year 2017 and the Fiscal Year 2016 Statutory Employer Normal Cost.

| DEVELOPMENT OF CURRENT AND PRIOR FISCAL YEAR STATUTORY EMPLOYER NORMAL COST | | |
|---|---|---|
| **Valuation Date** | **June 30, 2015 (Lag)** | **June 30, 2014 (Lag)** |
| **Fiscal Year** | **2017** | **2016** |
| 1. Present Value of Future Benefits | | |
| a. Pensioners and Beneficiaries | $ 10,709,804,441 | $ 10,238,097,980 |
| b. Supplemental Benefits | 892,687,904 | 909,475,153 |
| c. Active Members | 10,834,286,682 | 10,545,329,313 |
| d. Future VSF Transfers | 255,288,369 | 274,576,778 |
| e. Total | $ 22,692,067,396 | $ 21,967,479,224 |
| 2. PV Future Employee Contributions | $ 145,483,824 | $ 122,655,436 |
| 3. PV Future Employer Normal Contributions | $ 3,857,941,147 | $ 3,816,129,221 |
| 4. Actuarial Accrued Liability (1.e.-2.-3.) | 18,688,642,425 | 18,028,694,567 |
| 5. Present Value of Future Salaries (@ t = 0.5) | 10,739,396,434 | 10,155,569,206 |
| 6. Employer Normal Cost Rate (3. / 5.) | 35.923% | 37.577% |
| 7. Annual Salaries (@ t = 1.5)[1] | $ 1,139,672,128 | $ 1,120,951,027 |
| 8. Statutory Employer Normal Contribution (6. times 7.) | $ 409,404,419 | $ 421,219,767 |

[1] The projected annualized covered payroll under the One-Year Lag methodology.

## Table IV-3
## Schedule of Unfunded Actuarial Accrued Liability Bases

The Initial UAAL is being amortized over a closed 22-year period using Increasing Dollar Payments (IDP). Under IDP, amortization payments increase by 3.0% per year, consistent with the assumed rate of General Wage Increases. UAALs established after June 30, 2010 are generally amortized using Level Dollar Payments (LDP) as follows:

- Benefit Changes – Generally over the remaining working lifetimes of those impacted, unless the amortization period is determined by statute.
- Assumption and/or Method Changes – Over a closed 20-year period.
- Actuarial Gains and Losses – Over a closed 15-year period.

Under the One-Year Lag methodology (OYLM), the number of payments is one less than the number of years in the amortization period (e.g. 14 payments over a closed 15-year amortization period). **Table IV-3** shows the Schedule of Unfunded Actuarial Accrued Liability (UAAL) Bases as of June 30, 2015.

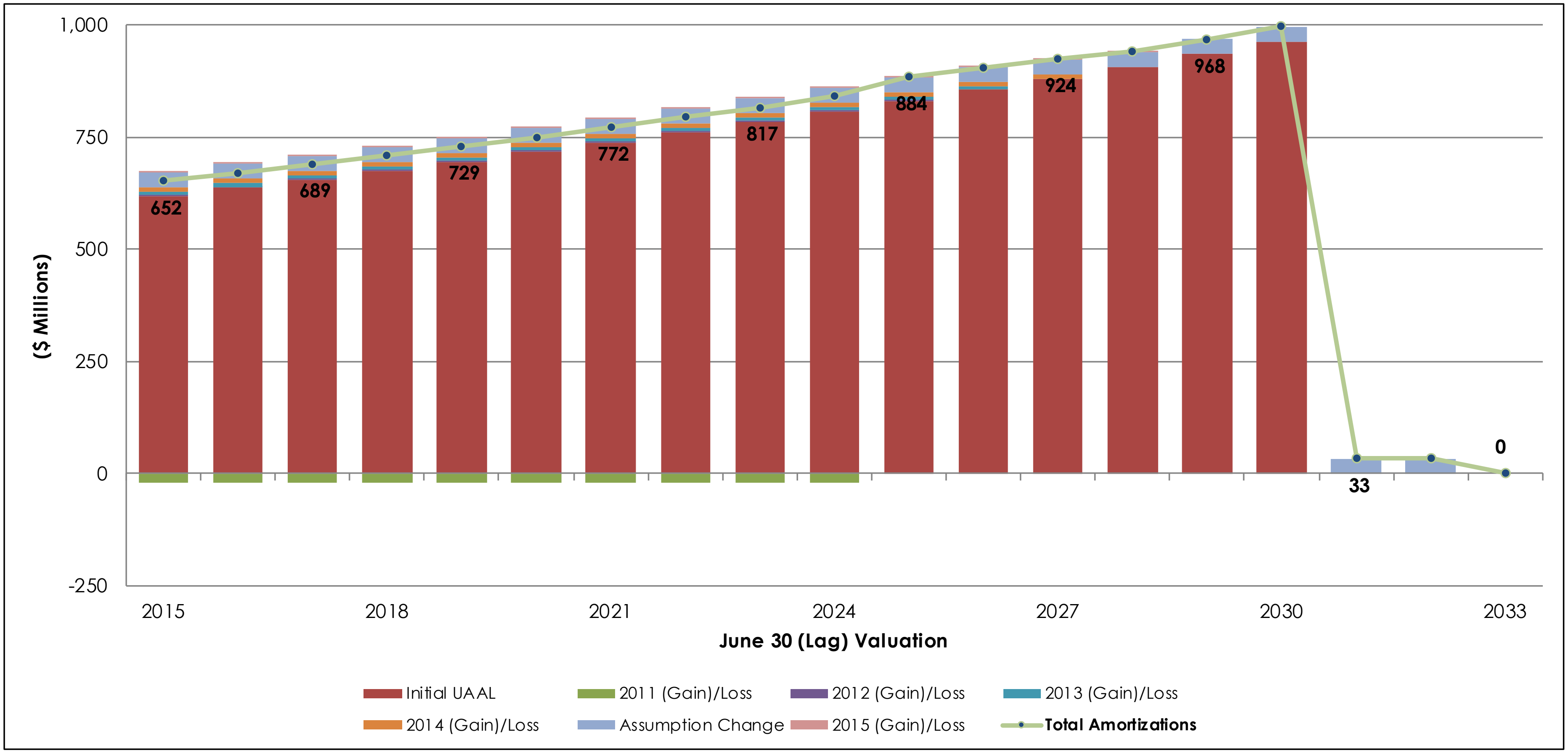
NEW YORK CITY FIRE PENSION FUND
SCHEDULE OF UNFUNDED ACTUARIAL ACCRUED LIABILITY BASES
($ Millions)

| Amortization Base | Date Established | Original Amount[1] | Amortization Period/Methods | Amortization Payment | Years/ Payments Remaining | OLYM UAAL June 30, 2015[2] |
|---|---|---|---|---|---|---|
| Initial UAAL | 6/30/10 | $ 7,957 | 22-Years Closed IDP-3% | $ 618 | 17 / 17 | $ 7,398 |
| (Gain)/Loss | 6/30/11 | $ (168) | 15-Years Closed /LDP | $ (20) | 11 / 11 | $ (154) |
| (Gain)/Loss | 6/30/12 | $ 26 | 15-Years Closed /LDP | $ 3 | 12 / 12 | $ 26 |
| (Gain)/Loss | 6/30/13 | $ 61 | 15-Years Closed /LDP | $ 7 | 13 / 13 | $ 63 |
| (Gain)/Loss | 6/30/14 | $ 84 | 15-Years Closed /LDP | $ 10 | 14 / 14 | $ 90 |
| Assumptions Change | 6/30/14 | $ 328 | 20-Years Closed /LDP | $ 33 | 19 / 19 | $ 351 |
| (Gain)/Loss | 6/30/15 | $ 4 | 15-Years Closed /LDP | $ 1 | 15 / 14 | $ 4 |

[1] Initial UAAL amount is before reflecting any adjustments under OYLM.

[2] Initial UAAL amount reflects adjustment under OYLM in year established.

## Graph IV-4
## Remaining UAAL Base Amortizations



## Table IV-5
## Reconciliation of Outstanding UAAL Bases

| | Amounts (in $ Thousands) Remaining to be Amortized, as of | | | | | |
|---|---|---|---|---|---|---|
| **June 30 (Lag) Valuation Date** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** |
| Initial UAL amortization base | $ 7,095,864 | $ 7,592,575 | $ 7,572,584 | $ 7,534,650 | $ 7,477,020 | $ 7,397,804 |
| 2010-2011 (Gain)/Loss | | (168,320) | (180,103) | (172,116) | (163,570) | (154,426) |
| 2011-2012 (Gain)/Loss | | | 26,298 | 28,139 | 26,891 | 25,556 |
| 2012-2013 (Gain)/Loss | | | | 61,312 | 65,604 | 62,695 |
| 2013-2014 (Gain)/Loss | | | | | 84,382 | 90,290 |
| Assumption Change at June 30, 2014 | | | | | 327,575 | 350,506 |
| 2014-2015 (Gain)/Loss | | | | | | 4,283 |
| **Sum of Outstanding Amortization Amounts** | **$ 7,095,864** | **$ 7,424,255** | **$ 7,418,779** | **$ 7,451,985** | **$ 7,817,902** | **$ 7,776,708** |

| June 30 (Lag) Valuation Date | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| 1. Actuarial Accrued Liability (AAL) | $ 15,349,598 | $ 15,808,930 | $ 16,358,108 | $ 17,003,722 | $ 18,028,695 | $ 18,688,642 |
| 2. Actuarial Value of Assets (AVA) | 7,392,656 | 7,955,668 | 8,520,769 | 9,144,587 | 9,808,854 | 10,504,728 |
| 3. Unfunded Actuarial Accrued Liability (UAAL) (1. - 2.) | 7,956,942 | 7,853,262 | 7,837,339 | 7,859,135 | 8,219,841 | 8,183,914 |
| 4. PV 1-year Adjusted Employer Normal Cost | 861,078 | 429,007 | 418,560 | 407,150 | 401,939 | 407,206 |
| **5. Adjusted UAAL (3. - 4.)** | **$ 7,095,864** | **$ 7,424,255** | **$ 7,418,779** | **$ 7,451,985** | **$ 7,817,902** | **$ 7,776,708** |

