



Fiscal Year 2018
Actuarial Valuation Report
for the
New York City
Fire Pension Fund

JUNE 30, 2016 (LAG) ACTUARIAL VALUATION

prepared by the
New York City
Office of the Actuary

2018



OFFICE OF THE ACTUARY

255 GREENWICH STREET • 9TH FLOOR
NEW YORK, NY 10007
(212) 442-5775 • FAX: (212) 442-5777

SHERRY S. CHAN
CHIEF ACTUARY

July 2, 2019

Board of Trustees
New York City Fire Pension Fund and Group Life Insurance Plan
24 State Street, 9th Floor
New York, NY 10004

Re: Fiscal Year 2018 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2016 (Lag) actuarial valuation of the benefits under both the New York City Fire Pension Fund (FIRE) and Group Life Insurance Plan (collectively, the Plan). This valuation, known as the June 30, 2016 (Lag) valuation, forms the basis for determining the actuarially-required contribution (Actuarial Contribution) of \$1,200,417,052 for Fiscal Year 2018 (i.e. for the period beginning July 1, 2017 and ending June 30, 2018). It is not intended, nor necessary suitable, for other purposes. Calculations made for other purposes may differ significantly from those shown herein. This report does not present GASB results. The Office of the Actuary published Fiscal Year 2018 GASB 67 and GASB 68 results in a Report dated September 28, 2018, which is available on the website of the Office of the Actuary (www.nyc.gov/actuary).

Results of the June 30, 2015 (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, 2016 (Lag) and June 30, 2015 (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, 2016 and June 30, 2015.

Consistent with the 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.

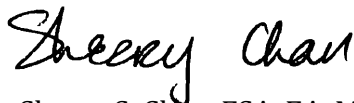
The June 30, 2016 (Lag) actuarial valuation reflects the enactment of Chapter 298 of the Laws of 2016 (chapter 298/16), which modifies the Disability benefit provisions for Tier 3 and Tier 3 Modified members.

The June 30, 2016 (Lag) actuarial valuation also reflects a change in valuing the Accidental Death Benefit (ADB) for those members who are eligible for Special Accidental Death Benefits (SADB) pursuant to Section 208(f) of the General Municipal Law.

A summary of the actuarial assumptions and methods are shown in SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS. All other actuarial assumptions and methods are unchanged from the prior year.

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

SSC/eh

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. Sam Rumley – New York City Office of the Actuary
Mr. Michael Samet – New York City Office of the Actuary
Keith Snow, Esq. – New York City Office of the Actuary
Ms. Lei Tian – New York City Fire Pension Fund

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SECTION I – EXECUTIVE SUMMARY

This report presents the results of the June 30, 2016 (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 2018 (i.e. July 1, 2017 to June 30, 2018),
- 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 it has equaled the Actuarial Contribution in all historical years.

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

All results are based on Final SKIM amounts as determined by the Actuary in the memo dated May 11, 2018 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. The actuary's scope of work did not include an analysis of the range of such deviations.

Additional risks may be present for the Plan and are presented in SECTION VII-RISK AND UNCERTAINTY for consideration.

Table I-1 Executive Summary

Presented in **Table I-1** are the principal results of the June 30, 2016 (Lag) actuarial valuation and, for comparative purposes, the June 30, 2015 (Lag) actuarial valuation.

NEW YORK CITY FIRE PENSION FUND		
SUMMARY OF VALUATION RESULTS		
Valuation Date	June 30, 2016 (Lag)	June 30, 2015 (Lag)
Fiscal Year	2018	2017
Funded Status		
1. Accrued Liability	\$ 20,125,428,678	\$ 18,688,642,425
2. Actuarial Value of Assets (AVA) ¹	<u>11,082,451,000</u>	<u>10,504,728,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 9,042,977,678	\$ 8,183,914,425
4. Funded Ratio (AVA Basis) (2. / 1.)	55.1%	56.2%
5. Market Value of Assets (MVA) ¹	10,899,763,000	10,815,330,000
6. Unfunded Accrued Liability (MVA Basis) (1. - 5.)	\$ 9,225,665,678	\$ 7,873,312,425
7. Funded Ratio (MVA Basis) (5. / 1.)	54.2%	57.9%
Contribution²		
1. Normal Cost	\$ 414,118,544	\$ 409,404,419
2. Unfunded Accrued Liability	786,298,508	651,765,574
3. Administrative Expenses	<u>NA</u>	<u>NA</u>
4. Actuarial Contribution (1. + 2. + 3.)	\$ 1,200,417,052	\$ 1,061,169,993
5. Statutory Contribution (4.)	\$ 1,200,417,052	\$ 1,061,169,993
Participant Data		
1. Active Members		
a. Number	10,951	10,780
b. Annual Salary ³	\$ 1,180,226,281	\$ 1,164,994,036
c. Average Salary	\$ 107,773	\$ 108,070
2. Active/Inactive Members ⁴	21	18
3. Terminated Vested Members	58	32
4. Retirees and Beneficiaries		
a. Number	16,647	16,710
b. Total Annual Benefits	\$ 1,140,016,751	\$ 1,052,202,954
c. Average Annual Benefit	\$ 68,482	\$ 62,968

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

² Including results for Variable Supplements Funds.

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

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

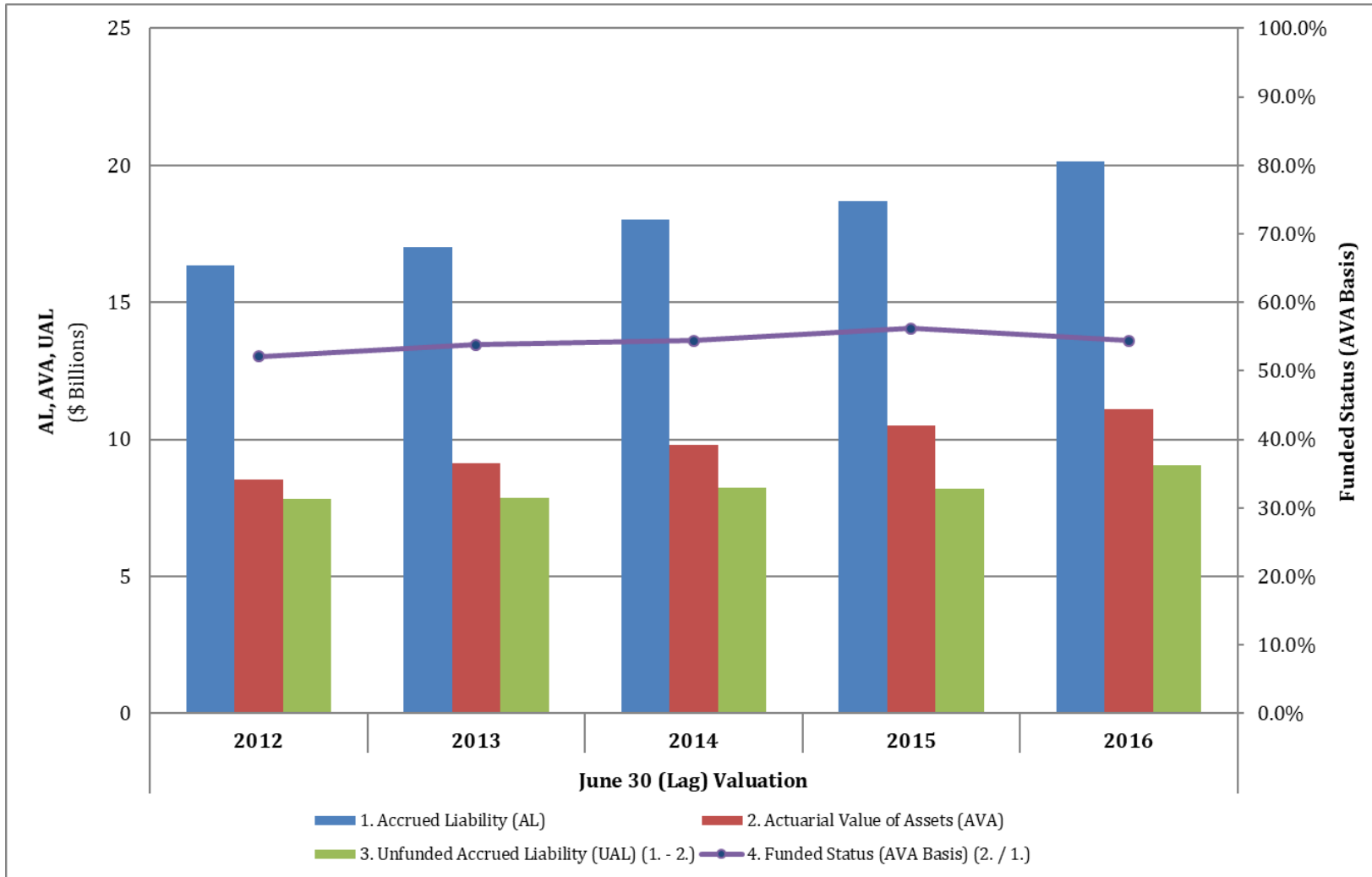
Table I-2
Actuarial Liabilities

NEW YORK CITY FIRE PENSION FUND		
ACTUARIAL LIABILITIES BY STATUS		
Valuation Date	June 30, 2016 (Lag)	June 30, 2015 (Lag)
Fiscal Year	2018	2017
Accrued Liability		
1. Active Members	\$ 7,234,580,515	\$ 6,991,286,330
2. Active/Inactive Members ¹	5,629,970	7,337,667
3. Terminated Vested Members	10,361,142	6,069,033
4. Retirees and Beneficiaries	<u>12,666,895,160</u>	<u>11,455,492,345</u>
5. Accrued Liability Pre-Adjustments (1. to 4.)	\$ 19,917,466,787	\$ 18,460,185,375
6. Actuarial Adjustments ²	<u>207,961,891</u>	<u>228,457,050</u>
7. Total Accrued Liability (AL) (5. + 6.)	\$ 20,125,428,678	\$ 18,688,642,425
Present Value of Benefits		
1. Active Members	\$ 11,250,296,067	\$ 10,820,079,982
2. Active/Inactive Members ¹	5,629,970	7,337,667
3. Terminated Vested Members	10,361,142	6,069,033
4. Retirees and Beneficiaries	<u>12,666,895,160</u>	<u>11,455,492,345</u>
5. Present Value of Benefits (1. to 4.)	\$ 23,933,182,339	\$ 22,288,979,027
6. Actuarial Adjustments ²	<u>371,910,010</u>	<u>403,088,369</u>
7. Total Present Value of Benefits (5. + 6.)	\$ 24,305,092,349	\$ 22,692,067,396

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, 2016	June 30, 2015
ASSETS		
Cash	\$ 37,457	\$ 8,375
Receivables		
Investment Securities Sold	\$ 153,595	\$ 178,385
Member Loans	26,917	29,124
Transferrable earnings due from QPP to VSFs	0	(12,000)
Accrued Interest and Dividends	<u>20,518</u>	<u>18,568</u>
Total Receivables	\$ 201,030	\$ 214,077
INVESTMENTS AT FAIR VALUE		
Short-Term Investments		
Commercial Paper	\$ 52,525	\$ 300,618
Short-Term Investment Fund	118,935	211,956
U.S. Treasury Bills	25,998	182,521
Discount Notes	0	0
Debt Securities	2,211,925	2,463,809
Equity Securities	1,802,947	1,943,618
Alternative Investments	2,117,856	1,887,226
Collective Trust Funds		
Fixed Income	401,512	394,772
Domestic Equity	1,736,914	1,516,030
International Equity	1,966,228	2,022,335
Mortgage Debt Security	86,107	72,185
Treasury Inflation Protected Securities	547,146	300,374
Promissory Notes	0	0
Collateral From Securities Lending	<u>854,211</u>	<u>795,944</u>
Total Investments	\$ 11,922,304	\$ 12,091,388
OTHER ASSETS	<u>6,176</u>	<u>5,596</u>
TOTAL ASSETS	\$ 12,166,967	\$ 12,319,436
LIABILITIES		
Accounts Payable	\$ 89,435	\$ 74,788
Payable for Investment Securities Purchased	215,792	574,447
Accrued Benefits Payable	18,893	18,927
Accrued Transfers to VSFs	88,873	40,000
Security Lending	<u>854,211</u>	<u>795,944</u>
TOTAL LIABILITIES	\$ 1,267,204	\$ 1,504,106
PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS	\$ 10,899,763	\$ 10,815,330

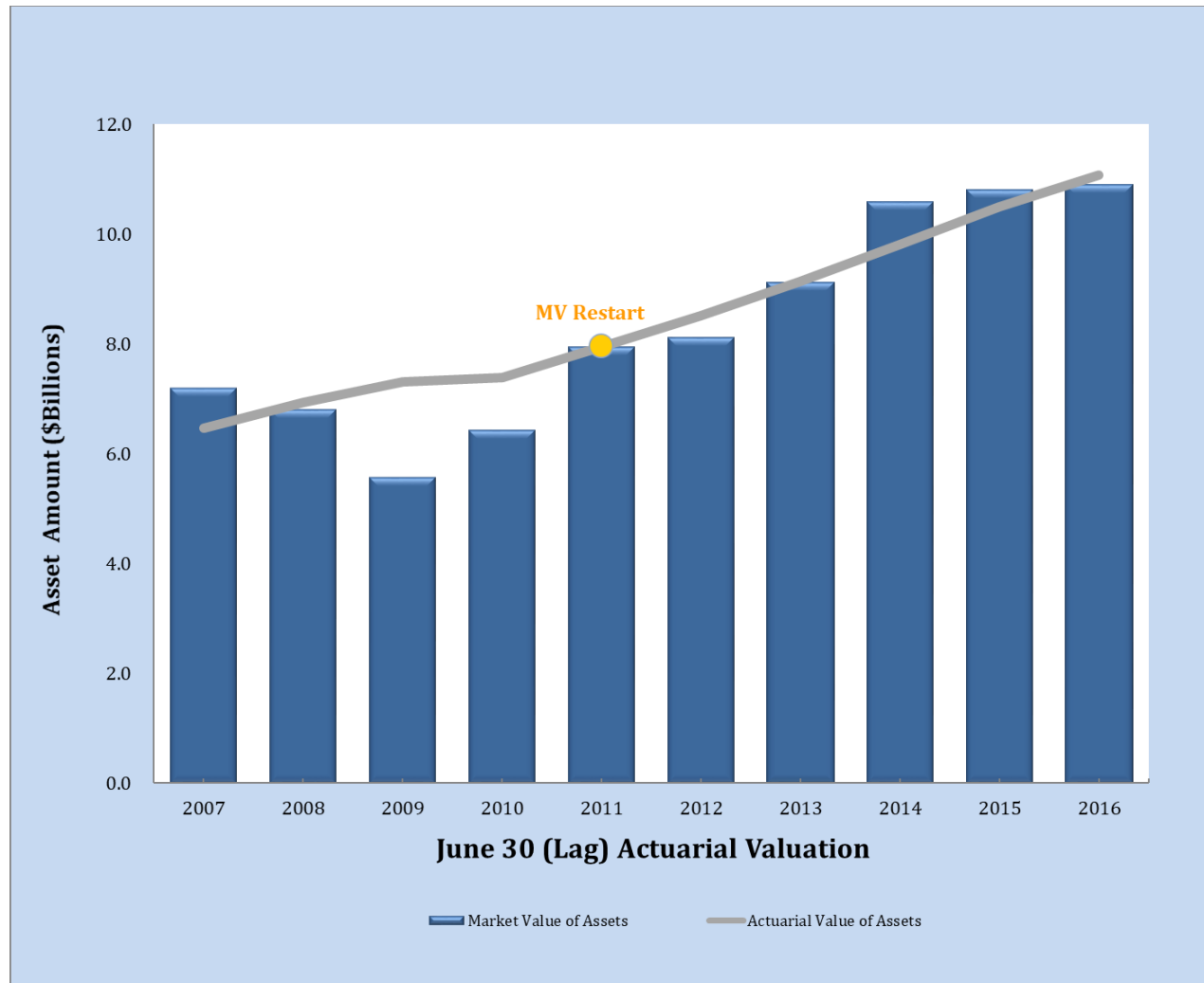
Table II-2
Statement of Changes in Plan Net Assets

