



Fiscal Year 2019
Actuarial Valuation Report
of the
New York City
Police Pension Fund

JUNE 30, 2017 (LAG) ACTUARIAL VALUATION

prepared by the
New York City
Office of the Actuary

2019



OFFICE OF THE ACTUARY

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SHERRY S. CHAN
CHIEF ACTUARY

August 28, 2019

Board of Trustees
New York City Police Pension Fund
233 Broadway, Room 2501
New York, NY 10279

Re: Fiscal Year 2019 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2017 (Lag) actuarial valuation of the benefits under both the New York City Police Pension Fund (POLICE) and Group Life Insurance Plan (collectively, the Plan). These results form the basis for determining the statutorily-required contribution (Statutory Contribution) of \$2,558,256,001 for Fiscal Year 2019 (i.e. for the period beginning July 1, 2018 and ending June 30, 2019). It is not intended, nor necessarily suitable, for other purposes. Calculations made for other purposes may differ significantly from those shown herein.

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

The June 30, 2017 (Lag) and June 30, 2016 (Lag) actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employer's payroll facilities. Financial information was provided by POLICE and the Office of the Comptroller as of June 30, 2017 and June 30, 2016.

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

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

A summary of the actuarial assumptions and methods used in the valuation of the Plan is shown in SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS. The assumptions and methods have changed from the prior valuation. These new assumptions and methods were

presented in the report entitled “Proposed Changes in Actuarial Assumptions and Methods Used in Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2018 for the New York City Police Pension Fund” dated January 2, 2019 which was adopted by the Board of Trustees at the March 13, 2019 Board meeting.

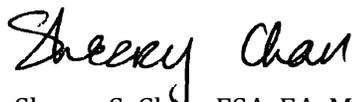
The June 30, 2017 (Lag) actuarial valuation also includes changes in:

- The handling of the VSF offset due to escalation for Tier 3, Tier 3 Revised, and Tier 3 Enhanced members. Future VSF payments were previously offset by expected escalation on members’ pension. Beginning with this valuation, an offset for future escalation is no longer included.
- Valuing the non-uniformed service for Tier 1 and Tier 2 members. Beginning with this valuation, non-uniformed service by individual is collected and valued accordingly.

This report does not present Governmental Accounting Standards Board (GASB) results. The Office of the Actuary will publish Fiscal Year 2019 GASB67 and GASB68 results in a Report later this calendar year, which will be available on the website of the Office of the Actuary (www.nyc.gov/actuary).

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

Best Regards,



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

SSC/eh

cc: Mr. Craig Chu - New York City Office of the Actuary
Mr. Anderson Huynh - New York City Office of the Actuary
Mr. Kevin Holloran - New York City Police Pension Fund
Mr. Michael Samet - New York City Office of the Actuary
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Keith Snow, Esq. - New York City Office of the Actuary

Table of Contents

SECTION I – EXECUTIVE SUMMARY.....	1
Table I-1 Executive Summary.....	2
Table I-2 Actuarial Liabilities	3
Graph I-3 Historical Funded Status.....	4
SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS.....	5
Table II-1 Statement of Plan Net Assets	6
Table II-2 Statement of Changes in Plan Net Assets.....	7
Table II-3 Development of Actuarial Value of Assets.....	8
Graph II-4 Historical Market and Actuarial Value of Assets.....	9
Graph II-5 Future Recognition of UIR as of June 30, 2017.....	10
SECTION III – CONTRIBUTION DEVELOPMENT AND HISTORY	11
Table III-1 Statutory Contributions	11
Table III-2 Schedule of Unfunded Accrued Liability Bases.....	12
Graph III-3 Remaining UAL Amortizations as of June 30, 2017	14
Table III-4 Reconciliation of Outstanding UAL Bases	15
Table III-5 Actuarial and Statutory Contribution History.....	16
Table III-6 City Rates: Contributions as Percentage of Salary.....	17
SECTION IV - (GAIN)/LOSS ANALYSIS.....	18
Table IV-1 Development of Experience (Gain)/Loss	18
SECTION V – SCHEDULE OF FUNDING PROGRESS.....	19
Table V-1 Schedule of Funding Progress	20
SECTION VI – VARIABLE SUPPLEMENTS FUNDS (VSF).....	21
Table VI-1 VSF Accrued Liability.....	22
Table VI-2 VSF Member Data.....	23
Table VI-3 VSF Statement of Assets	24
Table VI-4 Development of VSF Actuarial Value of Assets as of June 30, 2017.....	25
Table VI-5 SKIM Calculation as of June 30, 2017	26
Summary of VSF Plan Provisions	27
Summary of VSF Actuarial Assumptions and Methods.....	28
SECTION VII – RISK AND UNCERTAINTY	30
High Risk Types.....	31
Investment Risk	31

