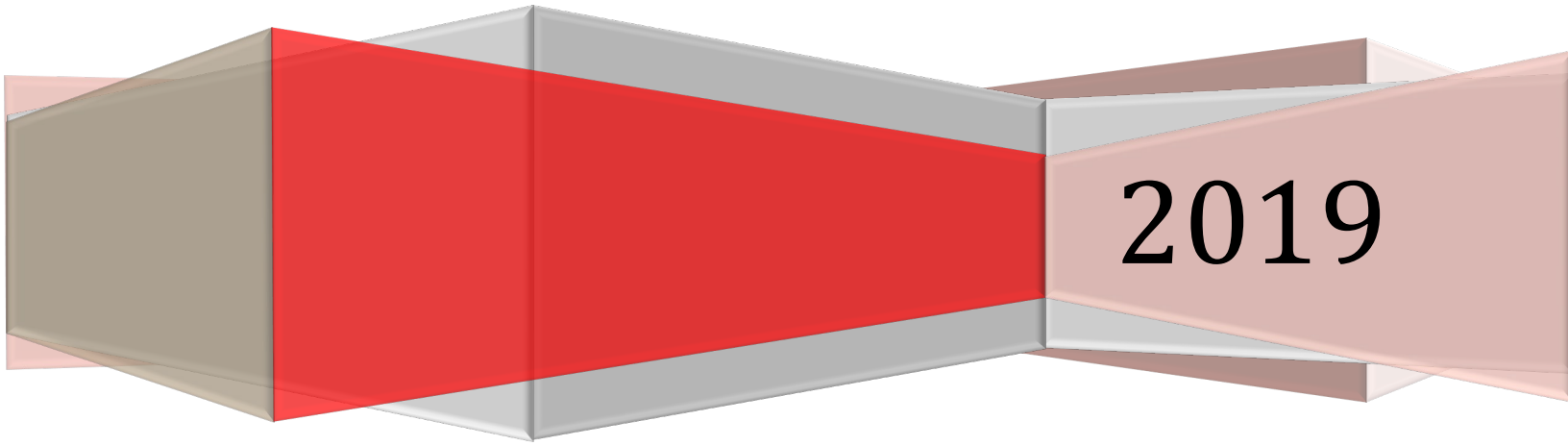
Fiscal Year 2019
Actuarial Valuation Report
for the
New York City
Fire Pension Fund

JUNE 30, 2017 (LAG) ACTUARIAL VALUATION

prepared by the

New York City

Office of the Actuary



OFFICE OF THE ACTUARY

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SHERRY S. CHAN
CHIEF ACTUARY

November 21, 2019

Board of Trustees
New York City Fire Pension Fund and Group Life Insurance Plan
One Battery Park, 9th Floor
New York, NY 10004

Re: Fiscal Year 2019 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2017 (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 $1,398,565,399 for Fiscal Year 2019 (i.e. for the period beginning July 1, 2018 and ending June 30, 2019). It is not intended, nor necessarily suitable, for other purposes. Calculations made for other purposes may differ significantly from those shown herein.

Results of the June 30, 2016 (Lag) actuarial valuation are shown in this Report for comparative purposes. Other historical information that the Actuary believes useful is also included.

The June 30, 2017 (Lag) and June 30, 2016 (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 by FIRE and the Office of the Comptroller as of June 30, 2017 and June 30, 2016.

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 accuracy of the results and calculations presented 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 is shown in SECTION VIII – SUMMARY OF PLAN PROVISIONS. The benefits under the Plan are unchanged from the prior valuation.

A summary of the actuarial assumptions and methods used in the valuation of the Plan is shown in SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS. The assumptions and

methods have changed from the prior valuation. These new assumptions and methods were presented in the report entitled "Proposed Changes in Actuarial Assumptions and Methods Used in Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2018 for the New York City Fire Pension Fund" dated January 23, 2019 which was adopted by the Board of Trustees at the February 27, 2019 Board meeting.

The June 30, 2017 (Lag) actuarial valuation also includes changes in:

- The handling of the VSF offset due to escalation for Tier 3, Tier 3 Modified, and Tier 3 Enhanced members. Future VSF payments were previously offset by expected escalation on members' pension. Beginning with this valuation, an offset for future escalation is no longer included.

- Valuing the non-uniformed service for Tier 1 and Tier 2 members. Beginning with this valuation, non-uniformed service by individual is collected and valued accordingly.

This report does not present Governmental Accounting Standards Board (GASB) results. The Office of the Actuary published Fiscal Year 2019 GASB67 and GASB68 results in a report dated September 27, 2019, which is available on the website of the Office of the Actuary (www.nyc.gov/actuary).

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, 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/mm

cc: Mr. Craig Chu - New York City Office of the Actuary
Mr. Patrick Dunn – New York City Fire Pension Fund
Mr. Anderson Huynh - 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 report presents the results of the June 30, 2017 (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) for Fiscal Year 2019 (i.e. July 1, 2018 to June 30, 2019),
- 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.

The statutorily-required contribution (Statutory Contribution) is also shown and compared to the Actuarial Contribution in historical years.

This Report does not provide financial and accounting information required by the current GASB standards. That information is provided in a separate report.

All results are based on preliminary SKIM amounts as determined by the Actuary in a letter dated October 26, 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 methods, and changes in applicable statute and plan provisions. These and additional risks may be present for the Plan. A further discussion is presented in SECTION VII – RISK AND UNCENTAINTY for consideration.

Table I-1
Executive Summary

Presented in **Table I-1** are the principal results of the June 30, 2017 (Lag) actuarial valuation and, for comparative purposes, the June 30, 2016 (Lag) actuarial valuation.

NEW YORK CITY FIRE PENSION FUND

SUMMARY OF VALUATION RESULTS

Valuation Date	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Fiscal Year	**2019**	**2018**
Funded Status		
1. Accrued Liability[1]	$ 20,942,655,456	$ 20,125,428,678
2. Actuarial Value of Assets (AVA)[2]	11,814,576,000	11,082,451,000
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	$ 9,128,079,456	$ 9,042,977,678
4. Funded Ratio (AVA Basis) (2. / 1.)	56.4%	55.1%
5. Market Value of Assets (MVA)[2]	12,089,896,000	10,899,763,000
6. Unfunded Accrued Liability (MVA Basis) (1. - 5.)	$ 8,852,759,456	$ 9,225,665,678
7. Funded Ratio (MVA Basis) (5. / 1.)	57.7%	54.2%
Contribution[3]		
1. Normal Cost	$ 577,125,956	$ 414,118,544
2. Amortization of Unfunded Accrued Liability	821,439,443	786,298,508
3. Administrative Expenses	NA	NA
4. Actuarial Contribution (1. + 2. + 3.)	$ 1,398,565,399	$ 1,200,417,052
5. Statutory Contribution (4.)	$ 1,398,565,399	$ 1,200,417,052
Participant Data		
1. Active Members		
a. Number	11,091	10,951
b. Annual Salary[4]	$ 1,256,001,332	$ 1,180,226,281
c. Average Salary	$ 113,245	$ 107,773
2. Active Off Payroll Members[5]	15	21
3. Terminated Vested Members	58	58
4. Retirees and Beneficiaries		
a. Number	16,636	16,647
b. Total Annual Benefits	$ 1,196,134,725	$ 1,140,016,751
c. Average Annual Benefit	$ 71,900	$ 68,482

[1] Includes unfunded VSF Accrued Liability.

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

[3] Including results for Variable Supplements Funds.

[4] 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.

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

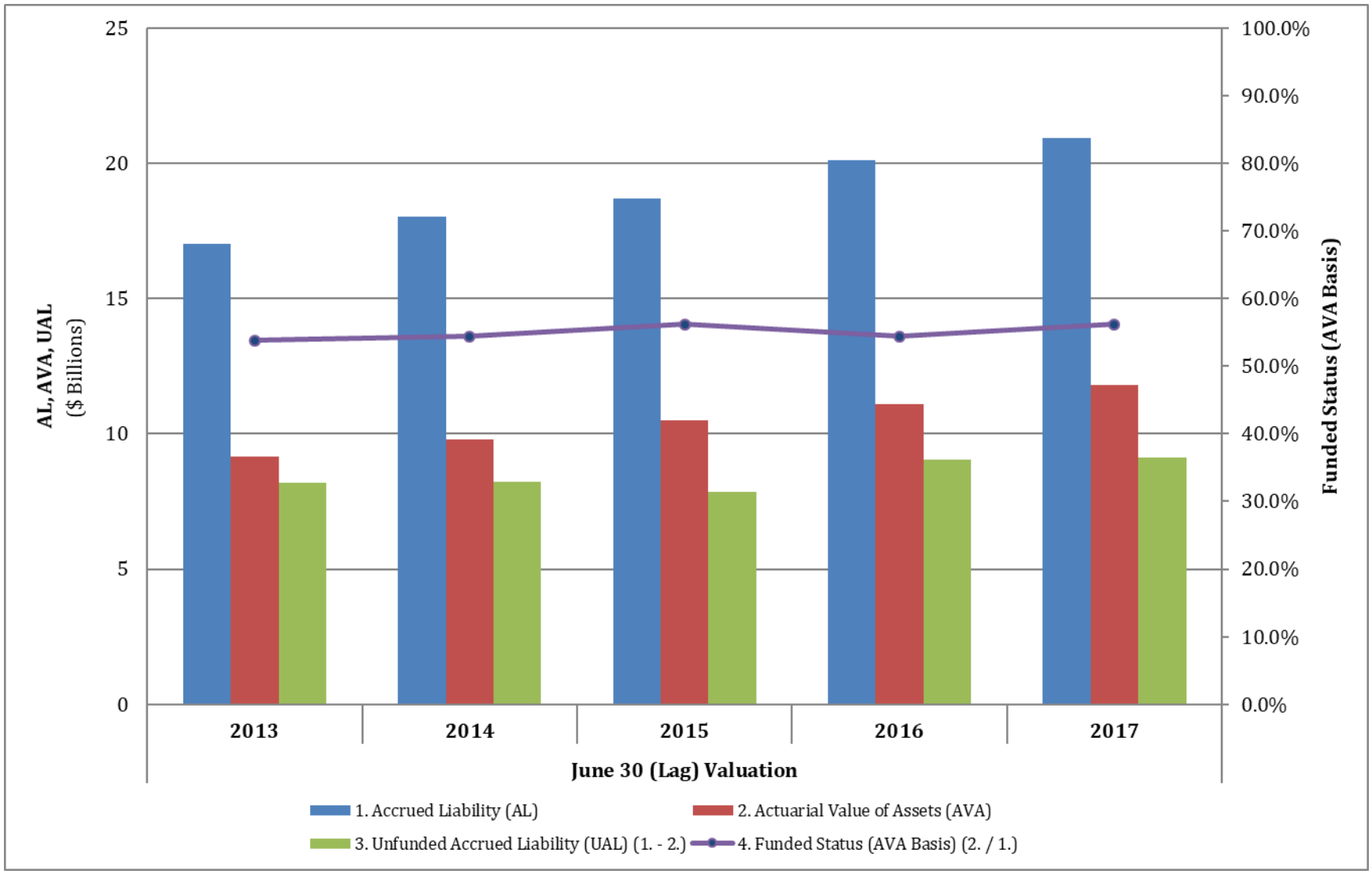
Table I-2
Actuarial Liabilities

NEW YORK CITY FIRE PENSION FUND ACTUARIAL LIABILITIES BY STATUS		
Valuation Date	**June 30, 2017 (Lag)**	**June 30, 2016 (Lag)**
Fiscal Year	**2019**	**2018**
Accrued Liability		
1. Active Members	$ 7,575,439,810	$ 7,234,580,515
2. Active Off Payroll Members[1]	2,674,393	5,629,970
3. Terminated Vested Members	11,765,858	10,361,142
4. Retirees and Beneficiaries	13,384,339,259	12,666,895,160
5. Accrued Liability Pre-Adjustments (1. to 4.)	$ 20,974,219,320	$ 19,917,466,787
6. Actuarial Adjustments[2]	(31,563,864)	207,961,891
7. Total Accrued Liability (5. + 6.)	$ 20,942,655,456	$ 20,125,428,678
Present Value of Benefits		
1. Active Members	$ 13,238,039,466	$ 11,250,296,067
2. Active Off Payroll Members[1]	2,674,393	5,629,970
3. Terminated Vested Members	11,765,858	10,361,142
4. Retirees and Beneficiaries	13,384,339,259	12,666,895,160
5. Present Value of Benefits (1. to 4.)	$ 26,636,818,976	$ 23,933,182,339
6. Actuarial Adjustments[2]	110,106,250	371,910,010
7. Total Present Value of Benefits (5. + 6.)	$ 26,746,925,226	$ 24,305,092,349

[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 – 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 expected rate of return and the AVA, where EIR equals the sum of beginning-of-fiscal-year AVA plus one-half of net cash flow, multiplied by the expected rate of return.

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 II-1
Statement of Plan Net Assets

($ Thousands)		
	June 30, 2017	**June 30, 2016**
ASSETS		
Cash	$ 37,035	$ 37,457
Receivables		
Investment Securities Sold	$ 138,400	$ 153,595
Member Loans	26,951	26,917
Accrued Interest and Dividends	23,004	20,518
Other Receivables	178	0
Total Receivables	$ 188,533	$ 201,030
INVESTMENTS AT FAIR VALUE		
Short-Term Investments		
Commercial Paper	$ 136,416	$ 52,525
Short-Term Investment Fund	91,493	118,935
U.S. Treasury Bills	0	25,998
Debt Securities	2,219,638	2,211,925
Equity Securities	1,878,641	1,802,947
Alternative Investments	2,391,376	2,117,856
Collective Trust Funds		
Fixed Income	575,442	401,512
Domestic Equity	2,149,785	1,736,914
International Equity	2,232,054	1,966,228
Mortgage Debt Security	89,229	86,107
Treasury Inflation Protected Securities	543,317	547,146
Collateral From Securities Lending	1,080,020	854,211
Total Investments	$ 13,387,411	$ 11,922,304
OTHER ASSETS	2,508	6,176
TOTAL ASSETS	$ 13,615,487	$ 12,166,967
LIABILITIES		
Accounts Payable	$ 147,979	$ 89,435
Payable for Investment Securities Purchased	147,296	215,792
Accrued Benefits Payable	15,680	18,893
Accrued Transfers to VSFs	134,616	88,873
Security Lending	1,080,020	854,211
TOTAL LIABILITIES	$ 1,525,591	$ 1,267,204
PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS	$ 12,089,896	$ 10,899,763

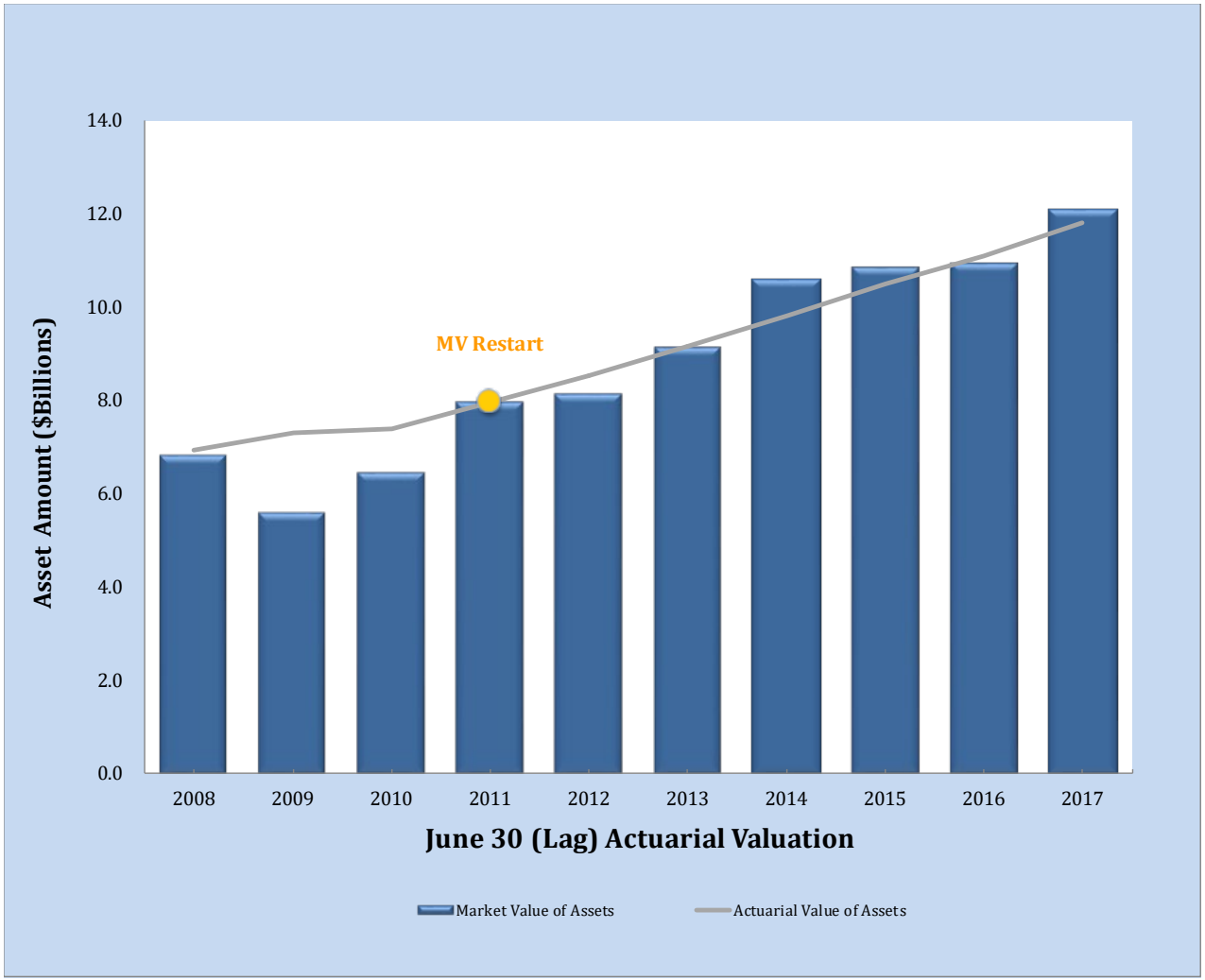
Table II-2
Statement of Changes in Plan Net Assets