## Table IV-6
## Actuarial and Statutory Contribution History

**Table IV-6** compares the Statutory Contributions to the Actuarial Contributions for Fiscal Years 2008 through 2017.

| ($ Thousands) | | | |
|---|---|---|---|
| **Fiscal Year Ended June 30** | **Actuarial Contribution Certified** | **Statutory Contribution Contributed** | **Percentage of Actuarial Contribution Contributed** |
| 2008 | $ 780,202 | $ 780,202 | 100.0% |
| 2009 | 843,751 | 843,751 | 100.0% |
| 2010 | 874,331 | 874,331 | 100.0% |
| 2011 | 890,706 | 890,706 | 100.0% |
| 2012 | 976,895 | 976,895 | 100.0% |
| 2013 | 962,173 | 962,173 | 100.0% |
| 2014 | 969,956 | 969,956 | 100.0% |
| 2015 | 988,784 | 988,784 | 100.0% |
| 2016 | 1,054,478 | 1,054,478 | 100.0% |
| 2017 | 1,061,170 | 1,061,170 | 100.0% |

## Table IV-7
## City Rates: Contributions as Percentage of Salary

**Table IV-7** shows the City Rates defined to be the contributions as a percentage of salary for the Fiscal Years 2008 through 2017.

| CITY RATES ($ Thousands) | | | |
|---|---|---|---|
| **Fiscal Year Ended June 30** | **Actuarial Contribution** | **Salary[1] at Time =1.0** | **City Rate** |
| 2008 | $ 780,202 | $ 944,467 | 82.608% |
| 2009 | 843,751 | 1,013,660 | 83.238% |
| 2010 | 874,331 | 1,059,907 | 82.491% |
| 2011 | 890,706 | 1,082,953 | 82.248% |
| 2012 | 976,895 | 1,149,426 | 84.990% |
| 2013 | 962,173 | 1,129,926 | 85.154% |
| 2014 | 969,956 | 1,102,396 | 87.986% |
| 2015 | 988,784 | 1,111,744 | 88.940% |
| 2016 | 1,054,478 | 1,129,470 | 93.360% |
| 2017 | 1,061,170 | 1,145,919 | 92.604% |

[1]Includes assumed overtime paid and the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

# SECTION V - (GAIN)/LOSS ANALYSIS

## Table V-1
## Development of Experience (Gain)/Loss

**Table V-1** develops the asset and liability (Gain)/Loss between the June 30, 2014 (Lag) actuarial valuation and the June 30, 2015 (Lag) actuarial valuation[1].

| DEVELOPMENT OF EXPERIENCE (GAIN) / LOSS<br>June 30, 2015<br>($ Thousands) | | |
|---|---|---|
| 1. Expected Actuarial Accrued Liability (AAL) before Change in Mortality | | |
| a. AAL at June 30, 2014 | $ | 18,825,234 |
| b. Total Normal Cost and Administrative Expenses at June 30, 2014 | | 485,538 |
| c. Interest on 1.a. and 1.b. to June 30, 2015 | | 1,351,754 |
| d. Fiscal Year 2015 Benefit Payments | | (1,219,890) |
| e. Interest on 1.d. to June 30, 2015 | | (41,974) |
| f. Expected AAL at June 30, 2015 before Change in Mortality | $ | 19,400,662 |
| 2. Actual AAL at June 30, 2015 | $ | 19,515,829 |
| 3. Expected Total Actuarial Asset Value (AAV) | | |
| a. Total AAV at June 30, 2014 | $ | 10,605,393 |
| b. Interest on 3.a. to June 30, 2015 | | 742,378 |
| c. Total Contributions Paid in Fiscal Year 2015 | | 1,097,366 |
| d. Interest on 3.c. to June 30, 2015 | | 37,758 |
| e. Fiscal Year 2015 Benefit Payments | | (1,219,890) |
| f. Interest on 3.e. to June 30, 2015 | | (41,974) |
| g. Expected Total AAV at June 30, 2015 | $ | 11,221,031 |
| 4. Actual Total AAV at June 30, 2015 | $ | 11,331,915 |
| 5. Liability (Gain) / Loss (2. - 1.e.) | **$** | **115,167** |
| 6. Actuarial Asset (Gain) / Loss (3.g. - 4.) | **$** | **(110,884)** |
| 7. Total Actuarial (Gain) / Loss (5. + 6.) | **$** | **4,283** |

[1] Includes results for Variable Supplements Funds.

# SECTION VI – SCHEDULE OF FUNDING PROGRESS

## Table VI-1

## Schedule of Funding Progress

| NEW YORK CITY FIRE PENSION FUND ($ Thousands) | | | | | | |
|---|---|---|---|---|---|---|
| June 30 (Lag) Valuation Date | (1) Actuarial Value of Assets (AVA) | (2) Actuarial Accrued Liability (AAL) | (3) Unfunded (AAL) (UAAL) (2) - (1) | (4) Funded Ratio (1) / (2) | (5) Covered Payroll | (6) UAAL as a % of Covered Payroll (3) / (5) |
| 2006 | $6,174,111 | $6,251,960 | 77,849 | 98.8% | $932,730 | 8.3% |
| 2007 | 6,459,130 | 6,520,670 | 61,540 | 99.1% | 1,000,383 | 6.2% |
| 2008 | 6,942,992 | 6,986,243 | 43,251 | 99.4% | 1,051,592 | 4.1% |
| 2009 | 7,304,758 | 7,327,560 | 22,802 | 99.7% | 1,079,682 | 2.1% |
| 2010 | 7,392,656 | 15,349,598 | 7,956,942 | 48.2% | 1,138,188 | 699.1% |
| 2011 | 7,955,668 | 15,808,930 | 7,853,262 | 50.3% | 1,125,460 | 697.8% |
| 2012 | 8,520,769 | 16,358,108 | 7,837,339 | 52.1% | 1,106,113 | 708.5% |
| 2013 | 9,144,587 | 17,003,722 | 7,859,135 | 53.8% | 1,129,706 | 695.7% |
| 2014 | 9,808,854 | 18,028,695 | 8,219,841 | 54.4% | 1,150,390 | 714.5% |
| 2015 | 10,504,728 | 18,688,642 | 8,183,914 | 56.2% | 1,164,994 | 702.5% |

Effective June 30, 2010, AAL is based on the Entry Age Normal cost method. Previously, the Frozen Initial Liability cost method was used. AAL includes accrued liabilities attributable to the Variable Supplements Funds, net of their Actuarial Value of Assets, if any. Salaries include assumed overtime and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

# SECTION VII – VARIABLE SUPPLEMENTS FUNDS (VSF)

The New York City Fire Pension Fund administers both the Firefighters Variable Supplements Fund (FFVSF) and the Fire Officers Variable Supplements Fund (FOVSF). The FFVSF and FOVSF (the Funds) operate pursuant to the provisions of Title 13, Chapter 3 of the Administrative Code of the City of New York (ACCNY) and provide supplemental benefits to retirees who were Firefighters and Fire Officers, respectively, of the New York City Fire Department, Subchapter One Pension Fund or New York City Fire Department, Subchapter Two Pension Fund and who retired for service (with 20 or more years of service) on or after October 1, 1968.

## Table VII-1
## VSF Actuarial Accrued Liability

| ($ Thousands) | | |
|---|---|---|
| **Valuation Date** | **June 30, 2015** | **June 30, 2014** |
| FFVSF | | |
| Active | $ 168,186 | $ 167,731 |
| Retiree | 383,104 | 394,522 |
| Total | $ 551,290 | $ 562,253 |
| FOVSF | | |
| Active | $ 193,385 | $ 181,658 |
| Retiree | 163,169 | 167,931 |
| Total | $ 356,554 | $ 349,589 |
| Total VSF AAL | $ 907,844 | $ 911,842 |

## Table VII-2
## VSF Member Data

| VARIABLE SUPPLEMENTS FUNDS<br><br>MEMBERS INCLUDED IN THE<br>JUNE 30, 2015 (LAG) AND THE JUNE 30, 2014 (LAG) ACTUARIAL VALUATIONS | | | | |
|---|---|---|---|---|
| | **June 30, 2015** | | **June 30, 2014** | |
| | **FFVSF** | **FOVSF** | **FFVSF** | **FOVSF** |
| Actives | | | | |
| Number | 8,081 | 2,699 | 7,623 | 2,696 |
| Average Age | 38.60 | 47.24 | 39.17 | 47.03 |
| Retirees | | | | |
| Number | 3,621 | 1,593 | 3,691 | 1,629 |
| Average Age | 71.40 | 72.62 | 70.91 | 72.27 |

## Table VII-3
## VSF Statement of Assets

| ($ Thousands) | | | | |
|---|---|---|---|---|
| **Valuation Date** | **June 30, 2015** | | **June 30, 2014** | |
| | **MVA**[1] | **AAV** | **MVA**[2] | **AAV** |
| FFVSF | $547,074 | $530,699 | $546,005 | $511,336 |
| FOVSF | 316,927 | 296,488 | 316,795 | 285,203 |
| Total | $864,001 | $827,187 | $862,800 | $796,539 |

[1] Includes Accrued Benefits Payable of $21,630,000 for FFVSF and $9,522,000 for FOVSF.

[2] Includes Accrued Benefits Payable of $22,034,000 for FFVSF and $9,669,000 for FOVSF.