(\$ Thousands)		
	June 30, 2016	June 30, 2015
ADDITIONS		
Contributions		
Member Contributions	\$ 116,619	\$ 108,582
Employer Contributions	<u>1,054,478</u>	<u>988,784</u>
Total Contributions	\$ 1,171,097	\$ 1,097,366
Investment Income (Loss)		
Interest Income	\$ 137,160	\$ 115,571
Dividend Income	145,276	227,390
Net Appreciation (Depreciation) in Fair Value	<u>(44,510)</u>	<u>(8,490)</u>
Total Investment Income (Loss)	\$ 237,926	\$ 334,471
Less Investment Expenses	46,321	68,027
Net Income (Loss)	\$ 191,605	\$ 266,444
Securities Lending Transactions		
Securities Lending Income	\$ 6,196	\$ 5,332
Securities Lending Fees	<u>(403)</u>	<u>(346)</u>
Net Securities Lending Income (Loss)	\$ 5,793	\$ 4,986
Net Investment Income (Loss)	\$ 197,398	\$ 271,430
Other		
Net Receipts from Other Retirement Systems	42,786	40,737
Litigation Income	<u>887</u>	<u>464</u>
TOTAL ADDITIONS	\$ 1,412,168	\$ 1,409,997
DEDUCTIONS		
Benefit Payments and Withdrawals	\$ 1,290,862	\$ 1,150,505
Accrued Transfers to VSFs	<u>36,873</u>	<u>40,000</u>
TOTAL DEDUCTIONS	\$ 1,327,735	\$ 1,190,505
NET INCREASE (DECREASE) IN PLAN NET ASSETS	\$ 84,433	\$ 219,492
PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
Beginning of Year	\$ 10,815,330	\$ 10,595,838
End of Year	\$ 10,899,763	\$ 10,815,330

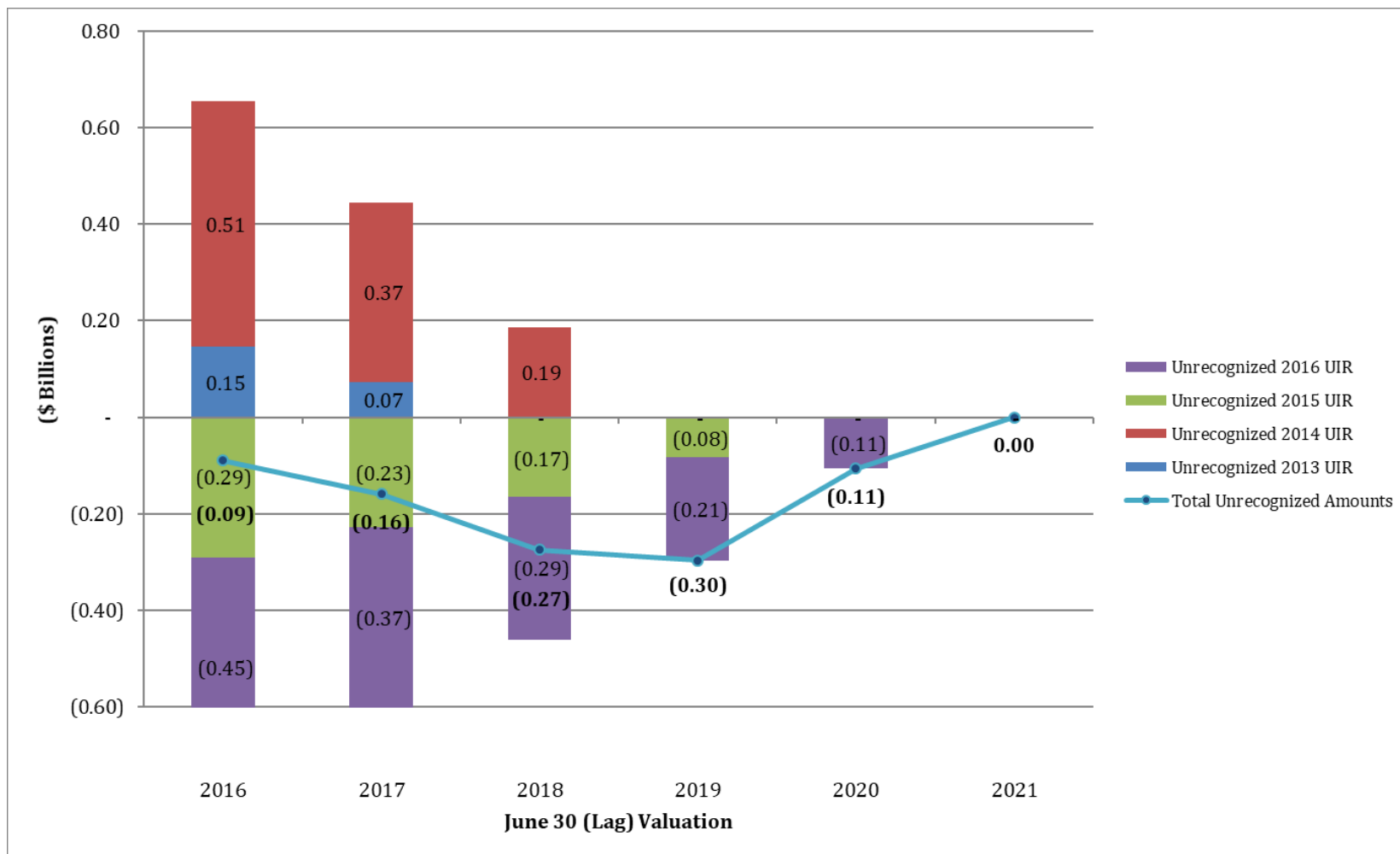
Table II-3
Development of Actuarial Value of Assets

(\$ Thousands)		
Valuation Date	June 30, 2016	June 30, 2015
1. Market Value of Assets (MVA)		
Beginning of Year (BOY)	\$ 10,815,330	\$ 10,595,838
End of Year (EOY)	\$ 10,899,763	\$ 10,815,330
2. Contributions		
a. Employee	\$ 116,619	\$ 108,582
b. Employer	<u>1,054,478</u>	<u>988,784</u>
c. Total Contributions	\$ 1,171,097	\$ 1,097,366
3. Net Investment Income		
a. Investment Income	\$ 243,719	\$ 339,457
b. Investment Expenses	<u>(46,321)</u>	<u>(68,027)</u>
c. Total Net Investment Income	\$ 197,398	\$ 271,430
4. Cash Flow (Other)	\$ (1,247,189)	\$ (1,109,304)
5. Preliminary SKIM from FIRE to VSFs - EOY	\$ (36,873)	\$ (40,000)
6. Net Cash Flow (2.c. + 4. + 5.)	\$ (112,965)	\$ (51,938)
7. Average invested assets		
a. AVA @ BOY	\$ 10,504,728	\$ 9,808,854
b. 1/2 Net Cash Flow ((2.c. + 4.) / 2)	<u>(38,046)</u>	<u>(5,969)</u>
c. Total	\$ 10,466,682	\$ 9,802,885
8. Expected Rate of Return (AIR)	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	\$ 732,668	\$ 686,202
10. Unexpected Investment Return (UIR) (3.c. - 9.)	\$ (535,270)	\$ (414,772)
11. AVA @ EOY		
a. AVA @ BOY (prior to corridor limit)	\$ 10,504,728	\$ 9,808,854
b. Net Cash Flow (6.)	(112,965)	(51,938)
c. Expected Investment Return (9.)	732,668	686,202
d. Phase in of UIR		
15% * UIR	(80,291)	(62,216)
15% * UIR	(62,216)	139,231
15% * UIR	139,231	54,494
15% * UIR	54,494	(69,899)
20% * UIR	(93,198)	N/A
20% * UIR	N/A	N/A
Total	\$ (41,980)	\$ 61,610
e. AVA (11.a. + 11.b. + 11.c. + 11.d.)	\$ 11,082,451	\$ 10,504,728
12. Corridor		
a. 80% of MVA	\$ 8,719,810	\$ 8,652,264
b. 120% of MVA	\$ 13,079,716	\$ 12,978,396
13. Final AVA of EOY (11e. bounded by 12)	\$ 11,082,451	\$ 10,504,728

Graph II-4
Historical Market and Actuarial Value of Assets



Graph II-5
Future Recognition of UIR as of June 30, 2016



SECTION III - CONTRIBUTION DEVELOPMENT AND HISTORY

Table III-1
Statutory Contributions

Table III-1 shows the components of the Fiscal Year 2018 and the Fiscal Year 2017 Statutory Contributions.

COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS □		
Valuation Date	June 30, 2016 (Lag)	June 30, 2015 (Lag)
Fiscal Year	2018	2017
Normal Cost ¹	\$ 414,118,544 ²	\$ 409,404,419 ³
Amortization of Unfunded Accrued Liability		
- Initial UAL	636,581,477	618,040,269
- 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	NA
- 2016 Enhanced ADR	249,358	NA
- 2016 SADB	96,997,069	NA
- Total	786,298,508	651,765,574
Administrative Expenses	NA	NA
Total Contribution to the New York City Fire Pension Fund	\$ 1,200,417,052	\$ 1,061,169,993

¹ Includes amounts necessary, if any, to provide for financing of the Excess Benefit Plan established by Chapter 623/04.

² Includes \$469,252 for Group Life Insurance Plan.

³ Includes \$462,587 for Group Life Insurance Plan.

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/or Method Changes – Over a closed 20-year period.
- Actuarial Gains and Losses – Over a closed 15-year period.

Under the One-Year Lag methodology (OYLM), the number of payments is one fewer than the number of years in the amortization period (e.g. 14 payments over a closed 15-year amortization period).

Table III-2 shows the Schedule of Unfunded Accrued Liability (UAL) Bases as of June 30, 2016.

NEW YORK CITY FIRE PENSION FUND SCHEDULE OF UNFUNDED ACCRUED LIABILITY BASES (\$ Millions)						
Amortization Base	Date Established	Original Amount	Amortization Period/Methods	Amortization Payment	Years/Payments Remaining	OLYM UAL June 30, 2016
Initial UAL	6/30/10	\$ 7,096 ¹	22-Years Closed IDP-3%	\$ 637	16 / 16	\$ 7,295
(Gain)/Loss	6/30/11	\$ (168)	15-Years Closed /LDP	\$ (20)	10 / 10	\$ (145)
(Gain)/Loss	6/30/12	\$ 26	15-Years Closed /LDP	\$ 3	11 / 11	\$ 24
(Gain)/Loss	6/30/13	\$ 61	15-Years Closed /LDP	\$ 7	12 / 12	\$ 60
(Gain)/Loss	6/30/14	\$ 84	15-Years Closed /LDP	\$ 10	13 / 13	\$ 86
Assumptions Change	6/30/14	\$ 328	20-Years Closed /LDP	\$ 33	18 / 18	\$ 341
(Gain)/Loss	6/30/15	\$ 4	15-Years Closed /LDP	\$ < 1	14 / 14	\$ 5
(Gain)/Loss	6/30/16	\$ 158	15 Years Closed/LDP	\$ 19	15 / 14	\$ 158
Enhanced ADR	6/30/16	\$ 3	22 Years Closed/LDP	\$ < 1	22 / 21	\$ 3
SADB	6/30/16	\$ 820	15 Years Closed/LDP	\$ 97	15 / 14	\$ 820

¹ Initial UAL as of June 30, 2010 after adjustments under OYLM. The amount prior to adjustments under OYLM was \$7,956,942,215.

Graph III-3
Remaining UAL Base Amortizations as of June 30, 2016

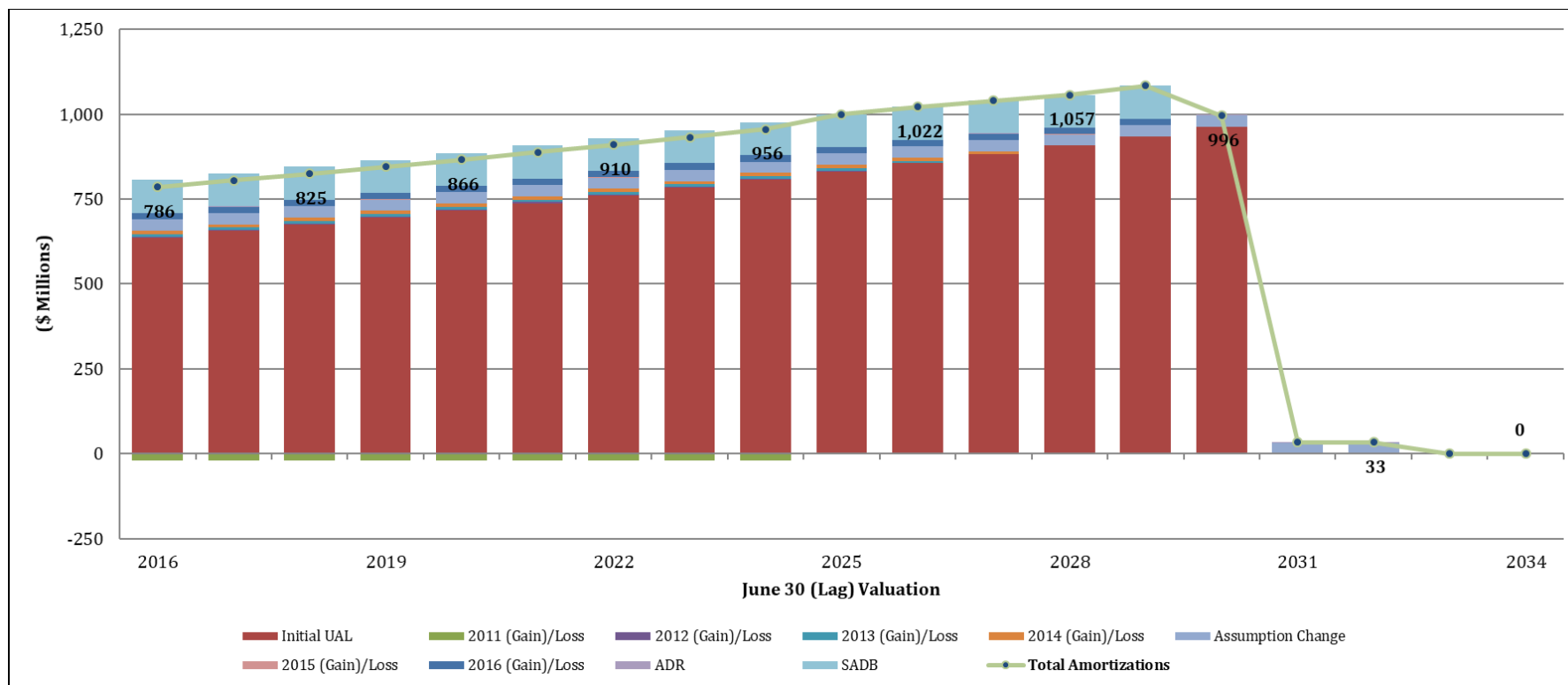


Table III-4
Reconciliation of Outstanding UAL Bases

June 30 (Lag) Valuation Date	Amounts (in \$ Thousands) Remaining to be Amortized, as of						
	2010	2011	2012	2013	2014	2015	2016
Initial UAL amortization base	\$ 7,095,864	\$ 7,592,575	\$ 7,572,584	\$ 7,534,650	\$ 7,477,020	\$ 7,397,804	\$ 7,294,965
2010-2011 (Gain)/Loss		(168,320)	(180,103)	(172,116)	(163,570)	(154,426)	(144,642)
2011-2012 (Gain)/Loss			26,298	28,139	26,891	25,556	24,127
2012-2013 (Gain)/Loss				61,312	65,604	62,695	59,582
2013-2014 (Gain)/Loss					84,383	90,290	86,286
Assumption Change at June 30, 2014					327,575	350,506	341,128
2014-2015 (Gain)/Loss						4,283	4,582
2015-2016 (Gain)/Loss							158,483
2016 Enhanced ADR							2,612
2016 SADB							820,068
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

June 30 (Lag) Valuation Date	2010	2011	2012	2013	2014	2015	2016
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
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
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
4. PV 1-year Adjusted Employer Normal Cost	861,078	429,007	418,560	407,150	401,939	407,206	395,787
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

Table III-5
Actuarial and Statutory Contribution History

Table III-5 compares the Statutory Contributions to the Actuarial Contributions for Fiscal Years 2009 through 2018.