($ Thousands)	June 30, 2017	June 30, 2016
ADDITIONS		
Contributions		
Member Contributions	$ 108,368	$ 116,619
Employer Contributions	1,061,170	1,054,478
Total Contributions	$ 1,169,538	$ 1,171,097
Investment Income (Loss)		
Interest Income	$ 135,642	$ 137,160
Dividend Income	159,972	145,276
Net Appreciation (Depreciation) in Fair Value	1,067,973	(44,510)
Total Investment Income (Loss)	$ 1,363,587	$ 237,926
Less Investment Expenses	84,438	46,321
Net Income (Loss)	$ 1,279,149	$ 191,605
Securities Lending Transactions		
Securities Lending Income	$ 6,150	$ 6,196
Securities Lending Fees	(428)	(403)
Net Securities Lending Income (Loss)	$ 5,722	$ 5,793
Net Investment Income (Loss)	$ 1,284,871	$ 197,398
Other		
Net Receipts from Other Retirement Systems	44,999	42,786
Litigation Income	2,285	887
TOTAL ADDITIONS	$ 2,501,693	$ 1,412,168
DEDUCTIONS		
Benefit Payments and Withdrawals	$ 1,265,817	$ 1,290,862
Accrued Transfers to VSFs	45,743	36,873
TOTAL DEDUCTIONS	$ 1,311,560	$ 1,327,735
NET INCREASE (DECREASE) IN PLAN NET ASSETS	$ 1,190,133	$ 84,433
PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
Beginning of Year	$ 10,899,763	$ 10,815,330
End of Year	$ 12,089,896	$ 10,899,763

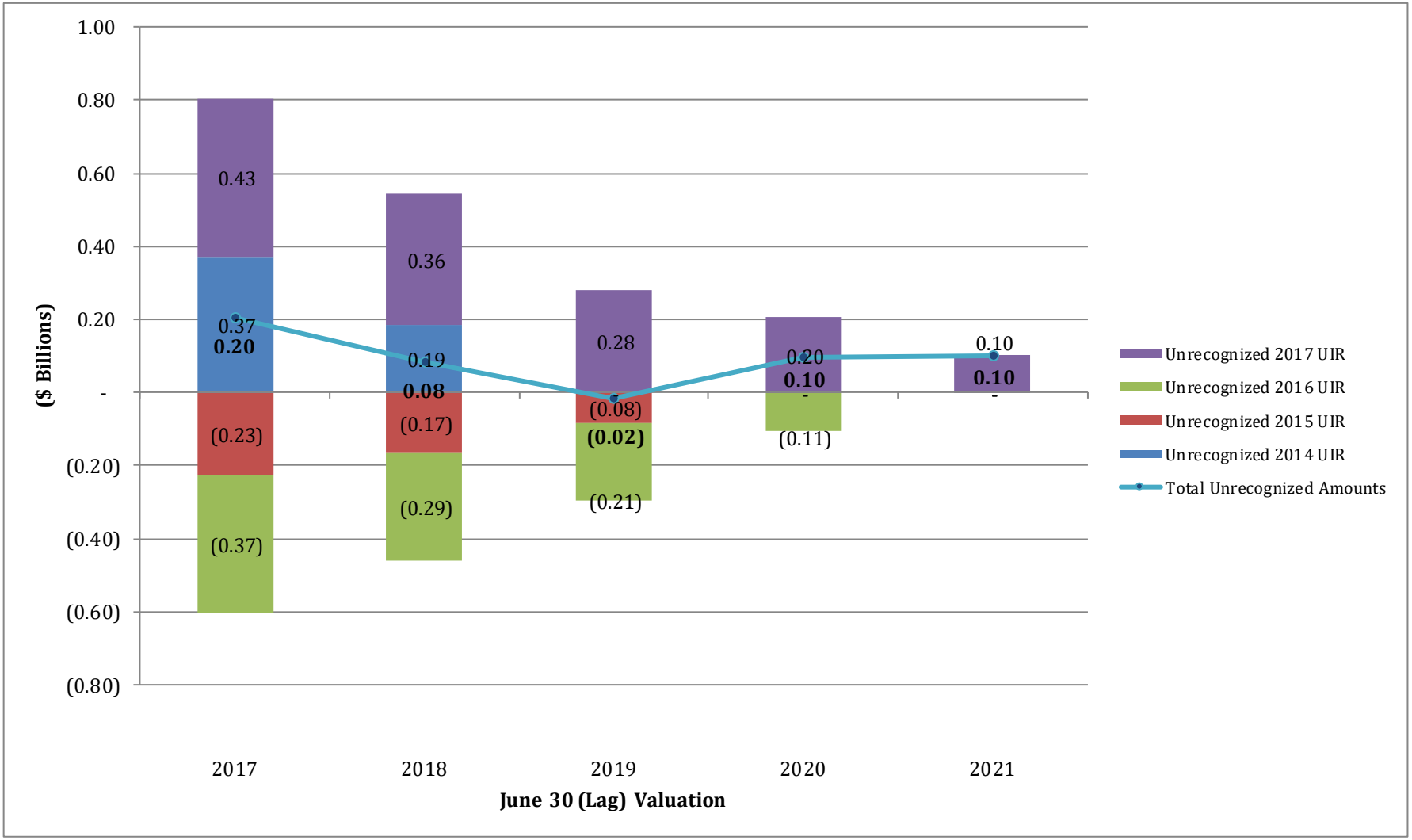
Table II-3
Development of Actuarial Value of Assets

($ Thousands)		
Valuation Date	**June 30, 2017**	**June 30, 2016**
1. Market Value of Assets (MVA)		
Beginning of Year (BOY)	$ 10,899,763	$ 10,815,330
End of Year (EOY)	$ 12,089,896	$ 10,899,763
2. Contributions		
a. Employee	$ 108,368	$ 116,619
b. Employer	1,061,170	1,054,478
c. Total Contributions	$ 1,169,538	$ 1,171,097
3. Net Investment Income		
a. Investment Income	$ 1,369,309	$ 243,719
b. Investment Expenses	(84,438)	(46,321)
c. Total Net Investment Income	$ 1,284,871	$ 197,398
4. Cash Flow (Other)	$ (1,218,533)	$ (1,247,189)
5. Preliminary SKIM from FIRE to VSFs - EOY	$ (45,743)	$ (36,873)
6. Net Cash Flow (2.c. + 4. + 5.)	$ (94,738)	$ (112,965)
7. Average invested assets		
a. AVA @ BOY	$ 11,082,451	$ 10,504,728
b. 1/2 Net Cash Flow ((2.c. + 4.) / 2)	(24,498)	(38,046)
c. Total	$ 11,057,953	$ 10,466,682
8. Expected Rate of Return (AIR)	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	$ 774,057	$ 732,668
10. Unexpected Investment Return (UIR) (3.c. - 9.)	$ 510,814	$ (535,270)
11. AVA @ EOY		
a. AVA @ BOY (prior to corridor limit)	$ 11,082,451	$ 10,504,728
b. Net Cash Flow (6.)	(94,738)	(112,965)
c. Expected Investment Return (9.)	774,057	732,668
d. Phase in of UIR		
15% * UIR for prior year	76,622	(80,291)
15% * UIR for second prior year	(80,291)	(62,216)
15% * UIR for third prior year	(62,216)	139,231
15% * UIR for fourth prior year	139,231	54,494
20% * UIR for fifth prior year	72,658	(93,198)
20% * UIR for sixth prior year	(93,198)	N/A
Total	$ 52,806	$ (41,980)
e. AVA (11.a. + 11.b. + 11.c. + 11.d.)	$ 11,814,576	$ 11,082,451
12. Corridor		
a. 80% of MVA	$ 9,671,917	$ 8,719,810
b. 120% of MVA	$ 14,507,875	$ 13,079,716
13. Final AVA of EOY (11e. bounded by 12)	**$ 11,814,576**	**$ 11,082,451**

Graph II-4
Historical Market and Actuarial Value of Assets



Graph II-5
Future Recognition of UIR as of June 30, 2017



SECTION III – CONTRIBUTION DEVELOPMENT AND HISTORY

Table III-1
Statutory Contributions

Table III-1 shows the components of the Fiscal Year 2019 and the Fiscal Year 2018 Statutory Contributions.

COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS		
Valuation Date	**June 30, 2017 (Lag)**	**June 30, 2016 (Lag)**
Fiscal Year	**2019**	**2018**
Normal Cost	$ 577,125,956	$ 414,118,544
Amortization of Unfunded Accrued Liability		
- Initial UAL	655,678,921	636,581,477
- 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	506,537
- 2016 (Gain)/Loss	18,745,299	18,745,299
- 2016 Enhanced ADR	249,358	249,358
- 2016 SADB	96,997,069	96,997,069
- 2017 (Gain)/Loss	7,078,925	NA
- 2017 No VSF Escation Offset	45,144	NA
- 2017 Non-uniformed Service	264,728	NA
- 2017 Assumption Changes	40,764,307	NA
- 2017 Method Changes	(32,109,613)	NA
Total	821,439,443	786,298,508
Administrative Expenses	NA	NA
Total Contribution to the New York City Fire Pension Fund	**$ 1,398,565,399**	**$ 1,200,417,052**

Table III-2
Schedule of Unfunded Accrued Liability Bases

The Initial UAL 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. Increments to the UAL established after June 30, 2010 are generally amortized using Level Dollar Payments (LDP) as follows:

- Benefit Changes – Over the remaining working lifetimes of those impacted, unless the amortization period is determined by statute.
- Assumption and 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 fewer than the number of years in the amortization period (e.g. 14 payments over a closed 15-year amortization period).

Table III-2
Schedule of Unfunded Accrued Liability Bases (cont'd)

Table III-2 shows the Schedule of Unfunded Accrued Liability (UAL) Bases as of June 30, 2017. Note that a change to the schedule at June 30, 2017 reduced amounts remaining to be amortized by the prior fiscal year's amortization payments, which are now included as a receivable in plan assets. This change has no impact on the determination of the amortization payments or the Employer Contribution.

NEW YORK CITY FIRE PENSION FUND
SCHEDULE OF UNFUNDED ACCRUED LIABILITY BASES

Amortization Base	Date Established	Original Amount	Amortization Years	Amortization Payment	Payments Remaining	OYLM UAL June 30, 2017
Initial UAL	6/30/10	$ 7,095,864,159	22	$ 655,678,921	14	$ 6,550,900,712
(Gain)/Loss	6/30/11	$ (168,320,189)	15	$ (19,908,798)	8	$ (114,926,965)
(Gain)/Loss	6/30/12	$ 26,297,732	15	$ 3,110,478	9	$ 19,591,385
(Gain)/Loss	6/30/13	$ 61,311,940	15	$ 7,251,935	10	$ 49,240,293
(Gain)/Loss	6/30/14	$ 84,382,762	15	$ 9,980,736	11	$ 72,352,772
Assumptions Change[1]	6/30/14	$ 327,575,238	20	$ 32,784,417	16	$ 299,401,059
(Gain)/Loss	6/30/15	$ 4,282,552	15	$ 506,537	12	$ 3,889,439
(Gain)/Loss	6/30/16	$ 158,483,315	15	$ 18,745,299	13	$ 151,455,382
SADB	6/30/16	$ 820,067,832	15	$ 96,997,069	13	$ 783,701,974
Enhanced ADR	6/30/16	$ 2,612,048	22	$ 249,358	20	$ 2,553,828
(Gain)/Loss	6/30/17	$ 59,849,221	15	$ 7,078,925	14	$ 59,849,221
No VSF Escalation Offset	6/30/17	$ 462,349	21	$ 45,144	20	$ 462,349
Non-Uniformed Service	6/30/17	$ 2,645,107	20	$ 264,728	19	$ 2,645,107
Assumption Change[2]	6/30/17	$ 407,308,674	20	$ 40,764,307	19	$ 407,308,674
Method Changes[3]	6/30/17	$ (320,832,740)	20	$ (32,109,613)	19	$ (320,832,740)

[1] Change in post retirement mortality assumptions including the change to the mortality improvement scale MP-2015.

[2] Changes in demographic assumptions to better align with future experience and change to the mortality improvement scale MP-2018.

[3] Refinements to valuation methodologies.

Graph III-3
Remaining UAL Amortizations as of June 30, 2017

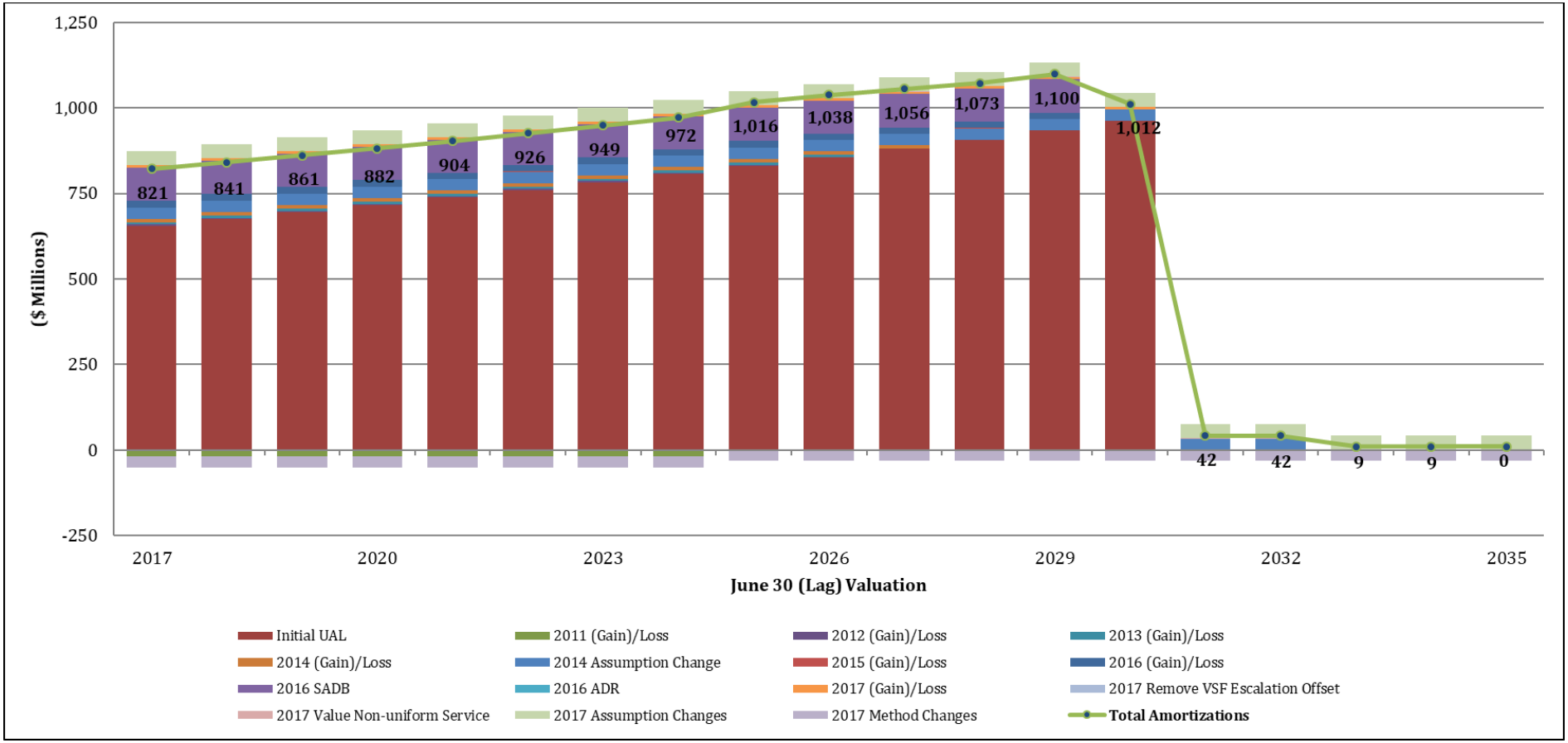


Table III-4
Reconciliation of Outstanding UAL Bases

	Amounts (in $ Thousands) Remaining to be Amortized, as of							
June 30 (Lag) Valuation Date	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017 [1]**
Unfunded Accrued Liability, June 30, 2010	$ 7,095,864	$ 7,592,575	$ 7,572,584	$ 7,534,650	$ 7,477,020	$ 7,397,804	$ 7,294,965	$ 6,550,901
2011 (Gain)/Loss		(168,320)	(180,103)	(172,116)	(163,570)	(154,426)	(144,642)	(114,927)
2012 (Gain)/Loss			26,298	28,139	26,891	25,556	24,127	19,591
2013 (Gain)/Loss				61,312	65,604	62,695	59,582	49,240
2014 (Gain)/Loss					84,383	90,290	86,286	72,353
2014 Assumption Change					327,575	350,506	341,128	299,401
2015 (Gain)/Loss						4,283	4,582	3,889
2016 (Gain)/Loss							158,483	151,455
2016 Enhanced ADR							2,612	2,554
2016 SADB							820,068	783,702
2017 (Gain)/Loss								59,849
2017 Removal of VSF Escalation Offset								462
2017 Non-uniformed Service								2,645
2017 Assumption Changes								407,309
2017 Method Changes								(320,833)
Sum of Outstanding Amortization Amounts	**$ 7,095,864**	**$ 7,424,255**	**$ 7,418,779**	**$ 7,451,985**	**$ 7,817,903**	**$ 7,776,708**	**$ 8,647,191**	**$ 7,967,591**

June 30 (Lag) Valuation Date	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
1. Accrued Liability (AL)	$ 15,349,598	$ 15,808,930	$ 16,358,108	$ 17,003,722	$ 18,028,696	$ 18,688,642	$ 20,125,429	$ 20,942,655
2. Actuarial Value of Assets (AVA)	7,392,656	7,955,668	8,520,769	9,144,587	9,808,854	10,504,728	11,082,451	11,814,576
3. Unfunded Accrued Liability (UAL) (1. - 2.)	7,956,942	7,853,262	7,837,339	7,859,135	8,219,842	8,183,914	9,042,978	9,128,079
4. PV 1-year Adjusted Employer Contribution[2]	861,078	429,007	418,560	407,150	401,939	407,206	395,787	1,160,488
5. Adjusted UAL (3. - 4.)	**$ 7,095,864**	**$ 7,424,255**	**$ 7,418,779**	**$ 7,451,985**	**$ 7,817,903**	**$ 7,776,708**	**$ 8,647,191**	**$ 7,967,591**

[1] Beginning at June 30, 2017, amounts remaining to be amortized have been reduced by the prior valuation year's amortization payments. When considered with (2) below, this change has no effect.