## Table VII-4
## Development of VSF Actuarial Value of Assets

| ($ Thousands) | FFVSF | FOVSF |
|---|---|---|
| 1. Market Value of Assets (MVA) | | |
| a. Beginning of Year (BOY)[1] | $ 523,971 | $ 307,126 |
| b. End of Year (EOY)[2] | $ 525,444 | $ 307,405 |
| 2. Contributions | | |
| a. Employee | $ 0 | $ 0 |
| b. Employer | 0 | 0 |
| c. Total Contributions | $ 0 | $ 0 |
| 3. Benefit Payments and Other Cash Flow | $ (47,819) | $ (22,117) |
| 4. Preliminary SKIM from FIRE to VSFs - EOY | $ 30,000 | $ 10,000 |
| 5. Net Cash Flow (2.c. + 3. + 4.) | $ (17,819) | $ (12,117) |
| 6. Net Investment Income | | |
| a. Investment Income | $ 18,888 | $ 12,249 |
| b. Investment Expenses | 0 | 0 |
| c. Total Net Investment Income | $ 18,888 | $ 12,249 |
| 7. Average invested assets | | |
| a. AVA @ BOY | $ 511,336 | $ 285,203 |
| b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2) | (23,910) | (11,059) |
| c. Total | $ 487,426 | $ 274,144 |
| 8. Expected Rate of Return (AIR) | 7.00% | 7.00% |
| 9. Expected Investment Return (EIR) (7.c. x 8.) | $ 34,120 | $ 19,190 |
| 10. Unexpected Investment Return (UIR) (6.c. - 9.) | $ (15,232) | $ (6,941) |
| 11. Preliminary AVA @ EOY | | |
| a. AVA @ BOY | $ 511,336 | $ 285,203 |
| b. Net Cash Flow (5.) | (17,819) | (12,117) |
| c. Expected Investment Return (9.) | 34,120 | 19,190 |
| d. Phase in of UIR | | |
| 15% * UIR for year ending June 30, 2015 | (2,285) | (1,041) |
| 15% * UIR for year ending June 30, 2014 | 6,219 | 4,959 |
| 15% * UIR for year ending June 30, 2013 | 2,625 | 2,409 |
| 15% * UIR for year ending June 30, 2012 | (3,497) | (2,115) |
| 20% * UIR for year ending June 30, 2011 | 0 | 0 |
| 20% * UIR for year ending June 30, 2010 | 0 | 0 |
| Total | $ 3,062 | $ 4,212 |
| e. AVA (11.a. + 11.b. + 11.c. + 11.d.) | $ 530,699 | $ 296,488 |
| 12. Corridor | | |
| a. 80% of MVA | $ 420,355 | $ 245,924 |
| b. 120% of MVA | $ 630,533 | $ 368,886 |
| **13. Final AVA at EOY (11e. bounded by 12.)** | **$ 530,699** | **$ 296,488** |

[1] Net of Accrued Benefits Payable of $22,034,000 for FFVSF and $9,669,000 for FOVSF.
[2] Net of Accrued Benefits Payable of $21,630,000 for FFVSF and $9,522,000 for FOVSF.

## Table VII-5

## SKIM Calculation as of June 30, 2015

For details, see Summary of VSF Actuarial Assumptions and Methods.

| ($ Thousands) | Preliminary[1] | | | | Final | | | |
|---|---|---|---|---|---|---|---|---|
| Total FIRE Pension Fund | | | | | | | | |
| 1. FY2015 Equity Earnings | $ | | | 335,433 | $ | | | 351,447 |
| 2. FY2015 Hypothetical Earnings | | | | 180,879 | | | | 187,947 |
| 3. FY2015 Excess Earnings (2. - 1.) | | | | 154,554 | | | | 163,500 |
| 4. Deficit at June 30, 2014 | | | | 0 | | | | 0 |
| 5. Hypothetical Interest Rate (HIR) | | | | 2.562% | | | | 2.562% |
| 6. Deficit with interest (4. x (1+HIR)^2)) | | | | 0 | | | | 0 |
| 7. Potential SKIM (3. - 6.) | $ | | | 154,554 | $ | | | 163,500 |
| | FFVSF | | FOVSF | | FFVSF | | FOVSF | |
| Allocations to VSF | | | | | | | | |
| 8. Allocation Percentage[2] | | 67.4% | | 32.6% | | 67.606% | | 32.394% |
| 9. Potential SKIM (7. x 8.) | $ | 104,170 | $ | 50,385 | $ | 110,536 | $ | 52,964 |
| 10. Accumulated Benefit Obligation | | 551,839 | | 326,119 | | 556,988 | | 338,756 |
| 11. MVA Prior to SKIM | | 517,074 | | 306,927 | | 517,074 | | 306,927 |
| 12. ABO Gate = (10. - 11.) | | 34,765 | | 19,192 | | 39,914 | | 31,829 |
| **13. SKIM Payable (Lesser of 9 and 12, not less than zero)** | **$** | **34,765** | **$** | **19,192** | **$** | **39,914** | **$** | **31,829** |
| 14. Rounded Estimate, for FY15 Financial Statements[3] | $ | 30,000 | $ | 10,000 | | | | |

[1] Estimated at November 6, 2015.

[2] For estimated SKIM, based on Valuation Salaries at June 30, 2014.

[3] Included in MVA at June 30, 2015.

## Table VII-6
## VSF Projected Benefit Payments as of June 30, 2015

| ($ Thousands) | FFVSF | | | FOVSF | | |
|---|---|---|---|---|---|---|
| Fiscal Year | Actives | Retirees | Total | Actives | Retirees | Total |
| 2016 | $ 7,422 | $ 42,452 | **$ 49,874** | $ 15,478 | $ 18,641 | **$ 34,119** |
| 2017 | 7,386 | 41,178 | **48,564** | 11,734 | 17,979 | **29,713** |
| 2018 | 7,830 | 39,857 | **47,687** | 12,325 | 17,283 | **29,608** |
| 2019 | 8,773 | 38,515 | **47,288** | 12,509 | 16,600 | **29,109** |
| 2020 | 9,836 | 37,172 | **47,008** | 12,879 | 15,946 | **28,825** |
| 2021 | 11,109 | 35,806 | **46,915** | 13,357 | 15,301 | **28,658** |
| 2022 | 12,464 | 34,438 | **46,902** | 13,815 | 14,648 | **28,463** |
| 2023 | 13,924 | 32,985 | **46,909** | 14,147 | 13,991 | **28,138** |
| 2024 | 15,992 | 31,535 | **47,527** | 14,534 | 13,335 | **27,869** |
| 2025 | 17,946 | 30,089 | **48,035** | 14,993 | 12,695 | **27,688** |

The population shown represents a closed group based upon members' status classification at June 30, 2015.

## Summary of VSF Plan Provisions

**A.** Eligibility

Service Retirement with at least 20 years of allowable service on or after October 1, 1968. This benefit is not payable to disability retirees, vested retirees, or beneficiaries of members who die while eligible for service retirement.

**B.** Benefits

The benefit is currently $12,000 per year, prorated in the first year and in the year of death based on the number of full months of retirement. The month of retirement and the month of death are not included in these two prorations.

**C.** Cost of Living Benefits

Any Auto COLA payable to a retiree reduces VSF benefits by an amount equal to such Auto COLA until the attainment of age 62.

**D.** Form of Payment

Firefighters: Life annuity payable annually on or about December 15 for the current calendar year.

Fire Officers: Life annuity payable annually on or about January 31 for the prior calendar year.

**E.** VSF DROP

Firefighters who retire on and after January 1, 2002 with 20 or more years of service are entitled to an additional one-time special lump sum payment (VSF DROP) payable on or about December 15 succeeding the date of retirement equal to the cumulative Fund benefits that would have been paid after January 1, 2002 had the member retired at the completion of the 20th year of service.

Fire Officers who retire on and after January 1, 2002 with 20 or more years of service are entitled to an additional one-time special lump sum payment (VSF DROP) payable on or about January 31 of the calendar year succeeding the date of retirement equal to the cumulative Fund benefits that would have been paid after January 1, 2002 had the member retired at the completion of the 20th year of service.

## Summary of VSF Actuarial Assumptions and Methods

Assumptions not detailed below are as described in SECTION X – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS (2016 A&M).

1. **FFVSF vs. FOVSF Membership**: Amongst current active members, 68% of members who become eligible for VSF benefits are assumed to retire as Fire Fighters, while the remaining 32% are assumed to retire as Fire Officers.

2. **COLA**: 1.5% per year for Auto COLA, used to estimate future COLA on the first $18,000 of FIRE benefits which, in general, reduces benefits payable by the Fund until age 62.

3. **Actuarial Asset Valuation Method**: Information on the Market Value of Assets (MVA) of the Variable Supplements Funds (VSF) is provided by the Office of the Comptroller. The same Actuarial Asset Valuation Method (AAVM) is used to determine the Actuarial Value of Assets (AVA) of the FFVSF and the FOVSF as is used to determine the AVA of the Plan. For more information, see SECTION III – MARKET AND ACTUARIAL VALUES OF ASSETS.

4. **Liability Method**: The obligations of FIRE to the FFVSF and the FOVSF are recognized through a methodology where the APV of future VSF transfers from FIRE to the FFVSF and FOVSF is included directly as an actuarial liability of FIRE. This amount is computed as the excess, if any, of the APV of benefits of the FFVSF and FOVSF over the AVA of the FFVSF and FOVSF, respectively. Under EAN, a portion of the APV of future VSF transfers is reflected in the APV of future normal costs and a portion is reflected in the UAAL.

5. **SKIM Calculation**: The ACCNY provides that FIRE transfer to the Funds a portion of the amount by which earnings on equity investments of FIRE exceed what the earnings would have been had such funds been invested at a yield rate equal to that of newly issued fixed-income securities, less any negative Cumulative Earnings Differentials and other limitations, determined as follows:

    a. *Hypothetical Interest Rate*: 115% of the average of monthly yields of 10-year U.S. Treasury Notes

    b. *Hypothetical Fixed Income Securities Earnings*: Investment earnings had equities been invested in fixed income securities earning the Hypothetical Interest Rate

c. *Earnings Differential*: Difference between actual equity investment earnings and Hypothetical Fixed Income Securities Earnings

d. *Cumulative Earnings Factor*: The current year's positive Earnings Differential, offset by any negative Earnings Differentials from prior years accumulated with interest at the corresponding year's Hypothetical Interest Rate

e. *Proportionate Transferable Earnings*: The portion of the Cumulative Earnings Factor allocable to the VSFs based on the ratio of total contributions between Firefighters and Fire Officers, limited so as not to allow assets to exceed the Accumulated Benefit Obligation (ABO) of the VSFs.