(\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution Certified	Statutory Contribution Contributed	Percentage of Actuarial Contribution Contributed
2009	\$ 843,751	\$ 843,751	100.0%
2010	874,331	874,331	100.0%
2011	890,706	890,706	100.0%
2012	976,895	976,895	100.0%
2013	962,173	962,173	100.0%
2014	969,956	969,956	100.0%
2015	988,784	988,784	100.0%
2016	1,054,478	1,054,478	100.0%
2017	1,061,170	1,061,170	100.0%
2018	1,200,417	1,200,417	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 2009 through 2018.

CITY RATES (\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution	Salary ¹ at Time =1.0	City Rate
2009	\$ 843,751	\$ 1,013,660	83.238%
2010	874,331	1,059,907	82.491%
2011	890,706	1,082,953	82.248%
2012	976,895	1,149,426	84.990%
2013	962,173	1,129,926	85.154%
2014	969,956	1,102,396	87.986%
2015	988,784	1,111,744	88.940%
2016	1,054,478	1,129,470	93.360%
2017	1,061,170	1,145,919	92.604%
2018	1,200,417	1,164,528	103.082%

¹Includes assumed overtime paid and 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, 2015 (Lag) actuarial valuation and the June 30, 2016 (Lag) actuarial valuation.¹

DEVELOPMENT OF EXPERIENCE (GAIN) / LOSS	
June 30, 2016	
(\$ Thousands)	
1. Expected Accrued Liability (AL)	
a. AL at June 30, 2015	\$ 19,515,829
b. Total Normal Cost and Administrative Expenses at June 30, 2015	482,635
c. Interest on 1.a. and 1.b. to June 30, 2016	1,399,892
d. Fiscal Year 2016 Benefit Payments	(1,358,431)
e. Interest on 1.d. to June 30, 2016	<u>(46,741)</u>
f. Expected AL at June 30, 2016	\$ 19,993,184
2. Actual AL at June 30, 2016 before Plan Changes ²	\$ 20,152,024
3. Expected Total Actuarial Value of Assets (AVA)	
a. Total AVA at June 30, 2015	\$ 11,331,915
b. Interest on 3.a. to June 30, 2016	793,234
c. Total Contributions Paid in Fiscal Year 2016	1,171,097
d. Interest on 3.c. to June 30, 2016	40,295
e. Fiscal Year 2016 Benefit Payments	(1,358,431)
f. Interest on 3.e. to June 30, 2016	<u>(46,741)</u>
g. Expected Total AVA at June 30, 2016	\$ 11,931,369
4. Actual Total AVA at June 30, 2016	\$ 11,931,726
5. Liability (Gain) / Loss (2. - 1.f.)	\$ 158,840
6. Actuarial Asset (Gain) / Loss (3.g. - 4.)	\$ (357)
7. Total Actuarial (Gain) / Loss (5. + 6.)	\$ 158,483

¹ Includes the Accrued Liability for FIRE, FFVSF, and FOVSF.

² Enhanced ADR and SADB.

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) Actuarial 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)
2007	6,459,130	6,520,670	61,540	99.1%	1,000,383	6.2%
2008	6,942,992	6,986,243	43,251	99.4%	1,051,592	4.1%
2009	7,304,758	7,327,560	22,802	99.7%	1,079,682	2.1%
2010	7,392,656	15,349,598	7,956,942	48.2%	1,138,188	699.1%
2011	7,955,668	15,808,930	7,853,262	50.3%	1,125,460	697.8%
2012	8,520,769	16,358,108	7,837,339	52.1%	1,106,113	708.5%
2013	9,144,587	17,003,722	7,859,135	53.8%	1,129,706	695.7%
2014	9,808,854	18,028,695	8,219,841	54.4%	1,150,390	714.5%
2015	10,504,728	18,688,642	8,183,914	56.2%	1,164,994	702.5%
2016	11,082,451	20,125,429	9,042,978	55.1%	1,180,226	766.2%

Effective June 30, 2010, AL is based on the Entry Age Normal cost method. Previously, the Frozen Initial Liability Cost method was used. Salaries 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, 2016	June 30, 2015 ¹
FFVSF		
Active	\$ 186,126	\$ 181,343
Retiree	<u>370,075</u>	<u>383,104</u>
Total	\$ 556,201	\$ 564,447
FOVSF		
Active	\$ 186,025	\$ 180,228
Retiree	<u>158,211</u>	<u>163,169</u>
Total	\$ 344,236	\$ 343,397
Total VSF AL	\$ 900,437	\$ 907,844

¹ Revised based on a change in the methodology of allocating active accrued liability.

Table VI-2
VSF Member Data

VARIABLE SUPPLEMENTS FUNDS				
MEMBERS INCLUDED IN THE JUNE 30, 2016 (LAG) AND THE JUNE 30, 2015 (LAG) ACTUARIAL VALUATIONS				
	June 30, 2016		June 30, 2015	
	FFVSF	FOVSF	FFVSF	FOVSF
Actives				
Number	8,399	2,552	8,081	2,699
Average Age	38.5	47.9	38.6	47.2
Retirees				
Number	3,535	1,553	3,621	1,593
Average Age	71.9	73.0	71.4	72.6

Table VI-3
VSF Statement of Assets

(\$ Thousands)				
Valuation Date	June 30, 2016		June 30, 2015	
	MVA ¹	AVA	MVA ²	AVA
FFVSF	\$ 524,075	\$ 535,824	\$ 547,074	\$ 530,699
FOVSF	<u>314,272</u>	<u>313,451</u>	<u>316,927</u>	<u>296,488</u>
Total	\$ 838,347	\$ 849,275	\$ 864,001	\$ 827,187

¹ Includes Accrued Benefits Payable of \$21,225,000 for FFVSF and \$9,263,000 for FOVSF.

² Includes Accrued Benefits Payable of \$21,630,000 for FFVSF and \$9,522,000 for FOVSF.

Table VI-4
Development of VSF Actuarial Value of Assets as of June 30, 2016

(\$ Thousands)		
	FFVSF	FOVSF
1. Market Value of Assets (MVA)		
a. Beginning of Year (BOY) ¹	\$ 547,074	\$ 316,927
b. End of Year (EOY) ²	\$ 524,075	\$ 314,272
2. Contributions		
a. Employee	\$ 0	\$ 0
b. Employer	<u>0</u>	<u>0</u>
c. Total Contributions	\$ 0	\$ 0
3. Benefit Payments and Other Cash Flow		
	\$ (46,407)	\$ (21,826)
4. Preliminary SKIM from FIRE to VSFs - EOY		
	\$ 18,739	\$ 18,134
5. Net Cash Flow (2.c. + 3. + 4.)		
	\$ (27,668)	\$ (3,692)
6. Net Investment Income		
a. Investment Income	\$ 4,669	\$ 1,037
b. Investment Expenses	<u>0</u>	<u>0</u>
c. Total Net Investment Income	\$ 4,669	\$ 1,037
7. Average invested assets		
a. AVA @ BOY	\$ 530,699	\$ 296,488
b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2)	<u>(23,204)</u>	<u>(10,913)</u>
c. Total	\$ 507,495	\$ 285,575
8. Expected Rate of Return (AIR)		
	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)		
	\$ 35,525	\$ 19,990
10. Unexpected Investment Return (UIR) (6.c. - 9.)		
	\$ (30,856)	\$ (18,953)
11. Preliminary AVA @ EOY		
a. AVA @ BOY	\$ 530,699	\$ 296,488
b. Net Cash Flow (5.)	(27,668)	(3,692)
c. Expected Investment Return (9.)	35,525	19,990
d. Phase in of UIR		
15% * UIR	(4,628)	(2,843)
15% * UIR	(2,285)	(1,041)
15% * UIR	6,219	4,960
15% * UIR	2,625	2,409
20% * UIR	(4,663)	(2,820)
20% * UIR	<u>0</u>	<u>0</u>
Total	\$ (2,732)	\$ 665
e. AVA (11.a. + 11.b. + 11.c. + 11.d.)	\$ 535,824	\$ 313,451
12. Corridor		
a. 80% of MVA	\$ 419,260	\$ 251,418
b. 120% of MVA	\$ 628,890	\$ 377,126
13. Final AVA at EOY (11e. bounded by 12.)		
	\$ 535,824	\$ 313,451

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

² Includes Accrued Benefits Payable of \$21,225,000 for FFVSF and \$9,263,000 for FOVSF.

Table VI-5
SKIM Calculation as of June 30, 2016

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

(\$ Thousands)	Final	
Total FIRE Pension Fund		
1. FY2016 Equity Earnings	\$	31,432
2. FY2016 Hypothetical Earnings		168,164
3. FY2016 Excess Earnings (1. - 2.)		(136,732)
4. Deficit at June 30, 2015		0
5. Hypothetical Interest Rate (HIR)		2.324%
6. Deficit with interest (4. x (1+HIR))		0
7. Potential SKIM (3. - 6.), not less than 0	\$	0
	FFVSF	FOVSF
Allocations to VSF ¹		
8. Allocation Percentage	N/A	N/A
9. Potential SKIM (7. x 8.)	N/A	N/A
10. Accumulated Benefit Obligation	N/A	N/A
11. MVA Prior to SKIM	N/A	N/A
12. ABO Gate = (10. - 11.)	N/A	N/A
13. SKIM Payable (Lesser of 9 and 12, not less than zero)	N/A	N/A
14. Rounded Estimate, for FY16 Financial Statements	N/A	N/A

¹ Not calculated due to no potential SKIM.

Summary of VSF Plan Provisions

A. Eligibility

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

B. Benefits

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

C. Cost of Living Benefits

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

D. Form of Payment

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

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

E. VSF DROP

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

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

Summary of VSF Actuarial Assumptions and Methods

Assumptions not detailed below are as described in SECTION XI – SUMMARY OF 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. 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 Factor allocable to the VSFs based on the ratio of total contributions between firefighters and fire officers, limited so assets do not or do not further exceed the Accumulated Benefit Obligation (ABO) of the VSFs

SECTION VII - RISK AND UNCERTAINTY

The Fiscal Year 2018 employer contribution is based on the census data reported as of June 30, 2016 and on actuarial assumptions and methods adopted by the Board of Trustees during Fiscal Year 2012 and enacted by the New York State Legislature as Chapter 3 of the Laws of 2013 (the 2012 A&M), with revisions made to the post-retirement mortality assumptions and to the AAVM during Fiscal Year 2016 (the 2016 A&M).

The funded status of FIRE depends highly on the realization of the actuarial assumptions used, as well as certain demographic characteristics of the Plan and other exogenous factors. Many of the risks faced by the Plan are described in fuller detail below; quantifying these risks for the Plan is beyond the scope of this valuation but may be undertaken in future years.

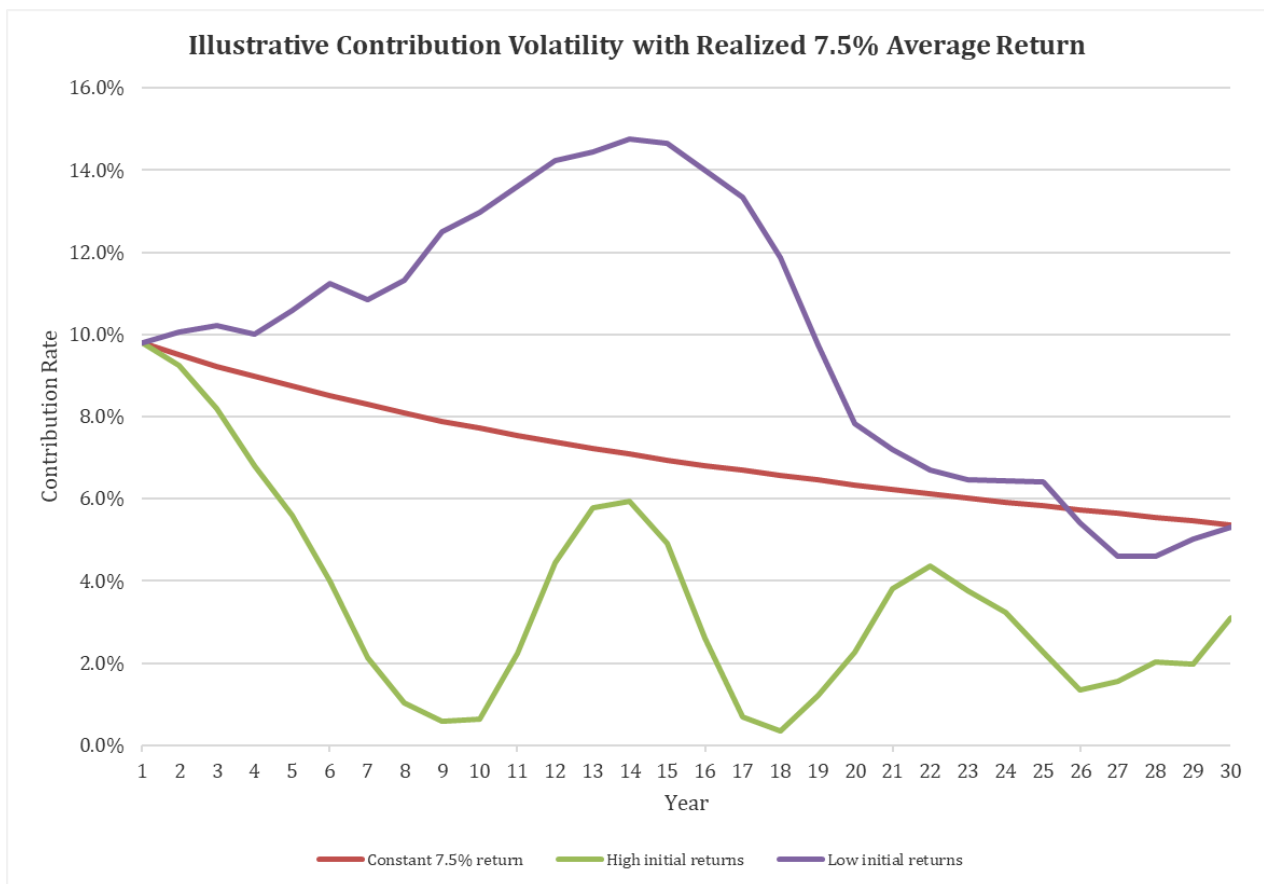
These risks have been separated, based on the Actuary's professional judgement, into high, medium, and low risks.