[2] Beginning at June 30, 2017, the PV 1-year Adjusted Employer Contribution includes amounts used to pay UAL bases and one year of administrative expenses. When considered with (1) above, this change has no effect.

Table III-5
Actuarial and Statutory Contribution History

Table III-5 compares the Statutory Contributions to the Actuarial Contributions for Fiscal Years 2010 through 2019.

($ Thousands)			
Fiscal Year Ended June 30	**Actuarial Contribution Certified**	**Statutory Contribution Certified**	**Percentage of Actuarial Contribution Contributed**
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%
2018	1,200,417	1,200,417	100.0%
2019	1,398,565	1,398,565	100.0%

Table III-6
City Rates: Contributions as a Percentage of Salary

Table III-6 shows the City Rates defined to be the contributions as a percentage of salary for the Fiscal Years 2010 through 2019.

CITY RATES ($ Thousands)			
Fiscal Year Ended June 30	**Actuarial Contribution**	**Salary[1] at Beginning of Fiscal Year**	**City Rate**
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%
2018	1,200,417	1,164,528	103.082%
2019	1,398,565	1,272,490	109.908%

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

SECTION IV – (GAIN)/LOSS ANALYSIS

Table IV-1
Development of Experience (Gain)/Loss

Table IV-1 develops the asset and liability (Gain)/Loss between the June 30, 2016 (Lag) actuarial valuation and the June 30, 2017 (Lag) actuarial valuation.[1]

DEVELOPMENT OF EXPERIENCE (GAIN) / LOSS June 30, 2017 ($ Thousands)	
1. Expected Accrued Liability (AL)	
a. AL at June 30, 2016	$ 20,974,704
b. Total Normal Cost and Admin. Expenses at June 30, 2016	478,916
c. Interest on 1.a. and 1.b. to June 30, 2017	1,501,753
d. Fiscal Year 2017 Benefit Payments	(1,334,807)
e. Interest on 1.d. to June 30, 2016	(45,928)
f. Expected AL at June 30, 2017	$ 21,574,638
2. Actual AL at June 30, 2017 before Plan Changes[2] and 2019 A&M	$ 21,739,665
3. Expected Total Actuarial Value of Assets (AVA)	
a. Total AVA at June 30, 2016	$ 11,931,726
b. Interest on 3.a. to June 30, 2017	835,221
c. Total Contributions Paid in Fiscal Year 2017	1,169,538
d. Interest on 3.c. to June 30, 2017	40,242
e. Fiscal Year 2017 Benefit Payments	(1,334,807)
f. Interest on 3.e. to June 30, 2017	(45,928)
g. Expected Total AVA at June 30, 2017	$ 12,595,992
4. Actual Total AVA at June 30, 2017	$ 12,701,169
5. Accrued Liability (Gain)/Loss (2. - 1.f.)	**$ 165,027**
6. Actuarial Asset (Gain) / Loss (3.g. - 4.)	**$ (105,177)**
7. Total Actuarial (Gain) / Loss (5. + 6.)	**$ 59,850**

[1] Includes results for Variable Supplements Funds.

[2] Removal of Escalation offset on VSF benefits and a change in valuing non-uniformed service.

SECTION V – SCHEDULE OF FUNDING PROGRESS

A schedule of funding progress is provided below. This schedule of funding progress was previously required by GASB 25, which has been superseded by GASB 67, and is provided for historical context. These liability and asset measures are used to develop the Actuarial Contribution and are not suitable for other purposes including, but not limited to, settlement of plan obligations. For more information, see SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS.

Table V-1
Schedule of Funding Progress

NEW YORK CITY FIRE PENSION FUND ($ Thousands)						
June 30 (Lag) Valuation Date	**(1) Actuarial Value of Assets (AVA)**	**(2) Accrued Liability (AL)**	**(3) Unfunded (AL) (UAL) (2) - (1)**	**(4) Funded Ratio (1) / (2)**	**(5) Covered Payroll**	**(6) UAL as a % of Covered Payroll (3) / (5)**
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%
2016	11,082,451	20,125,429	9,042,978	55.1%	1,180,226	766.2%
2017	11,814,576	20,942,655	9,128,079	56.4%	1,256,001	726.8%

Effective June 30, 2010, AL is based on the Entry Age Normal cost method. Previously, the Frozen Initial Liability cost method was used.
Salaries shown are base salaries 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

SECTION VI – 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 VI-1
VSF Accrued Liability

($ Thousands)		
Valuation Date	**June 30, 2017**	**June 30, 2016**
FFVSF		
Active	$ 133,811	$ 186,126
Retiree	366,673	370,075
Total	$ 500,484	$ 556,201
FOVSF		
Active	$ 138,444	$ 186,025
Retiree	158,302	158,211
Total	$ 296,746	$ 344,236
Total VSF AL	$ 797,230	$ 900,437

Table VI-2
VSF Member Data

VARIABLE SUPPLEMENTS FUNDS MEMBERS INCLUDED IN THE JUNE 30, 2017 (LAG) AND JUNE 30, 2016 (LAG) ACTUARIAL VALUATIONS				
	June 30, 2017		**June 30, 2016**	
	FFVSF	**FOVSF**	**FFVSF**	**FOVSF**
Actives				
Number	8,431	2,660	8,399	2,552
Average Age	38.5	47.6	38.5	47.9
Retirees				
Number	3,474	1,536	3,535	1,553
Average Age	72.2	73.2	71.9	73.0

Table VI-3
VSF Statement of Assets

($ Thousands)				
Valuation Date	**June 30, 2017[1]**		**June 30, 2016**	
	MVA[2]	**AVA**	**MVA[3]**	**AVA**
FFVSF	$ 547,077	$ 547,690	$ 524,075	$ 535,824
FOVSF	354,337	338,903	314,272	313,451
Total	$ 901,414	$ 886,593	$ 838,347	$ 849,275

[1] Reflects preliminary SKIM amounts as determined by the Actuary in a letter dated October 26, 2017 to the Boards.

[2] Includes Accrued Benefits Payable of $20,831,000 for FFVSF and $9,121,000 for FOVSF.

[3] Includes Accrued Benefits Payable of $21,225,000 for FFVSF and $9,263,000 for FOVSF.

Table VI-4
Development of VSF Actuarial Value of Assets

($ Thousands)	June 30, 2017		June 30, 2016	
	FFVSF	FOVSF	FFVSF	FOVSF
1. Market Value of Assets (MVA)				
a. Beginning of Year (BOY)[1]	$ 524,075	$ 314,272	$ 547,074	$ 316,927
b. End of Year (EOY)[2]	$ 547,077	$ 354,337	$ 524,075	$ 314,272
2. Contributions				
a. Employee	$ 0	$ 0	$ 0	$ 0
b. Employer	0	0	0	0
c. Total Contributions	$ 0	$ 0	$ 0	$ 0
3. Benefit Payments and Other Cash Flow	$ (47,667)	$ (21,859)	$ (46,407)	$ (21,826)
4. Preliminary SKIM from FIRE to VSFs - EOY[3]	$ 23,914	$ 21,829	$ 18,739	$ 18,134
5. Net Cash Flow (2.c. + 3. + 4.)	$ (23,753)	$ (30)	$ (27,668)	$ (3,692)
6. Net Investment Income				
a. Investment Income	$ 47,194	$ 40,342	$ 4,669	$ 1,037
b. Investment Expenses	(439)	(247)	0	0
c. Total Net Investment Income	$ 46,755	$ 40,095	$ 4,669	$ 1,037
7. Average invested assets				
a. AVA @ BOY	$ 535,824	$ 313,451	$ 530,699	$ 296,488
b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2)	(23,834)	(10,930)	(23,204)	(10,913)
c. Total	$ 511,990	$ 302,521	$ 507,495	$ 285,575
8. Expected Rate of Return (AIR)	7.00%	7.00%	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	$ 35,839	$ 21,176	$ 35,525	$ 19,990
10. Unexpected Investment Return (UIR) (6.c. - 9.)	$ 10,916	$ 18,919	$ (30,856)	$ (18,953)
11. AVA @ EOY				
a. AVA @ BOY	$ 535,824	$ 313,451	$ 530,699	$ 296,488
b. Net Cash Flow (5.)	(23,753)	(30)	(27,668)	(3,692)
c. Expected Investment Return (9.)	35,839	21,176	35,525	19,990
d. Phase in of UIR				
15% * UIR for prior year	1,637	2,838	(4,628)	(2,843)
15% * UIR for second prior year	(4,628)	(2,843)	(2,285)	(1,041)
15% * UIR for third prior year	(2,285)	(1,041)	6,219	4,960
15% * UIR for fourth prior year	6,219	4,960	2,625	2,409
20% * UIR for fifth prior year	3,500	3,212	(4,663)	(2,820)
20% * UIR for sixth prior year	(4,663)	(2,820)	0	0
Total	$ (220)	$ 4,306	$ (2,732)	$ 665
e. AVA (11.a. + 11.b. + 11.c. + 11.d.)	$ 547,690	$ 338,903	$ 535,824	$ 313,451
12. Final AVA at EOY	**$ 547,690**	**$ 338,903**	**$ 535,824**	**$ 313,451**

[1] Includes Accrued Benefits Payable for 6/30/2017 of $21,225,000 for FFVSF and $9,263,000 for FOVSF and Accrued Benefits Payable for 6/30/2016 of $21,630,000 for FFVSF and $9,522,000 for FOVSF

[2] Includes Accrued Benefits Payable for 6/30/2017 of $20,831,000 for FFVSF and $9,121,000 for FOVSF and Accrued Benefits Payable for 6/30/2016 of $21,225,000 for FFVSF and $9,263,000 for FOVSF

[3] Reflects preliminary SKIM amounts as determined by the Actuary in a letter dated October 26, 2017 to the Boards.

Table VI-5
SKIM Calculation as of June 30, 2017

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

($ Thousands)	Preliminary	
Total FIRE Pension Fund		
1. FY2017 Equity Earnings	$	1,289,276
2. FY2017 Hypothetical Earnings		177,890
3. FY2017 Excess Earnings (1. - 2.)		1,111,385
4. Deficit at June 30, 2016		136,732
5. Hypothetical Interest Rate (HIR)		2.415%
6. Deficit with interest (4. x (1+HIR))		140,034
7. Potential SKIM (3. - 6.), not less than 0	$	971,351

	FFVSF	FOVSF
Allocations to VSF		
8. Allocation Percentage	68.774%	31.226%
9. Potential SKIM (7. x 8.)	$ 668,037	$ 303,314
10. Accumulated Benefit Obligation	547,210	334,917
11. MVA Prior to SKIM	533,077	354,337
12. ABO Gate = (10. - 11.), not less than zero	14,133	0
13. SKIM Payable (Lesser of 9 and 12, not less than zero)	14,133	0
14. Rounded Estimate, for FY17 Financial Statements[1]	$ 14,000	$ 0

[1] Included in MVA at June 30, 2017.

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 XI – ACTUARIAL ASSUMPTIONS AND METHODS.

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, except there is no corridor of 80% to 120% of the MVA for the VSFs. For more information, see SECTION II – 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 PV 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 PV of benefits of the FFVSF and FOVSF over the AVA of the FFVSF and FOVSF, respectively. Under EAN, a portion of the PV of future VSF transfers is reflected in the PV of future normal costs and a portion is reflected in the UAL.

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 the Hypothetical Interest Rate, 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 Differential*: 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 Differential allocable to the VSFs based on the ratio of total contributions between Firefighters and Fire Officers, limited so to not allow assets to exceed the Accumulated Benefit Obligation (ABO) of the VSFs

SECTION VII – RISK AND UNCERTAINTY

The actuarial assumptions and methods adopted by the Board of Trustees during the Fiscal Year 2019 are referred to as the "2019 A&M." The Fiscal Year 2019 employer contribution is based on the Census data reported as of June 30, 2017 and on the 2019 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; quantifying these risks for the Plan is beyond the scope of this valuation but may be undertaken in future years.

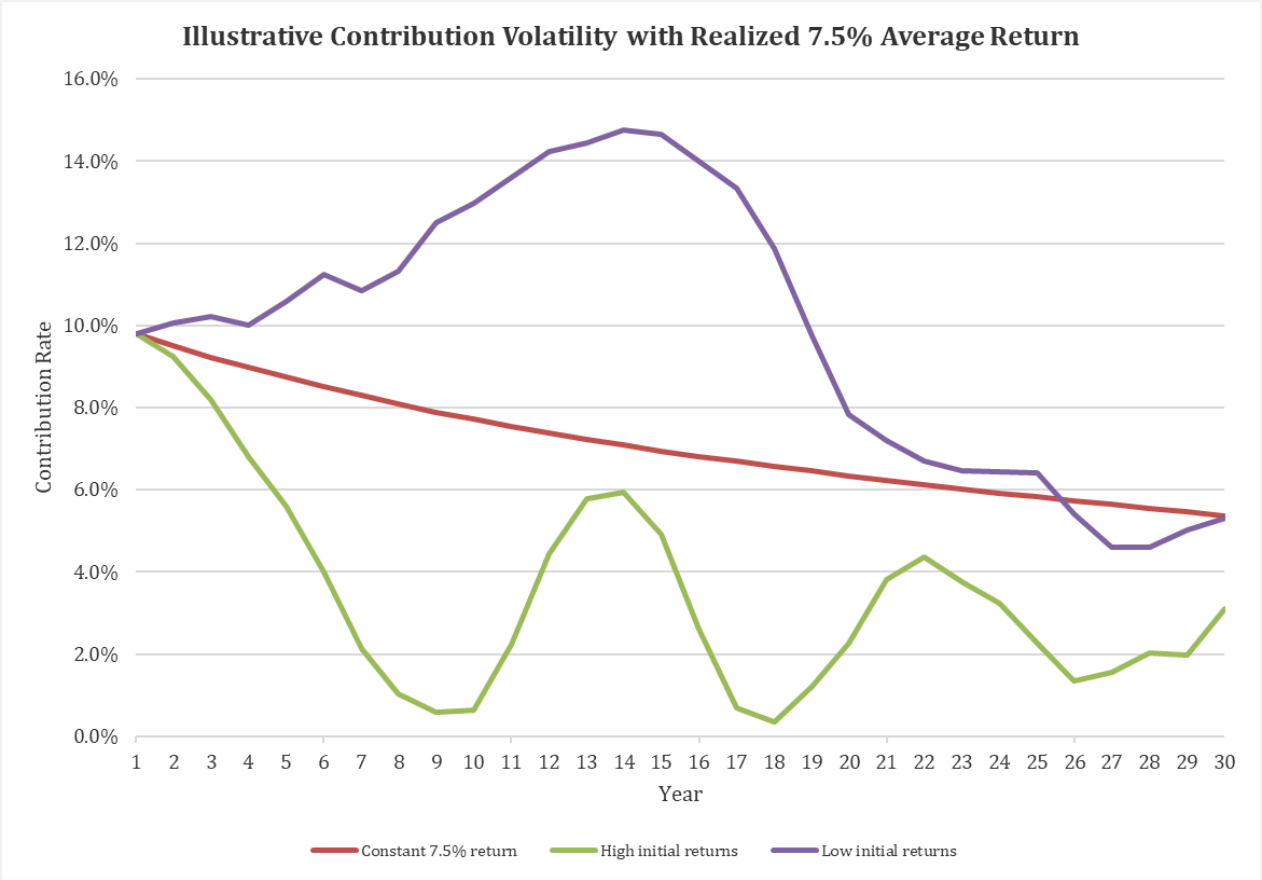
These risks have been separated, based on the Actuary's professional judgement, into high, medium, and low risks.