# SECTION VIII – SUMMARY OF PLAN PROVISIONS

**A.** Effective Date

July 15, 1941.

**B.** Tier Membership

1. Tier 1: Pre-July 1, 1973.
2. Tier 2: July 1, 1973 to June 30, 2009.
3. Tier 3: July 1, 2009 to March 31, 2012.
4. Tier 3 Modified: On or after April 1, 2012.

Eligible service includes City service in positions in the competitive class of the civil service, who serve probationary periods or permanent appointments in the Fire Department.

**C.** Member Contributions

1. Tier 1 and Tier 2

   Required Member Contributions – Based upon age at entry and elected retirement age, credited with regular and special interest. Contributions are required for the first 20 years or 25 years, depending on member's selection of minimum period of Membership service.

   Voluntary Member Contributions – Additional contributions to the Annuity Savings Fund credited with regular and special interest.

2. Tier 3 and Tier 3 Modified

   Members contribute 3.0% of salary for a maximum of 25 years.

## D. Increased-Take-Home-Pay (ITHP) Contributions

1. Tier 1 and Tier 2

   The City of New York pays a portion of member contributions. Effective October 1, 2000, the rate of ITHP contributions is 5.0% of salary, accumulated with regular and additional interest. The member may elect to waive the ITHP reduction from the full member rate and contribute at the full member rate, which results in additional benefits attributable to the ITHP contributions.

2. Tier 3 and Tier 3 Modified

   The City of New York does not pay any portion of member contributions.

## E. Credited Service

Credited Service is classified as Allowable Fire Service or certain other Credited Service.

1. Tier 1 and Tier 2

   Members are credited with one year of service for two hundred fifty or more days of service and not more than one year for all service in any calendar year. Allowable Fire Service includes service in the Uniformed Force of the New York City Police Department, Uniformed Transit Police Force, Uniformed Housing Police Force, Uniformed Correction Force, Uniformed Sanitation Force, and as an Emergency Medical Technician, provided all such service immediately precedes the Uniformed Fire Force service.

   Members may purchase, subject to limitations in the law, years of certain wartime military service, combined military service, and service as police officers in a foreign country for the United States Government, and authorized Child Care Leave.

2. Tier 3 and Tier 3 Modified

   Fire service includes service in the uniformed force of the New York City Police Department and the New York State and Local Police and Fire Retirement System.

Members may purchase, subject to limitations in the law, years of certain wartime military service.

**F.** Salary Base

1. Tier 1

   Final Salary (FS). The contract rate of base pay and holiday pay on the last day paid, plus any overtime, night differential and worked vacation earned in the previous 12 months, plus applicable longevity pay.

   For members appointed on or after June 17, 1971, the pensionable compensation for the final year of service is limited by the Kingston Law to 120% of the pensionable compensation for the year immediately preceding the final year.

2. Tier 2

   Final Average Salary (FAS). Total pensionable compensation (i.e. wages, overtime, night differential, worked vacation, etc.) a member earned during the 12 months preceding the date of retirement, not in excess of 120% of the immediate previous 12 months' pensionable compensation.

   If greater, FAS will equal the greatest average three consecutive years' pensionable compensation, where each year's salary cannot exceed 120% of the average of the two previous years.

3. Tier 3

   Final Average Salary (FAS). The average total pensionable compensation earned by a member during any three consecutive year period based on the month and day of retirement that provides the highest average wages. If the wages earned during any year included in the period exceed the average of the prior two years by more than 10%, the amount in excess of 10% shall be excluded. Additionally, if the member was on a leave of absence without pay (e.g. suspension) at any time during the three year period, that time, not in excess of 12 months, will be excluded from the calculation and the same period of time immediately preceding the three-year period will be included for the final average salary.

4. Tier 3 Modified

Final Average Salary (FAS). The average total pensionable compensation earned by a member during any five consecutive years based on the month and day of retirement that provides the highest average wages. If the wages earned during any year included in the period exceed the average of the prior four years by more than 10%, the amount in excess of 10% shall be excluded. Additionally, if the member was on a leave of absence without pay (e.g. suspension) at any time during the five year period, that time, not in excess of 12 months, will be excluded from the calculation and the same period of time immediately preceding the five-year period will be included for the final average salary.

## G. Service Retirement

1. Eligibility

a. Tier 1 and Tier 2

Completion of 20 or 25 years of Credited Service, in accordance with the member's selection of the minimum period of Membership service.

b. Tier 3

Early Service Retirement: Completion of 20 years of Credited Service or attainment of age 62.

Normal Service Retirement: Completion of 22 years of Credited Service.

c. Tier 3 Modified

Early Service Retirement: Completion of 20 years of Credited Service.

Normal Service Retirement: Completion of 22 years of Credited Service.

2. Benefits

a. Tier 1 and Tier 2

50% of [FS (Tier 1) or FAS (Tier 2)] plus 1/60$^{th}$ of the sum of all salary after 20 or 25 years, as applicable, of Credited Service.

The benefit is adjusted by the annuitized value of the net excess or deficit of accumulated member contributions and ITHP over or under required amounts.

b. Tier 3 and Tier 3 Modified

2.1% of FAS times number of years of Credited Service for first 20 years plus 4.0% of FAS times number of years of Credited Service in excess of 20 years (total benefit limited to 50% of FAS), less 50% of the Primary Social Security Retirement benefit at age 62.

## H. Disability Retirement

1. Accidental Disability (ADR)

a. Eligibility

i. All Tiers

Immediate. Must be found by the Medical Board and the Board of Trustees to be physically or mentally unable to perform regular job duties as a result of an injury received in the performance of duty and such disability was not the result of willful negligence on the part of the member.

b. Benefits

i. Tier 1 and Tier 2

75% of [FS (Tier 1) or FAS (Tier 2)] plus 1/60$^{th}$ of the sum of all salary after 20 or 25 years in accordance with the Member's selection of the minimum period of Membership service of Credited Service, plus annuitized value of actual member accumulated contributions and ITHP.

ii. Tier 3 and Tier 3 Modified

50% of FAS less 50% of the Primary Social Security Disability Benefits.

2. Ordinary Disability (ODR)

a. Eligibility

i. Tier 1 and Tier 2

Immediate. Must be found by the Medical Board and the Board of Trustees to be physically or mentally unable to perform regular job duties as a result of an injury not received in the performance of duty.

ii. Tier 3 and Tier 3 Modified

5 years of Credited Service and eligibility for Social Security disability benefit.

b. Benefits

i. Tier 1 and Tier 2

For members choosing 20 years as their minimum period of Membership service: 2.5% times [FS (Tier 1) or FAS (Tier 2)] times Credited Service.

For members choosing 25 years as their minimum period of Membership service: 2.0% times [FS (Tier 1) or FAS (Tier 2)] times Credited Service.

Minimum Benefit:

Less than 10 years of service: ⅓ of [FS (Tier 1) or FAS (Tier 2)]

10 or more years of service: ½ of [FS (Tier 1) or FAS (Tier 2)]

plus (regardless of service) the annuitized value of the net excess or deficit of member accumulated contributions and ITHP over or under the required amounts.

ii. Tier 3 and Tier 3 Modified

The greater of:

(a) 33 1/3% of FAS

(b) 2.0% of FAS times number of years of Credited Service (not in excess of 22 years),

less 50% of the Primary Social Security Disability Benefit.

**I.** Death Benefits

1. Accidental Death Benefits

a. Eligibility

i. All Tiers: Immediate.

b. Benefits

i. Tier I and Tier 2

50% of average of the final five years of salary, payable to surviving spouse or other eligible dependents for life.

In addition, a lump sum of accumulated member contributions and ITHP.

ii. Tier 3 and Tier 3 Modified

50% of FAS, payable to surviving spouse or other eligible dependents for life.

In addition, there may be a benefit payable in accordance with General Municipal Law Section 208(f), applicable to all tiers.

2. Ordinary Death Benefit

a. Eligibility

i. Tier 1: Immediate

ii. Tier 2, Tier 3 and Tier 3 Modified: 90 days of service

b. Benefits

i. Tier 1

Less than 10 years of Credited Service: 50% of FS plus accumulated member contributions and ITHP with interest.

At least 10 years of Credited Service: 100% of FS plus accumulated member contributions and ITHP with interest.

Form of Payment of Death Benefits: Lump sum. The first $50,000 of benefit on account of death in active service will be paid from the Group Life Insurance Plan.

However, if a member would have been eligible for a service retirement benefit at the date of death, the beneficiary may elect to receive the pension reserve had the member retired on the day before his or her death plus the accumulated member contributions. The beneficiary can also elect to receive the death benefit in the form of an annuity.

ii. Tier 2

Three times final year's salary raised to the next highest multiple of $1,000 plus accumulated member contributions.

Form of Payment of Death Benefits: Lump sum. The first $50,000 of benefit on account of death in active service will be paid from the Group Life Insurance Plan.

However, if a member would have been eligible for a service retirement benefit at the date of death, the beneficiary may elect to receive the pension reserve had the member retired on the date of his or her death plus the accumulated member contributions. The beneficiary can also elect to receive any death benefit and ITHP, if applicable, in the form of an annuity. The accumulated member contributions would still be paid as a lump sum.

iii. Tier 3 and Tier 3 Modified

Three times final year's salary raised to the next highest multiple of $1,000 plus accumulated member contributions.

Form of Payment of Death Benefits: Lump sum. The first $50,000 of benefit on account of death in active service will be paid from the Group Life Insurance Plan.

## J. Vested Benefit upon Termination

1. Eligibility

| Credited Service: | Vested Percentage: |
|---|---|
| Less than 5 years | 0% |
| 5 or more years | 100% |

2. Benefit at Service Retirement Date

A vestee may elect a refund of accumulated member contributions, but would then lose entitlement to a vested benefit.

a. Tier 1 and Tier 2

2.5% for members choosing 20 years as their minimum period of Membership service, or 2.0% for members choosing 25 years as their minimum period of Membership service times [FS (Tier 1) or FAS (Tier 2)] times number of years of Credited Service plus annuitized value of the net excess or deficit of accumulated member contributions and ITHP over or under the required amounts with interest to normal retirement date.

b. Tier 3

2.1% of FAS times number of years of Credited Service payable at the Early Retirement Age (i.e. the earlier of the date when 20 years of Credited Service would have been completed or age 62) or at age 55. If the benefit commences before the Early Retirement Age, there are reductions.