Maturity Risk.....	33
Medium Risk Types	35
Interest Rate Risk.....	35
Inflation Risk.....	36
Longevity Risk	36
Low Risk Types	37
Credit/Solvency Risk	37
Contribution Risk.....	37
Agency Risk.....	37
Intergenerational Equity Risk.....	37
SECTION VIII – SUMMARY OF PLAN PROVISIONS.....	39
SECTION IX – CHAPTER AMENDMENTS.....	49
SECTION X – SUBSEQUENT EVENTS	50
SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS.....	51
Table XI-1a Service Retirement, Unreduced with Full COLA/Escalation	52
Table XI-1b Early Service Retirement.....	53
Table XI-2 Active Termination Rates.....	54
Table XI-3 Active Disability Rates.....	55
Table XI-4 Active Mortality Rates	56
Table XI-5 Service Retiree Mortality	57
Table XI-6 Disabled Retiree Mortality	58
Table XI-7 Beneficiary Mortality	59
Table XI-8 Salary Scale	60
Table XI-9 Overtime Assumptions.....	61
Additional Assumptions and Methods.....	62
SECTION XII – SUMMARY OF DEMOGRAPHIC DATA.....	65
Table XII-1 Status Reconciliation	66
Graph XII-2 Headcount Summary by Status.....	67
Table XII-3 Summary of Active Membership	68
Graph XII-4 Active Membership by Tier	69
Table XII-5 Schedule of Active Member Salary Data.....	70
Table XII-6 Detailed Active Membership and Salaries as of June 30, 2017	71
Table XII-7 Summary of Non-Pensioner Membership	74
Table XII-8 Summary of Non-Pensioner Membership as of June 30, 2017	75

Table XII-9 Summary of Pensioner Membership	76
Table XII-10 Distribution of Pension Benefits by Cause and Age as of June 30, 2017.....	77
Graph XII-11 Pensioner Average Benefits.....	79
Table XII-12 Reconciliation of Pensioner and Beneficiary Data.....	80
APPENDIX: ACRONYMS AND ABBREVIATIONS.....	81

SECTION I - EXECUTIVE SUMMARY

This report presents the results of the June 30, 2017 (Lag) actuarial valuation of the New York City Police Pension Fund (POLICE) and Group Life Insurance Plan (collectively, the Plan).

The purposes of the valuation are:

- To determine the actuarially-required contribution (Actuarial Contribution) for Fiscal Year 2019 (i.e. July 1, 2018 to June 30, 2019),
- To measure the funding progress of the Plan,
- To disclose the census data and financial information used in the valuation, and
- To disclose the actuarial assumptions and actuarial methods used to determine the Actuarial Contribution.

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

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

All results are based on preliminary SKIM amounts as determined by the Actuary in a letter dated October 26, 2017 to the Boards. All results are without regard to the Variable Supplements Funds, unless specifically noted.

Future measurements of this information may differ from current measurements for many reasons including, but not limited to, experience differing from economic or demographic assumptions, changes in actuarial assumptions and methods, and changes in applicable statute and plan provisions. These and additional risks may be present for the Plan. A further discussion is presented in SECTION VII - RISK AND UNCERTAINTY for consideration.

Table I-1 Executive Summary

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

NEW YORK CITY POLICE PENSION FUND		
SUMMARY OF VALUATION RESULTS		
Valuation Date	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Fiscal Year	2019	2018
Funded Status		
1. Accrued Liability (AL) ¹	\$ 47,696,249,723	\$ 48,059,916,306
2. Actuarial Value of Assets (AVA) ²	<u>34,162,505,000</u>	<u>33,692,647,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 13,533,744,723	\$ 14,367,269,306
4. Funded Ratio (AVA Basis) (2. / 1.)	71.6%	70.1%
5. Market Value of Assets (MVA) ²	35,423,525,000	33,482,610,000
6. Unfunded Accrued Liability (MVA Basis) (1. - 5.)	\$ 12,272,724,723	\$ 14,577,306,306
7. Funded Ratio (MVA Basis) (5. / 1.)	74.3%	69.7%
Contribution³		
1. Normal Cost	\$ 1,449,290,567	\$ 1,271,502,845
2. Amortization of Unfunded Accrued Liability	1,087,307,361	1,122,495,030
3. Administrative Expenses	<u>21,658,073</u>	<u>21,155,462</u>
4. Actuarial Contribution (1. + 2. + 3.)	\$ 2,558,256,001	\$ 2,415,153,337
5. Statutory Contribution (4.)	\$ 2,558,256,001	\$ 2,415,153,337
Participant Data		
1. Active Members		
a. Number	36,165	35,961
b. Annual Salary ⁴	\$ 3,968,885,246	\$ 3,717,425,239
c. Average Salary	\$ 109,744	\$ 103,374
2. Active Off Payroll Members ⁵	1,822	1,659
3. Terminated Vested Members	502	574
4. Retirees and Beneficiaries		
a. Number	49,799	49,151
b. Total Annual Benefits	\$ 2,493,041,013	\$ 2,378,811,349
c. Average Annual Benefit	\$ 50,062	\$ 48,398

¹ Includes unfunded VSF Accrued Liability.

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

³ Including results for Variable Supplements Funds.