High Risk Types

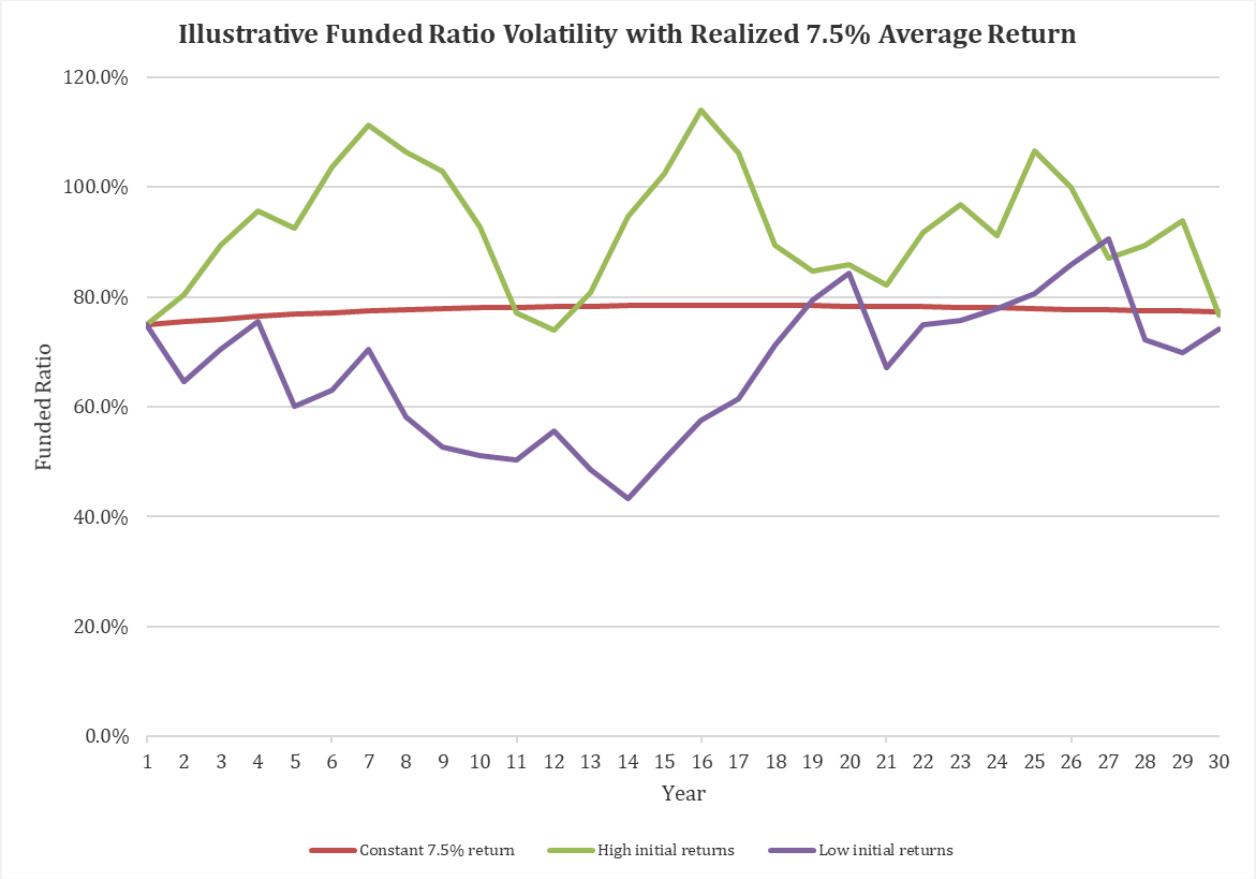
Investment Risk

The most substantial risk for FIRE is that investment returns may be less 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 available specifically for the Plan at this time, 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 the long-term expected rate of return is 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 retirement system. A mature retirement system has a significant ratio of retirees to active members and, usually, of assets to active member payroll and of Accrued Liability (AL) to active member payroll. These ratios, sometimes known as volatility ratios, for the Plan can be found in the chart below.

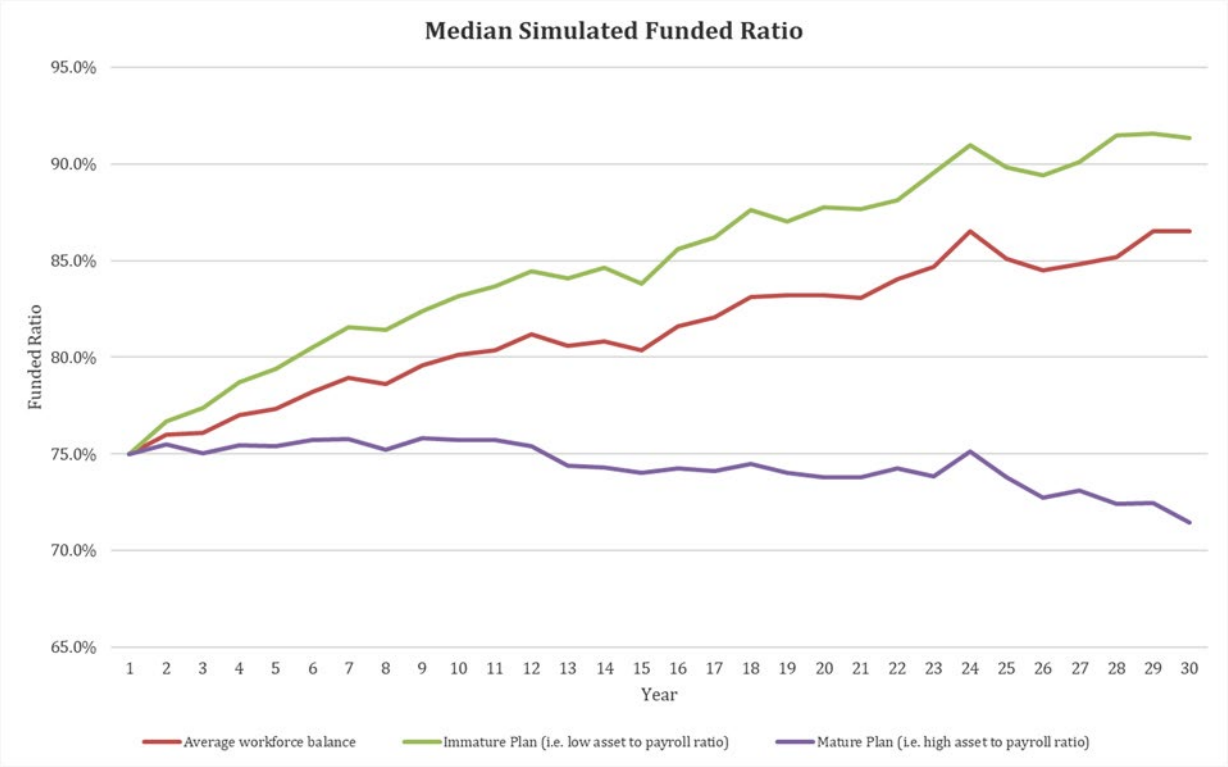
Valuation Date	**June 30, 2017 (Lag)**	**June 30, 2016 (Lag)**
Fiscal Year	**2019**	**2018**
Volatility Ratios		
1. Market Value of Assets (MVA)	$ 12,089,896,000	$ 10,899,763,000
2. Actuarial Value of Assets (AVA)	11,814,576,000	11,082,451,000
3. Accrued Liability	20,942,655,456	20,125,428,678
4. Active Salary	1,256,001,332	1,180,226,281
5. Asset Volatility Ratio (MVA basis) (1. / 4.)	9.6	9.2
6. Asset Volatility Ratio (AVA basis) (2. / 4.)	9.4	9.4
7. Liability Volatility Ratio (3. / 4.)	16.7	17.1

As a plan becomes more mature, Asset Volatility and Liability Volatility Ratios increase, and the plan's contribution becomes more sensitive to investment losses and changes in liabilities. For example, the same percentage of investment losses in more mature plans can increase contributions as a percentage of payroll more than in less mature plans. Therefore, mature plans may need to consider more conservative investment strategies.

Similarly, assumption changes that affect retiree liabilities will impact contributions to a greater degree in more mature plans.

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.*



As mentioned above, a plan's Support Ratio (i.e. the ratio of retired members to active members) is a measure of maturity risk. A high Support Ratio implies that contributions support the benefit payments of many retirees. A high Support Ratio also generally implies an actuarial liability with shorter duration. The plan sponsor should take this into account in order to avoid an asset/liability mismatch with respect to duration (see page 66).

Interest Rate Risk

The 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 (AIR) may significantly increase the Accrued Liability and Unfunded Accrued Liability of the Plan, as well as the Normal Cost and resulting contribution. The sensitivity of the Accrued Liability, Unfunded Accrued Liability, Funded Ratio, and Normal Cost of the Plan are shown below:

NEW YORK CITY FIRE PENSION FUND

SENSITIVITY ANALYSIS AS OF JUNE 30, 2017

Valuation Date	**June 30, 2017**
Results at 7.0%	
1. Accrued Liability (AL)	$ 20,942,655,456
2. Actuarial Value of Assets (AVA)	11,814,576,000
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	$ 9,128,079,456
4. Funded Ratio (AVA Basis) (2. / 1.)	56.4%
5. Normal Cost	577,125,956
Results at 6.0%	
1. Accrued Liability (AL)	$ 23,376,011,333
2. Actuarial Value of Assets (AVA)	11,814,576,000
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	$ 11,561,435,333
4. Funded Ratio (AVA Basis) (2. / 1.)	50.5%
5. Normal Cost	713,789,409
Sensitivity Analysis for 1.0% Reduction in Interest Rate	
1. Increase in Accrued Liability	11.6%
2. Increase in Unfunded Accrued Liability	26.7%
3. Decrease in Funded Ratio	5.9%
4. Increase in Normal Cost	23.7%

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). More granular analysis is not currently available but will 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-2018 was subsequently applied to these base rates.[1]

This scale MP-2018 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.

In a letter dated June 28, 2019, Buck analyzed historical Plan experience and noted "it appears that historical mortality improvement in NYC pensioners has kept pace with, and in some cases may have exceeded slightly, the mortality improvement trends in historical Social Security Administration (SSA) graduated rates that are based on a broad US population" and that "continued use of MP-20xx mortality improvement scales seems reasonable." It may be prudent in future years, after longer trends can be observed, to quantify the effect of changing the ultimate mortality improvement rate to be higher than 1.0%.

[1] Retirement Plans Experience Committee. "Mortality Improvement Scale MP-2018 Report" *Society of Actuaries.*

[2] Retirement Plans Experience Committee. "Mortality Improvement Scale BB Report" S*ociety 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. See Table III-5-ACTUARIAL AND STATUTORY CONTRIBUTION HISTORY.

Contribution risk may also increase in future years if 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 long-term asset returns 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.

Intergenerational Equity Risk

Intergenerational inequity could exist for certain stakeholders (e.g. public taxpayers). If, for example, liabilities are valued using overly conservative assumptions, aggressive funding patterns may occur, thus causing current taxpayers to shoulder a disproportionately high share of the funding burden, as compared to future taxpayers. The reverse can also be true if aggressive or unrealistic assumptions are used. As the Plan is ongoing, current and future taxpayers should be expected to offer similar funding contributions over the lifetime of the Plan.

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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).*

In future years of higher funded status, this risk could increase as current taxpayers and plan members may receive preferential treatment over taxpayers and plan members prior to and subsequent to them when considering changes in statute and plan provisions.

SECTION VIII – SUMMARY OF PLAN PROVISIONS

A. Effective Date

July 15, 1941.

B. Tier Membership

Tier 1: Prior to July 1, 1973

Tier 2: July 1, 1973 to June 30, 2009

Tier 3: July 1, 2009 to March 31, 2012 and did not elect to join Tier 3 Enhanced

Tier 3 Modified: April 1, 2012 to June 14, 2016 and did not elect to join Tier 3 Enhanced

Tier 3 Enhanced: On or after June 15, 2016 and those in Tier 3 and Tier 3 Modified who elected to join

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

C. Member Contributions

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.

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

Tier 3, Tier 3 Modified, and Tier 3 Enhanced: Basic Member Contributions - Members contribute 3.0% of salary for a maximum of 25 years.

Enhanced Plan Members are required to contribute an additional 2.0% of salary for a maximum of 25 years.

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

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.

Tier 3, Tier 3 Modified, and Tier 3 Enhanced: 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:

- 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.
- **Tier 1 and Tier 2**: Allowable Fire Service includes service in the Uniformed Force of the New York 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.
- **Tier 3, Tier 3 Modified, and Tier 3 Enhanced**: Fire Service includes service in the Uniformed Force of the New York Police Department and the New York State and Local Fire and Police Retirement System.
- 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.

F. Salary Base

Tier 1: Final Salary (FS): The contact 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.

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.

For members hired prior to July 1, 2000 (original Tier 2 members), 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.

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.

Tier 3 Modified and Tier 3 Enhanced: 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

   The eligibility requirements for an unreduced service retirement benefit are summarized in the table below:

Tier	Minimum Service for Normal Retirement	Minimum Service for Early Retirement
1	20	NA
2	20	NA
3	22	20
3 Modified/3 Enhanced	22	20

2. Benefits

   a. Tier 2

      i. 50% of FAS plus $1/60^{th}$ of the sum of all salary after 20 or 25 years, as applicable, of Credited Service.

      ii. 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, Tier 3 Modified, and Tier 3 Enhanced

i. 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 for 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 1/60th 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.

ii. Tier 3 Enhanced Plan

75% of FAS.

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, Tier 3 Modified and Tier 3 Enhanced

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

    b. Benefits

        i. Tier 1 and Tier 2

            (a) 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.

            (b) 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 FAS.

        10 or more years of service: ½ of FAS.

        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, Tier 3 Modified, and Tier 3 Enhanced

        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 (non-Enhanced Plan only).

I. Death Benefits:

1. Accidental Death Benefits

    a. Eligibility for all Tiers: Immediate.

    b. Benefits

        i. Tier 1 and Tier 2

        50% of the average of the final salary as defined as the last 12 months of earnings, payable annually to surviving spouse or other eligible dependents for life.

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

        ii. Tier 3, Tier 3 Modified, and Tier 3 Enhanced

        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).

2. Ordinary Death Benefit

    a. Eligibility

        i. Tier 1: Immediate

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

    b. Benefits

        i. Tier 1

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

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

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.

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, Tier 3 Modified, and Tier 3 Enhanced

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

c. 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: Five years of Credited Service for all Tiers

2. Benefits: A vestee may elect a refund of accumulated member contributions, but would then lose entitlement to a vested benefit. The Benefit at Service Retirement Date:

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 and Tier 3 Enhanced

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 (non-Enhanced Plan only).

K. Forms of Payment

1. Normal Form of Payment: Single Life Annuity.

2. Optional Forms of Payment: Joint and Survivor Annuities, Certain and Life Annuities.

L. Loans

Applicable to Tier 1 and Tier 2 only.

1. Eligibility: After three years of membership and 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 all members.

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).

    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 (1) all Tier 3 and Tier 3 Modified and (2) Tier 3 Enhanced Plan members receiving vested or service retirement benefits. Members in both (1) and (2) receive AutoCOLA, if greater.

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 non-Enhanced Plan disability retiree first becomes eligible for ODR/ADR.

    c. Death Benefits: The first day of the month following the day 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 which is the lesser of 3.0% or the Cost-of-Living Index increase, as computed on the 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 (e.g. diseases in the respiratory tract, gastroesophageal tract, psychological axis, and skin), 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 (e.g. diseases in the respiratory tract, gastroesophageal tract, psychological axis, and skin) 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

None.

SECTION IX – CHAPTER AMENDMENTS

The Chapter amendments enacted during the past five years that had a significant impact on the June 30, 2017 (Lag) actuarial valuation results include:

- **Chapter 76 of the Laws of 2017** (Chapter 76/17) grants a 3% COLA increase to beneficiaries receiving Special Accidental Death Benefits pursuant to GML 208-f. (Similar legislation was enacted in each of the previous years.)

- **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 June 15, 2016 and later are mandated into the Enhanced Disability Benefits. Additionally, Chapter 298/16 changes FIRE into a corpus funded entity.

- **Chapter 326 of the Laws of 2016** (Chapter 326/16) extends the deadline to file a Notice of Participation in the World Trade Center Rescue, Recovery, and Cleanup Operations to September 11, 2018.

- **Chapter 41 of the Laws of 2016** (Chapter 41/16) 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.

- **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 new actuarial assumptions and methods that require State Legislation.

SECTION X – SUBSEQUENT EVENTS

The Board of Directors, based on recommendations of the Actuary, adopted new factors that provide the adjustment necessary for a retiree to choose an alternative form of benefit payment that is actuarial equivalent to the benefit payable for only the retiree's own lifetime (i.e. Maximum Retirement Allowance). The new Option Factors are effective for retirements on and after April 1, 2019 and produce, in almost all cases, a benefit that is greater than the benefit provided under the prior set of Option Factors.