In addition, the benefit is reduced by 50% of the Primary Social Security Retirement benefit at age 62.

c. Tier 3 Modified

2.1% of FAS times number of years of Credited Service payable at the Early Retirement Age (i.e. the date when 20 years of Credited Service would have been completed) or at age 55. If the benefit commences before the Early Retirement Age, there are reductions.

In addition, the benefit is reduced by 50% of the Primary Social Security Retirement benefit at age 62.

**K.** Normal Form of Retirement Income

Single Life Annuity.

**L.** Loans

Applicable to Tier 1 and Tier 2 only.

1. Eligibility: After three years of membership up to the day of retirement.

2. Amount: Up to 90% of accumulated member contributions with a limit of $50,000 for tax-free treatment under IRC Section 72(p).

**M.** Cost of Living Adjustments (Auto COLA)

Applicable to Tier 1 and Tier 2 only.

1. Eligibility

    a. Service Retirees: Age 62 and retired 5 years or age 55 and retired 10 years.

    b. Disability Retirees: Retired 5 years.

    c. Beneficiaries receiving accidental death benefits: Receiving benefits for 5 years.

2. Amount

Starting with benefits for September 2001, the Auto COLA percentage is 50% of the increase in CPI-U based upon the 12 months ending March 31 prior to the Auto COLA effective on the ensuing September 1, rounded to the next higher 0.1%. Such percentage shall not be less than 1.0% nor greater than 3.0%. This percentage is applied to the first $18,000 of the total retirement benefit (including all prior Auto COLAs) that is payable if no optional form of benefit is elected.

If a retiree dies and has chosen an optional form of payment which provides for benefits to be continued to the spouse for life, one half of the Auto COLA amount is paid to such spouse.

**N.** Escalation

Applicable to Tier 3 and Tier 3 Modified only.

1. Eligibility

   Service, vesting, disability retirement, and survivor benefits.

2. Full Escalation Date

   a. Vested and Service Pensions: The first day of the month following the day which a member completes or would have completed 25 years of service.

   b. Disability Pensions: The first day of the month following the day which a disability retiree first becomes eligible for ODR/ADR.

   c. Death Benefits: The first day of the month following the day on which a beneficiary first becomes eligible for a death benefit paid other than in a lump sum.

3. Amount

   If a member first begins receiving benefits on the same date as the Full Escalation Date, the member will receive Full Escalation, the lesser of 3.0% or the Cost-of-Living Index increase, as computed December 31 of each prior year for benefits being escalated the following April.

   In the event of a decrease in the Cost-of-Living Index, the current benefit will be decreased by the lesser of 3% or the Cost-of-Living Index. However, the benefit will not be reduced below the benefit payable at the initial commencement date.

In addition, Cost-of-Living Index changes are computed on a cumulative basis so that any increases or decreases not affected in an adjustment are carried forward and applied in subsequent years.

4. Partial Escalation

Partial Escalation is calculated on benefits that commence prior to the member's Full Escalation Date. For each month that the benefit commencement date succeeds the date when a member completes or would have completed 22 years of service, a member will receive 1/36th of the Full Escalation, to a maximum of Full Escalation at 25 years of service.

**O.** WTC Disability Benefits

Certain active, vested, and retired members of the Plan, who participated in the rescue, recovery, or clean-up operations at the WTC site and who become disabled due to certain diseases, are presumed to have become disabled in the performance of duty and therefore may be entitled to be reclassified with an Accidental Disability Retirement.

**P.** WTC Death Benefits

Certain active, vested, and retired members of the Plan, who participated in the rescue, recovery, or clean-up operations at the WTC site and who die due to certain diseases are presumed to have died in the performance of duty potentially entitling eligible beneficiaries to receive Accidental Death Benefits.

**Q.** Changes Since the Prior Valuation

There are no new plan provisions reflected since the prior valuation.

## SECTION IX – CHAPTER ADMENDMENTS

The June 30, 2015 (Lag) actuarial valuation results reflect the following Chapter amendments from the prior five years:

- Chapter 427 of the Laws of 2014 (Chapter 427/14), amended Military Law Section 243-d, effective November 4, 2014, to provide non-contributory retirement service credit for members of the New York City Retirement Systems called to active military duty on or after September 11, 2001 and prior to January 1, 2006 who did not receive his or her full salary from a participating employer and is otherwise eligible to receive retirement service credit for such service.

- Chapter 489 of the Laws of 2013 (Chapter 489/13), addressed limitations in existing disability provisions intended to protect public employees who suffered injuries or illnesses in WTC rescue, recovery, and cleanup operations.

- Chapter 3 of the Laws of 2013 (Chapter 3/13), effective retroactive to July 1, 2011, enacted those 2012 A&M that require State legislation.

- Chapter 18 of the Laws of 2012 (Chapter 18/12), placed certain limitations on the Tier 3 and Tier 4 benefits available to participants hired on and after April 1, 2012 in most New York State Public Employee Retirement Systems, including FIRE, and is generally referred to as Tier 6 (referred to by FIRE as Tier 3 Modified).

# SECTION X – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS (2016 A&M)

The February 10, 2012 report entitled, "Proposed Changes in Actuarial Assumptions and Methods For Determining Employer Contributions For Fiscal Years Beginning on and After July 1, 2011 For the New York City Fire Department Pension Fund" contains the 2012 A&M. This report details the best judgment of the Actuary and takes into account the two most recent actuarial experience studies and recommendations prepared by The Segal Company in their report dated November 2006 and The Hay Group in their report dated December 2011.

A memorandum dated December 4, 2015 to the Board of Trustees of FIRE contains the revised probabilities of post-retirement mortality beginning with the June 30, 2014 (Lag) actuarial valuation.

In addition, beginning with the June 30, 2014 (Lag) actuarial valuation, the AVA is constrained to be within a corridor of 80% to 120% of Market Value.

The 2012 A&M, after reflection of the above changes to the probabilities of post-retirement mortality and the introduction of the AVA corridor, are referred to as the 2016 A&M.

Representative samples of the actuarial assumptions and a description of the actuarial methods follow. Full tables of the 2012 A&M are available on the New York City Office of the Actuary website, under "Reports."

## Table X-1: Active Member Mortality

**Table X-1** presents a sample of probabilities of mortality that are used for active members.

| NEW YORK CITY FIRE PENSION FUND<br>PROBABILITIES OF ACTIVE MEMBER MORTALITY | | | |
|---|---|---|---|
| | Ordinary Death | | |
| Age | Males | Females | Accidental Death |
| 20 | 0.04% | 0.03% | 0.02% |
| 30 | 0.04% | 0.03% | 0.02% |
| 40 | 0.05% | 0.04% | 0.02% |
| 50 | 0.15% | 0.10% | 0.10% |
| 60 | 0.30% | 0.20% | 0.30% |
| 70+ | NA | NA | NA |

## Table X-2: Service Retiree Morality

**Table X-2** presents a sample of the Valuation Table probabilities of mortality that are used for service retirees with separate probabilities for males and females. The Valuation Table probabilities reflect the application of Mortality Improvement Scale MP-2015.

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF POST-RETIREMENT MORTALITY
IN THE JUNE 30, 2015 (LAG) VALUATION

| Age | Males | Females |
|---|---|---|
| 20 | 0.0219% | 0.0126% |
| 30 | 0.0400% | 0.0264% |
| 40 | 0.1056% | 0.0611% |
| 50 | 0.2224% | 0.1489% |
| 60 | 0.6537% | 0.3880% |
| 70 | 1.3393% | 0.8562% |
| 80 | 4.0628% | 2.5162% |
| 90 | 12.5513% | 7.7017% |
| 100 | 31.0742% | 21.4488% |
| 110 | 96.7583% | 96.7971% |
| 115 | 100.0000% | 100.0000% |

## Table X-3: Disabled Retiree Mortality

**Table X-3** presents a sample of the Valuation Table probabilities of mortality that are used for disabled retirees with separate probabilities for males and females. The Valuation Table probabilities reflect the application of Mortality Improvement Scale MP-2015.

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF POST-DISABLEMENT MORTALITY
IN THE JUNE 30, 2015 (LAG) VALUATION

| Age | Males | Females |
|---|---|---|
| 20 | 0.0532% | 0.0154% |
| 30 | 0.1176% | 0.0411% |
| 40 | 0.1704% | 0.0684% |
| 50 | 0.2786% | 0.2605% |
| 60 | 0.8385% | 0.6219% |
| 70 | 1.8182% | 1.5428% |
| 80 | 4.6181% | 4.6534% |
| 90 | 12.7036% | 12.7907% |
| 100 | 31.0742% | 21.6887% |
| 110 | 96.7583% | 96.7971% |
| 115 | 100.0000% | 100.0000% |

## Table X-4: Beneficiary Mortality

**Table X-4** presents a sample of the Valuation Table probabilities of mortality that are used for beneficiaries with separate probabilities for males and females. The Valuation Table probabilities reflect the application of Mortality Improvement Scale MP-2015.