High Risk Types

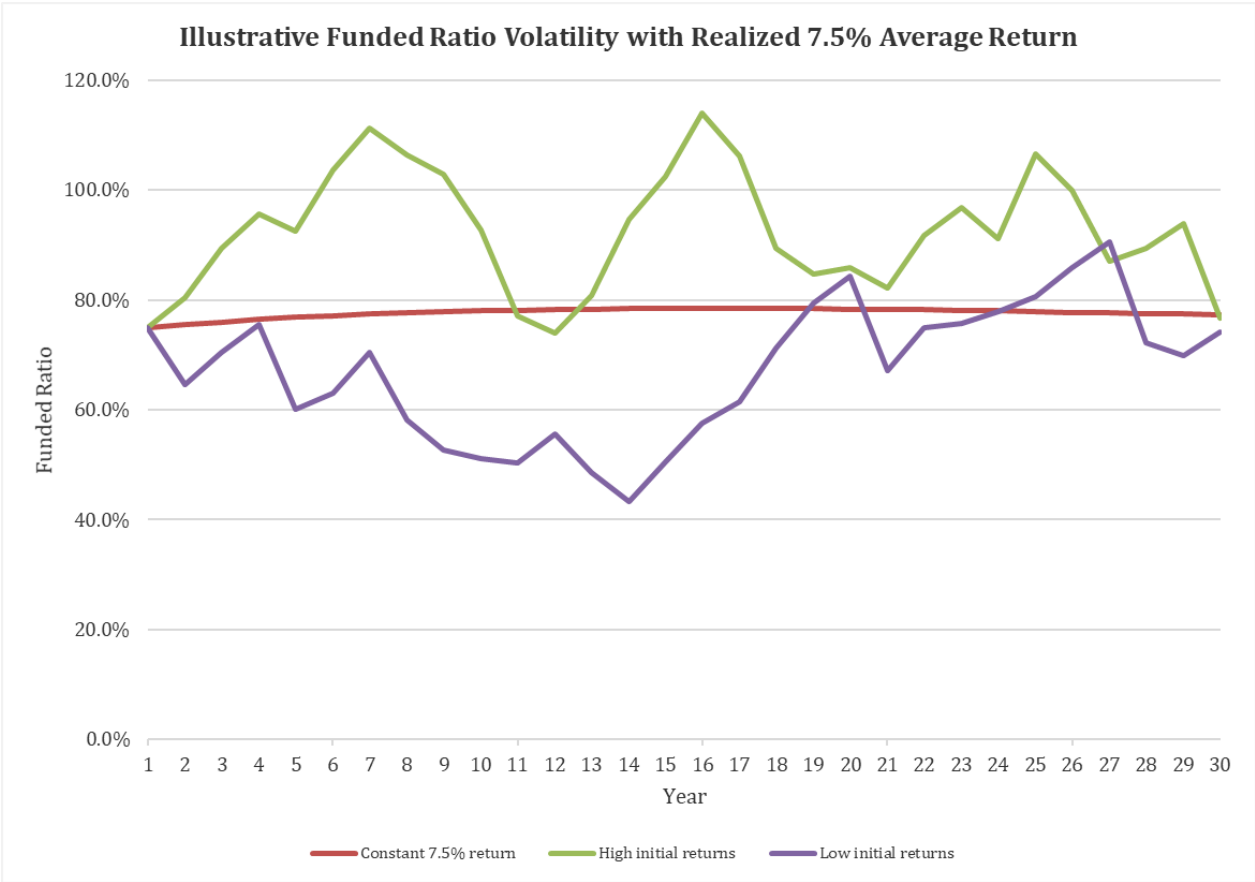
Investment Risk

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

This investment return volatility can contribute substantially to contribution and funded status volatility, even if the long-term investment return assumption of 7.0% is realized. While not 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 long-term expected rates of return are realized. Further risk exists that long-term expected rates of return may not be realized.

Maturity Risk

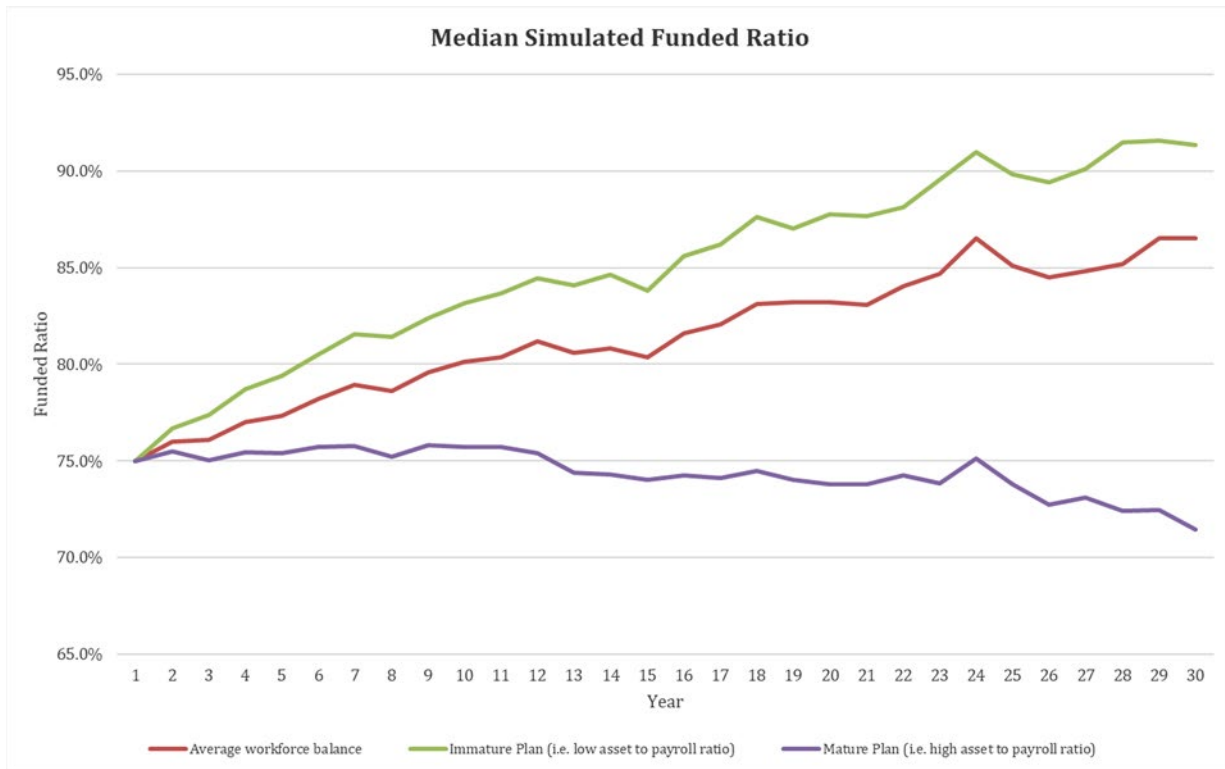
With respect to future fiscal years, it should be noted that FIRE is a mature retirement system. A mature retirement system has a significant ratio of retirees to active members and, usually, of assets to active member payroll and of Accrued Liability (AL) to active member payroll. These ratios, sometimes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

Valuation Date	June 30, 2016 (Lag)	June 30, 2015 (Lag)
Fiscal Year	2018	2017
Volatility Ratios		
1. Market Value of Assets (MVA)	\$ 10,899,763,000	\$ 10,815,330,000
2. Actuarial Value of Assets (AVA)	11,082,451,000	10,504,728,000
3. Accrued Liability	20,125,428,678	18,688,642,425
4. Active Salary	1,180,226,281	1,164,994,036
5. Asset Volatility Ratio (MVA basis) (1. / 4.)	9.2	9.3
6. Asset Volatility Ratio (AVA basis) (2. / 4.)	9.4	9.0
7. Liability Volatility Ratio (3. / 4.)	17.1	16.0

As a plan approaches maturity, Asset Volatility and Liability Volatility Ratios increase, and the plan becomes more sensitive to investment losses. These ratios indicate a mature pension plan. The same percentage of investment losses in more mature plans can increase contributions as a percentage of payroll more so than in less mature plans. Generally, mature plans need to consider more conservative investment strategies.

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*.



A plan's Support Ratio (i.e. the ratio of inactive participants to active participants) is a measure of maturity risk. A low Support Ratio implies that contributions are potentially low as a percentage of active payroll and support the benefit payments of few inactive participants. A high Support Ratio implies that contributions are potentially high as a percentage of active payroll and support the benefit payments of many inactive participants. Because the Plan's Support Ratio is high, contributions for active members form a smaller proportion of the total actuarial contribution than in less mature pension funds (see Page 64).

Medium Risk Types

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 the Investment Risk subsection 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. While not on a funding basis, the sensitivity could be expected to be generally similar to the sensitivity reported for GASB 67/68 purposes.¹

NEW YORK CITY FIRE PENSION FUND	
GASB 67/68 SENSITIVITY ANALYSIS AS OF JUNE 30, 2016	
Valuation Date	June 30, 2016
Results at 7.0%	
1. Total Pension Liability	\$ 20,643,807,528
2. Plan Fiduciary Net Position	<u>11,738,110,000</u>
3. Net Pension Liability (1. - 2.)	\$ 8,905,697,528
4. Funded Ratio (GASB Basis) (2. / 1.)	56.9%
Results at 6.0%	
1. Total Pension Liability	\$ 22,941,068,999
2. Plan Fiduciary Net Position	<u>11,738,110,000</u>
3. Net Pension Liability (1. - 2.)	\$ 11,202,958,999
4. Funded Ratio (GASB Basis) (2. / 1.)	51.2%
Sensitivity Analysis for 1.0% Reduction in Interest Rate	
1. Increase in Total Pension Liability	11.1%
2. Increase in Net Pension Liability	25.8%
3. Decrease in Funded Ratio	5.7%

¹ As disclosed in the fiscal year 2016 report for GASB 67/68, dated October 11, 2016.

Inflation Risk

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

Longevity Risk

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

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

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

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

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

² Retirement Plans Experience Committee. “Mortality Improvement Scale BB Report.” *Society of Actuaries*.

Low Risk Types

Credit/Solvency Risk

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

Contribution Risk

Many public pension systems suffer from high contribution risk, wherein sponsoring governmental entities fail to make contributions as determined by the actuary under their funding policies. A recent study found that in 2010, the Annual Required Contribution¹ 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 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 as the actuarial contribution determined for the Plan grows to be a larger part of the City budget. The five New York City Retirement Systems and Pension Funds currently require contributions of over 10% of the City's annual budget, and contribution risk may increase if this contribution rate becomes untenable.

Agency Risk

Because of the 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.

In future years of higher funded status, this may become a higher risk to the Plan, as current taxpayers and plan members may receive preferential treatment over future taxpayers and plan members when considering changes in statute and plan provisions.

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).

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

Tier 3 Modified: On or after April 1, 2012

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

C. Member Contributions

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 and Tier 3 Modified: 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 and Tier 3 Modified: The City of New York does not pay any portion of member contributions.

E. Credited Service

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

- 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 and Tier 3 Modified:** Allowable 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.
- Prior Service, Transferred Service, and Military Service must be purchased to count as Credited Service. Payments made for purchasing Military Service are considered Employer contributions.
- Part-time Service is service that is prorated based on the number of hours or days worked in the year.

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: 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	22	20

2. Benefits

- a. Tier 2

- i. 50% of FAS plus $1/60^{\text{th}}$ 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 and Tier 3 Modified

- 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.

Members may also be eligible for ADR due to certain qualifying conditions of impairment of health resulting in disability that are presumed to have been caused in the line-of-duty unless the contrary be proved by competent evidence. These presumptions apply to those impacted by the Lung Bill, the Heart/Stroke Bill, and Infectious Disease Bill and generally only apply to Tier 1, Tier 2, and Tier 3 Enhanced members.

b. Benefits

- i. Tier 1 and Tier 2

75% of FAS 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 Non-Enhanced Plan

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

- ii. Tier 3 and Tier 3 Modified 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 and Tier 3 Modified

Accident outside the performance of duties while a member plus 5 years of Credited Service and eligibility for Social Security disability benefit.

b. Benefits

i. Tier 2

(a) 2.5% times FAS times Credited Service for members choosing 20 years as their minimum period of Membership service

(b) 2.0% times FAS times Credited Service for members choosing 25 years as their minimum period of Membership service.

Minimum Benefit:

(a) $\frac{1}{3}$ of FAS less than 10 years of service.

(b) $\frac{1}{2}$ of FAS 10 or more years of service.

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

ii. Tier 3 and Tier 3 Modified

The greater of:

(a) 33 $\frac{1}{3}$ % 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 final salary as defined as the last 12 months of earnings, payable to surviving spouse or other eligible dependents for life.

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

ii. Tier 3 and Tier 3 Modified: 50% of FAS, payable to surviving spouse or other eligible dependents for life.

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

2. Ordinary Death Benefit

a. Eligibility

i. Tier 1: Immediate

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

a. Benefits

i. Tier 1

(a) 50% of FS plus accumulated member contributions and ITHP with interest for less than 10 years of Credited Service.

(b) 100% of FS plus accumulated member contributions and ITHP with interest for at least 10 years of Credited Service.

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

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

- ii. Tier 2: Three times final year's salary raised to the next highest multiple of \$1,000 plus accumulated member contributions.

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

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

- iii. Tier 3 and Tier 3 Modified: Three times final year's salary raised to the next highest multiple of \$1,000 plus accumulated member contributions.

Form of Payment: 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: 5 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: 2.1% of FAS times number of years of Credited Service payable at the Early Retirement Age (i.e. the date when 20 years of Credited Service would have been completed) or at age 55. If the benefit commences before the Early Retirement Age, there are reductions.

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

K. Normal Form of Retirement Income

- 1. Normal Form of Payment: Single Life Annuity
- 2. Optional Forms of Payment: Joint and Survivor Annuities, Certain and Life Annuities.

Optional forms of payment are subject to actuarial reduction. The unreduced amount of the normal form is known as the maximum retirement allowance.

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 Non-Enhanced Plan members and (2) Tier 3 and Tier 3 Modified Enhanced Plan members receiving vested or service retirement benefits. (These members 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 disability retiree first becomes eligible for ODR/ADR.
 - c. Death Benefits: The first day of the month following the day on which a beneficiary first becomes eligible for a death benefit paid other than in a lump sum.

3. Amount

If a member first begins receiving benefits on the same date as the Full Escalation Date, the member will receive Full Escalation 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

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

- a. The Enhanced Accidental Disability Benefit is equal to 75% of FAS5.
- b. The Enhanced Ordinary Disability Benefit is equal to the greater of:
 - i. 33-1/3% of FAS5 or
 - ii. 2% of FAS5 multiplied by years of credited service (not in excess of 22 years).
- c. Under the OYLM, the first year in which these changes to the disability benefits will impact the employer contribution is Fiscal Year 2018.
- d. Additionally, Chapter 298/16 changes FIRE into a corpus funded entity. Accordingly, starting in Fiscal Year 2020, Administrative Expenses will be reflected in the Employer Contribution.

SECTION IX - CHAPTER AMENDMENTS

The June 30, 2016 (Lag) actuarial valuation results reflect the following Chapter amendments from the prior five years.

- **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. This law will be reflected in future valuations as participants request military service credit.
- **Chapter 298 of the Laws of 2016** (Chapter 298/16), signed into law on September 8, 2016, changes the Accidental Disability Retirement and Ordinary Disability Retirement benefits for current Tier 3 and Tier 3 Modified members who elect to participate in the Enhanced Disability Benefits. Tier 3 Modified members as of April 1, 2017 and later are mandated into the Enhanced Disability Benefits. Additionally, Chapter 298/16 changes FIRE into a corpus funded entity.
- **Chapter 438 of the Laws of 2016** (Chapter 438/16), enacted on November 14, 2016, amended Retirement and Social Security Law Section 43 to eliminate restrictions upon transferring between public retirement systems.
- **Chapter 510 of the Laws of 2015** (Chapter 510/15), clarifies for Tier 6 the definition of multiple employers for the purpose of exclusion of wages and changes the plan year for contributions from plan year April 1 to March 31 to plan year January 1 to December 31.
- **Chapter 427 of the Laws of 2014** (Chapter 427/14), amended Military Law Section 243-d, effective November 4, 2014, to provide non-contributory retirement service credit for members of the New York City Retirement Systems called to active military duty on or after September 11, 2001 and prior to January 1, 2006 who did not receive his or her full salary from a participating employer and is otherwise eligible to receive retirement service credit for such service.
- **Chapter 489 of the Laws of 2013** (Chapter 489/13) addressed limitations in existing disability provisions intended to protect public employees who suffered injuries or illnesses in WTC rescue, recovery, and cleanup operations.
- **Chapter 3 of the Laws of 2013** (Chapter 3/13), effective retroactive to July 1, 2011, enacted those 2012 A&M that require State legislation.
- **Chapter 18 of the Laws of 2012** (Chapter 18/12), placed certain limitations on the Tier 3 benefits available to participants hired on and after April 1, 2012 in most New York State Public Employee Retirement Systems, including FIRE, and is generally referred to as Tier 6 (referred to by FIRE as Tier 3 and Tier 3 Modified).

SECTION X - SUBSEQUENT EVENTS

In February 2017, the City engaged Bolton to perform an actuarial audit of the five New York City Retirement Systems and Pension Funds, serving as the Independent Actuary under Section 96 of the New York City Charter. The engagement includes, but is not limited to, contribution audits, experience studies, and administrative reviews of each system. Bolton released their reports for the actuarial audit on June 4, 2019. In conjunction with the findings, 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." Note that this valuation report does not reflect the new 2019 A&M.