For virtually all retirees who would have elected an Optional Retirement Allowance prior to these new Option Factors and were to elect an Optional Retirement Allowance under the new Option Factors, there will be a reduction in the actuarial gains. For those retirees who would have declined an Optional Retirement Allowance, but would now elect an Optional Retirement Allowance in light of more favorable new factors, no additional cost is expected.

SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS

The Actuary issued a Report entitled, "Proposed Changes in Actuarial Assumptions and Methods Used in Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2018 for the New York City Fire Pension Fund," dated January 23, 2019. The actuarial assumptions and methods described in that report were adopted by the Board of Trustees at the February 27, 2019 Board meeting and are referred to as the "2019 A&M."

The actuarial assumptions and a description of the actuarial methods follow.

Table XI-1a
Service Retirement, Unreduced with Full COLA/Escalation

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF SERVICE RETIREMENT
RETIREMENT WITH FULL COLA/ESCALATION
FOR THOSE ELIGIBLE FOR UNREDUCED

	Years of Service Since First Eligible	
Age	**Year 1**	**Ultimate**
19	0.00%	0.00%
20	0.00%	0.00%
21	0.00%	0.00%
22	0.00%	0.00%
23	0.00%	0.00%
24	0.00%	0.00%
25	0.00%	0.00%
26	0.00%	0.00%
27	0.00%	0.00%
28	0.00%	0.00%
29	0.00%	0.00%
30	0.00%	0.00%
31	0.00%	0.00%
32	0.00%	0.00%
33	0.00%	0.00%
34	0.00%	0.00%
35	0.00%	0.00%
36	5.00%	0.00%
37	5.00%	0.00%
38	5.00%	1.50%
39	5.00%	1.50%
40	5.00%	1.50%
41	5.00%	1.50%
42	5.00%	1.50%
43	5.00%	1.50%
44	5.00%	1.50%
45	5.00%	1.50%
46	5.50%	1.50%
47	6.00%	1.50%
48	6.50%	1.50%
49	7.00%	1.50%
50	7.50%	1.50%
51	8.00%	1.50%
52	8.50%	2.25%
53	9.00%	3.00%
54	9.50%	3.75%
55	10.00%	4.50%
56	10.00%	5.25%
57	10.00%	6.00%
58	10.00%	6.75%
59	10.00%	7.50%
60	10.00%	9.00%
61	15.00%	11.25%
62	20.00%*	15.00%*
63	25.00%*	25.00%*
64	25.00%*	25.00%*
65	100.00%	100.00%

*100% for Tier 3, Tier 3 Modified, and Tier 3 Enhanced members.

Table XI-1b
Early Service Retirement

NEW YORK CITY FIRE PENSION FUND PROBABILITIES OF EARLY SERVICE RETIREMENT FOR TIER 3, TIER 3 MODIFIED, AND TIER 3 ENHANCED MEMBERS		
Years of Service	**Reduced Service Retirement**	**Unreduced Before Full Escalation**
20	5.00%	N/A
21	2.00%	N/A
22	N/A	5.00%
23	N/A	2.00%
24	N/A	2.00%

Table XI-2
Active Termination Rates

NEW YORK CITY FIRE PENSION FUND PROBABILITIES OF TERMINATION	
Years of Service	**Probability of Termination**
0	2.00%
1	0.80%
2	0.40%
3	0.40%
4	0.40%
5	0.40%
6	0.36%
7	0.32%
8	0.28%
9	0.24%
10	0.20%
11	0.18%
12	0.16%
13	0.14%
14	0.12%
15	0.10%
16	0.10%
17	0.10%
18	0.10%
19	0.10%
20	N/A

Table XI-3
Active Disability Rates

NEW YORK CITY FIRE PENSION FUND PROBABILITIES OF DISABILITY RETIREMENT				
		Accidental Disability		
Age	Ordinary Disability	Tier 1 & Tier 2 Eligible for WTC Benefits	Tier 1 & Tier 2 Not Eligible for WTC AND Tier 3 Enahnced Plan	Tier 3 & Tier 3 Modified Non-Enhanced Plan
15	0.0025%	0.050%	0.035%	0.030%
16	0.0025%	0.050%	0.035%	0.030%
17	0.0025%	0.050%	0.035%	0.030%
18	0.0025%	0.050%	0.035%	0.030%
19	0.0025%	0.050%	0.035%	0.030%
20	0.0025%	0.050%	0.035%	0.030%
21	0.0025%	0.050%	0.035%	0.030%
22	0.0025%	0.050%	0.035%	0.030%
23	0.0025%	0.050%	0.035%	0.030%
24	0.0025%	0.050%	0.035%	0.030%
25	0.0025%	0.050%	0.035%	0.030%
26	0.0025%	0.090%	0.045%	0.040%
27	0.0050%	0.130%	0.055%	0.050%
28	0.0075%	0.170%	0.075%	0.070%
29	0.0100%	0.210%	0.115%	0.100%
30	0.0125%	0.250%	0.175%	0.150%
31	0.0150%	0.400%	0.275%	0.240%
32	0.0175%	0.550%	0.375%	0.330%
33	0.0200%	0.700%	0.475%	0.420%
34	0.0225%	0.850%	0.575%	0.510%
35	0.0250%	1.000%	0.700%	0.600%
36	0.0275%	1.200%	0.850%	0.720%
37	0.0300%	1.400%	1.000%	0.840%
38	0.0325%	1.600%	1.150%	0.960%
39	0.0350%	1.800%	1.300%	1.080%
40	0.0375%	2.000%	1.500%	1.200%
41	0.0400%	2.200%	1.650%	1.320%
42	0.0425%	2.400%	1.800%	1.440%
43	0.0450%	2.600%	1.950%	1.560%
44	0.0475%	2.800%	2.100%	1.680%
45	0.0500%	3.000%	2.300%	1.800%
46	0.0550%	3.400%	2.650%	1.920%
47	0.0600%	3.800%	3.000%	2.040%
48	0.0650%	4.200%	3.350%	2.160%
49	0.0700%	4.600%	3.700%	2.280%
50	0.0750%	5.000%	4.050%	2.400%
51	0.1100%	5.600%	4.400%	2.520%
52	0.1450%	6.200%	4.750%	2.640%
53	0.1800%	6.800%	5.100%	2.760%
54	0.2150%	7.400%	5.450%	2.880%
55	0.2500%	8.000%	5.800%	3.000%
56	0.5000%	10.000%	8.000%	4.000%
57	0.7500%	12.000%	10.000%	5.000%
58	1.0000%	15.000%	12.500%	6.000%
59	1.2500%	18.000%	15.000%	7.000%
60	1.5000%	21.000%	17.500%	8.000%
61	2.0000%	25.000%	20.000%	9.000%
62	2.5000%*	30.000%	22.000%*	N/A
63	2.5000%*	30.000%	22.000%*	N/A
64	2.5000%*	30.000%	22.000%*	N/A
65	N/A	N/A	N/A	N/A

*N/A for Tier 3, Tier 3 Modified, and Tier 3 Enhanced members.

Table XI-4
Active Mortality Rates

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF ACTIVE MEMBER MORTALITY

	Ordinary Death		Accidental Death
Age	Males	Females	All
15	0.020%	0.015%	0.010%
16	0.020%	0.015%	0.010%
17	0.020%	0.015%	0.010%
18	0.020%	0.015%	0.010%
19	0.020%	0.015%	0.010%
20	0.020%	0.015%	0.010%
21	0.020%	0.015%	0.010%
22	0.020%	0.015%	0.010%
23	0.020%	0.015%	0.010%
24	0.020%	0.015%	0.010%
25	0.020%	0.015%	0.010%
26	0.020%	0.015%	0.010%
27	0.020%	0.015%	0.010%
28	0.020%	0.015%	0.010%
29	0.020%	0.015%	0.010%
30	0.020%	0.015%	0.010%
31	0.020%	0.015%	0.010%
32	0.020%	0.015%	0.010%
33	0.020%	0.015%	0.010%
34	0.020%	0.015%	0.010%
35	0.020%	0.015%	0.010%
36	0.021%	0.016%	0.010%
37	0.022%	0.017%	0.010%
38	0.023%	0.018%	0.010%
39	0.024%	0.019%	0.010%
40	0.025%	0.020%	0.010%
41	0.030%	0.023%	0.013%
42	0.035%	0.026%	0.016%
43	0.040%	0.029%	0.019%
44	0.045%	0.032%	0.022%
45	0.050%	0.035%	0.025%
46	0.055%	0.038%	0.030%
47	0.060%	0.041%	0.035%
48	0.065%	0.044%	0.040%
49	0.070%	0.047%	0.045%
50	0.075%	0.050%	0.050%
51	0.080%	0.055%	0.060%
52	0.085%	0.060%	0.070%
53	0.090%	0.065%	0.080%
54	0.095%	0.070%	0.090%
55	0.100%	0.075%	0.100%
56	0.110%	0.080%	0.110%
57	0.120%	0.085%	0.120%
58	0.130%	0.090%	0.130%
59	0.140%	0.095%	0.140%
60	0.150%	0.100%	0.150%
61	0.160%	0.110%	0.200%
62	0.170%*	0.120%*	0.250%*
63	0.180%*	0.130%*	0.300%*
64	0.190%*	0.140%*	0.350%*
65	N/A	N/A	N/A

*Probabilities are N/A for Tier 3 and Tier 3 Modified members.

Table XI-5
Service Retiree Mortality

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF MORTALITY FOR SERVICE RETIREES
BASE TABLE

Age	Males	Females	Age	Males	Females
15	0.0100%	0.0084%	68	1.2063%	0.7604%
16	0.0135%	0.0103%	69	1.2653%	0.8243%
17	0.0181%	0.0112%	70	1.4084%	0.9061%
18	0.0217%	0.0131%	71	1.5806%	0.9954%
19	0.0240%	0.0140%	72	1.7538%	1.0940%
20	0.0251%	0.0142%	73	1.9842%	1.2060%
21	0.0268%	0.0150%	74	2.2163%	1.3283%
22	0.0284%	0.0158%	75	2.4510%	1.4362%
23	0.0301%	0.0168%	76	2.6879%	1.6455%
24	0.0315%	0.0179%	77	2.9280%	1.8563%
25	0.0327%	0.0191%	78	3.3690%	2.0670%
26	0.0342%	0.0204%	79	3.8155%	2.3446%
27	0.0354%	0.0217%	80	4.2660%	2.6218%
28	0.0371%	0.0231%	81	4.7728%	2.8997%
29	0.0394%	0.0247%	82	5.2958%	3.1772%
30	0.0427%	0.0265%	83	6.2483%	3.4554%
31	0.0503%	0.0323%	84	7.2266%	3.9664%
32	0.0581%	0.0372%	85	8.2335%	4.4805%
33	0.0655%	0.0415%	86	9.2715%	4.9967%
34	0.0725%	0.0448%	87	10.3365%	5.5147%
35	0.0799%	0.0478%	88	11.2397%	6.0388%
36	0.0851%	0.0505%	89	12.1663%	7.0317%
37	0.0901%	0.0532%	90	13.1242%	8.0312%
38	0.0961%	0.0561%	91	14.6163%	9.4265%
39	0.1037%	0.0595%	92	16.2757%	10.8698%
40	0.1138%	0.0634%	93	18.9667%	12.3822%
41	0.1230%	0.0688%	94	21.5036%	13.7895%
42	0.1327%	0.0725%	95	23.9289%	15.2575%
43	0.1430%	0.0775%	96	25.8261%	16.7330%
44	0.1542%	0.0843%	97	27.5777%	18.2626%
45	0.1666%	0.0931%	98	29.2887%	19.6947%
46	0.1798%	0.1041%	99	30.8020%	21.1460%
47	0.1941%	0.1166%	100	32.1584%	22.1859%
48	0.2093%	0.1295%	101	33.7521%	23.0680%
49	0.2250%	0.1425%	102	35.1259%	24.0803%
50	0.2412%	0.1555%	103	36.3671%	25.2770%
51	0.2975%	0.1681%	104	37.3834%	26.6309%
52	0.3514%	0.1797%	105	38.1051%	28.0912%
53	0.4018%	0.1902%	106	38.4698%	29.6244%
54	0.4483%	0.1996%	107	38.6325%	31.1943%
55	0.4895%	0.2075%	108	38.8076%	32.7579%
56	0.5352%	0.2144%	109	38.9794%	34.2712%
57	0.5757%	0.2629%	110	50.0000%	50.0000%
58	0.6104%	0.3090%	111	50.0000%	50.0000%
59	0.6391%	0.3530%	112	50.0000%	50.0000%
60	0.6625%	0.3957%	113	50.0000%	50.0000%
61	0.7126%	0.4377%	114	50.0000%	50.0000%
62	0.7621%	0.4800%	115	50.0000%	50.0000%
63	0.8255%	0.5231%	116	50.0000%	50.0000%
64	0.9079%	0.5675%	117	50.0000%	50.0000%
65	0.9997%	0.6138%	118	50.0000%	50.0000%
66	1.0607%	0.6613%	119	50.0000%	50.0000%
67	1.1308%	0.7103%	120	100.0000%	100.0000%

Table XI-6
Disabled Retiree Mortality

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF MORTALITY FOR DISABLED RETIREES
BASE TABLE

Age	Males	Females	Age	Males	Females
15	0.0238%	0.0098%	68	1.5909%	1.2517%
16	0.0321%	0.0120%	69	1.7622%	1.4342%
17	0.0433%	0.0131%	70	1.9120%	1.6327%
18	0.0517%	0.0153%	71	2.1153%	1.8400%
19	0.0573%	0.0164%	72	2.3101%	2.0561%
20	0.0608%	0.0173%	73	2.4968%	2.2946%
21	0.0660%	0.0191%	74	2.6752%	2.5649%
22	0.0716%	0.0211%	75	2.8786%	2.8625%
23	0.0772%	0.0234%	76	3.2717%	3.1737%
24	0.0831%	0.0259%	77	3.6597%	3.4562%
25	0.0886%	0.0282%	78	4.0420%	3.7889%
26	0.0936%	0.0307%	79	4.4200%	4.3087%
27	0.1008%	0.0332%	80	4.8490%	4.8485%
28	0.1089%	0.0359%	81	5.6563%	5.4107%
29	0.1170%	0.0386%	82	6.4729%	5.8954%
30	0.1254%	0.0412%	83	7.2988%	6.3864%
31	0.1342%	0.0438%	84	8.1300%	7.2278%
32	0.1426%	0.0464%	85	8.9696%	8.0743%
33	0.1544%	0.0491%	86	9.7646%	8.8707%
34	0.1602%	0.0506%	87	10.5803%	9.6600%
35	0.1670%	0.0528%	88	11.4245%	10.5768%
36	0.1696%	0.0551%	89	12.3269%	11.9527%
37	0.1721%	0.0580%	90	13.2834%	13.2782%
38	0.1754%	0.0608%	91	15.7515%	14.7506%
39	0.1792%	0.0648%	92	18.1410%	15.8458%
40	0.1836%	0.0709%	93	20.4240%	16.9974%
41	0.1891%	0.0790%	94	22.5700%	18.2075%
42	0.1957%	0.0892%	95	24.6643%	19.3408%
43	0.2038%	0.1023%	96	26.5127%	20.3502%
44	0.2134%	0.1184%	97	28.2029%	21.2709%
45	0.2247%	0.1371%	98	29.5441%	21.9254%
46	0.2374%	0.1586%	99	30.9728%	22.3227%
47	0.2518%	0.1824%	100	32.1584%	22.4341%
48	0.2672%	0.2079%	101	33.7521%	23.0680%
49	0.2837%	0.2388%	102	35.1259%	24.0803%
50	0.3022%	0.2719%	103	36.3671%	25.2770%
51	0.3597%	0.2959%	104	37.3834%	26.6309%
52	0.4188%	0.3426%	105	38.1051%	28.0912%
53	0.4788%	0.3791%	106	38.4698%	29.6244%
54	0.5392%	0.4326%	107	38.6325%	31.1943%
55	0.5986%	0.4868%	108	38.8076%	32.7579%
56	0.6556%	0.5294%	109	38.9794%	34.2712%
57	0.7090%	0.5421%	110	50.0000%	50.0000%
58	0.7577%	0.5621%	111	50.0000%	50.0000%
59	0.8017%	0.6003%	112	50.0000%	50.0000%
60	0.8498%	0.6343%	113	50.0000%	50.0000%
61	0.9095%	0.6687%	114	50.0000%	50.0000%
62	0.9862%	0.7391%	115	50.0000%	50.0000%
63	1.0698%	0.8094%	116	50.0000%	50.0000%
64	1.1631%	0.8897%	117	50.0000%	50.0000%
65	1.2477%	0.9710%	118	50.0000%	50.0000%
66	1.3403%	1.0569%	119	50.0000%	50.0000%
67	1.4168%	1.1551%	120	100.0000%	100.0000%