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF BENEFICIARY MORTALITY
IN THE JUNE 30, 2015 (LAG) VALUATION

| Age | Males | Females |
|---|---|---|
| 20 | 0.0219% | 0.0126% |
| 30 | 0.0400% | 0.0264% |
| 40 | 0.0925% | 0.0680% |
| 50 | 0.4086% | 0.2472% |
| 60 | 1.0773% | 0.7335% |
| 70 | 1.9534% | 1.3903% |
| 80 | 5.2649% | 3.7065% |
| 90 | 14.0544% | 10.5748% |
| 100 | 31.0742% | 21.4655% |
| 110 | 96.7583% | 96.7971% |
| 115 | 100.0000% | 100.0000% |

## Table X-5: Withdrawal

**Table X-5** presents a sample of probabilities of withdrawal from active service, for causes other than death or retirement.

| NEW YORK CITY FIRE PENSION FUND<br><br>PROBABILITIES OF WITHDRAWAL FOR<br>CAUSES OTHER THAN DEATH OR RETIREMENT | |
|---|---|
| Years Of Service | Probability Of Withdrawal |
| 0 | 2.00% |
| 5 | 0.40% |
| 10 | 0.20% |
| 15 | 0.10% |
| 20 | NA |

## Table X-6: Disability

**Table X-6** presents a sample of probabilities of disability retirement during active service.

| NEW YORK CITY FIRE PENSION FUND<br><br>PROBABILITIES OF DISABILITY RETIREMENT | | | | |
|---|---|---|---|---|
| | | Accidental Disability | | |
| | | Tier 1 and Tier 2 | | Tier 3/<br>Tier 3 Modified |
| Age | Ordinary Disability | Not Eligible for WTC Benefits | Eligible for WTC Benefits | |
| 20 | 0.010% | 0.030% | 0.050% | 0.030% |
| 30 | 0.050% | 0.150% | 0.250% | 0.150% |
| 40 | 0.150% | 1.300% | 2.000% | 1.200% |
| 50 | 0.300% | 3.500% | 5.000% | 2.400% |
| 60 | 6.000% | 15.000% | 21.000% | 8.000% |

## Table X-7a: Service Retirement, Unreduced with Full Escalation

**Table X-7a** presents a sample of select and ultimate age-based probabilities of retirement, for those eligible for unreduced retirement.

| NEW YORK CITY FIRE PENSION FUND<br><br>PROBABILITIES OF SERVICE RETIREMENT<br>FOR THOSE ELIGIBLE FOR<br>UNREDUCED RETIREMENT WITH FULL ESCALATION | | | |
|---|---|---|---|
| | Years of Service Since First Eligible | | |
| Age | 0 | 1 | 2 or More |
| 40 | 10.00% | 2.00% | 2.00% |
| 50 | 15.00% | 2.00% | 2.00% |
| 60 | 20.00% | 12.00% | 12.00% |
| 61 | 30.00% | 15.00% | 15.00% |
| 62 | 40.00% | 20.00% | 20.00% |
| 63 | 100.00% | 100.00% | 100.00% |

## Table X-7b: Service Retirement, Tier 3 and Tier 3 Modified Early Service Retirement

**Table X-7b** presents a sample of probabilities of retirement, for those assumed to retire prior to eligibility for unreduced retirement.

| NEW YORK CITY FIRE PENSION FUND<br><br>PROBABILITIES OF SERVICE RETIREMENT<br>FOR<br>TIER 3 AND TIER 3 MODIFIED EARLY SERVICE RETIREMENT | | |
|---|---|---|
| Years of Service | Reduced Retirement | Unreduced Before Full Escalation |
| 20 | 5.00% | NA |
| 21 | 2.00% | NA |
| 22 | NA | 5.00% |
| 23 | NA | 2.00% |
| 24 | NA | 2.00% |

## Table X-8: Salary Scale

**Table X-8** presents a sample of service-based salary increase rates.

| NEW YORK CITY FIRE PENSION FUND<br>ANNUAL RATES OF SALARY INCREASE | |
|---|---|
| Years of Service | Salary Scale Rate of Next Increase |
| 0 | 8.00% |
| 1 | 12.00% |
| 2 | 13.00% |
| 3 | 13.00% |
| 4 | 49.00% |
| 5 | 4.00% |
| 10 | 4.50% |
| 15 | 5.00% |
| 20 | 4.50% |
| 25 | 4.00% |
| 30 + | 3.50% |

Salary Scale includes an assumed General Wage Increase of 3.0% per annum.
Longevity increases for the first 10 years are first included in FAS after 20 years of service.
All longevity increases are included in FAS after 25 years of service.

## Table X-9: Overtime Assumptions

| NEW YORK CITY FIRE PENSION FUND<br>OVERTIME | | | | | |
|---|---|---|---|---|---|
| Years of Service | All Tiers Baseline | Tier 1/2 Dual Service | Tier 1/2 Dual Disability | Tier 3/ Tier 3 Modified Dual Service | Tier 3/ Tier 3 Modified Dual Disability |
| 0 | 15.00% | 16.00% | 15.00% | 16.00% | 15.00% |
| 5 | 15.00% | 16.00% | 15.00% | 16.00% | 15.00% |
| 10 | 15.00% | 16.00% | 15.00% | 16.00% | 15.00% |
| 15 | 15.00% | 18.00% | 15.00% | 16.00% | 15.00% |
| 20 | 18.00% | 23.00% | 20.00% | 21.00% | 20.00% |
| 25 | 13.00% | 18.00% | 15.00% | 16.00% | 15.00% |
| 30 | 8.00% | 10.00% | 8.00% | 9.00% | 8.00% |
| 35 | 5.00% | 6.00% | 5.00% | 6.00% | 5.00% |
| 40 | 5.00% | 6.00% | 5.00% | 6.00% | 5.00% |
| 45 | 5.00% | 6.00% | 5.00% | 6.00% | 5.00% |

Dual Overtime assumptions are used for years immediately preceding retirement in which compensation would contribute toward FS or FAS calculations.

## Additional Assumption and Methods

1. **Marital Assumption**: All active members are assumed to be married and females are assumed to be three years younger than their male spouses.

2. **Credited Service**: Calculated in whole year increments for valuation purposes.

3. **Loans**: Except for Death Benefits, it is assumed that eligible members take the maximum allowable loan at retirement.

4. **Actuarial Interest Rate**: 7.0% per annum, net of investment expenses.

5. **COLA**: Based on an assumed long-term Consumer Price Index inflation rate of 2.5% per year. 1.5% per year for Auto COLA, 2.5% per year for Escalation.

6. **Actuarial Asset Valuation Method (AAVM)**:

   The Actuary reset the Actuarial Value of Assets to market value as of June 30, 2011.

   Beginning with the June 30, 2012 (Lag) actuarial valuation, the AAVM recognizes investment returns greater or less than expected over a period of six years.

   In accordance with this AAVM, actual Unexpected Investment Returns (UIR) are phased into the Actuarial Value of Assets (AVA) at rates of 15%, 15%, 15%, 15%, 20%, and 20% per year (i.e. cumulative rates of 15%, 30%, 45%, 60%, 80%, and 100% over a period of six years).

   Beginning with the June 30, 2014 (Lag) actuarial valuation, the AVA is constrained to be within a corridor of 80% to 120% of Market Value.

   For more information, see page SECTION III – MARKET AND ACTUARIAL VALUES OF ASSETS.

7. **Actuarial Cost Method**: Beginning with the June 30, 2010 (Lag) actuarial valuation, the Entry Age Normal (EAN) cost method of funding is used by the Actuary to calculate the contribution required of the employer under the 2016 A&M.

   Under this method, the Actuarial Present Value (APV) of Benefits (APVB) of each individual included in the actuarial valuation is allocated on a level basis over the earnings between the age a member enters the plan and assumed exit age(s). The employer portion of this APVB allocated to a valuation year is the Normal Cost. The portion of this APVB not provided for at a valuation date by the APV of Future Normal Costs or future member contributions is the Actuarial Accrued Liability (AAL).

The excess, if any, of the AAL over the Actuarial Value of Assets (AVA) is the Unfunded Actuarial Accrued Liability (UAAL).

Under this method, actuarial gains and losses, as they occur, reduce and increase the UAAL, respectively, and are explicitly identified and amortized.

Increases or decreases in obligations due to benefit changes, actuarial assumption changes, and actuarial method changes are also explicitly identified and amortized.

Under EAN, the explicit UAALs that are developed each year are generally financed over fixed periods. Ideally, these periods are reasonably consistent with the expected future working lifetimes of all active participants. For more information, see page 25.

Under EAN, the employer normal cost remains constant and changes gradually over time for the entire Plan as the characteristics of the members change (e.g. more Tier 3 Modified active members decrease the average employer normal cost).

8. **Lump Sum Death Benefits**: Liabilities for group life lump sum death benefits are calculated under the One-Year Term Cost method.

9. **Allowances for Administrative Expenses**: None.

10. **WTC Disability and Death Benefits**: For actuarial valuations beginning June 30, 2014 and later, obligations attributable to the WTC Disability Law and to the WTC Death Benefits Law are determined through the use of explicit assumptions in the 2016 A&M, and through estimation techniques for post-retirement reclassifications.

11. **One-Year Lag Methodology**: One-Year Lag methodology uses a June 30, XX-2 valuation date to determine Fiscal Year XX employer contributions.

    This methodology requires adjustments to determine Fiscal Year XX employer contributions as follows:

Present Value of Future Salary (PVFS): The PVFS at June 30, XX-2 is reduced by the value of salary projected to be paid during Fiscal Year XX-1.

Salary for Determining Employer Normal Contributions: Salary used to determine the employer Normal Contribution is the salary projected to be paid during Fiscal Year XX to members on payroll at June 30, XX-2.

UAAL Payments: For determining the UAAL payments for Fiscal Year XX, and to be consistent with the OYLM, the UAAL as of June 30, XX-2 is adjusted by the discounted value of employer normal cost paid during Fiscal Year XX-1.

# SECTION XI – SUBSEQUENT EVENTS

Chapter 41 of the Laws of 2016 (Chapter 41/16), signed into law on May 31, 2016, provides up to three years of service credit to members of public retirement systems of the State of New York for military service. Chapter 41/16 removes the requirement that such military service occur during specified periods of hostilities. This law will be reflected in future valuations as participants request military service credit.

Chapter 298 of the Laws of 2016 (Chapter 298/16), signed into law on September 8, 2016, changes the Accidental Disability Retirement and Ordinary Disability Retirement benefits for current Tier 3 and Tier 3 Modified members who elect to participate in the Enhanced Disability Benefits. Tier 3 Modified members as of April 1, 2017 and later are mandated into the Enhanced Disability Benefits. Members electing or mandated into this benefit will pay an extra 2% of wages.

The Enhanced Accidental Disability Benefit is equal to 75% of FAS5.