⁴ Salaries shown are the base salary plus assumed overtime paid and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

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

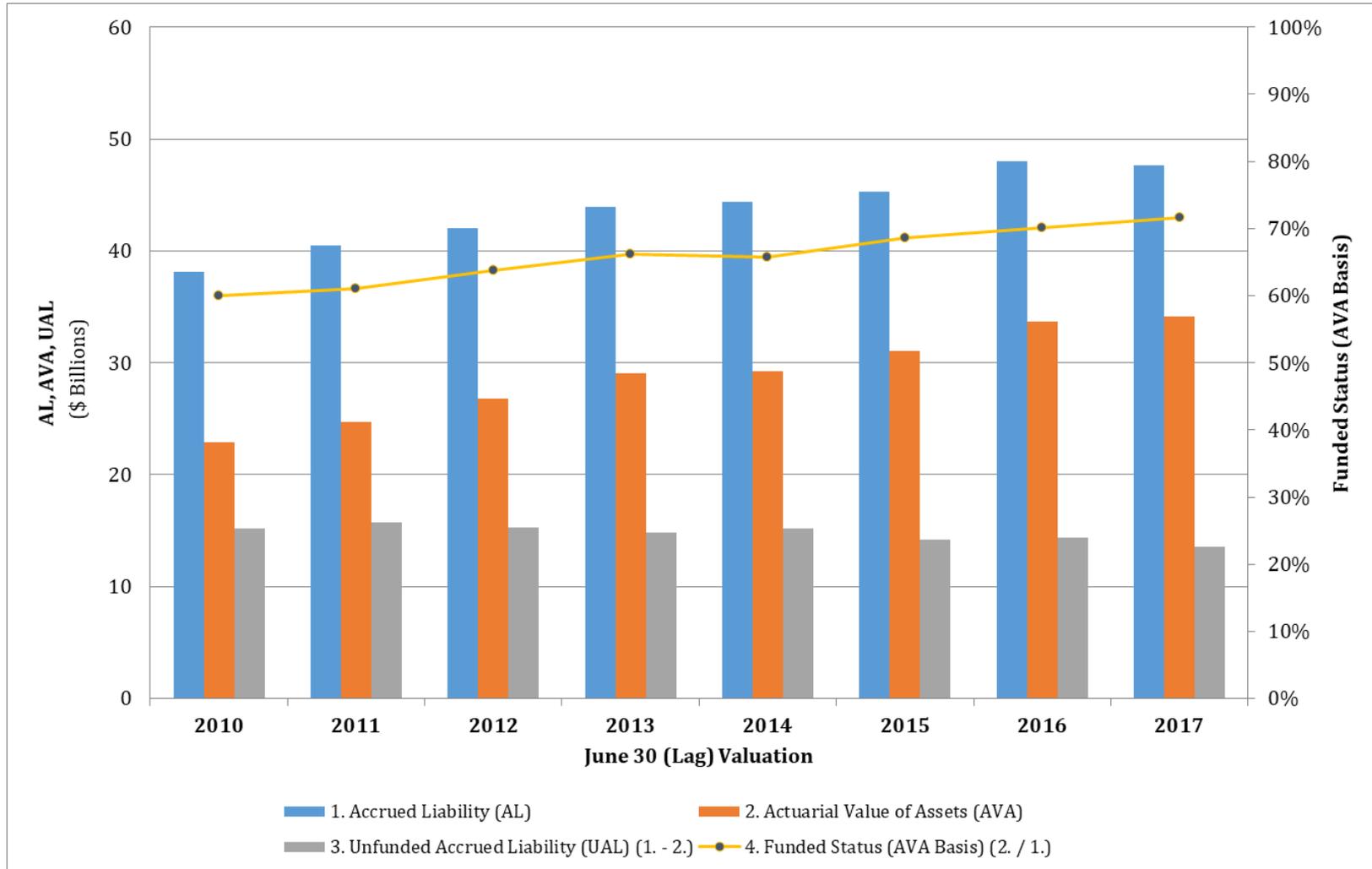
Table I-2
Actuarial Liabilities

NEW YORK CITY POLICE PENSION FUND		
ACTUARIAL LIABILITIES BY STATUS		
Valuation Date	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Fiscal Year	2019	2018
Accrued Liability		
1. Active Members	\$ 15,584,859,906	\$ 15,592,545,840
2. Active Off Payroll Members ¹	57,076,208	102,645,530
3. Terminated Vested Members	72,186,203	87,094,234
4. Retirees and Beneficiaries	<u>29,780,499,097</u>	<u>28,379,697,973</u>
5. Accrued Liability Pre-Adjustments (1. to 4.)	\$ 45,494,621,414	\$ 44,161,983,577
6. Actuarial Adjustments ²	<u>2,201,628,309</u>	<u>3,897,932,729</u>
7. Total Accrued Liability (5. + 6.)	\$ 47,696,249,723	\$ 48,059,916,306
Present Value of Benefits		
1. Active Members	\$ 28,498,860,261	\$ 26,354,471,735
2. Active Off Payroll Members ¹	57,076,208	102,645,530
3. Terminated Vested Members	72,186,203	87,094,234
4. Retirees and Beneficiaries	<u>29,780,499,097</u>	<u>28,379,697,973</u>
5. Present Value of Benefits (1. to 4.)	\$ 58,408,621,769	\$ 54,923,909,472
6. Actuarial Adjustments ²	<u>3,192,414,233</u>	<u>4,714,241,566</u>
7. Total Present Value of Benefits (5. + 6.)	\$ 61,601,036,002	\$ 59,638,151,038

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

² Includes unfunded VSF liability and other actuarial loading adjustments.