Table XI-7
Beneficiary Mortality

NEW YORK CITY FIRE PENSION FUND

PROBABILITIES OF BENEFICIARY MORTALITY
BASE TABLE

Age	Males	Females	Age	Males	Females
15	0.0105%	0.0092%	68	1.8256%	1.3605%
16	0.0142%	0.0112%	69	1.9386%	1.4332%
17	0.0191%	0.0122%	70	2.0542%	1.5007%
18	0.0222%	0.0133%	71	2.2359%	1.6745%
19	0.0240%	0.0143%	72	2.4230%	1.8463%
20	0.0251%	0.0145%	73	2.6165%	2.0157%
21	0.0268%	0.0153%	74	2.8157%	2.1838%
22	0.0284%	0.0161%	75	3.0220%	2.3492%
23	0.0301%	0.0171%	76	3.4928%	2.6652%
24	0.0315%	0.0183%	77	3.9787%	2.9831%
25	0.0327%	0.0195%	78	4.4792%	3.3011%
26	0.0342%	0.0208%	79	4.9963%	3.6207%
27	0.0354%	0.0221%	80	5.5282%	3.9391%
28	0.0371%	0.0236%	81	6.1051%	4.4386%
29	0.0394%	0.0252%	82	6.6894%	4.9473%
30	0.0427%	0.0270%	83	7.2805%	5.4665%
31	0.0495%	0.0330%	84	7.8749%	5.9942%
32	0.0562%	0.0384%	85	8.4753%	6.5354%
33	0.0625%	0.0431%	86	9.6136%	7.4659%
34	0.0682%	0.0471%	87	10.8005%	8.3995%
35	0.0743%	0.0511%	88	12.0443%	9.3428%
36	0.0780%	0.0542%	89	13.3397%	10.2918%
37	0.0818%	0.0579%	90	14.6958%	11.2477%
38	0.0861%	0.0618%	91	16.4185%	12.8868%
39	0.0917%	0.0666%	92	18.1416%	14.4887%
40	0.0997%	0.0719%	93	19.8574%	16.0801%
41	0.1394%	0.0775%	94	21.6187%	17.5854%
42	0.1774%	0.0859%	95	23.5884%	19.0626%
43	0.2143%	0.0968%	96	25.4266%	20.2474%
44	0.2507%	0.1111%	97	27.2119%	21.2937%
45	0.2875%	0.1287%	98	29.0202%	22.0663%
46	0.3207%	0.1501%	99	30.6654%	22.5443%
47	0.3534%	0.1748%	100	32.1584%	22.6473%
48	0.3849%	0.2022%	101	33.7521%	23.5294%
49	0.4150%	0.2319%	102	35.1259%	24.5619%
50	0.4431%	0.2633%	103	36.3671%	25.7825%
51	0.5156%	0.2999%	104	37.3834%	27.1635%
52	0.5928%	0.3376%	105	38.1051%	28.6530%
53	0.6740%	0.3762%	106	38.4698%	30.2169%
54	0.7583%	0.4151%	107	38.6325%	31.8182%
55	0.8440%	0.4540%	108	38.8076%	33.4131%
56	0.9048%	0.5132%	109	38.9794%	34.9566%
57	0.9604%	0.5735%	110	50.0000%	50.0000%
58	1.0101%	0.6353%	111	50.0000%	50.0000%
59	1.0536%	0.6981%	112	50.0000%	50.0000%
60	1.0919%	0.7631%	113	50.0000%	50.0000%
61	1.1835%	0.8329%	114	50.0000%	50.0000%
62	1.2676%	0.8908%	115	50.0000%	50.0000%
63	1.3473%	0.9493%	116	50.0000%	50.0000%
64	1.4238%	1.0146%	117	50.0000%	50.0000%
65	1.4985%	1.0876%	118	50.0000%	50.0000%
66	1.6059%	1.1681%	119	50.0000%	50.0000%
67	1.7146%	1.2609%	120	100.0000%	100.0000%

Table XI-8
Salary Scale

NEW YORK CITY FIRE PENSION FUND ANNUAL RATES OF MERIT AND SALARY INCREASE		
Years of Service	**Merit Increase**	**Salary Increase***
0	20.00%	23.00%
1	12.00%	15.00%
2	12.00%	15.00%
3	12.00%	15.00%
4	27.00%	30.00%
5	16.00%	19.00%
6	1.65%	4.65%
7	1.80%	4.80%
8	1.95%	4.95%
9	4.05%	7.05%
10	2.25%	5.25%
11	2.40%	5.40%
12	2.55%	5.55%
13	2.70%	5.70%
14	4.65%	7.65%
15	3.00%	6.00%
16	2.85%	5.85%
17	2.70%	5.70%
18	2.55%	5.55%
19	4.20%	7.20%
20	2.25%	5.25%
21	2.10%	5.10%
22	1.95%	4.95%
23	1.80%	4.80%
24	1.65%	4.65%
25	1.50%	4.50%
26	1.35%	4.35%
27	1.20%	4.20%
28	1.05%	4.05%
29	0.90%	3.90%
30+	0.75%	3.75%

*Salary Increase is the General Wage Increase of 3.00% plus the Merit Increase.

Table XI-9
Overtime Assumptions

NEW YORK CITY FIRE PENSION FUND OVERTIME ASSUMPTION				
Years of Service	**All Tiers Baseline**	**Tier 1 & Tier 2 Dual Service**	**Tier 3, Tier 3 Modified, & Tier 3 Enhanced Dual Service**	**All Tiers Dual Disability**
0-13	20.00%	21.00%	21.00%	20.00%
14	20.00%	22.00%	21.00%	20.00%
15	20.00%	24.00%	21.00%	20.00%
16	20.00%	25.00%	22.00%	21.00%
17	20.00%	26.00%	24.00%	22.00%
18	21.00%	28.00%	25.00%	24.00%
19	22.00%	29.00%	26.00%	25.00%
20	24.00%	30.00%	28.00%	26.00%
21	22.00%	29.00%	26.00%	25.00%
22	21.00%	28.00%	25.00%	24.00%
23	20.00%	26.00%	24.00%	22.00%
24	19.00%	25.00%	22.00%	21.00%
25	17.00%	24.00%	21.00%	20.00%
26	16.00%	21.00%	19.00%	17.00%
27	15.00%	19.00%	18.00%	15.00%
28	13.00%	16.00%	15.00%	13.00%
29	12.00%	15.00%	13.00%	12.00%
30	11.00%	13.00%	12.00%	11.00%
31	9.00%	12.00%	11.00%	10.00%
32	8.00%	11.00%	9.00%	8.00%
33	7.00%	9.00%	8.00%	7.00%
34+	7.00%	8.00%	8.00%	7.00%

Additional Assumptions and Methods

1. **Post-commencement Mortality Assumption:** The service retiree mortality, disabled retiree mortality, and beneficiary mortality base tables are projected from 2012 using mortality improvement scale MP-2018. The base tables are also multiplied by adjustment factors to convert them from lives-weighted to amounts-weighted tables to account for socioeconomic effects on mortality. The adjustment factors used are as follows:

	Adjustment Factor	
	Male	**Female**
Service Retiree	0.910	0.910
Disabled Retiree	0.830	0.830
Beneficiary	0.890	0.951

   These post-adjusted probabilities were then smoothed at certain ages to reflect internal consistency between service and disability post-commencement mortality.

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

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

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

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

6. **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.

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

   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).

   The AVA is further constrained to be within a corridor of 80% to 120% of the MVA.

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

8. **Actuarial Cost Method:** The Entry Age Normal (EAN) cost method of funding is used by the Actuary to calculate the Employer Contribution.

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

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

   Under this method, actuarial gains and losses, as they occur, reduce and increase the UAL, 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 UALs 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 12.

   Under EAN, the Normal Cost as a percentage of pay remains constant by individual and changes gradually over time for the entire plan as the characteristics of the group changes (e.g. more Tier 3 Enhanced active members decrease the average Normal Cost as a percentage of pay).

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

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

11. **WTC Disability and Death Benefits**: Obligations attributable to the WTC Disability Law and to the WTC Death Benefits Law are determined through the use of explicit assumptions in the 2019 A&M, and through estimation techniques for post-retirement reclassifications.

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

    This methodology requires adjustments to certain components used to determine Fiscal Year XX employer contributions.

    Normal Cost: The normal cost as of June 30, XX-2 is rolled forward with the assumed AIR of 7.0% to derive the normal cost as of December 31, XX-1.

    UAL Payments: For determining the UAL payments for Fiscal Year XX, and to be consistent with the OYLM, the UAL as of June 30, XX-2 is adjusted by the discounted

value of employer normal cost and UAL payments paid during Fiscal Year XX-1 and the discounted value of Administrative Expenses reimbursed during Fiscal Years XX-1 and XX.

13. **Changes to the June 30, 2017 (Lag) Valuation Include:**

- The handling of the VSF offset due to escalation for Tier 3, Tier 3 Modified, and Tier 3 Enhanced members. Future VSF payments were previously offset by expected escalation on members' pension. Beginning with this valuation, an offset for future escalation is no longer included.

- Beginning with this valuation, non-uniformed service by individual is collected and valued accordingly for Tier 1 and Tier 2 members.

SECTION XII – SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2017 (Lag) and June 30, 2016 (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 by the Office of the Comptroller as of June 30, 2017 and June 30, 2016.

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 accuracy of 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.

Table XII-1
Status Reconciliation

CHANGES IN THE NUMBER OF ACTIVES AND PENSIONERS DURING THE FISCAL YEAR CLASSIFIED BY STATUS										
Status	**(1) Active Members**	**(2) Active Off Payroll**	**(3) Deferred Vested**	**(4) Service Pension**	**(5) Ordinary Disability**	**(6) Accidental Disability**	**(7) Accidental Death**	**(8) Other Beneficiary**	**(9) Pensioners Subtotal (4) to (8)**	**(10) Grand Total (1) + (2) + (3) + (9)**
Number at June 30, 2016	**10,951**	**21**	**58**	**5,174**	**853**	**9,560**	**633**	**427**	**16,647**	**27,677**
New Entrants	**616**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**617**
Rehires	**18**	**(12)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**
Leaving Active Payroll	**(9)**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Vested Termination	**(1)**	**(3)**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Non-Vested Termination / Cashout	**(40)**	**0**	**(2)**	**0**	**0**	**0**	**0**	**0**	**0**	**(42)**
Accidental Death (from Active)	**(2)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**(2)**
Ordinary Death (from Active)	**(3)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**(3)**
Service Retirement	**(120)**	**0**	**(2)**	**122**	**0**	**0**	**0**	**0**	**122**	**0**
Ordinary Disability Retirement	**(2)**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**
Accidental Disability Retirement	**(317)**	**0**	**(1)**	**0**	**0**	**319**	**0**	**0**	**319**	**1**
Reclassifications	**0**	**0**	**0**	**(25)**	**(2)**	**27**	**12**	**(1)**	**11**	**11**
Death with Beneficiary	**0**	**0**	**0**	**(4)**	**(1)**	**(14)**	**6**	**8**	**(5)**	**(5)**
Death without Beneficiary	**0**	**0**	**0**	**(181)**	**(65)**	**(154)**	**(8)**	**(52)**	**(460)**	**(460)**
Off Pension Payroll	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Net Change	**140**	**(6)**	**0**	**(88)**	**(66)**	**178**	**10**	**(45)**	**(11)**	**123**
Number at June 30, 2017	**11,091**	**15**	**58**	**5,086**	**787**	**9,738**	**643**	**382**	**16,636**	**27,800**

Graph XII-2
Headcount Summary by Status

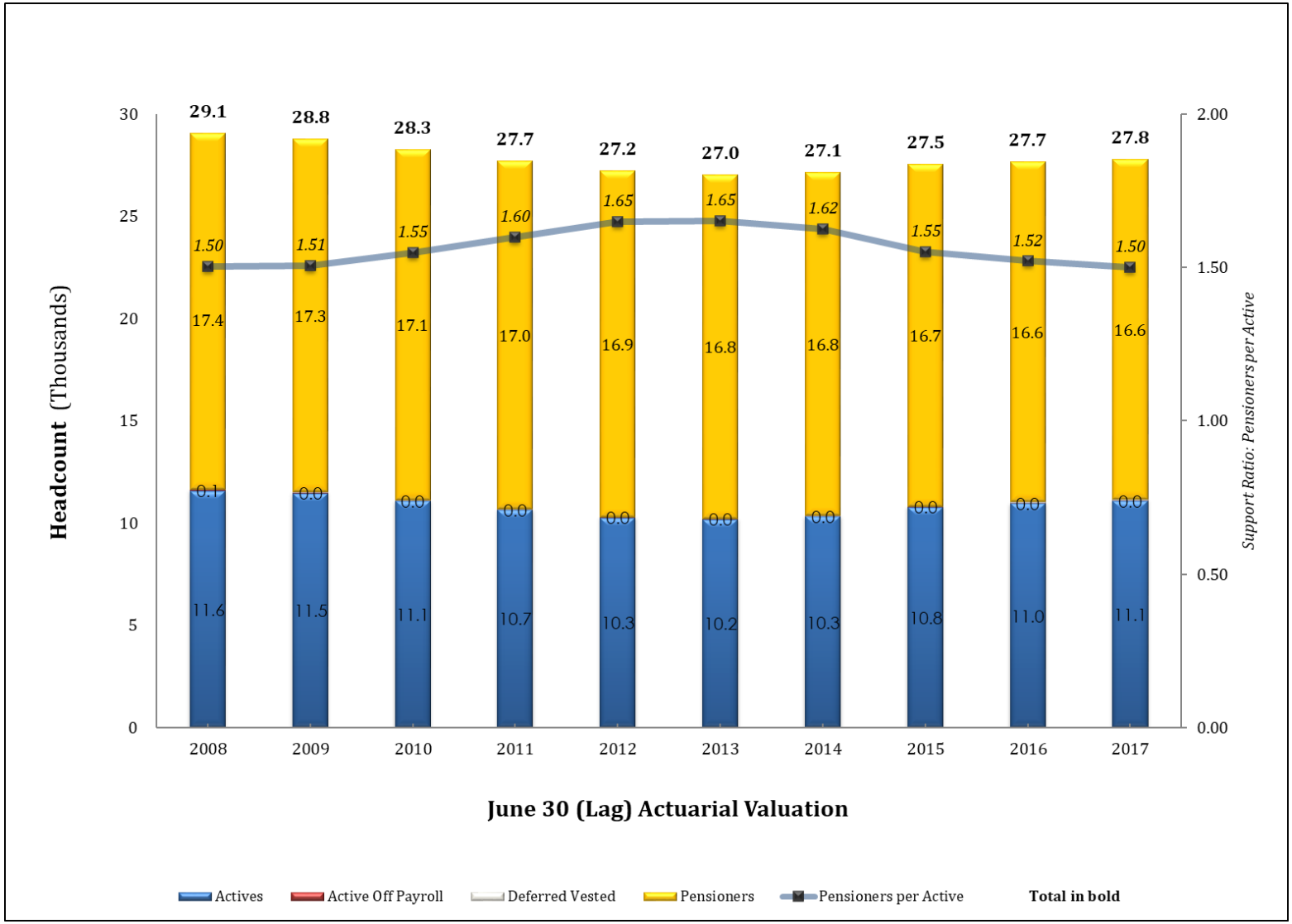

Table XII-3
Summary of Active Membership

NEW YORK CITY FIRE PENSION FUND

ACTIVE MEMBERS INCLUDED IN THE
JUNE 30, 2017 (LAG) AND THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATIONS

	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Number		
Males	11,004	10,877
Females	87	74
Total	11,091	10,951
Annual Salary[1]		
Males	$ 1,247,538,831	$ 1,173,210,416
Females	8,462,501	7,015,865
Total	$ 1,256,001,332	$ 1,180,226,281
Average Salary[1]		
Males	$ 113,371	$ 107,862
Females	97,270	94,809
Total Average	$ 113,245	$ 107,773
Average Age		
Males	40.7	40.7
Females	37.7	37.9
Total Average	40.7	40.7
Average Past Service		
Males	14.0	14.0
Females	8.9	9.0
Total Average	14.0	14.0

[1]Salaries shown are base salaries 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 XII-4
Active Membership by Tier