SECTION XI - ACTUARIAL ASSUMPTIONS AND METHODS

The February 10, 2012 report entitled, "Proposed Changes in Actuarial Assumptions and Methods For Determining Employer Contributions For Fiscal Years Beginning on and After July 1, 2011 For the New York City Fire Department Pension Fund" contains the 2012 A&M.

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

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

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

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

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

NEW YORK CITY FIRE PENSION FUND			
PROBABILITIES OF SERVICE RETIREMENT FOR THOSE ELIGIBLE FOR UNREDUCED RETIREMENT WITH FULL ESCALATION			
Age	Years of Service Since First Eligible		
	0	1	2 or More
19	0%	0%	0%
20	0%	0%	0%
21	0%	0%	0%
22	0%	0%	0%
23	0%	0%	0%
24	0%	0%	0%
25	0%	0%	0%
26	0%	0%	0%
27	0%	0%	0%
28	0%	0%	0%
29	0%	0%	0%
30	0%	0%	0%
31	0%	0%	0%
32	0%	0%	0%
33	0%	0%	0%
34	0%	0%	0%
35	0%	0%	0%
36	10%	0%	0%
37	10%	2%	0%
38	10%	2%	2%
39	10%	2%	2%
40	10%	2%	2%
41	10%	2%	2%
42	10%	2%	2%
43	10%	2%	2%
44	10%	2%	2%
45	10%	2%	2%
46	11%	2%	2%
47	12%	2%	2%
48	13%	2%	2%
49	14%	2%	2%
50	15%	2%	2%
51	16%	2%	2%
52	17%	3%	3%
53	18%	4%	4%
54	19%	5%	5%
55	20%	6%	6%
56	20%	7%	7%
57	20%	8%	8%
58	20%	9%	9%
59	20%	10%	10%
60	20%	12%	12%
61	30%	15%	15%
62	40%	20%	20%
63	100%	100%	100%

Table XI-1b
Service Retirement, Tier 3, and Tier 3 Modified Early Service Retirement

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

Table XI-2
Active Withdrawal 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	NA

Table XI-3
Active Disability Rates

NEW YORK CITY FIRE PENSION FUND					
PROBABILITIES OF DISABILITY RETIREMENT					
		Accidental Disability			
		Tier 1 and Tier 2		Tier 3 / Tier 3 Modified	
Age	Ordinary Disability	Eligible for WTC Benefits	Not Eligible for WTC Benefits	Enhanced Plan	Non-Enhanced Plan
19	0.01%	0.05%	0.03%		0.03%
20	0.01%	0.05%	0.03%		0.03%
21	0.01%	0.05%	0.03%		0.03%
22	0.01%	0.05%	0.03%		0.03%
23	0.01%	0.05%	0.03%		0.03%
24	0.01%	0.05%	0.03%		0.03%
25	0.01%	0.05%	0.03%		0.03%
26	0.01%	0.09%	0.04%		0.04%
27	0.02%	0.13%	0.05%		0.05%
28	0.03%	0.17%	0.07%		0.07%
29	0.04%	0.21%	0.10%		0.10%
30	0.05%	0.25%	0.15%		0.15%
31	0.06%	0.40%	0.24%		0.24%
32	0.07%	0.55%	0.33%		0.33%
33	0.08%	0.70%	0.42%		0.42%
34	0.09%	0.85%	0.51%		0.51%
35	0.10%	1.00%	0.60%		0.60%
36	0.11%	1.20%	0.72%		0.72%
37	0.12%	1.40%	0.85%		0.84%
38	0.13%	1.60%	0.99%		0.96%
39	0.14%	1.80%	1.14%		1.08%
40	0.15%	2.00%	1.30%		1.20%
41	0.16%	2.20%	1.44%		1.32%
42	0.17%	2.40%	1.58%		1.44%
43	0.18%	2.60%	1.72%		1.56%
44	0.19%	2.80%	1.86%		1.68%
45	0.20%	3.00%	2.00%		1.80%
46	0.22%	3.40%	2.30%		1.92%
47	0.24%	3.80%	2.60%		2.04%
48	0.26%	4.20%	2.90%		2.16%
49	0.28%	4.60%	3.20%		2.28%
50	0.30%	5.00%	3.50%		2.40%
51	0.44%	5.60%	3.80%		2.52%
52	0.58%	6.20%	4.10%		2.64%
53	0.72%	6.80%	4.40%		2.76%
54	0.86%	7.40%	4.70%		2.88%
55	1.00%	8.00%	5.00%		3.00%
56	2.00%	10.00%	7.00%		4.00%
57	3.00%	12.00%	9.00%		5.00%
58	4.00%	15.00%	11.00%		6.00%
59	5.00%	18.00%	13.00%		7.00%
60	6.00%	21.00%	15.00%		8.00%
61	8.00%	25.00%	17.00%		9.00%
62	10.00%	30.00%	19.00%		10.00%
63	NA	NA	NA		NA

Table XI-4
Active Mortality Rates

NEW YORK CITY FIRE PENSION FUND			
PROBABILITIES OF ACTIVE MEMBER MORTALITY			
	Ordinary Death		Accidental Death
Age	Males	Females	
19	0.040%	0.030%	0.020%
20	0.040%	0.030%	0.020%
21	0.040%	0.030%	0.020%
22	0.040%	0.030%	0.020%
23	0.040%	0.030%	0.020%
24	0.040%	0.030%	0.020%
25	0.040%	0.030%	0.020%
26	0.040%	0.030%	0.020%
27	0.040%	0.030%	0.020%
28	0.040%	0.030%	0.020%
29	0.040%	0.030%	0.020%
30	0.040%	0.030%	0.020%
31	0.040%	0.030%	0.020%
32	0.040%	0.030%	0.020%
33	0.040%	0.030%	0.020%
34	0.040%	0.030%	0.020%
35	0.040%	0.030%	0.020%
36	0.042%	0.032%	0.020%
37	0.044%	0.034%	0.020%
38	0.046%	0.036%	0.020%
39	0.048%	0.038%	0.020%
40	0.050%	0.040%	0.020%
41	0.060%	0.046%	0.026%
42	0.070%	0.052%	0.032%
43	0.080%	0.058%	0.038%
44	0.090%	0.064%	0.044%
45	0.100%	0.070%	0.050%
46	0.110%	0.076%	0.060%
47	0.120%	0.082%	0.070%
48	0.130%	0.088%	0.080%
49	0.140%	0.094%	0.090%
50	0.150%	0.100%	0.100%
51	0.160%	0.110%	0.120%
52	0.170%	0.120%	0.140%
53	0.180%	0.130%	0.160%
54	0.190%	0.140%	0.180%
55	0.200%	0.150%	0.200%
56	0.220%	0.160%	0.220%
57	0.240%	0.170%	0.240%
58	0.260%	0.180%	0.260%
59	0.280%	0.190%	0.280%
60	0.300%	0.200%	0.300%
61	0.320%	0.220%	0.400%
62	0.340%	0.240%	0.500%
63	NA	NA	NA

Table XI-5
Service Retiree Mortality

NEW YORK CITY FIRE PENSION FUND					
PROBABILITIES OF MORTALITY IN THE NEXT YEAR FOR SERVICE RETIREES IN THE JUNE 30, 2016 (LAG) VALUATION					
Age	Males	Females	Age	Males	Females
19	0.0201%	0.0121%	68	1.1358%	0.7052%
20	0.0211%	0.0122%	69	1.1879%	0.7646%
21	0.0227%	0.0130%	70	1.3198%	0.8412%
22	0.0241%	0.0138%	71	1.4793%	0.9255%
23	0.0258%	0.0149%	72	1.6405%	1.0192%
24	0.0272%	0.0160%	73	1.8559%	1.1258%
25	0.0284%	0.0174%	74	2.0731%	1.2425%
26	0.0300%	0.0189%	75	2.2930%	1.3465%
27	0.0314%	0.0204%	76	2.5161%	1.5460%
28	0.0333%	0.0223%	77	2.7423%	1.7478%
29	0.0357%	0.0242%	78	3.1569%	1.9505%
30	0.0391%	0.0263%	79	3.5778%	2.2169%
31	0.0464%	0.0324%	80	4.0035%	2.4835%
32	0.0539%	0.0376%	81	4.4828%	2.7513%
33	0.0610%	0.0421%	82	4.9780%	3.0183%
34	0.0678%	0.0455%	83	5.8776%	3.2848%
35	0.0748%	0.0484%	84	6.8040%	3.7722%
36	0.0796%	0.0509%	85	7.7575%	4.2606%
37	0.0839%	0.0531%	86	8.7400%	4.7501%
38	0.0888%	0.0553%	87	9.7489%	5.2383%
39	0.0950%	0.0579%	88	10.6018%	5.7308%
40	0.1032%	0.0606%	89	11.4770%	6.6656%
41	0.1105%	0.0649%	90	12.3806%	7.6039%
42	0.1182%	0.0674%	91	13.7854%	8.9141%
43	0.1265%	0.0713%	92	15.3442%	10.2675%
44	0.1357%	0.0770%	93	17.8758%	11.6854%
45	0.1462%	0.0849%	94	20.2606%	13.0043%
46	0.1577%	0.0950%	95	22.5343%	14.3814%
47	0.1706%	0.1068%	96	24.3926%	15.8186%
48	0.1846%	0.1192%	97	26.1264%	17.3172%
49	0.1998%	0.1326%	98	27.8318%	18.7283%
50	0.2162%	0.1465%	99	29.3588%	20.1716%
51	0.2696%	0.1605%	100	30.7448%	21.2257%
52	0.3221%	0.1737%	101	32.3665%	22.1344%
53	0.3728%	0.1861%	102	33.7861%	23.1735%
54	0.4209%	0.1970%	103	35.0826%	24.4013%
55	0.4648%	0.2060%	104	36.1722%	25.7784%
56	0.5135%	0.2135%	105	36.9822%	27.2744%
57	0.5574%	0.2615%	106	37.4491%	28.8471%
58	0.5950%	0.3060%	107	37.7175%	30.4676%
59	0.6258%	0.3472%	108	38.0028%	32.0883%
60	0.6496%	0.3859%	109	38.2863%	33.6686%
61	0.6977%	0.4228%	110	96.4196%	96.4583%
62	0.7433%	0.4592%	111	97.1087%	97.1672%
63	0.8006%	0.4961%	112	97.8219%	97.8611%
64	0.8745%	0.5341%	113	98.5792%	98.5792%
65	0.9562%	0.5740%	114	99.2823%	99.2823%
66	1.0082%	0.6157%	115	100.0000%	100.0000%
67	1.0692%	0.6595%			

Mortality Improvement Scale MP-2015 is applied to these rates to estimate future mortality improvement.

Table XI-6
Disabled Retiree Mortality

NEW YORK CITY FIRE PENSION FUND					
PROBABILITIES OF MORTALITY IN THE NEXT YEAR FOR DISABLED RETIREES IN THE JUNE 30, 2016 (LAG) VALUATION					
Age	Males	Females	Age	Males	Females
19	0.0480%	0.0141%	68	1.4979%	1.1608%
20	0.0510%	0.0149%	69	1.6544%	1.3301%
21	0.0558%	0.0166%	70	1.7916%	1.5158%
22	0.0609%	0.0186%	71	1.9797%	1.7109%
23	0.0661%	0.0208%	72	2.1609%	1.9155%
24	0.0716%	0.0231%	73	2.3353%	2.1421%
25	0.0770%	0.0256%	74	2.5025%	2.3993%
26	0.0821%	0.0284%	75	2.6930%	2.6837%
27	0.0894%	0.0313%	76	3.0626%	2.9817%
28	0.0976%	0.0347%	77	3.4276%	3.2541%
29	0.1061%	0.0378%	78	3.7875%	3.5753%
30	0.1147%	0.0409%	79	4.1447%	4.0741%
31	0.1237%	0.0440%	80	4.5507%	4.5929%
32	0.1322%	0.0469%	81	5.3126%	5.1337%
33	0.1437%	0.0498%	82	6.0846%	5.6004%
34	0.1498%	0.0514%	83	6.8657%	6.0712%
35	0.1564%	0.0535%	84	7.6546%	6.8738%
36	0.1587%	0.0555%	85	8.4511%	7.6781%
37	0.1602%	0.0578%	86	9.2048%	8.4328%
38	0.1621%	0.0600%	87	9.9789%	9.1758%
39	0.1641%	0.0630%	88	10.7761%	10.0374%
40	0.1666%	0.0678%	89	11.6285%	11.3305%
41	0.1699%	0.0745%	90	12.5308%	12.6282%
42	0.1743%	0.0830%	91	14.8561%	13.9489%
43	0.1803%	0.0941%	92	17.1028%	14.9678%
44	0.1879%	0.1081%	93	19.2493%	16.0409%
45	0.1973%	0.1249%	94	21.2654%	17.1707%
46	0.2083%	0.1447%	95	23.2269%	18.2303%
47	0.2212%	0.1670%	96	25.0411%	19.2382%
48	0.2357%	0.1915%	97	26.7186%	20.1699%
49	0.2519%	0.2222%	98	28.0744%	20.8495%
50	0.2708%	0.2562%	99	29.5216%	21.2940%
51	0.3259%	0.2825%	100	30.7448%	21.4632%
52	0.3839%	0.3313%	101	32.3665%	22.1344%
53	0.4442%	0.3708%	102	33.7861%	23.1735%
54	0.5062%	0.4271%	103	35.0826%	24.4013%
55	0.5684%	0.4834%	104	36.1722%	25.7784%
56	0.6290%	0.5272%	105	36.9822%	27.2744%
57	0.6865%	0.5393%	106	37.4491%	28.8471%
58	0.7387%	0.5568%	107	37.7175%	30.4676%
59	0.7850%	0.5905%	108	38.0028%	32.0883%
60	0.8333%	0.6186%	109	38.2863%	33.6686%
61	0.8906%	0.6459%	110	36.4196%	36.4583%
62	0.9619%	0.7070%	111	37.1087%	39.1672%
63	1.0376%	0.7675%	112	37.8219%	42.8611%
64	1.1203%	0.8373%	113	38.5792%	47.5792%
65	1.1935%	0.9079%	114	39.2823%	53.2823%
66	1.2741%	0.9841%	115	40.0000%	60.0000%
67	1.3395%	1.0724%			

Mortality Improvement Scale MP-2015 is applied to these rates to estimate future mortality improvement.

Table XI-7
Beneficiary Mortality

NEW YORK CITY FIRE PENSION FUND					
PROBABILITIES OF BENEFICIARY MORTALITY IN THE NEXT YEAR IN THE JUNE 30, 2016 (LAG) VALUATION					
Age	Males	Females	Age	Males	Females
19	0.0201%	0.0121%	68	1.7189%	1.2370%
20	0.0211%	0.0122%	69	1.8200%	1.3031%
21	0.0227%	0.0130%	70	1.9248%	1.3660%
22	0.0241%	0.0138%	71	2.0926%	1.5265%
23	0.0258%	0.0149%	72	2.2666%	1.6863%
24	0.0272%	0.0160%	73	2.4473%	1.8449%
25	0.0284%	0.0174%	74	2.6339%	2.0027%
26	0.0300%	0.0189%	75	2.8272%	2.1592%
27	0.0314%	0.0204%	76	3.2696%	2.4549%
28	0.0333%	0.0223%	77	3.7263%	2.7536%
29	0.0357%	0.0242%	78	4.1972%	3.0540%
30	0.0391%	0.0263%	79	4.6851%	3.3564%
31	0.0456%	0.0325%	80	5.1881%	3.6583%
32	0.0521%	0.0381%	81	5.7341%	4.1289%
33	0.0582%	0.0430%	82	6.2881%	4.6076%
34	0.0638%	0.0469%	83	6.8485%	5.0947%
35	0.0696%	0.0507%	84	7.4144%	5.5889%
36	0.0730%	0.0535%	85	7.9854%	6.0929%
37	0.0762%	0.0566%	86	9.0625%	6.9582%
38	0.0796%	0.0597%	87	10.1865%	7.8220%
39	0.0840%	0.0634%	88	11.3608%	8.6925%
40	0.0904%	0.0674%	89	12.5840%	9.5648%
41	0.1253%	0.0716%	90	13.8632%	10.4405%
42	0.1580%	0.0783%	91	15.4852%	11.9474%
43	0.1896%	0.0873%	92	17.1034%	13.4176%
44	0.2207%	0.0994%	93	18.7153%	14.8777%
45	0.2524%	0.1151%	94	20.3691%	16.2589%
46	0.2813%	0.1343%	95	22.2136%	17.6157%
47	0.3105%	0.1569%	96	24.0153%	18.7657%
48	0.3396%	0.1825%	97	25.7797%	19.7956%
49	0.3686%	0.2116%	98	27.5766%	20.5720%
50	0.3971%	0.2431%	99	29.2286%	21.0838%
51	0.4672%	0.2806%	100	30.7448%	21.2423%
52	0.5435%	0.3201%	101	32.3665%	22.1344%
53	0.6253%	0.3608%	102	33.7861%	23.1735%
54	0.7119%	0.4018%	103	35.0826%	24.4013%
55	0.8014%	0.4420%	104	36.1722%	25.7784%
56	0.8681%	0.5009%	105	36.9822%	27.2744%
57	0.9299%	0.5593%	106	37.4491%	28.8471%
58	0.9847%	0.6169%	107	37.7175%	30.4676%
59	1.0316%	0.6732%	108	38.0028%	32.0883%
60	1.0706%	0.7296%	109	38.2863%	33.6686%
61	1.1588%	0.7888%	110	96.4196%	96.4583%
62	1.2363%	0.8354%	111	97.1087%	97.1672%
63	1.3067%	0.8825%	112	97.8219%	97.8611%
64	1.3714%	0.9360%	113	98.5792%	98.5792%
65	1.4334%	0.9970%	114	99.2823%	99.2823%
66	1.5265%	1.0662%	115	100.0000%	100.0000%
67	1.6211%	1.1477%			

Mortality Improvement Scale MP-2015 is applied to these rates to estimate future mortality improvement.