Graph I-3
Historical Funded Status



SECTION II - MARKET AND ACTUARIAL VALUES OF ASSETS

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

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

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

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

Table II-1
Statement of Plan Net Assets

(\$ Thousands)		
	June 30, 2017	June 30, 2016
ASSETS		
Cash	\$ 107,908	\$ 116,153
Receivables		
Investment Securities Sold	\$ 694,085	\$ 575,823
Member Loans	234,570	251,861
Transferrable Earnings due from VSFs to QPP	326,195	326,195
Accrued Interest and Dividends	<u>3,238</u>	<u>66,102</u>
Total Receivables	\$ 1,258,088	\$ 1,219,981
INVESTMENTS AT FAIR VALUE		
Short-Term Investments		
Commercial Paper	\$ 246,623	\$ 75,098
Short-term Investment Fund	218,581	464,188
U.S. Treasury Bills	0	293,310
Debt Securities	7,702,198	6,870,189
Equity Securities	6,518,200	6,180,793
Alternative Investments	7,209,973	6,382,258
Collective Trust Funds		
Fixed Income	731,787	656,243
Domestic Equity	6,785,844	5,803,115
International Equity	6,552,823	5,402,281
Mortgage Debt Security	308,817	302,440
Treasury Inflation Protected Securities	1,592,909	1,503,457
Collateral From Securities Lending	<u>3,853,421</u>	<u>2,945,709</u>
Total Investments	\$41,721,176	\$36,879,081
OTHER ASSETS	<u>17,667</u>	<u>16,104</u>
TOTAL ASSETS	\$43,104,839	\$38,231,319
LIABILITIES		
Accounts Payable	\$ 468,980	\$ 260,836
Payable for Investment Securities Purchased	556,363	837,047
Accrued Benefits Payable	84,111	115,117
Transferrable earnings due from QPP to VSFs	564,439	590,000
Accrued Transfers to VSFs	2,154,000	0
Security Lending	<u>3,853,421</u>	<u>2,945,709</u>
TOTAL LIABILITIES	\$ 7,681,314	\$ 4,748,709
PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS	\$35,423,525	\$33,482,610

Table II-2
Statement of Changes in Plan Net Assets

(\$ Thousands)		
	June 30, 2017	June 30, 2016
ADDITIONS		
Contributions		
Member Contributions	\$ 276,301	\$ 249,921
Employer Contributions	<u>2,293,840</u>	<u>2,393,940</u>
Total Contributions	\$ 2,570,141	\$ 2,643,861
Investment Income (Loss)		
Interest Income	\$ 400,562	\$ 416,038
Dividend Income	485,237	449,480
Net Appreciation (Depreciation) in Fair Value	<u>3,418,739</u>	<u>(85,518)</u>
Total Investment Income (Loss)	\$ 4,304,538	\$ 780,000
Less Investment Expenses	245,288	156,155
Net Income (Loss)	\$ 4,059,250	\$ 623,845
Securities Lending Transactions		
Securities Lending Income	\$ 22,034	\$ 21,896
Securities Lending Fees	<u>(1,537)</u>	<u>(1,423)</u>
Net Securities Lending Income (Loss)	<u>\$ 20,497</u>	<u>\$ 20,473</u>
Net Investment Income (Loss)	\$ 4,079,747	\$ 644,318
Other		
Net Receipts from Other Retirement Systems	\$ 2,450	\$ 3,786
Transferrable Earnings due from VSFs to QPP	25,562	326,195
Litigation Income	<u>7,931</u>	<u>2,693</u>
TOTAL ADDITIONS	\$ 6,685,831	\$ 3,620,853
DEDUCTIONS		
Benefit Payments and Withdrawals	\$ 2,571,999	\$ 2,475,738
Transferrable Earnings due from QPP to VSFs	2,154,000	0
Accrued Transfers to VSFs	0	0
Administrative Expenses	<u>18,917</u>	<u>18,478</u>
TOTAL DEDUCTIONS	\$ 4,744,916	\$ 2,494,216
NET INCREASE (DECREASE) IN PLAN NET ASSETS	\$ 1,940,915	\$ 1,126,637
PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
Beginning of Year	\$ 33,482,610	\$ 32,355,973
End of Year	\$ 35,423,525	\$ 33,482,610