The Enhanced Ordinary Disability Benefit is equal to the greater of:

33 1/3% of FAS5 or

2% of FAS5 multiplied by years of credited service (not in excess of 22 years).

Under the OYLM, the first year in which these changes to the disability benefits will impact the employer contribution is Fiscal Year 2019.

Additionally, Chapter 298/16 changes FIRE into a corpus funded entity. Accordingly, starting in Fiscal Year 2019, Administrative Expenses will be reflected in the Employer Contribution and the UAAL Payments.

In February 2017, the City engaged Bolton to perform an actuarial audit of the five New York City Retirement Systems and Pension Funds, serving as the Independent Actuary under Section 96 of the New York City Charter. The engagement includes, but is not limited to, contribution audits, experience studies, and administrative reviews of each system. Bolton released their reports for the First Engagement on March 12, 2018. Further experience studies are being conducted and changes to actuarial assumptions in future actuarial valuations are anticipated; the first year in which changes to actuarial assumptions will impact the employer contribution is expected to be Fiscal Year 2019.

# SECTION XII – RISK AND UNCERTAINTY

The Fiscal Year 2017 employer contribution is based on the census data reported as of June 30, 2015 and on actuarial assumptions and methods adopted by the Board of Trustees during Fiscal Year 2012 and enacted by the New York State Legislature as Chapter 3 of the Laws of 2013 (the 2012 A&M), with revisions made to the post-retirement mortality assumptions and to the AAVM during Fiscal Year 2016 (the 2016 A&M).

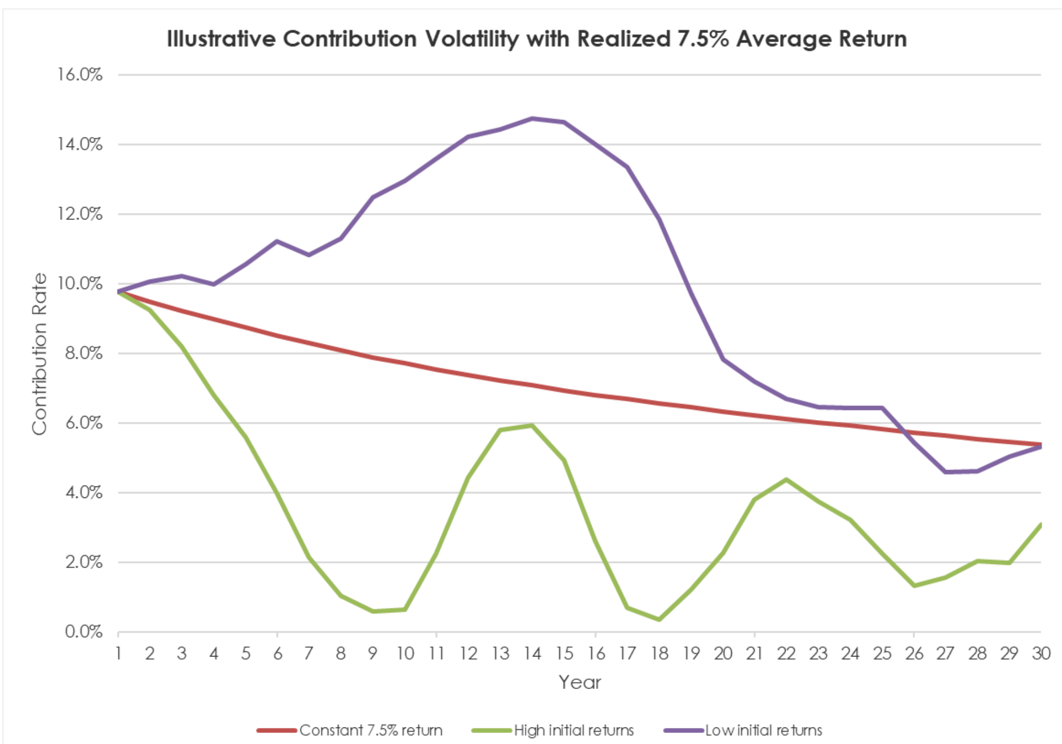
The funded status of FIRE depends highly on the realization of the actuarial assumptions used, as well as certain demographic characteristics of the Plan and other exogenous factors. Many of the risks faced by the Plan are described in fuller detail below; in future years, full stochastic simulation of the Plan funding would help quantify these risks as they pertain to the Plan.

## High Risk Types

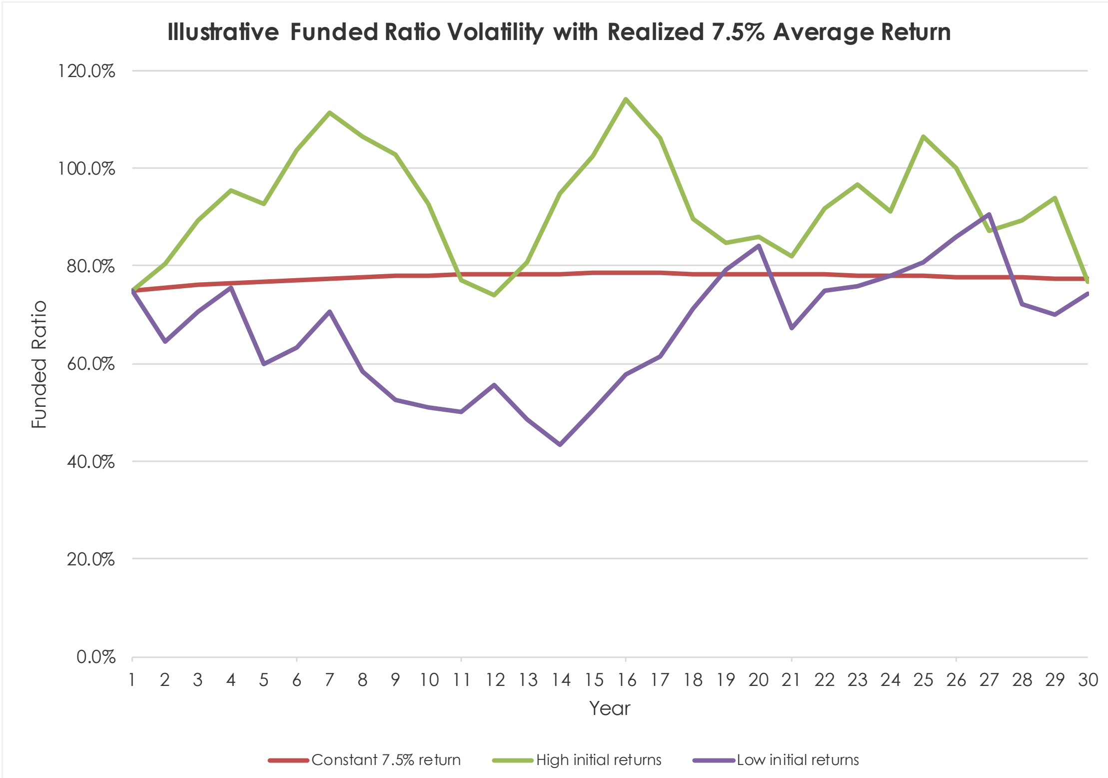
### Investment Risk

The most substantial risk for FIRE is the investment risk that investment returns may be different than assumed. As risk-free investment return rates have fallen in recent decades, more aggressive asset allocations have become necessary to achieve long-term rates of return commensurate with the actuarial assumption of 7.0%.

This investment return volatility can contribute substantially to contribution and funded status volatility, even if the long-term investment return assumption of 7.0% is realized. While not yet available specifically for the Plan, recent research demonstrates this volatility based on a sample public plan with typical characteristics, a typical contribution policy, and a long-term return assumption of 7.5%, which can be realized in different patterns.[1] Similar scenario analysis could be done for FIRE.




[1] Yin, Yimeng; Boyd, Don. Pension Simulation Project. *The Nelson A. Rockefeller Institute of Government*.




Note that these illustrations show volatility even if long-term expected rates of return are realized. Further risk exists that long-term expected rates of return may not be realized.

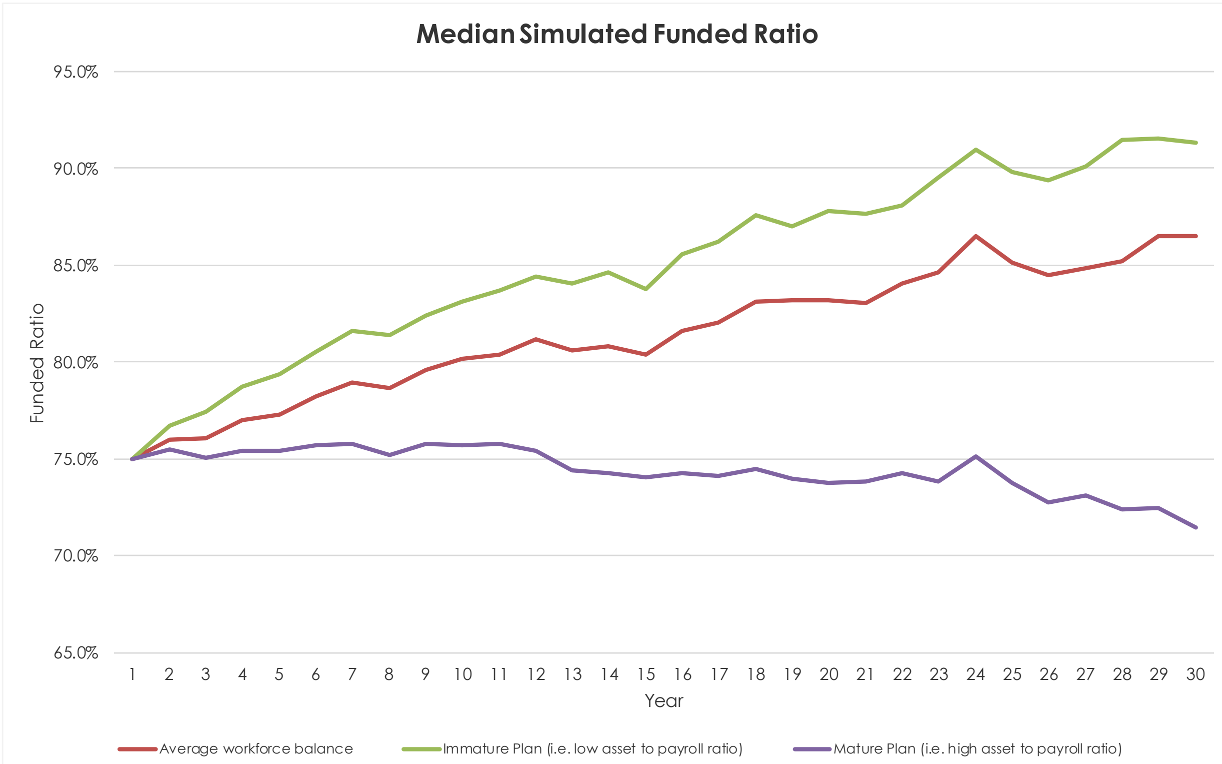
## Maturity Risk

With respect to future fiscal years, it should be noted that FIRE is a mature pension fund. A mature pension fund has a significant ratio of retirees to active members and, usually, of assets to active member payroll and of Actuarial Accrued Liability (AAL) to active member payroll. These ratios, sometimes known as volatility ratios, for the Plan can be found in the chart below.