**Table XI-8
Salary Scale**

NEW YORK CITY FIRE PENSION FUND		
ANNUAL RATES OF SALARY INCREASE		
Years of Service	Merit Increase	Salary Scale
0	5.00%	8.00%
1	9.00%	12.00%
2	10.00%	13.00%
3	10.00%	13.00%
4	46.00%	49.00%
5	1.00%	4.00%
6	1.10%	4.10%
7	1.20%	4.20%
8	1.30%	4.30%
9	2.70%	5.70%
10	1.50%	4.50%
11	1.60%	4.60%
12	1.70%	4.70%
13	1.80%	4.80%
14	3.10%	6.10%
15	2.00%	5.00%
16	1.90%	4.90%
17	1.80%	4.80%
18	1.70%	4.70%
19	2.80%	5.80%
20	1.50%	4.50%
21	1.40%	4.40%
22	1.30%	4.30%
23	1.20%	4.20%
24	1.10%	4.10%
25	1.00%	4.00%
26	0.90%	3.90%
27	0.80%	3.80%
28	0.70%	3.70%
29	0.60%	3.60%
30+	0.50%	3.50%

**Table XI-9
Overtime Assumptions**

NEW YORK CITY FIRE PENSION FUND					
OVERTIME					
Years of Service	All Tiers Baseline	Tier 1/2 Dual Service	Tier 1/2 Dual Disability	Tier 3/ Tier 3 Modified Dual Service	Tier 3/ Tier 3 Modified Dual Disability
0	15.00%	16.00%	15.00%	16.00%	15.00%
1	15.00%	16.00%	15.00%	16.00%	15.00%
2	15.00%	16.00%	15.00%	16.00%	15.00%
3	15.00%	16.00%	15.00%	16.00%	15.00%
4	15.00%	16.00%	15.00%	16.00%	15.00%
5	15.00%	16.00%	15.00%	16.00%	15.00%
6	15.00%	16.00%	15.00%	16.00%	15.00%
7	15.00%	16.00%	15.00%	16.00%	15.00%
8	15.00%	16.00%	15.00%	16.00%	15.00%
9	15.00%	16.00%	15.00%	16.00%	15.00%
10	15.00%	16.00%	15.00%	16.00%	15.00%
11	15.00%	16.00%	15.00%	16.00%	15.00%
12	15.00%	16.00%	15.00%	16.00%	15.00%
13	15.00%	16.00%	15.00%	16.00%	15.00%
14	15.00%	17.00%	15.00%	16.00%	15.00%
15	15.00%	18.00%	15.00%	16.00%	15.00%
16	15.00%	19.00%	16.00%	17.00%	16.00%
17	15.00%	20.00%	17.00%	18.00%	17.00%
18	16.00%	21.00%	18.00%	19.00%	18.00%
19	17.00%	22.00%	19.00%	20.00%	19.00%
20	18.00%	23.00%	20.00%	21.00%	20.00%
21	17.00%	22.00%	19.00%	20.00%	19.00%
22	16.00%	21.00%	18.00%	19.00%	18.00%
23	15.00%	20.00%	17.00%	18.00%	17.00%
24	14.00%	19.00%	16.00%	17.00%	16.00%
25	13.00%	18.00%	15.00%	16.00%	15.00%
26	12.00%	16.00%	13.00%	14.00%	13.00%
27	11.00%	14.00%	11.00%	13.00%	11.00%
28	10.00%	12.00%	10.00%	11.00%	10.00%
29	9.00%	11.00%	9.00%	10.00%	9.00%
30	8.00%	10.00%	8.00%	9.00%	8.00%
31	7.00%	9.00%	7.00%	8.00%	7.00%
32	6.00%	8.00%	6.00%	7.00%	6.00%
33	5.00%	7.00%	5.00%	6.00%	5.00%
34	5.00%	6.00%	5.00%	6.00%	5.00%
35	5.00%	6.00%	5.00%	6.00%	5.00%
36	5.00%	6.00%	5.00%	6.00%	5.00%
37	5.00%	6.00%	5.00%	6.00%	5.00%
38	5.00%	6.00%	5.00%	6.00%	5.00%
39	5.00%	6.00%	5.00%	6.00%	5.00%
40	5.00%	6.00%	5.00%	6.00%	5.00%
41	5.00%	6.00%	5.00%	6.00%	5.00%
42	5.00%	6.00%	5.00%	6.00%	5.00%
43	5.00%	6.00%	5.00%	6.00%	5.00%
44	5.00%	6.00%	5.00%	6.00%	5.00%
45	5.00%	6.00%	5.00%	6.00%	5.00%

Additional Assumptions and Methods

1. **Marital Assumption:** All active members are assumed to be married and females are assumed to be three years younger than their male spouses.
2. **Credited Service:** Calculated in whole year increments for valuation purposes.
3. **Loans:** Except for Death Benefits, it is assumed that eligible members take the maximum allowable loan at retirement.
4. **Actuarial Interest Rate:** 7.0% per annum, net of investment expenses.
5. **COLA:** Based on an assumed long-term Consumer Price Index Inflation rate of 2.5% per year. 1.5% per year for Auto COLA, 2.5% per year for Escalation.
6. **Actuarial Asset Valuation Method (AAVM):**

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

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

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

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

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

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

Under this method, the Present Value (PV) of Future Benefits (PVFB) of each individual included in the actuarial valuation is allocated on a level basis over the earnings between the age a member enters the plan and assumed exit age(s). The employer portion of this 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 employer normal cost remains constant as a percentage of payroll and changes gradually over time for the entire Plan as the characteristics of the members change (e.g. more Tier 3 Modified active members decrease the average employer normal cost).

8. **Lump Sum Death Benefits:** Liabilities for group life lump sum death benefits are calculated under the One-Year Term Cost method.
9. **Allowances for Administrative Expenses:** None.
10. **WTC Disability and Death Benefits:** For actuarial valuations beginning June 30, 2014 and after, obligations attributable to the WTC Disability Law and to the WTC Death Benefits Law are determined through the use of explicit assumptions in the 2016 A&M, and through estimation techniques for post-retirement reclassifications.
11. **One-Year Lag Methodology (OLYM):** One-Year Lag methodology uses a June 30, XX-2 valuation date to determine Fiscal Year XX employer contributions.

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

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

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

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 paid during Fiscal Year XX-1 and the discounted value of Administrative Expenses reimbursed during Fiscal Years XX-1 and XX.

SECTION XII - SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2016 (Lag) and June 30, 2015 (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, 2016 and June 30, 2015.

Consistent with the 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/ Inactive	(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, 2015	10,780	18	32	5,305	904	9,390	635	476	16,710	27,540
New Entrants	629	0	22	0	0	0	0	0	0	651
Rehires	17	(9)	0	0	0	0	0	0	0	8
Leaving Active Payroll	(13)	13	0	0	0	0	0	0	0	0
Vested Termination	(8)	0	8	0	0	0	0	0	0	0
Non-Vested Termination / Cashout	(23)	(1)	0	0	0	0	0	0	0	(24)
Accidental Death (from Active)	0	0	0	0	0	0	0	0	0	0
Ordinary Death (from Active)	(1)	0	0	0	0	0	0	0	0	(1)
Service Retirement	(90)	0	(3)	93	0	0	0	0	93	0
Ordinary Disability Retirement	(4)	0	0	0	4	0	0	0	4	0
Accidental Disability Retirement	(336)	0	(1)	0	0	337	0	0	337	0
Reclassifications	0	0	0	(34)	0	33	1	0	0	0
Death with Beneficiary	0	0	0	(4)	(2)	(184)	14	14	(162)	(162)
Death without Beneficiary	0	0	0	(186)	(53)	(16)	(15)	(61)	(331)	(331)
Off Pension Payroll	0	0	0	0	0	0	(2)	(2)	(4)	(4)
Net Change	171	3	26	(131)	(51)	170	(2)	(49)	(63)	137
Number at June 30, 2016	10,951	21	58	5,174	853	9,560	633	427	16,647	27,677

Graph XII-2
Headcount Summary by Status

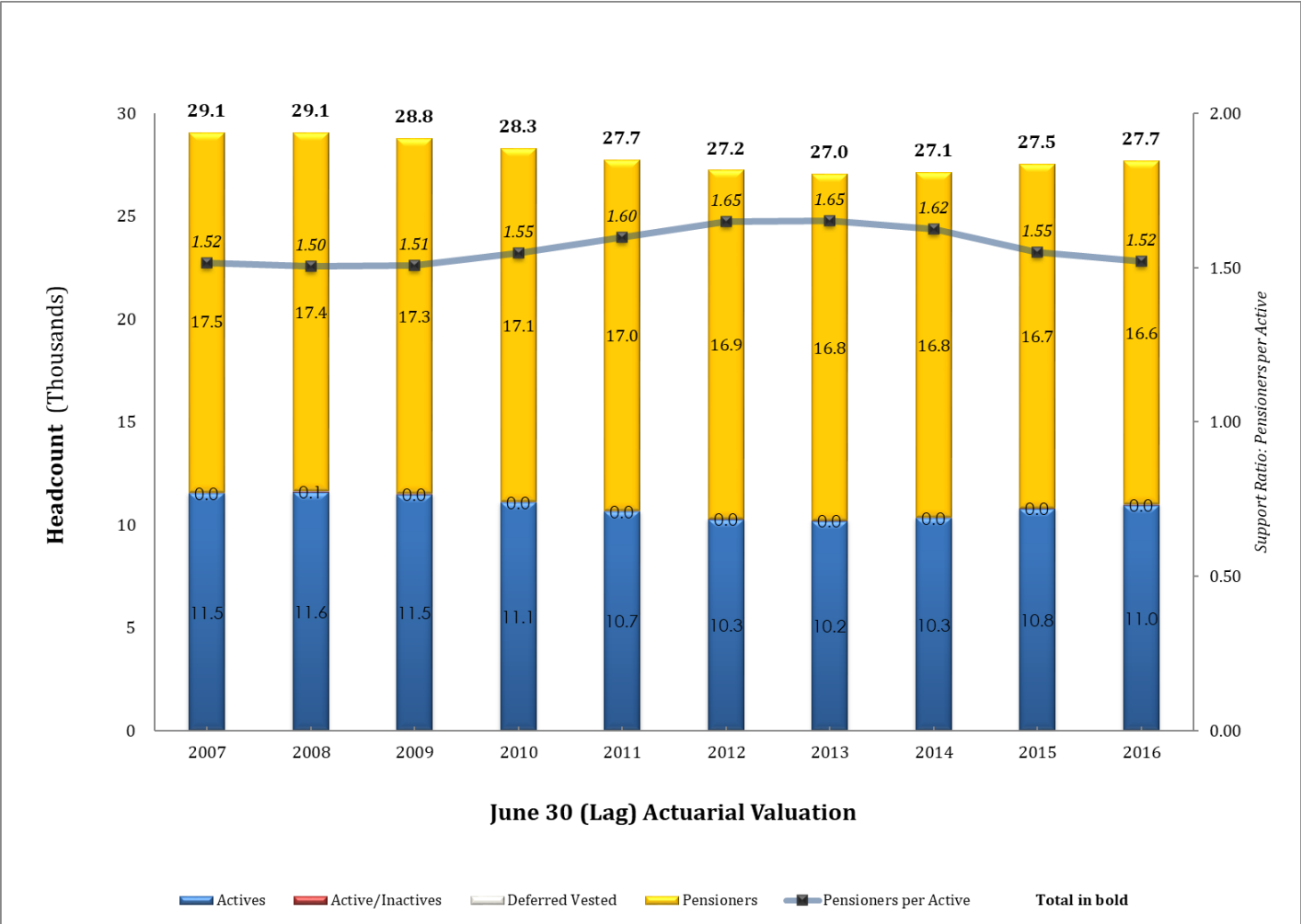


Table XII-3
Summary of Active Membership

NEW YORK CITY FIRE PENSION FUND		
ACTIVE MEMBERS INCLUDED IN THE JUNE 30, 2016 (LAG) AND THE JUNE 30, 2015 (LAG) ACTUARIAL VALUATIONS		
	June 30, 2016 (Lag)	June 30, 2015 (Lag)
Number		
Males	10,877	10,714
Females	74	66
Total	10,951	10,780
Annual Salary ¹		
Males	\$ 1,173,210,416	\$ 1,158,561,564
Females	7,015,865	6,432,472
Total	\$ 1,180,226,281	\$ 1,164,994,036
Average Salary ¹		
Males	\$ 107,862	\$ 108,135
Females	94,809	97,462
Total Average	\$ 107,773	\$ 108,070
Average Age		
Males	40.7	40.8
Females	37.9	37.9
Total Average	40.7	40.8
Average Past Service		
Males	14.0	14.2
Females	9.0	9.2
Total Average	14.0	14.1