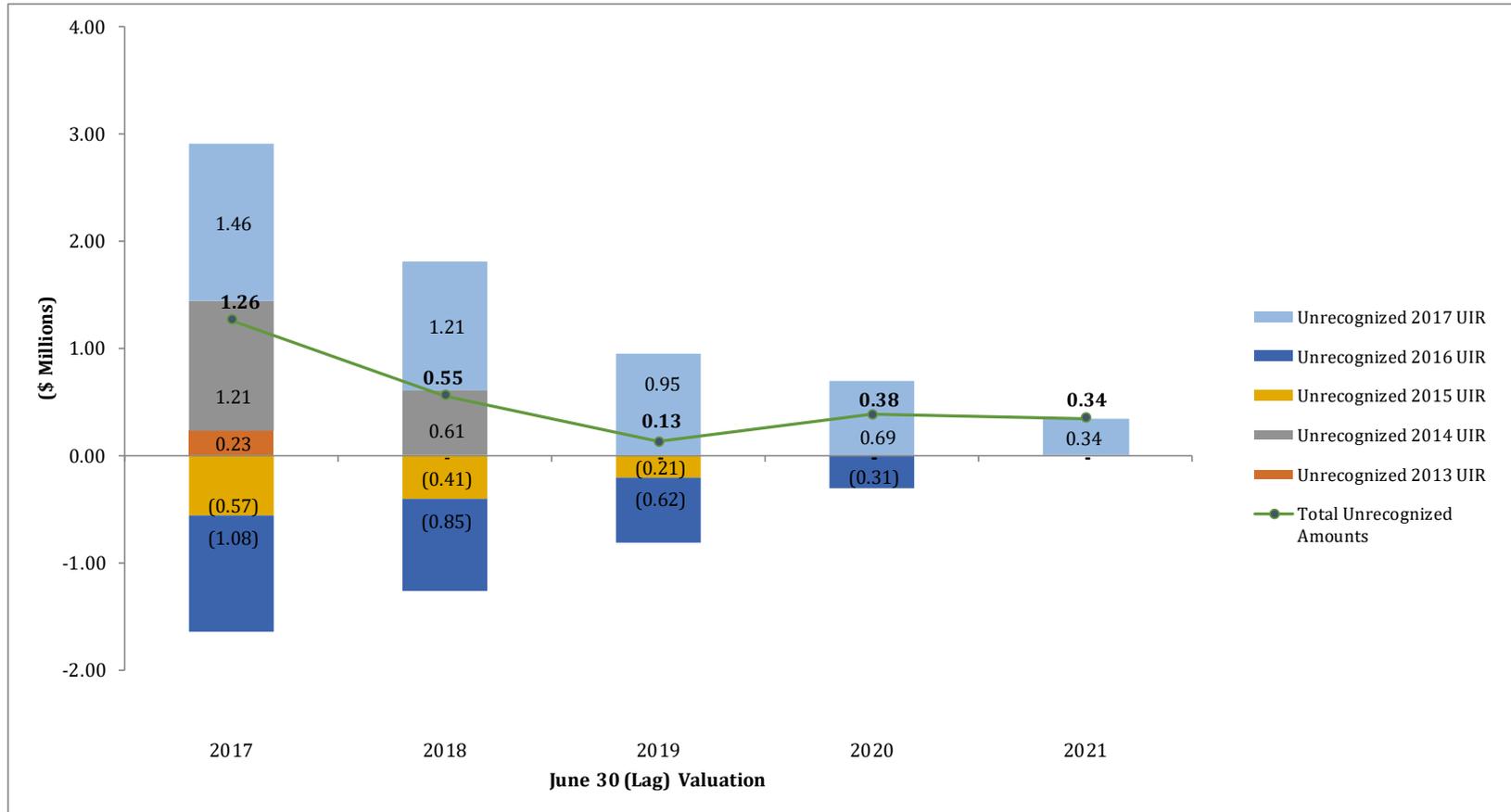
Table II-3
Development of Actuarial Value of Assets