| Valuation Date | June 30, 2015 (Lag) | June 30, 2014 (Lag) |
|---|---|---|
| **Fiscal Year** | **2017** | **2016** |
| **Volatility Ratios** | | |
| 1. Market Value of Assets (MVA) | $ 10,815,330,000 | $ 10,595,838,000 |
| 2. Actuarial Value of Assets (AVA) | 10,504,728,000 | 9,808,854,000 |
| 3. Actuarial Accrued Liability | 18,688,642,425 | 18,028,694,567 |
| 4. Active Salary | 1,164,994,036 | 1,150,389,645 |
| 5. Asset Volatility Ratio (MVA basis) (1. / 4.) | 9.3 | 9.2 |
| 6. Asset Volatility Ratio (AVA basis) (2. / 4.) | 9.0 | 8.5 |
| 7. Liability Volatility Ratio (3. / 4.) | 16.0 | 15.7 |

These ratios indicate a mature pension plan; consequently, there is potential for significant volatility in employer contributions to FIRE in the future, particularly when considered as a fraction of active member payroll. In cases where the retiree population grows in size but the active population remains level or approximately level, retiree benefit payments can grow more quickly in future years than contributions for active workers. Thus for mature pension plans, net cashflow (prior to investment income) shrinks or even becomes negative.

While not available specifically for the Plan, illustrative forecasts of sample plans of various maturities can demonstrate this effect.[1]




[1] Boyd, Donald J. and Yin, Yimeng. "How Public Pension Plan Demographic Characteristics Affect Funding and Contribution Risk." Pension Simulation Project. *The Nelson A. Rockefeller Institute of Government*.

## Medium Risk Types

### Interest Rate Risk

The Actuarial Accrued Liability for the Plan depends heavily on the actuarial assumption used for future investment returns. While the returns themselves can produce substantial volatility, as detailed in Investment Risk above, the long-term rate of return assumption of 7.0% depends itself on the allocation of Plan assets.

If market conditions or the allocation of Plan assets no longer justifies a long-term rate of return assumption of 7.0%, a reduction in the Actuarial Interest Rate would significantly increase the Actuarial Accrued Liability and Unfunded Actuarial Accrued Liability of the Plan, as well as the Normal Cost and resulting contribution. While not yet available on this funding basis, the sensitivity could be expected to be generally similar to the sensitivity reported for GASB 67/68 purposes.[1]

NEW YORK CITY FIRE PENSION FUND

GASB 67/68 SENSITIVITY ANALYSIS AS OF JUNE 30, 2015

| Valuation Date | June 30, 2015 |
|---|---|
| **Results at 7.0%** | |
| 1. Total Pension Liability | $ 18,601,755,963 |
| 2. Plan Fiduciary Net Position | 11,679,331,000 |
| 3. Net Pension Liability (1. - 2.) | $ 6,922,424,963 |
| 4. Funded Ratio (GASB Basis) (2. / 1.) | 62.8% |
| **Results at 6.0%** | |
| 1. Total Pension Liability | $ 20,569,756,525 |
| 2. Plan Fiduciary Net Position | 11,679,331,000 |
| 3. Net Pension Liability (1. - 2.) | $ 8,890,425,525 |
| 4. Funded Ratio (GASB Basis) (2. / 1.) | 56.8% |
| **Sensitivity Analysis for 1.0% Reduction in Interest Rate** | |
| 1. Increase in Total Pension Liability | 10.6% |
| 2. Increase in Net Pension Liability | 28.4% |
| 3. Decrease in Funded Ratio | 6.0% |

[1] As disclosed in the fiscal year 2015 report for GASB 67/68, dated January 8, 2016 (as revised).

### Inflation Risk

FIRE faces risk in the event that inflation is higher than expected. Inflation is a key driver of the salary increase assumptions (affecting active members) and COLA assumptions (affecting both active members and pensioners/beneficiaries). This risk is not currently quantified but should be considered in future years.

### Longevity Risk

FIRE faces risk in its assumption of future mortality rates. Actuarial experience studies were used to develop the "base" mortality rates assumed in the valuation; Society of Actuaries mortality improvement scale MP-2015 was subsequently applied to these base rates.[1]

This scale MP-2015 is an assumption regarding the *improvement* of future mortality rates as compared to mortality when the experience studies were completed. The scale was developed using large amounts of historical data from the Social Security Administration. Risk therefore exists that the mortality improvement inherent in the Plan population is higher than the improvement seen in the population provided by the Social Security Administration.

Furthermore, while the scale uses recent experience to develop short-term mortality improvement rates, an actuarial assumption is applied to long-term mortality improvement rates based on expert opinion. A rate of 1.0% is assumed, which the Society of Actuaries characterizes as "neither overly optimistic nor too pessimistic with respect to future longevity improvements."[2] Risk to the Plan exists, however, if Plan mortality experience shows higher levels of long-term mortality improvement; expert opinion can in some cases be flawed, particularly when past experience is not indicative or predictive of future experience.

This longevity risk is not currently quantified but should be considered in future years.

[1] Retirement Plans Experience Committee. "Mortality Improvement Scale MP-2015 Report" and "Mortality Improvement Scale MP-2014 report." *Society of Actuaries.*

[2] Retirement Plans Experience Committee. "Mortality Improvement Scale BB Report" 5.5 Selection of 1.0% Long-Term Rate of Mortality Improvement. *Society of Actuaries*.

## Low Risk Types

### Credit/Solvency Risk

All public pension systems face credit risk in the event their sponsoring entities become unable to pay their debts and obligations. Credit rating agencies currently consider New York City bonds to be of high quality, and the Actuary believes the City and FIRE face low solvency risk.

### Contribution Risk

Many public pension systems suffer from high contribution risk, wherein sponsoring governmental entities fail to make contributions as determined by the actuary under their funding policies. A recent study found that in 2010, the Annual Required Contribution[1] was not made for over 35% of the 110 public plans in the study.[2]

The New York City Retirement Systems and Pension Funds face low contribution risk. City benefits are constitutionally protected, and participating employers have historically contributed to the actuarial contribution as certified by the Actuary. The Actuary believes the City will continue to do so in future years.

Contribution risk may also increase in future years as the actuarial contribution determined for the Plan grows to be a larger part of the City budget. The five New York City Retirement Systems and Pension Funds currently require contributions of over 10% of the City's annual budget, and contribution risk may increase if this contribution rate becomes untenable.

### Agency Risk

Because of the volatility inherent in pension assets and the gradual amortization of unfunded liabilities, the long-term funded status of the Plan is expected to improve. Many public pension systems suffer from agency risk, wherein different stakeholders or agents want to influence the cost calculations in directions favorable to their interests. Agents may also downplay other risks (e.g. investment risk) to advance specific agendas.

In future years of higher funded status, this may become a higher risk to the Plan, as current taxpapers and plan members may receive preferential treatment over future taxpayers and plan members.

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[1] As defined at the time in GASB 25/27.

[2] Shnitser, Natalya. "*Funding Discipline for U.S. Public Pension Plans: An Empirical Analysis of Institutional Design." Iowa Law Review, Vol. 100 (2015)*.

# APPENDIX: ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 2012 A&M | Actuarial Assumptions and Methods enacted by Chapter 3/13 |
| 2016 A&M | 2012 A&M with changes proposed by the Actuary and adopted by Board of Trustees during Fiscal Year 2016 |
| AAL | Actuarial Accrued Liability |
| AAVM | Actuarial Asset Valuation Method |
| ABO | Accumulated Benefit Obligation |
| ACCNY | Administrative Code of the City of New York |
| AIR | Actuarial Interest Rate |
| APV | Actuarial Present Value |
| APVB | Actuarial Present Value of Benefits |
| AVA | Actuarial Value of Assets |
| CAFR | Comprehensive Annual Financial Report |
| COLA | Cost-of-Living Adjustment |
| EAN | Entry Age Normal cost method |
| EIR | Expected Investment Return |
| FAS | Final Average Salary |
| FIRE | New York City Fire Pension Fund |
| FFVSF | Firefighters Variable Supplements Fund |
| FOVSF | Fire Officers Variable Supplements Fund |
| FS | Final Salary |
| GASB | Governmental Accounting Standards Board |
| GASB5 | Governmental Accounting Standards Board Statement No. 5 |
| GASB67 | Governmental Accounting Standards Board Statement No. 67 |
| GASB68 | Governmental Accounting Standards Board Statement No. 68 |
| IRC | Internal Revenue Code |
| ITHP | Increased-Take-Home-Pay |
| MVA | Market Value of Assets |
| OYLM | One-Year Lag Methodology |
| PVFNC | Present Value of Future Normal Costs |
| PVFS | Present Value of Future Salary |
| UAAL | Unfunded Actuarial Accrued Liability |
| UIR | Unexpected Investment Return |
| VSF | Variable Supplements Funds |
| WTC | World Trade Center |