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

Graph XII-4
Active Membership by Tier

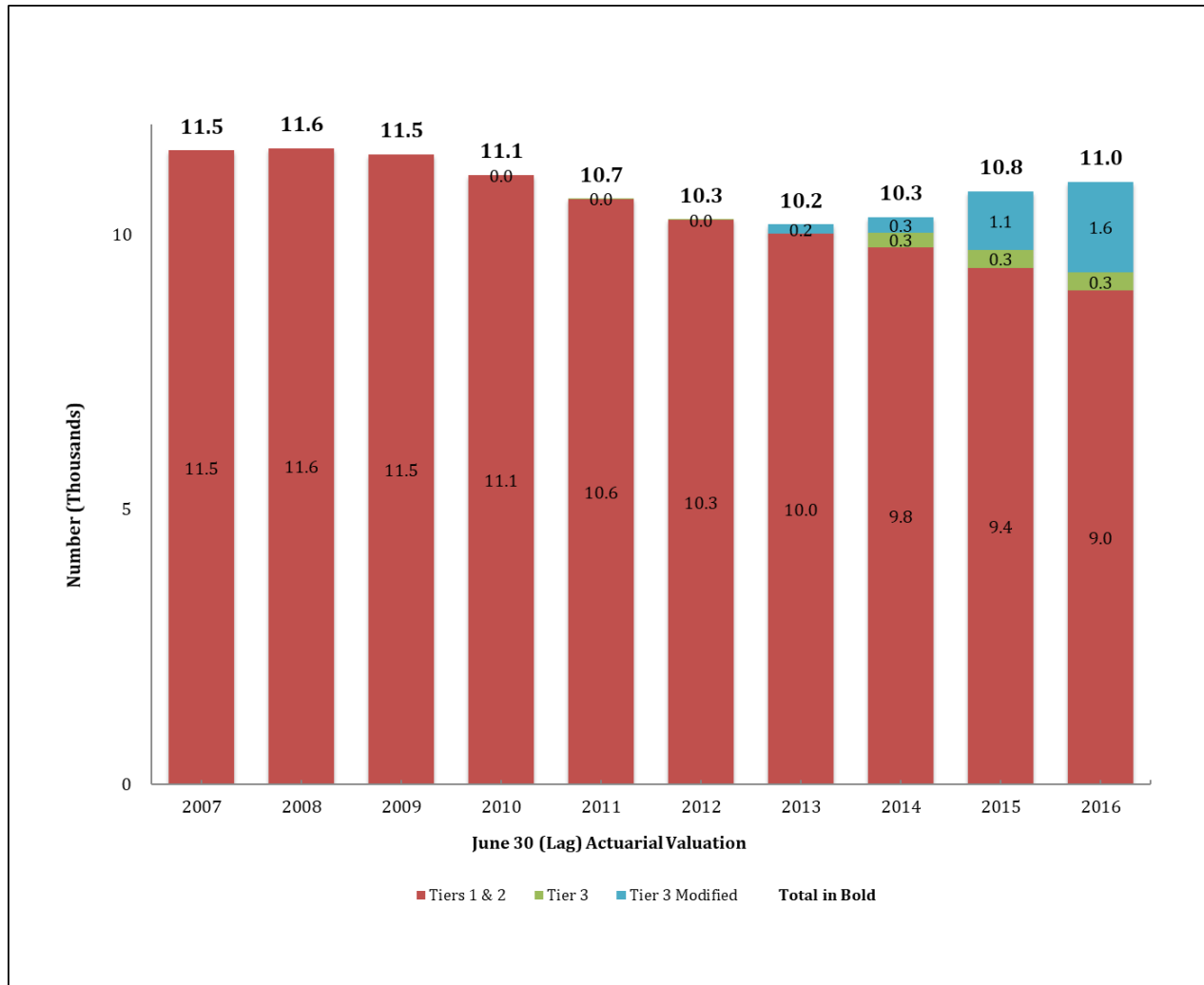


Table XII-5
Schedule of Active Member Salary Data

June 30 (Lag) Actuarial Valuation	Number	Annual Salary	Average Annual Salary	Percentage Increase/ (Decrease) In Avg. Salary
2007	11,528	\$1,000,383,326	\$86,779	8.3%
2008	11,574	1,051,591,517	90,858	4.7%
2009	11,460	1,079,682,340	94,213	3.7%
2010	11,080	1,138,187,795	102,725	9.0%
2011	10,650	1,125,459,668	105,677	2.9%
2012	10,267	1,106,113,386	107,735	1.9%
2013	10,182	1,129,706,314	110,951	3.0%
2014	10,319	1,150,389,645	111,483	0.5%
2015	10,780	1,164,994,036	108,070	(3.1%)
2016	10,951	1,180,226,281	107,773	(0.3%)

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

Salaries 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, 2016

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
<i>NUMBER:</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	229	0	0	0	0	0	0	0	0	229
25 TO 29	951	71	0	0	0	0	0	0	0	1,022
30 TO 34	698	565	623	2	0	0	0	0	0	1,888
35 TO 39	89	346	1,643	271	4	0	0	0	0	2,353
40 TO 44	0	99	1,067	661	178	2	0	0	0	2,007
45 TO 49	0	4	225	654	492	168	0	0	0	1,543
50 TO 54	0	0	2	234	366	368	157	0	0	1,127
55 TO 59	0	0	0	5	75	166	208	65	0	519
60 TO 64	0	0	0	2	1	26	84	64	7	184
65 TO 69	0	0	1	0	1	0	2	0	0	4
70 & UP	0	0	0	0	1	0	0	0	0	1
TOTAL	1,967	1,085	3,561	1,829	1,118	730	451	129	7	10,877

<i>SALARIES (IN THOUSANDS):</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	11,951	0	0	0	0	0	0	0	0	11,951
25 TO 29	51,398	5,068	0	0	0	0	0	0	0	56,466
30 TO 34	38,433	57,528	68,393	226	0	0	0	0	0	164,580
35 TO 39	4,939	37,352	185,824	31,848	468	0	0	0	0	260,431
40 TO 44	0	10,770	121,312	80,763	23,236	267	0	0	0	236,347
45 TO 49	0	503	25,712	79,488	66,659	23,590	0	0	0	195,952
50 TO 54	0	0	265	27,978	47,989	50,402	22,645	0	0	149,278
55 TO 59	0	0	0	635	9,782	21,385	29,251	10,514	0	71,567
60 TO 64	0	0	0	298	155	3,173	11,561	9,575	1,130	25,892
65 TO 69	0	0	153	0	155	0	283	0	0	591
70 & UP	0	0	0	0	155	0	0	0	0	155
TOTAL *	106,721	111,222	401,658	221,235	148,600	98,816	63,740	20,089	1,130	1,173,210

<i>AVERAGE SALARIES: **</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	52,186	0	0	0	0	0	0	0	0	52,186
25 TO 29	54,046	71,385	0	0	0	0	0	0	0	55,250
30 TO 34	55,062	101,820	109,780	112,877	0	0	0	0	0	87,171
35 TO 39	55,498	107,954	113,100	117,519	117,052	0	0	0	0	110,681
40 TO 44	0	108,790	113,694	122,182	130,538	133,314	0	0	0	117,761
45 TO 49	0	125,712	114,275	121,541	135,486	140,419	0	0	0	126,994
50 TO 54	0	0	132,268	119,563	131,117	136,961	144,237	0	0	132,456
55 TO 59	0	0	0	127,038	130,426	128,825	140,629	161,749	0	137,893
60 TO 64	0	0	0	148,780	155,413	122,019	137,633	149,615	161,462	140,719
65 TO 69	0	0	152,985	0	155,413	0	141,476	0	0	147,838
70 & UP	0	0	0	0	155,413	0	0	0	0	155,413
TOTAL	54,255	102,509	112,794	120,959	132,916	135,365	141,331	155,729	161,462	107,862

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 (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
<i>NUMBER:</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	2	0	0	0	0	0	0	0	0	2
25 TO 29	8	1	0	0	0	0	0	0	0	9
30 TO 34	12	3	2	0	0	0	0	0	0	17
35 TO 39	4	5	5	4	0	0	0	0	0	18
40 TO 44	0	5	7	4	0	0	0	0	0	16
45 TO 49	1	0	2	4	0	0	0	0	0	7
50 TO 54	0	0	0	1	0	0	0	0	0	1
55 TO 59	0	1	0	0	0	1	0	0	0	2
60 TO 64	0	0	0	0	0	0	0	1	0	1
65 TO 69	0	0	0	1	0	0	0	0	0	1
70 & UP	0	0	0	0	0	0	0	0	0	0
TOTAL	27	15	16	14	0	1	0	1	0	74

<i>SALARIES (IN THOUSANDS):</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	107	0	0	0	0	0	0	0	0	107
25 TO 29	431	59	0	0	0	0	0	0	0	489
30 TO 34	724	184	219	0	0	0	0	0	0	1,126
35 TO 39	220	500	562	441	0	0	0	0	0	1,723
40 TO 44	0	569	802	451	0	0	0	0	0	1,822
45 TO 49	130	0	220	566	0	0	0	0	0	916
50 TO 54	0	0	0	141	0	0	0	0	0	141
55 TO 59	0	148	0	0	0	178	0	0	0	326
60 TO 64	0	0	0	0	0	0	0	211	0	211
65 TO 69	0	0	0	154	0	0	0	0	0	154
70 & UP	0	0	0	0	0	0	0	0	0	0
TOTAL *	1,611	1,459	1,804	1,753	0	178	0	211	0	7,016

<i>AVERAGE SALARIES: **</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	53,484	0	0	0	0	0	0	0	0	53,484
25 TO 29	53,848	58,506	0	0	0	0	0	0	0	54,365
30 TO 34	60,298	61,177	109,455	0	0	0	0	0	0	66,236
35 TO 39	54,976	99,944	112,489	110,222	0	0	0	0	0	95,720
40 TO 44	0	113,748	114,628	112,680	0	0	0	0	0	113,866
45 TO 49	129,674	0	110,163	141,421	0	0	0	0	0	130,812
50 TO 54	0	0	0	140,894	0	0	0	0	0	140,894
55 TO 59	0	148,175	0	0	0	178,273	0	0	0	163,224
60 TO 64	0	0	0	0	0	0	0	211,382	0	211,382
65 TO 69	0	0	0	154,368	0	0	0	0	0	154,368
70 & UP	0	0	0	0	0	0	0	0	0	0
TOTAL	59,663	97,245	112,755	125,182	0	178,273	0	211,382	0	94,809

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 (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	
<i>NUMBER:</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	231	0	0	0	0	0	0	0	0	0	231
25 TO 29	959	72	0	0	0	0	0	0	0	0	1,031
30 TO 34	710	568	625	2	0	0	0	0	0	0	1,905
35 TO 39	93	351	1,648	275	4	0	0	0	0	0	2,371
40 TO 44	0	104	1,074	665	178	2	0	0	0	0	2,023
45 TO 49	1	4	227	658	492	168	0	0	0	0	1,550
50 TO 54	0	0	2	235	366	368	157	0	0	0	1,128
55 TO 59	0	1	0	5	75	167	208	65	0	0	521
60 TO 64	0	0	0	2	1	26	84	65	7	0	185
65 TO 69	0	0	1	1	1	0	2	0	0	0	5
70 & UP	0	0	0	0	1	0	0	0	0	0	1
TOTAL	1,994	1,100	3,577	1,843	1,118	731	451	130	7	0	10,951

<i>SALARIES (IN THOUSANDS):</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	12,058	0	0	0	0	0	0	0	0	0	12,058
25 TO 29	51,828	5,127	0	0	0	0	0	0	0	0	56,955
30 TO 34	39,157	57,712	68,612	226	0	0	0	0	0	0	165,706
35 TO 39	5,159	37,852	186,386	32,289	468	0	0	0	0	0	262,154
40 TO 44	0	11,339	122,114	81,213	23,236	267	0	0	0	0	238,169
45 TO 49	130	503	25,932	80,054	66,659	23,590	0	0	0	0	196,868
50 TO 54	0	0	265	28,119	47,989	50,402	22,645	0	0	0	149,419
55 TO 59	0	148	0	635	9,782	21,563	29,251	10,514	0	0	71,893
60 TO 64	0	0	0	298	155	3,173	11,561	9,787	1,130	0	26,104
65 TO 69	0	0	153	154	155	0	283	0	0	0	746
70 & UP	0	0	0	0	155	0	0	0	0	0	155
TOTAL *	108,331	112,680	403,462	222,987	148,600	98,995	63,740	20,300	1,130	0	1,180,226

<i>AVERAGE SALARIES: **</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	52,197	0	0	0	0	0	0	0	0	0	52,197
25 TO 29	54,044	71,206	0	0	0	0	0	0	0	0	55,243
30 TO 34	55,150	101,605	109,779	112,877	0	0	0	0	0	0	86,985
35 TO 39	55,476	107,840	113,099	117,413	117,052	0	0	0	0	0	110,567
40 TO 44	0	109,029	113,700	122,125	130,538	133,314	0	0	0	0	117,731
45 TO 49	129,674	125,712	114,238	121,662	135,486	140,419	0	0	0	0	127,012
50 TO 54	0	0	132,268	119,654	131,117	136,961	144,237	0	0	0	132,464
55 TO 59	0	148,175	0	127,038	130,426	129,121	140,629	161,749	0	0	137,991
60 TO 64	0	0	0	148,780	155,413	122,019	137,633	150,565	161,462	0	141,101
65 TO 69	0	0	152,985	154,368	155,413	0	141,476	0	0	0	149,144
70 & UP	0	0	0	0	155,413	0	0	0	0	0	155,413
TOTAL	54,329	102,437	112,793	120,991	132,916	135,424	141,331	156,157	161,462	0	107,773

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
Detailed Reconciliation of Active Membership

TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2016							TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2015				
TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
I	M	1	127,539	127,539	65.0	43.0	3	477,774	159,258	64.3	42.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		1	127,539	127,539	65.0	43.0	3	477,774	159,258	64.3	42.0
II	M	8,929	1,067,538,285	119,559	43.2	16.7	9,346	1,091,396,867	116,777	42.6	16.1
II	F	47	5,321,175	113,216	41.3	13.2	48	5,309,251	110,609	40.2	12.2
		8,976	1,072,859,460	119,525	43.2	16.7	9,394	1,096,706,118	116,745	42.6	16.0
III	M	330	19,920,996	60,367	29.9	3.0	312	16,859,294	54,036	28.9	2.0
III	F	6	437,779	72,963	34.7	3.0	6	405,088	67,515	33.7	2.0
		336	20,358,775	60,592	29.9	3.0	318	17,264,382	54,291	29.0	2.0
VI	M	1,617	85,623,596	52,952	29.0	1.3	1,053	49,827,629	47,320	28.3	0.8
VI	F	21	1,256,911	59,853	31.2	1.3	12	718,133	59,844	30.5	0.8
		1,638	86,880,507	53,041	29.0	1.3	1,065	50,545,762	47,461	28.3	0.8
ALL TIERS		10,951	1,180,226,281	107,773	40.7	14.0	10,780	1,164,994,036	108,070	40.8	14.1

JUNE 30, 2016 MEMBERS ALSO PRESENT AS OF JUNE 30, 2015							June 30, 2015 MEMBERS ALSO PRESENT 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	1	127,539	127,539	65.0	43.0	1	125,803	125,803	64.0	42.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		1	127,539	127,539	65.0	43.0	1	125,803	125,803	64.0	42.0
II	M	8,903	1,065,411,776	119,669	43.2	16.8	8,903	1,037,562,207	116,541	42.2	15.7
II	F	46	5,266,410	114,487	41.5	13.3	46	5,082,475	110,489	40.5	12.2
		8,949	1,070,678,186	119,642	43.2	16.8	8,949	1,042,644,682	116,510	42.2	15.7
III	M	308	18,750,069	60,877	29.8	3.0	308	16,643,634	54,038	28.8	2.0
III	F	6	437,779	72,963	34.7	3.0	6	405,088	67,515	33.7	2.0
		314	19,187,848	61,108	29.9	3.0	314	17,048,722	54,295	28.9	2.0
VI	M	1,010	55,395,760	54,847	29.2	1.8	1,010	47,769,561	47,297	28.2	0.8
VI	F	12	805,657	67,138	31.5	1.8	12	718,133	59,844	30.5	0.8
		1,022	56,201,417	54,992	29.2	1.8	1,022	48,487,694	47,444	28.2	0.8
ALL TIERS		10,286	1,146,194,990	111,433	41.4	14.8	10,286	1,108,306,901	107,749	40.4	13.8

SEPARATIONS FROM MEMBERSHIP DURING THE YEAR *							ADDITIONS DURING THE YEAR *				
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	2	351,971	175,986	64.5	42.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	2	351,971	175,986	64.5	42.0
II	M	26	2,126,509	81,789	36.8	8.9	443	53,834,660	121,523	49.6	22.8
II	F	1	54,765	54,765	35.0	9.0	2	226,776	113,388	34.5	13.0
		27	2,181,274	80,788	36.8	8.9	445	54,061,436	121,486	49.6	22.8
III	M	22	1,170,927	53,224	30.2	2.9	4	215,660	53,915	31.0	2.3
III	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		22	1,170,927	53,224	30.2	2.9	4	215,660	53,915	31.0	2.3
VI	M	607	30,227,836	49,799	28.7	0.5	43	2,058,068	47,862	30.0	0.2
VI	F	9	451,254	50,139	30.9	0.6	0	0	0	0.0	0.0
		616	30,679,090	49,804	28.7	0.5	43	2,058,068	47,862	30.0	0.2
ALL TIERS		665	34,031,291	51,175	29.1	0.9	494	56,687,135	114,751	47.8	20.7

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

* Separations and additions do not include members who joined after June 30, 2015 and are no longer members on June 30, 2016.