(\$ Thousands)		
Valuation Date	June 30, 2017	June 30, 2016
1. Market Value of Assets (MVA)		
a. Beginning of Year (BOY)	\$ 33,482,610	\$ 32,355,973
b. End of Year (EOY)	\$ 35,423,525	\$ 33,482,610
2. Contributions		
a. Employee	\$ 276,301	\$ 249,921
b. Employer	<u>2,293,840</u>	<u>2,393,940</u>
c. Total Contributions	\$ 2,570,141	\$ 2,643,861
3. Benefit Payments and Other Cash Flow	\$ (2,580,535)	\$ (2,487,737)
4. Transferable Earnings from VSFs to QPP	\$ (2,128,438)	\$ 326,195
5. Net Cash Flow (2.c. + 3. + 4.)	\$ (2,138,832)	\$ 482,319
6. Net Investment Income		
a. Investment Income	\$ 4,325,035	\$ 800,473
b. Investment Expenses	<u>(245,288)</u>	<u>(156,155)</u>
c. Total Net Investment Income	\$ 4,079,747	\$ 644,318
7. Average Invested Assets		
a. AVA @ BOY	\$ 33,692,647	\$ 31,092,977
b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2)	<u>(5,197)</u>	<u>78,062</u>
c. Total	\$ 33,687,450	\$ 31,171,039
8. Expected Rate of Return (AIR)	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	\$ 2,358,122	\$ 2,181,973
10. Unexpected Investment Return (UIR) (6.c. - 9.)	\$ 1,721,625	\$ (1,537,655)
11. Preliminary AVA @ EOY		
a. AVA @ BOY (prior to corridor limit)	\$ 33,692,647	\$ 31,092,977
b. Net Cash Flow (5.)	(2,138,832)	482,319
c. Expected Investment Return (9.)	2,358,122	2,181,973
d. Phase in of UIR		
15% * UIR for prior year	258,244	(230,648)
15% * UIR for second prior year	(230,648)	(154,887)
15% * UIR for third prior year	(154,888)	455,301
15% * UIR for fourth prior year	455,302	170,836
20% * UIR for fifth prior year	227,782	(305,224)
20% * UIR for sixth prior year	<u>(305,224)</u>	<u>N/A</u>
Total	\$ 250,568	\$ (64,622)
e. Preliminary AVA (11.a. + 11.b. + 11.c. + 11.d.)	\$ 34,162,505	\$ 33,692,647
12. Corridor		
a. 80% of MVA	\$ 28,338,820	\$ 26,786,088
b. 120% of MVA	\$ 42,508,230	\$ 40,179,132
13. Final AVA @ EOY (11e. bounded by 12.)	\$ 34,162,505	\$ 33,692,647

Graph II-4
Historical Market and Actuarial Value of Assets



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



SECTION III - CONTRIBUTION DEVELOPMENT AND HISTORY

Table III-1
Statutory Contributions

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

COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS		
Valuation Date	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Fiscal Year	2019	2018
Normal Cost	\$ 1,449,290,567	\$ 1,271,502,845
Amortization of Unfunded Accrued Liability		
-Initial UAL	1,220,770,246	1,185,213,831
-2011 (Gain)/Loss	32,652,194	32,652,194
-2012 (Gain)/Loss	(58,789,449)	(58,789,449)
-2013 (Gain)/Loss	(27,789,355)	(27,789,355)
-2014 (Gain)/Loss	(25,983,043)	(25,983,043)
-2014 Assumption Changes	70,722,523	70,722,523
-2015 (Gain)/Loss	(104,289,367)	(104,289,367)
-2016 (Gain)/Loss	2,510,395	2,510,395
-2016 SADB	46,805,208	46,805,208
-2016 Enhanced ADR	1,442,093	1,442,093
-2017 (Gain)/Loss	4,907,592	NA
-2017 No VSF Escalation Offset	1,515,961	NA
-2017 Non-Uniformed Service	5,541,419	NA
-2017 Assumption Changes	(39,298,270)	NA
-2017 Method Changes	(43,410,786)	NA
Total	1,087,307,361	1,122,495,030
Administrative Expenses	21,658,073	21,155,462
Total Contribution to the New York City Police Pension Fund	\$ 2,558,256,001	\$ 2,415,153,337

Table III-2
Schedule of Unfunded Accrued Liability Bases

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

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

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

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

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

NEW YORK CITY POLICE PENSION FUND SCHEDULE OF UNFUNDED ACCRUED LIABILITY BASES						
Amortization Base	Date Established	Original Amount	Amortization Years	Amortization Payment	Payments Remaining	OYLM UAL June 30, 2017
Initial UAL	6/30/10	\$ 13,211,374,581	22	\$ 1,220,770,246	14	\$ 12,196,739,003
(Gain)/Loss	6/30/11	\$ 276,060,031	15	\$ 32,652,194	8	\$ 188,490,411
(Gain)/Loss	6/30/12	\$ (497,039,100)	15	\$ (58,789,449)	9	\$ (370,286,093)
(Gain)/Loss	6/30/13	\$ (234,946,852)	15	\$ (27,789,355)	10	\$ (188,688,401)
(Gain)/Loss	6/30/14	\$ (219,675,273)	15	\$ (25,983,043)	11	\$ (188,357,368)
Assumption Change ¹	6/30/14	\$ 706,645,098	20	\$ 70,722,523	16	\$ 645,867,777
(Gain)/Loss	6/30/15	\$ (881,721,022)	15	\$ (104,289,367)	12	\$ (800,784,302)
(Gain)/Loss	6/30/16	\$ 21,224,294	15	\$ 2,510,395	13	\$ 20,283,104
SADB	6/30/16	\$ 395,717,583	15	\$ 46,805,208	13	\$ 378,169,511
Enhanced ADR	6/30/16	\$ 13,611,142	18	\$ 1,442,093	16	\$ 13,169,798
(Gain)/Loss	6/30/17	\$ 41,491,543	15	\$ 4,907,592	14	\$ 41,491,543
No VSF Escalation Offset	6/30/17	\$ 14,308,348	18	\$ 1,515,961	17	\$ 14,308,348
Non-Uniformed Service	6/30/17	\$ 55,368,731	20	\$ 5,541,419	19	\$ 55,368,731
Assumption Change ²	6/30/17	\$ (392,660,331)	20	\$ (39,298,270)	19	\$ (392,660,331)
Method Change ³	6/30/17	\$ (433,751,763)	20	\$ (43,410,786)	19	\$ (433,751,763)

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

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

³ Refinements to valuation methodologies.