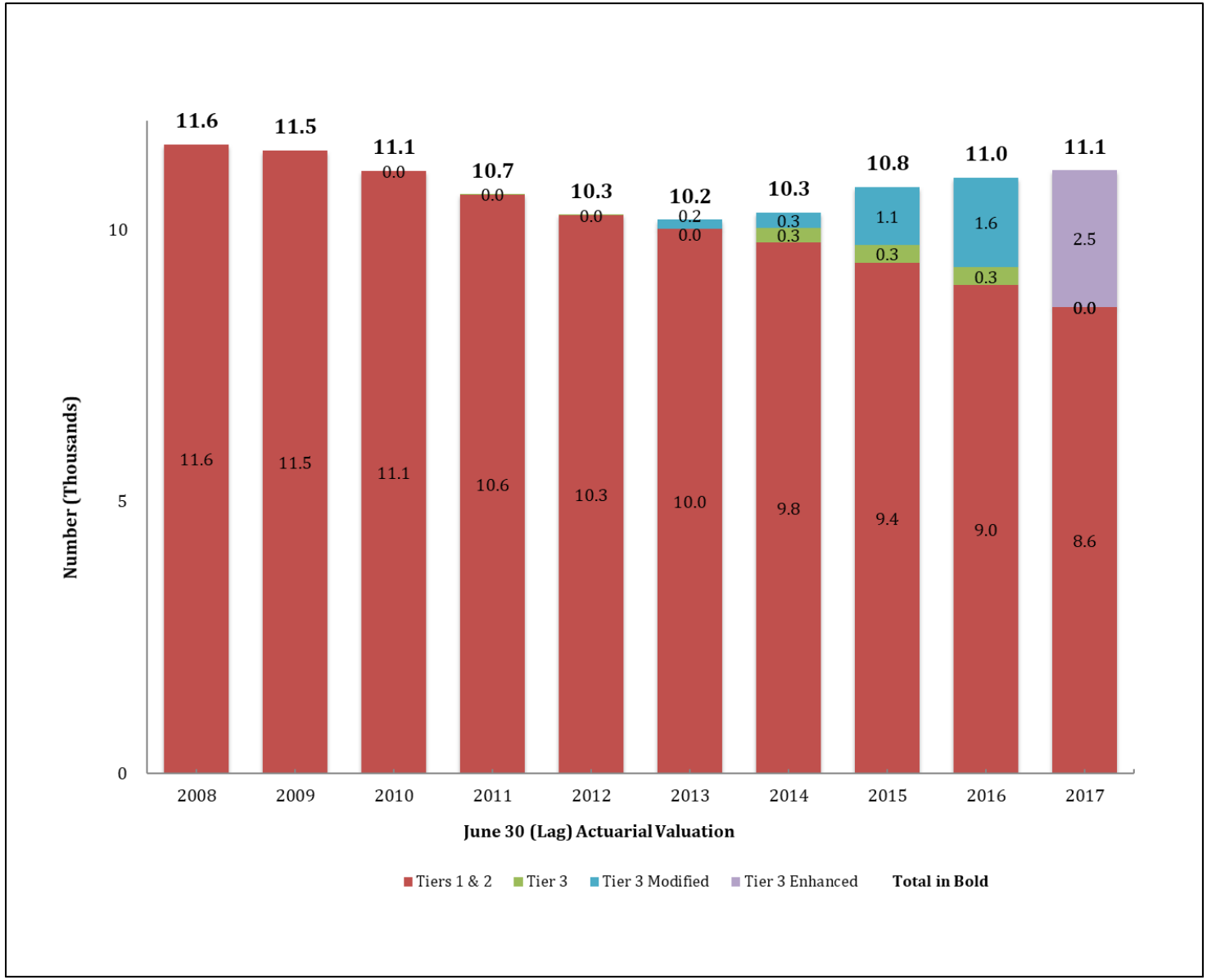

Table XII-5
Schedule of Active Member Salary Data

June 30 (Lag) Actuarial Valuation	Number	Annual Salary	Average Annual Salary	Percentage Increase/ (Decrease) In Avg. Salary
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%)
2016	10,951	1,180,226,281	107,773	(0.3%)
2017	11,091	1,256,001,332	113,245	5.1%

Salaries shown are base salaries 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 XII-6
Detailed Active Membership and Salaries as of June 30, 2017

ALL TIERS: MALE

AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
NUMBER:										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	150	0	0	0	0	0	0	0	0	**150**
25 TO 29	1,127	43	0	0	0	0	0	0	0	**1,170**
30 TO 34	1,044	360	554	0	0	0	0	0	0	**1,958**
35 TO 39	143	257	1,432	413	6	0	0	0	0	**2,251**
40 TO 44	5	61	955	827	194	3	0	0	0	**2,045**
45 TO 49	0	3	215	666	525	165	1	0	0	**1,575**
50 TO 54	0	0	3	245	402	314	146	1	0	**1,111**
55 TO 59	0	0	1	3	93	174	175	93	0	**539**
60 TO 64	0	0	0	1	1	26	61	102	8	**199**
65 TO 69	0	0	1	0	3	0	1	1	0	**6**
70 & UP	0	0	0	0	0	0	0	0	0	**0**
TOTAL	**2,469**	**724**	**3,161**	**2,155**	**1,224**	**682**	**384**	**197**	**8**	**11,004**
SALARIES (IN THOUSANDS):										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	8,726	0	0	0	0	0	0	0	0	**8,726**
25 TO 29	68,237	3,148	0	0	0	0	0	0	0	**71,385**
30 TO 34	64,757	37,140	65,337	0	0	0	0	0	0	**167,234**
35 TO 39	8,916	29,484	172,789	52,548	830	0	0	0	0	**264,567**
40 TO 44	392	7,174	115,873	107,471	27,081	357	0	0	0	**258,349**
45 TO 49	0	389	25,963	86,716	75,215	24,411	134	0	0	**212,828**
50 TO 54	0	0	394	31,588	56,381	45,320	22,082	133	0	**155,898**
55 TO 59	0	0	157	429	12,754	23,845	25,896	14,774	0	**77,855**
60 TO 64	0	0	0	169	159	3,437	8,615	16,026	1,366	**29,773**
65 TO 69	0	0	157	0	475	0	159	133	0	**924**
70 & UP	0	0	0	0	0	0	0	0	0	**0**
TOTAL *	**151,027**	**77,335**	**380,669**	**278,920**	**172,896**	**97,371**	**56,887**	**31,067**	**1,366**	**1,247,539**
*AVERAGE SALARIES: ***										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	58,172	0	0	0	0	0	0	0	0	**58,172**
25 TO 29	60,548	73,211	0	0	0	0	0	0	0	**61,013**
30 TO 34	62,028	103,167	117,937	0	0	0	0	0	0	**85,411**
35 TO 39	62,346	114,722	120,663	127,235	138,411	0	0	0	0	**117,533**
40 TO 44	78,342	117,614	121,333	129,953	139,595	119,144	0	0	0	**126,332**
45 TO 49	0	129,547	120,757	130,204	143,267	147,948	134,342	0	0	**135,129**
50 TO 54	0	0	131,194	128,929	140,251	144,332	151,249	132,995	0	**140,322**
55 TO 59	0	0	156,997	142,960	137,136	137,043	147,976	158,865	0	**144,444**
60 TO 64	0	0	0	169,210	159,090	132,183	141,231	157,118	170,801	**149,611**
65 TO 69	0	0	156,997	0	158,392	0	159,090	132,995	0	**154,043**
70 & UP	0	0	0	0	0	0	0	0	0	**0**
TOTAL	**61,169**	**106,816**	**120,427**	**129,429**	**141,255**	**142,773**	**148,142**	**157,698**	**170,801**	**113,371**

Note: Age is last birthday. Service is completed years.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2017 (cont'd)

ALL TIERS: FEMALE

AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
NUMBER:										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	3	0	0	0	0	0	0	0	0	**3**
25 TO 29	14	0	0	0	0	0	0	0	0	**14**
30 TO 34	13	3	2	0	0	0	0	0	0	**18**
35 TO 39	7	3	8	4	0	0	0	0	0	**22**
40 TO 44	0	2	10	5	1	0	0	0	0	**18**
45 TO 49	1	0	2	3	0	0	0	0	0	**6**
50 TO 54	0	0	0	0	2	0	0	0	0	**2**
55 TO 59	0	1	0	0	0	1	0	0	0	**2**
60 TO 64	0	0	0	0	0	0	0	0	0	**0**
65 TO 69	0	0	0	0	0	0	0	1	0	**1**
70 & UP	0	0	0	1	0	0	0	0	0	**1**
TOTAL	**38**	**9**	**22**	**13**	**3**	**1**	**0**	**1**	**0**	**87**
SALARIES (IN THOUSANDS):										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	169	0	0	0	0	0	0	0	0	**169**
25 TO 29	831	0	0	0	0	0	0	0	0	**831**
30 TO 34	852	222	196	0	0	0	0	0	0	**1,269**
35 TO 39	428	311	916	474	0	0	0	0	0	**2,128**
40 TO 44	0	272	1,206	605	124	0	0	0	0	**2,207**
45 TO 49	136	0	237	447	0	0	0	0	0	**821**
50 TO 54	0	0	0	0	322	0	0	0	0	**322**
55 TO 59	0	156	0	0	0	184	0	0	0	**340**
60 TO 64	0	0	0	0	0	0	0	0	0	**0**
65 TO 69	0	0	0	0	0	0	0	218	0	**218**
70 & UP	0	0	0	158	0	0	0	0	0	**158**
TOTAL *	**2,415**	**961**	**2,555**	**1,684**	**446**	**184**	**0**	**218**	**0**	**8,463**
*AVERAGE SALARIES: ***										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	56,445	0	0	0	0	0	0	0	0	**56,445**
25 TO 29	59,329	0	0	0	0	0	0	0	0	**59,329**
30 TO 34	65,508	73,936	97,814	0	0	0	0	0	0	**70,502**
35 TO 39	61,082	103,761	114,505	118,377	0	0	0	0	0	**96,746**
40 TO 44	0	136,058	120,598	121,090	123,830	0	0	0	0	**122,632**
45 TO 49	136,183	0	118,687	149,008	0	0	0	0	0	**136,763**
50 TO 54	0	0	0	0	160,914	0	0	0	0	**160,914**
55 TO 59	0	155,951	0	0	0	183,621	0	0	0	**169,786**
60 TO 64	0	0	0	0	0	0	0	0	0	**0**
65 TO 69	0	0	0	0	0	0	0	217,723	0	**217,723**
70 & UP	0	0	0	158,045	0	0	0	0	0	**158,045**
TOTAL	**63,560**	**106,795**	**116,137**	**129,541**	**148,553**	**183,621**	**0**	**217,723**	**0**	**97,270**

Note: Age is last birthday. Service is completed years.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2017 (cont'd)

ALL TIERS: ALL MEMBERS

AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
NUMBER:										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	153	0	0	0	0	0	0	0	0	**153**
25 TO 29	1,141	43	0	0	0	0	0	0	0	**1,184**
30 TO 34	1,057	363	556	0	0	0	0	0	0	**1,976**
35 TO 39	150	260	1,440	417	6	0	0	0	0	**2,273**
40 TO 44	5	63	965	832	195	3	0	0	0	**2,063**
45 TO 49	1	3	217	669	525	165	1	0	0	**1,581**
50 TO 54	0	0	3	245	404	314	146	1	0	**1,113**
55 TO 59	0	1	1	3	93	175	175	93	0	**541**
60 TO 64	0	0	0	1	1	26	61	102	8	**199**
65 TO 69	0	0	1	0	3	0	1	2	0	**7**
70 & UP	0	0	0	1	0	0	0	0	0	**1**
TOTAL	**2,507**	**733**	**3,183**	**2,168**	**1,227**	**683**	**384**	**198**	**8**	**11,091**
SALARIES (IN THOUSANDS):										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	8,895	0	0	0	0	0	0	0	0	**8,895**
25 TO 29	69,068	3,148	0	0	0	0	0	0	0	**72,216**
30 TO 34	65,609	37,362	65,533	0	0	0	0	0	0	**168,503**
35 TO 39	9,343	29,795	173,705	53,022	830	0	0	0	0	**266,695**
40 TO 44	392	7,447	117,079	108,076	27,205	357	0	0	0	**260,556**
45 TO 49	136	389	26,200	87,163	75,215	24,411	134	0	0	**213,649**
50 TO 54	0	0	394	31,588	56,703	45,320	22,082	133	0	**156,220**
55 TO 59	0	156	157	429	12,754	24,029	25,896	14,774	0	**78,195**
60 TO 64	0	0	0	169	159	3,437	8,615	16,026	1,366	**29,773**
65 TO 69	0	0	157	0	475	0	159	351	0	**1,142**
70 & UP	0	0	0	158	0	0	0	0	0	**158**
TOTAL *	**153,442**	**78,296**	**383,224**	**280,604**	**173,342**	**97,555**	**56,887**	**31,284**	**1,366**	**1,256,001**
*AVERAGE SALARIES: ***										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	58,138	0	0	0	0	0	0	0	0	**58,138**
25 TO 29	60,533	73,211	0	0	0	0	0	0	0	**60,993**
30 TO 34	62,071	102,926	117,865	0	0	0	0	0	0	**85,275**
35 TO 39	62,287	114,595	120,629	127,150	138,411	0	0	0	0	**117,332**
40 TO 44	78,342	118,200	121,325	129,899	139,514	119,144	0	0	0	**126,300**
45 TO 49	136,183	129,547	120,738	130,288	143,267	147,948	134,342	0	0	**135,135**
50 TO 54	0	0	131,194	128,929	140,354	144,332	151,249	132,995	0	**140,359**
55 TO 59	0	155,951	156,997	142,960	137,136	137,309	147,976	158,865	0	**144,538**
60 TO 64	0	0	0	169,210	159,090	132,183	141,231	157,118	170,801	**149,611**
65 TO 69	0	0	156,997	0	158,392	0	159,090	175,359	0	**163,140**
70 & UP	0	0	0	158,045	0	0	0	0	0	**158,045**
TOTAL	**61,206**	**106,816**	**120,397**	**129,430**	**141,273**	**142,833**	**148,142**	**158,001**	**170,801**	**113,245**

Note: Age is last birthday. Service is completed years.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-7
Summary of Non-Pensioner Membership

		TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2017					TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2016				
TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
I	M	0	0	0	0.0	0.0	1	127,539	127,539	65.0	43.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	1	127,539	127,539	65.0	43.0
II	M	8,532	1,096,254,213	128,487	43.8	17.5	8,929	1,067,538,285	119,559	43.2	16.7
II	F	49	5,948,333	121,395	42.1	14.2	47	5,321,175	113,216	41.3	13.2
		8,581	1,102,202,546	128,447	43.8	17.4	8,976	1,072,859,460	119,525	43.2	16.7
III	M	0	0	0	0.0	0.0	330	19,920,996	60,367	29.9	3.0
III	F	0	0	0	0.0	0.0	6	437,779	72,963	34.7	3.0
		0	0	0	0.0	0.0	336	20,358,775	60,592	29.9	3.0
III Modified	M	2	132,188	66,094	31.5	3.0	1,617	85,623,596	52,952	29.0	1.3
III Modified	F	0	0	0	0.0	0.0	21	1,256,911	59,853	31.2	1.3
		2	132,188	66,094	31.5	3.0	1,638	86,880,507	53,041	29.0	1.3
III Enhanced	M	2,470	151,152,430	61,195	30.0	2.2	0	0	0	0.0	0.0
III Enhanced	F	38	2,514,168	66,162	32.0	2.1	0	0	0	0.0	0.0
		2,508	153,666,598	61,271	30.0	2.2	0	0	0	0.0	0.0
ALL TIERS		**11,091**	**1,256,001,332**	**113,245**	**40.7**	**14.0**	**10,951**	**1,180,226,281**	**107,773**	**40.7**	**14.0**

		JUNE 30, 2017 MEMBERS ALSO PRESENT AS OF JUNE 30, 2016					JUNE 30, 2016 MEMBERS ALSO PRESENT AS OF JUNE 30, 2017				
I	M	0	0	0	0.0	0.0	0	0	0	0.0	0.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	0	0	0	0.0	0.0
II	M	8,477	1,091,309,495	128,738	43.9	17.5	8,477	1,012,588,037	119,451	42.9	16.4
II	F	47	5,786,233	123,111	42.3	14.5	47	5,321,175	113,216	41.3	13.2
		8,524	1,097,095,728	128,707	43.9	17.5	8,524	1,017,909,212	119,417	42.9	16.4
III	M	0	0	0	0.0	0.0	0	0	0	0.0	0.0
III	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	0	0	0	0.0	0.0
III Modified	M	2	132,188	66,094	31.5	3.0	2	107,713	53,857	30.5	2.0
III Modified	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		2	132,188	66,094	31.5	3.0	2	107,713	53,857	30.5	2.0
III Enhanced	M	0	0	0	0.0	0.0	0	0	0	0.0	0.0
III Enhanced	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	0	0	0	0.0	0.0
ALL TIERS		**8,526**	**1,097,227,916**	**128,692**	**43.9**	**17.5**	**8,526**	**1,018,016,925**	**119,401**	**42.9**	**16.4**

		ADDITIONS DURING THE YEAR [1]					SEPARATIONS FROM MEMBERSHIP DURING THE YEAR [1]				
I	M	0	0	0	0.0	0.0	1	127,539	127,539	65.0	43.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	1	127,539	127,539	65.0	43.0
II	M	55	4,944,718	89,904	35.8	8.7	452	54,950,248	121,571	49.6	22.6
II	F	2	162,100	81,050	36.5	7.5	0	0	0	0.0	0.0
		57	5,106,818	89,593	35.8	8.7	452	54,950,248	121,571	49.6	22.6
III	M	0	0	0	0.0	0.0	330	19,920,996	60,367	29.9	3.0
III	F	0	0	0	0.0	0.0	6	437,779	72,963	34.7	3.0
		0	0	0	0.0	0.0	336	20,358,775	60,592	29.9	3.0
III Modified	M	0	0	0	0.0	0.0	1,615	85,515,883	52,952	29.0	1.3
III Modified	F	0	0	0	0.0	0.0	21	1,256,911	59,853	31.2	1.3
		0	0	0	0.0	0.0	1,636	86,772,794	53,040	29.0	1.3
III Enhanced	M	2,470	151,152,430	61,195	30.0	2.2	0	0	0	0.0	0.0
III Enhanced	F	38	2,514,168	66,162	32.0	2.1	0	0	0	0.0	0.0
		2,508	153,666,598	61,271	30.0	2.2	0	0	0	0.0	0.0
ALL TIERS		**2,565**	**158,773,416**	**61,900**	**30.2**	**2.3**	**2,425**	**162,209,356**	**66,890**	**33.0**	**5.5**

Note: Age is nearest birthday. Service is nearest year.