Table XII-8
Summary of Non-Pensioner Membership as of June 30, 2016

STATUS	TIER 1		TIER 2		TIER 3		TIER 3 MODIFIED		ALL TIERS	
	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY
<i>MALES:</i>										
ACTIVES	1	127,539	8,929	1,067,538,285	330	19,920,996	1,617	85,623,596	10,877	1,173,210,416
INACTIVES	0	0	17	1,690,604	1	52,611	3	141,177	21	1,884,392
VESTED	0	0	57	5,051,827	0	0	0	0	57	5,051,827
ALL STATUS	1	127,539	9,003	1,074,280,716	331	19,973,607	1,620	85,764,773	10,955	1,180,146,635
<i>FEMALES:</i>										
ACTIVES	0	0	47	5,321,175	6	437,779	21	1,256,911	74	7,015,865
INACTIVES	0	0	0	0	0	0	0	0	0	0
VESTED	0	0	1	106,990	0	0	0	0	1	106,990
ALL STATUS	0	0	48	5,428,165	6	437,779	21	1,256,911	75	7,122,855
<i>TOTAL:</i>										
ACTIVES	1	127,539	8,976	1,072,859,460	336	20,358,775	1,638	86,880,507	10,951	1,180,226,281
INACTIVES	0	0	17	1,690,604	1	52,611	3	141,177	21	1,884,392
VESTED	0	0	58	5,158,817	0	0	0	0	58	5,158,817
ALL STATUS	1	127,539	9,051	1,079,708,881	337	20,411,386	1,641	87,021,684	11,030	1,187,269,490

Table XII-9
Summary of Pensioner Membership

Group	June 30, 2016 (LAG)				June 30, 2015 (LAG)			
	Number	Annual Amounts Payable			Number	Annual Amounts Payable		
		Plan Benefit	Supplementation	Total		Plan Benefit	Supplementation	Total
Service Pensioners	5,174	\$ 220,805,176	\$ 24,137,475	\$ 244,942,651	5,305	\$ 218,515,679	\$ 25,155,143	\$ 243,670,822
Ordinary Disability Pensioners	853	38,817,728	5,544,011	44,361,739	904	40,244,492	5,912,827	46,157,319
Accidental Disability Pensioners	9,560	737,520,662	38,141,349	775,662,011	9,390	690,738,217	38,878,694	729,616,911
Beneficiaries of Members Killed in the Line-of-Duty	633	63,948,213	2,462,250	66,410,463	635	21,611,545	2,466,987	24,078,532
Other Beneficiaries	427	7,442,209	1,197,678	8,639,887	476	7,318,079	1,361,291	8,679,370
Total	16,647	\$ 1,068,533,988	\$ 71,482,763	\$ 1,140,016,751	16,710	\$ 978,428,012	\$ 73,774,942	\$ 1,052,202,954

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2016

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>SERVICE RETIREMENT:</i>									
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	454,019	56,752	1	67,118	67,118	9	521,137	57,904
45 TO 49	63	3,951,635	62,724	0	0	0	63	3,951,635	62,724
50 TO 54	184	12,590,752	68,428	0	0	0	184	12,590,752	68,428
55 TO 59	581	36,546,958	62,904	1	56,540	56,540	582	36,603,498	62,893
60 TO 64	652	38,120,778	58,467	3	127,514	42,505	655	38,248,292	58,394
65 TO 69	616	32,033,143	52,002	2	66,923	33,462	618	32,100,066	51,942
70 TO 74	766	35,546,109	46,405	0	0	0	766	35,546,109	46,405
75 TO 79	955	38,226,552	40,028	1	34,760	34,760	956	38,261,312	40,022
80 TO 84	762	27,644,721	36,279	0	0	0	762	27,644,721	36,279
85 TO 89	375	12,864,266	34,305	0	0	0	375	12,864,266	34,305
90 & UP	204	6,610,863	32,406	0	0	0	204	6,610,863	32,406
TOTAL	5,166	244,589,796	47,346	8	352,855	44,107	5,174	244,942,651	47,341
<i>ORDINARY DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	1	25,197	25,197	0	0	0	1	25,197	25,197
35 TO 39	3	77,577	25,859	0	0	0	3	77,577	25,859
40 TO 44	3	106,870	35,623	0	0	0	3	106,870	35,623
45 TO 49	8	278,677	34,835	0	0	0	8	278,677	34,835
50 TO 54	15	481,293	32,086	0	0	0	15	481,293	32,086
55 TO 59	37	1,020,321	27,576	1	28,968	28,968	38	1,049,289	27,613
60 TO 64	40	994,028	24,851	0	0	0	40	994,028	24,851
65 TO 69	57	2,804,094	49,195	0	0	0	57	2,804,094	49,195
70 TO 74	86	5,721,286	66,527	0	0	0	86	5,721,286	66,527
75 TO 79	210	12,596,174	59,982	0	0	0	210	12,596,174	59,982
80 TO 84	203	11,081,043	54,586	0	0	0	203	11,081,043	54,586
85 TO 89	135	6,772,748	50,169	0	0	0	135	6,772,748	50,169
90 & UP	54	2,373,463	43,953	0	0	0	54	2,373,463	43,953
TOTAL	852	44,332,771	52,034	1	28,968	28,968	853	44,361,739	52,007
<i>ACCIDENTAL DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	16	1,384,977	86,561	1	68,455	68,455	17	1,453,432	85,496
35 TO 39	134	11,522,474	85,989	1	117,838	117,838	135	11,640,312	86,225
40 TO 44	331	29,083,168	87,865	1	79,249	79,249	332	29,162,417	87,839
45 TO 49	717	64,914,315	90,536	1	86,246	86,246	718	65,000,561	90,530
50 TO 54	1,316	125,939,580	95,699	1	103,752	103,752	1,317	126,043,332	95,705
55 TO 59	1,862	177,307,867	95,224	6	535,654	89,276	1,868	177,843,521	95,205
60 TO 64	1,516	138,817,150	91,568	4	394,073	98,518	1,520	139,211,223	91,586
65 TO 69	893	71,237,894	79,774	6	479,320	79,887	899	71,717,214	79,774
70 TO 74	843	55,892,336	66,302	0	0	0	843	55,892,336	66,302
75 TO 79	894	49,431,438	55,292	0	0	0	894	49,431,438	55,292
80 TO 84	658	31,461,795	47,814	1	66,514	66,514	659	31,528,309	47,843
85 TO 89	245	11,575,101	47,245	0	0	0	245	11,575,101	47,245
90 & UP	113	5,162,815	45,689	0	0	0	113	5,162,815	45,689
TOTAL	9,538	773,730,910	81,121	22	1,931,101	87,777	9,560	775,662,011	81,136

Table XII-10

Distribution of Pension Benefits by Cause and Age as of June 30, 2016 (cont'd)

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>ACCIDENTAL DEATH:</i>									
UNDER 30	1	76,270	76,270	3	168,037	56,012	4	244,307	61,077
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	3	291,427	97,142	3	291,427	97,142
40 TO 44	0	0	0	48	4,168,538	86,845	48	4,168,538	86,845
45 TO 49	0	0	0	73	7,322,101	100,303	73	7,322,101	100,303
50 TO 54	0	0	0	107	11,683,582	109,192	107	11,683,582	109,192
55 TO 59	0	0	0	116	14,168,001	122,138	116	14,168,001	122,138
60 TO 64	1	73,264	73,264	67	8,286,695	123,682	68	8,359,959	122,941
65 TO 69	2	120,486	60,243	51	6,111,313	119,830	53	6,231,799	117,581
70 TO 74	0	0	0	49	5,268,283	107,516	49	5,268,283	107,516
75 TO 79	1	73,133	73,133	46	4,223,306	91,811	47	4,296,439	91,414
80 TO 84	0	0	0	35	2,818,170	80,519	35	2,818,170	80,519
85 TO 89	0	0	0	12	882,283	73,524	12	882,283	73,524
90 & UP	0	0	0	18	675,574	37,532	18	675,574	37,532
TOTAL	5	343,153	68,631	628	66,067,310	105,203	633	66,410,463	104,914
<i>OTHER BENEFICIARIES:</i>									
UNDER 30	0	0	0	3	220,896	73,632	3	220,896	73,632
30 TO 34	0	0	0	3	170,870	56,957	3	170,870	56,957
35 TO 39	0	0	0	1	65,085	65,085	1	65,085	65,085
40 TO 44	0	0	0	0	0	0	0	0	0
45 TO 49	0	0	0	3	222,028	74,009	3	222,028	74,009
50 TO 54	1	23,535	23,535	8	445,060	55,633	9	468,595	52,066
55 TO 59	0	0	0	20	807,496	40,375	20	807,496	40,375
60 TO 64	0	0	0	21	680,528	32,406	21	680,528	32,406
65 TO 69	0	0	0	22	834,508	37,932	22	834,508	37,932
70 TO 74	0	0	0	38	1,267,144	33,346	38	1,267,144	33,346
75 TO 79	0	0	0	47	1,404,076	29,874	47	1,404,076	29,874
80 TO 84	0	0	0	45	804,618	17,880	45	804,618	17,880
85 TO 89	0	0	0	53	604,222	11,400	53	604,222	11,400
90 & UP	0	0	0	162	1,089,821	6,727	162	1,089,821	6,727
TOTAL	1	23,535	23,535	426	8,616,352	20,226	427	8,639,887	20,234
<i>ALL PENSIONERS AND BENEFICIARIES:</i>									
UNDER 30	1	76,270	76,270	6	388,933	64,822	7	465,203	66,458
30 TO 34	17	1,410,174	82,951	4	239,325	59,831	21	1,649,499	78,548
35 TO 39	137	11,600,051	84,672	5	474,350	94,870	142	12,074,401	85,031
40 TO 44	342	29,644,057	86,679	50	4,314,905	86,298	392	33,958,962	86,630
45 TO 49	788	69,144,627	87,747	77	7,630,375	99,096	865	76,775,002	88,757
50 TO 54	1,516	139,035,160	91,712	116	12,232,394	105,452	1,632	151,267,554	92,688
55 TO 59	2,480	214,875,146	86,643	144	15,596,659	108,310	2,624	230,471,805	87,832
60 TO 64	2,209	178,005,220	80,582	95	9,488,810	99,882	2,304	187,494,030	81,378
65 TO 69	1,568	106,195,617	67,727	81	7,492,064	92,495	1,649	113,687,681	68,943
70 TO 74	1,695	97,159,731	57,321	87	6,535,427	75,120	1,782	103,695,158	58,190
75 TO 79	2,060	100,327,297	48,703	94	5,662,142	60,236	2,154	105,989,439	49,206
80 TO 84	1,623	70,187,559	43,246	81	3,689,302	45,547	1,704	73,876,861	43,355
85 TO 89	755	31,212,115	41,341	65	1,486,505	22,869	820	32,698,620	39,876
90 & UP	371	14,147,141	38,132	180	1,765,395	9,808	551	15,912,536	28,879
TOTAL	15,562	1,063,020,165	68,309	1,085	76,996,586	70,965	16,647	1,140,016,751	68,482

Graph XII-11
Pensioner Average Benefits

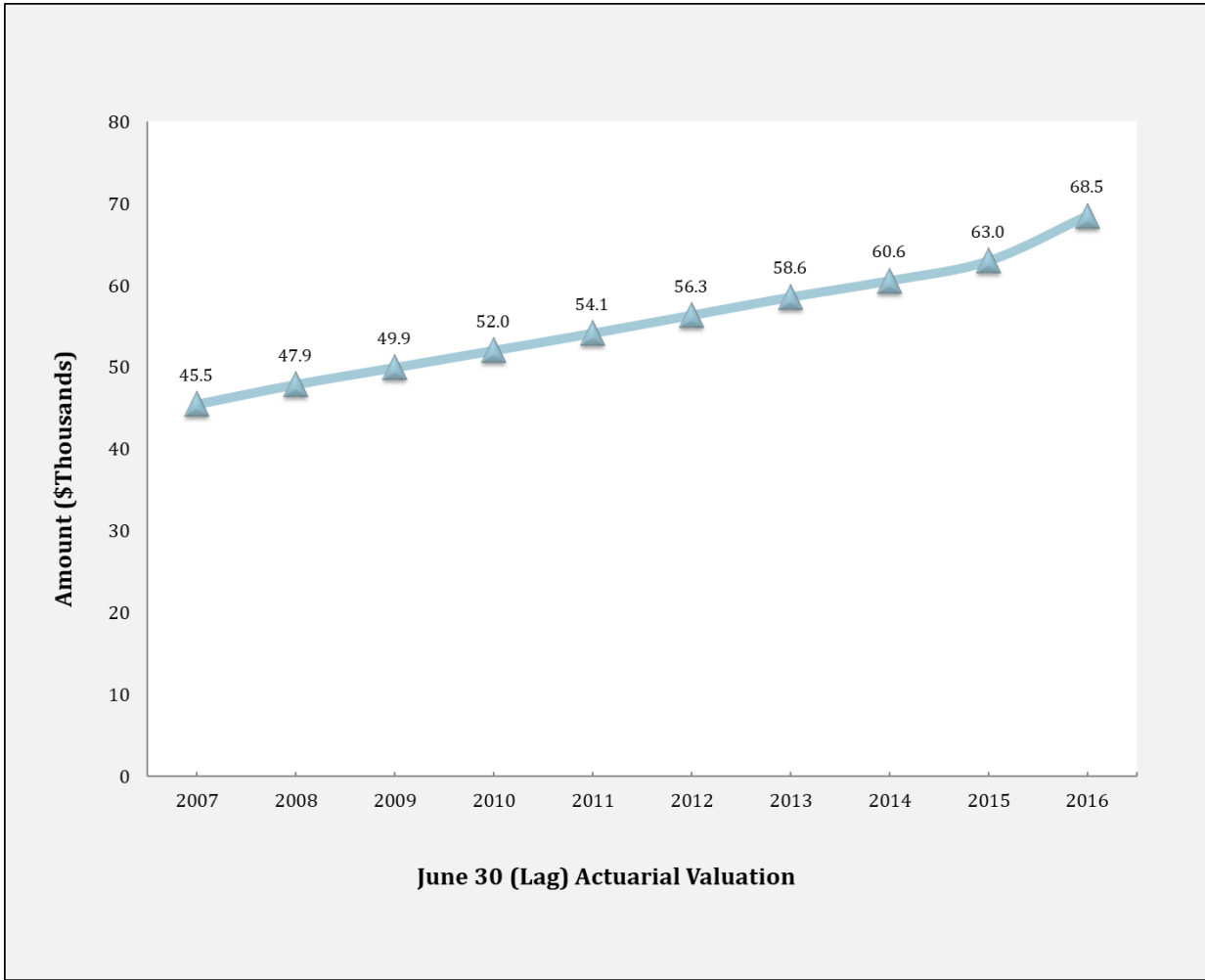


Table XII-12
Reconciliation of Pensioner and Beneficiary Data

SCHEDULE OF PENSIONERS AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS								
June 30 (Lag) Actuarial Valuation	Added to Rolls		Removed from Rolls		End of Year Rolls		% Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances ¹	Number	Annual Allowances	Number	Annual Allowances		
2007	777	\$ 71,664,072	783	\$ 26,221,335	17,479	\$ 794,506,827	6.1%	\$45,455
2008	616	62,100,681	691	23,260,349	17,404	833,347,159	4.9%	47,883
2009	476	49,098,185	617	20,247,862	17,263	862,197,482	3.5%	49,945
2010	556	54,883,701	679	25,161,316	17,140	891,919,867	3.4%	52,037
2011	653	64,843,804	776	35,553,289	17,017	921,210,382	3.3%	54,135
2012	538	58,288,645	638	26,379,782	16,917	953,119,245	3.5%	56,341
2013	453	54,522,199	563	23,448,369	16,807	984,193,075	3.3%	58,559
2014	490	54,256,974	534	23,299,539	16,763	1,015,150,510	3.1%	60,559
2015	500	59,578,951	553	22,526,507	16,710	1,052,202,954	3.6%	62,968
2016	498	110,481,515	561	22,667,718	16,647	1,140,016,751	8.3%	68,482

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

APPENDIX: ACRONYMS AND ABBREVIATIONS

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