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

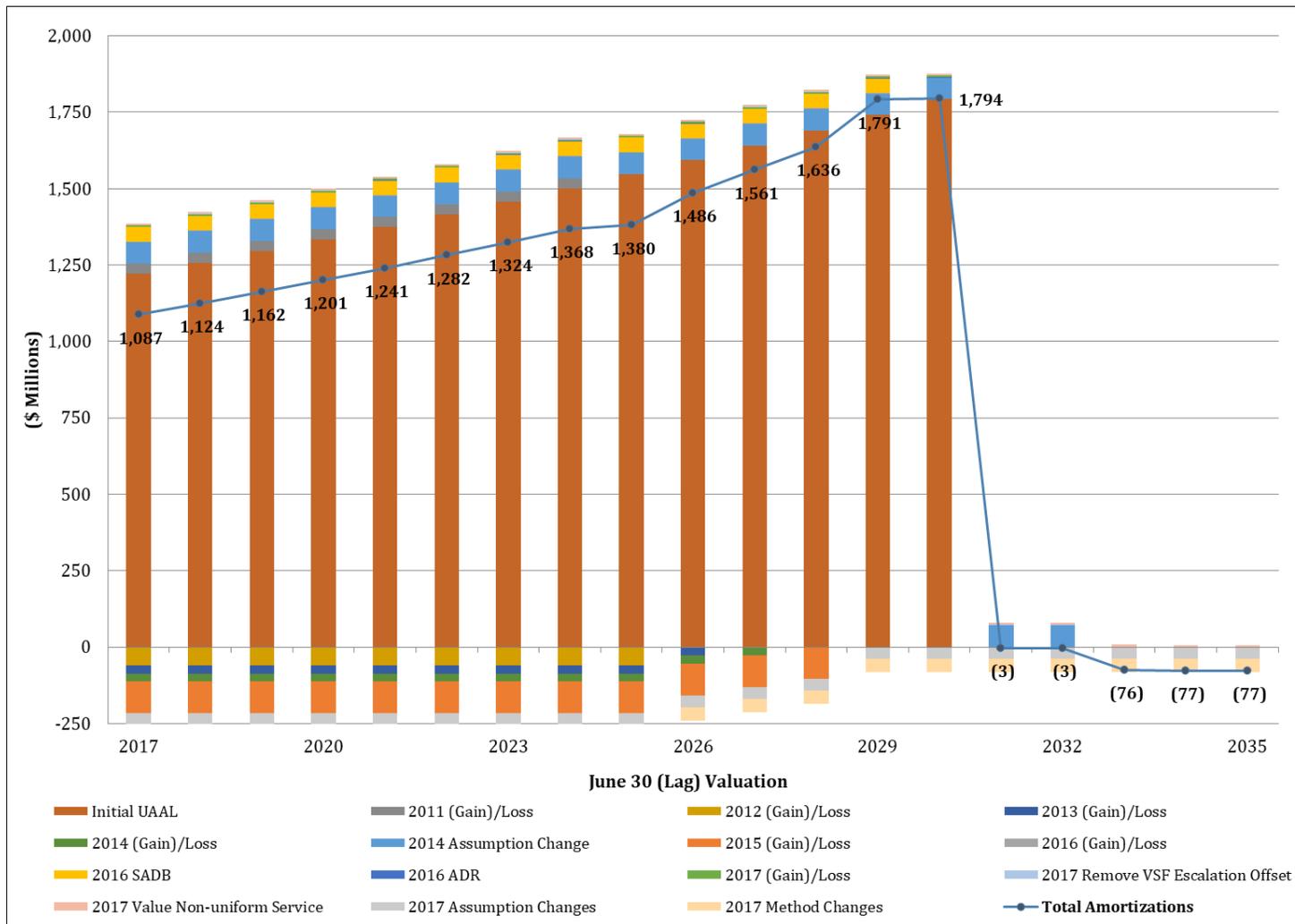


Table III-4
Reconciliation of Outstanding UAL Bases

June 30 (Lag) Valuation Date	Amounts (in \$ Thousands) Remaining to be Amortized, as of							
	2010	2011	2012	2013	2014	2015	2016	2017 ¹
Unfunded Accrued Liability, June 30, 2010	\$ 13,211,375	\$ 14,136,171	\$ 14,098,951	\$ 14,028,324	\$ 13,921,027	\$ 13,773,540	\$ 13,582,070	\$ 12,196,739
2011 (Gain)/Loss		276,060	295,384	282,285	268,270	253,273	237,226	188,490
2012 (Gain)/Loss			(497,039)	(531,832)	(508,248)	(483,013)	(456,011)	(370,286)
2013 (Gain)/Loss				(234,947)	(251,393)	(240,245)	(228,317)	(188,688)
2014 (Gain)/Loss					(219,675)	(235,053)	(224,629)	(188,357)
2014 Assumption Change					706,645	756,110	735,882	645,868
2015 (Gain)/Loss						(881,721)	(943,441)	(800,784)
2016 (Gain)/Loss							21,224	20,283
2016 SADB							395,717	378,170
2016 Enhanced ADR							13,611	13,170
2017 (Gain)/Loss								41,492
2017 Removal of VSF Escalation Offset								14,308
2017 Non-uniformed Service								55,369
2017 Assumption Changes								(392,660)
2017 Method Changes								(433,752)
Sum of Outstanding Amortization Amounts	\$ 13,211,375	\$ 14,412,231	\$ 13,897,296	\$ 13,543,830	\$ 13,916,626	\$ 12,942,891	\$ 13,133,332	\$ 11,179,360

June 30 (Lag) Valuation Date	2010	2011	2012	2013	2014	2015	2016	2017
1. Accrued Liability (AL)	\$ 38,134,430	\$ 40,524,580	\$ 42,015,625	\$ 43,900,094	\$ 44,384,022	\$ 45,297,561	\$ 48,059,916	\$ 47,696,250
2. Actuarial Value of Assets (AVA)	22,908,732	24,748,860	26,777,077	29,087,154	29,212,981	31,092,977	33,692,647	34,162,505
3. Unfunded Accrued Liability (UAL) (1. - 2.)	15,225,698	15,775,720	15,238,548	14,812,940	15,171,041	14,204,584	14,367,269	13,533,745
4. PV 1-year Adjusted Employer Contribution ²	2,014,323	1,328,510	1,306,238	1,232,609	1,216,942	1,223,860	1,195,008	2,334,817
5. PV Future Administrative Expense Reimbursement	0	34,979	35,014	36,501	37,473	37,833	38,929	19,568
6. Adjusted UAL (3. - 4. - 5.)	\$ 13,211,375	\$ 14,412,231	\$ 13,897,296	\$ 13,543,830	\$ 13,916,626	\$ 12,942,891	\$ 13,133,332	\$ 11,179,360

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

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

Table III-5
Actuarial and Statutory Contribution History