[1] Separations and additions do not include new member withdrawals.

Table XII-8
Summary of Non-Pensioner Membership as of June 30, 2017

	TIER 1		TIER 2		TIER 3		TIER 3 MODIFIED		TIER 3 ENHANCED		ALL TIERS	
STATUS	**NUMBER**	**SALARY**	**NUMBER**	**SALARY**	**NUMBER**	**SALARY**	**NUMBER**	**SALARY**	**NUMBER**	**SALARY**	**NUMBER**	**SALARY**
MALES:												
ACTIVES	0	0	8,532	1,096,254,213	0	0	2	132,188	2,470	151,152,430	11,004	1,247,538,831
INACTIVES	0	0	11	1,099,938	1	63,074	3	158,294	0	0	15	1,321,306
VESTED	0	0	57	5,143,072	0	0	0	0	0	0	57	5,143,072
ALL STATUS	**0**	**0**	**8,600**	**1,102,497,223**	**1**	**63,074**	**5**	**290,482**	**2,470**	**151,152,430**	**11,076**	**1,254,003,209**
FEMALES:												
ACTIVES	0	0	49	5,948,333	0	0	0	0	38	2,514,168	87	8,462,501
INACTIVES	0	0	0	0	0	0	0	0	0	0	0	0
VESTED	0	0	1	118,290	0	0	0	0	0	0	1	118,290
ALL STATUS	**0**	**0**	**50**	**6,066,623**	**0**	**0**	**0**	**0**	**38**	**2,514,168**	**88**	**8,580,791**
TOTAL:												
ACTIVES	0	0	8,581	1,102,202,546	0	0	2	132,188	2,508	153,666,598	11,091	1,256,001,332
INACTIVES	0	0	11	1,099,938	1	63,074	3	158,294	0	0	15	1,321,306
VESTED	0	0	58	5,261,362	0	0	0	0	0	0	58	5,261,362
ALL STATUS	**0**	**0**	**8,650**	**1,108,563,846**	**1**	**63,074**	**5**	**290,482**	**2,508**	**153,666,598**	**11,164**	**1,262,584,000**

Table XII-9
Summary of Pensioner Membership

Group	June 30, 2017 (Lag)				June 30, 2016 (Lag)			
	Number	Annual Amounts Payable			Number	Annual Amounts Payable		
		Plan Benefit	Supplementation	Total		Plan Benefit	Supplementation	Total
Service Pensioners	**5,086**	$ 228,733,390	$ 23,242,239	**$ 251,975,629**	**5,174**	$ 220,805,176	$ 24,137,475	**$ 244,942,651**
Ordinary Disability Pensioners	**787**	36,591,358	5,040,510	**$ 41,631,868**	**853**	38,817,728	5,544,011	**$ 44,361,739**
Accidental Disability Pensioners	**9,738**	787,024,157	37,909,168	**$ 824,933,325**	**9,560**	737,520,662	38,141,349	**$ 775,662,011**
Beneficiaries of Members Killed in the Line-of-Duty	**643**	66,876,559	2,558,895	**$ 69,435,454**	**633**	63,948,213	2,462,250	**$ 66,410,463**
Other Beneficiaries	**382**	7,118,822	1,039,627	**$ 8,158,449**	**427**	7,442,209	1,197,678	**$ 8,639,887**
Total	**16,636**	**$ 1,126,344,286**	**$ 69,790,439**	**$ 1,196,134,725**	**16,647**	**$ 1,068,533,988**	**$ 71,482,763**	**$ 1,140,016,751**

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2017

	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	9	665,485	73,943	0	0	0	9	665,485	73,943
45 TO 49	64	4,461,488	69,711	1	83,543	83,543	65	4,545,031	69,924
50 TO 54	188	14,053,196	74,751	0	0	0	188	14,053,196	74,751
55 TO 59	493	33,381,585	67,711	0	0	0	493	33,381,585	67,711
60 TO 64	678	42,286,779	62,370	4	184,774	46,194	682	42,471,553	62,275
65 TO 69	574	32,065,934	55,864	2	67,283	33,642	576	32,133,217	55,787
70 TO 74	761	36,585,079	48,075	0	0	0	761	36,585,079	48,075
75 TO 79	927	38,696,912	41,744	1	34,940	34,940	928	38,731,852	41,737
80 TO 84	770	28,234,706	36,668	0	0	0	770	28,234,706	36,668
85 TO 89	400	14,023,777	35,059	0	0	0	400	14,023,777	35,059
90 & UP	214	7,150,148	33,412	0	0	0	214	7,150,148	33,412
TOTAL	**5,078**	**251,605,089**	**49,548**	**8**	**370,540**	**46,318**	**5,086**	**251,975,629**	**49,543**
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	0	0	0	0	0	0	0	0	0
40 TO 44	8	306,834	38,354	0	0	0	8	306,834	38,354
45 TO 49	5	165,022	33,004	0	0	0	5	165,022	33,004
50 TO 54	14	486,275	34,734	0	0	0	14	486,275	34,734
55 TO 59	30	827,938	27,598	0	0	0	30	827,938	27,598
60 TO 64	42	1,043,786	24,852	1	29,148	29,148	43	1,072,934	24,952
65 TO 69	46	1,993,916	43,346	0	0	0	46	1,993,916	43,346
70 TO 74	77	5,076,051	65,923	0	0	0	77	5,076,051	65,923
75 TO 79	180	11,155,041	61,972	0	0	0	180	11,155,041	61,972
80 TO 84	186	10,585,495	56,911	0	0	0	186	10,585,495	56,911
85 TO 89	133	6,735,583	50,643	0	0	0	133	6,735,583	50,643
90 & UP	65	3,226,779	49,643	0	0	0	65	3,226,779	49,643
TOTAL	**786**	**41,602,720**	**52,930**	**1**	**29,148**	**29,148**	**787**	**41,631,868**	**52,899**
ACCIDENTAL DISABILITY:									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	14	1,288,653	92,047	1	68,560	68,560	15	1,357,213	90,481
35 TO 39	136	12,835,729	94,380	1	136,174	136,174	137	12,971,903	94,685
40 TO 44	322	30,473,160	94,637	0	0	0	322	30,473,160	94,637
45 TO 49	722	69,861,155	96,761	2	165,855	82,928	724	70,027,010	96,722
50 TO 54	1,296	128,978,411	99,520	1	103,932	103,932	1,297	129,082,343	99,524
55 TO 59	1,732	173,699,542	100,288	4	397,984	99,496	1,736	174,097,526	100,287
60 TO 64	1,747	164,191,642	93,985	5	372,646	74,529	1,752	164,564,288	93,929
65 TO 69	942	79,508,667	84,404	7	641,117	91,588	949	80,149,784	84,457
70 TO 74	834	57,551,862	69,007	0	0	0	834	57,551,862	69,007
75 TO 79	886	51,882,967	58,559	0	0	0	886	51,882,967	58,559
80 TO 84	685	33,800,663	49,344	1	66,694	66,694	686	33,867,357	49,369
85 TO 89	267	12,707,292	47,593	0	0	0	267	12,707,292	47,593
90 & UP	133	6,200,620	46,621	0	0	0	133	6,200,620	46,621
TOTAL	**9,716**	**822,980,363**	**84,704**	**22**	**1,952,962**	**88,771**	**9,738**	**824,933,325**	**84,713**

Table XII-10

Distribution of Pension Benefits by Cause and Age as of June 30, 2017 (cont'd)

	MALE			FEMALE			TOTAL		
AGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
ACCIDENTAL DEATH:									
UNDER 30	1	79,742	79,742	3	198,069	66,023	4	277,811	69,453
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	3	226,776	75,592	3	226,776	75,592
40 TO 44	0	0	0	37	3,208,444	86,715	37	3,208,444	86,715
45 TO 49	0	0	0	73	7,210,068	98,768	73	7,210,068	98,768
50 TO 54	0	0	0	95	10,737,729	113,029	95	10,737,729	113,029
55 TO 59	0	0	0	120	14,843,396	123,695	120	14,843,396	123,695
60 TO 64	0	0	0	84	10,454,312	124,456	84	10,454,312	124,456
65 TO 69	3	194,106	64,702	58	7,076,117	122,002	61	7,270,223	119,184
70 TO 74	0	0	0	47	5,324,384	113,285	47	5,324,384	113,285
75 TO 79	0	0	0	48	4,654,422	96,967	48	4,654,422	96,967
80 TO 84	1	73,315	73,315	38	3,230,644	85,017	39	3,303,959	84,717
85 TO 89	0	0	0	15	1,234,463	82,298	15	1,234,463	82,298
90 & UP	0	0	0	17	689,467	40,557	17	689,467	40,557
TOTAL	**5**	**347,163**	**69,433**	**638**	**69,088,291**	**108,289**	**643**	**69,435,454**	**107,987**
OTHER BENEFICIARIES:									
UNDER 30	0	0	0	3	183,099	61,033	3	183,099	61,033
30 TO 34	0	0	0	1	72,023	72,023	1	72,023	72,023
35 TO 39	0	0	0	3	163,932	54,644	3	163,932	54,644
40 TO 44	0	0	0	0	0	0	0	0	0
45 TO 49	0	0	0	1	96,406	96,406	1	96,406	96,406
50 TO 54	0	0	0	8	466,052	58,257	8	466,052	58,257
55 TO 59	1	23,535	23,535	17	752,812	44,283	18	776,347	43,130
60 TO 64	0	0	0	23	757,983	32,956	23	757,983	32,956
65 TO 69	0	0	0	16	592,008	37,001	16	592,008	37,001
70 TO 74	0	0	0	38	1,328,458	34,959	38	1,328,458	34,959
75 TO 79	0	0	0	39	1,076,079	27,592	39	1,076,079	27,592
80 TO 84	0	0	0	48	1,037,575	21,616	48	1,037,575	21,616
85 TO 89	0	0	0	39	585,544	15,014	39	585,544	15,014
90 & UP	0	0	0	145	1,022,943	7,055	145	1,022,943	7,055
TOTAL	**1**	**23,535**	**23,535**	**381**	**8,134,914**	**21,351**	**382**	**8,158,449**	**21,357**
ALL PENSIONERS AND BENEFICIARIES:									
UNDER 30	1	79,742	79,742	6	381,168	63,528	7	460,910	65,844
30 TO 34	14	1,288,653	92,047	2	140,583	70,292	16	1,429,236	89,327
35 TO 39	136	12,835,729	94,380	7	526,882	75,269	143	13,362,611	93,445
40 TO 44	339	31,445,479	92,760	37	3,208,444	86,715	376	34,653,923	92,165
45 TO 49	791	74,487,665	94,169	77	7,555,872	98,128	868	82,043,537	94,520
50 TO 54	1,498	143,517,882	95,806	104	11,307,713	108,728	1,602	154,825,595	96,645
55 TO 59	2,256	207,932,600	92,169	141	15,994,192	113,434	2,397	223,926,792	93,420
60 TO 64	2,467	207,522,207	84,119	117	11,798,863	100,845	2,584	219,321,070	84,877
65 TO 69	1,565	113,762,623	72,692	83	8,376,525	100,922	1,648	122,139,148	74,114
70 TO 74	1,672	99,212,992	59,338	85	6,652,842	78,269	1,757	105,865,834	60,254
75 TO 79	1,993	101,734,920	51,046	88	5,765,441	65,516	2,081	107,500,361	51,658
80 TO 84	1,642	72,694,179	44,272	87	4,334,913	49,827	1,729	77,029,092	44,551
85 TO 89	800	33,466,652	41,833	54	1,820,007	33,704	854	35,286,659	41,319
90 & UP	412	16,577,547	40,237	162	1,712,410	10,570	574	18,289,957	31,864
TOTAL	**15,586**	**1,116,558,870**	**71,639**	**1,050**	**79,575,855**	**75,787**	**16,636**	**1,196,134,725**	**71,900**

Graph XII-11
Pensioner Average Benefits

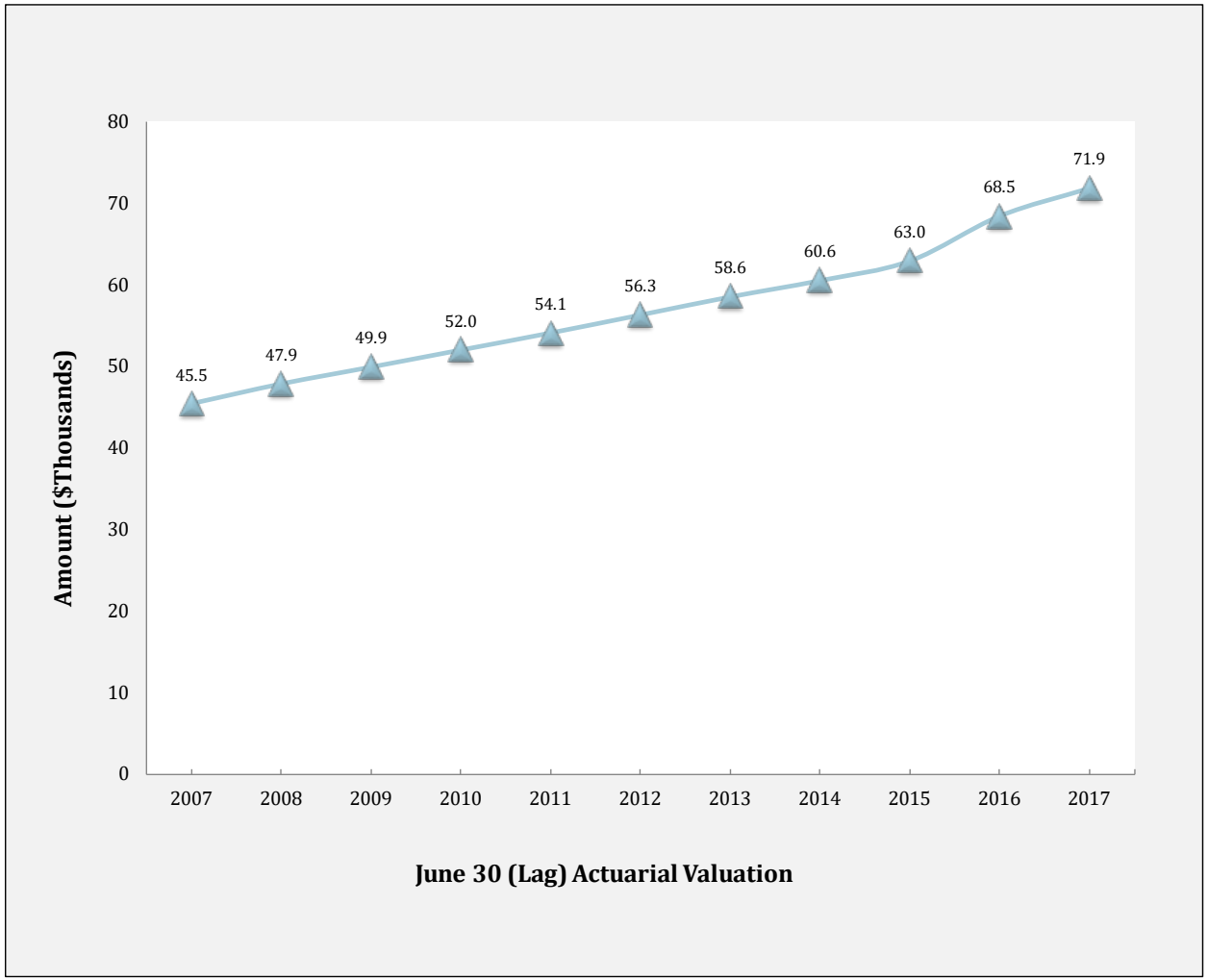

Table XII-12
Reconciliation of Pensioner and Beneficiary Data

SCHEDULE OF PENSIONERS AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS								
	Added to Rolls		**Removed from Rolls**		**End of Year Rolls**			
June 30 (Lag) Actuarial Valuation	**Number**	**Annual Allowances[1]**	**Number**	**Annual Allowances**	**Number**	**Annual Allowances[2]**	**% Increase In Annual Allowances**	**Average Annual Allowances**
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
2016	498	110,481,515	561	22,667,718	16,647	1,140,016,751	8.3%	68,482
2017	497	77,245,492	508	21,127,518	16,636	1,196,134,725	4.9%	71,900

[1] Amounts shown include changes due to benefit finalization, changes in benefit type (e.g. Service to Accident Disability), COLA increases and other changes.

[2] Allowances shown are those used in the actuarial valuation as of the Year End date and are not adjusted for anticipated changes due to finalization of benefit calculations or contract settlements.

APPENDIX: ACRONYMS AND ABBREVIATIONS

2019 A&M	2012 A&M with changes proposed by the Actuary and adopted by Board of Trustees during Fiscal Year 2019
AAVM	Actuarial Asset Valuation Method
ABO	Accumulated Benefit Obligation
ACCNY	Administrative Code of the City of New York
AIR	Actuarial Interest Rate
AL	Accrued Liability
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
GASB25	Governmental Accounting Standards Board Statement No. 25
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
PV	Present Value
PVFB	Present Value of Future Benefits
PVFNC	Present Value of Future Normal Costs
PVFS	Present Value of Future Salary
UAL	Unfunded Accrued Liability
UIR	Unexpected Investment Return
VSF	Variable Supplements Funds
WTC	World Trade Center