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

(\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution Certified	Statutory Contribution Certified	Percentage of Actuarial Contribution Contributed
2010	\$ 1,980,996	\$ 1,980,996	100.0%
2011	2,083,633	2,083,633	100.0%
2012	2,385,731	2,385,731	100.0%
2013	2,424,690	2,424,690	100.0%
2014	2,320,910	2,320,910	100.0%
2015	2,309,619	2,309,619	100.0%
2016	2,393,940	2,393,940	100.0%
2017	2,293,840	2,293,840	100.0%
2018	2,415,153	2,415,153	100.0%
2019	2,558,256	2,558,256	100.0%

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

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

CITY RATES (\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution	Salary ¹ at Beginning of Fiscal Year	City Rate
2010	\$ 1,980,996	\$ 3,097,485	63.955%
2011	2,083,633	3,252,706	64.058%
2012	2,385,731	3,448,765	69.176%
2013	2,424,690	3,459,872	70.080%
2014	2,320,910	3,420,312	67.857%
2015	2,309,619	3,512,778	65.749%
2016	2,393,940	3,540,326	67.619%
2017	2,293,840	3,509,985	65.352%
2018	2,415,153	3,673,054	65.753%
2019	2,558,256	3,994,618	64.043%

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

SECTION IV - (GAIN)/LOSS ANALYSIS

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

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

DEVELOPMENT OF EXPERIENCE (GAIN)/LOSS	
JUNE 30, 2017	
(\$ Thousands)	
1. Expected Accrued Liability (AL)	
a. AL at June 30, 2016	\$ 50,491,919
b. Total Normal Cost and Admin. Expenses at June 30, 2016	1,434,192
c. Interest on 1.a. and 1.b. to June 30, 2017	3,634,828
d. Fiscal Year 2017 Benefit Payments	(2,984,833)
e. Interest on 1.d. to June 30, 2016	<u>(102,702)</u>
f. Expected AL at June 30, 2017	\$ 52,473,404
2. Actual AL at June 30, 2017 before Plan Changes ² and 2019 A&M	\$ 52,684,294
3. Expected Total Actuarial Value of Assets (AVA)	
a. Total AVA at June 30, 2016	\$ 36,124,650
b. Interest on 3.a. to June 30, 2017	2,528,726
c. Total Contributions Paid in Fiscal Year 2017	2,570,141
d. Interest on 3.c. to June 30, 2017	88,434
e. Fiscal Year 2017 Benefit Payments	(2,984,833)
f. Interest on 3.e. to June 30, 2017	<u>(102,702)</u>
g. Expected Total AVA at June 30, 2017	\$ 38,224,416
4. Actual Total AVA at June 30, 2017	\$ 38,393,814
5. Accrued Liability (Gain)/Loss (2. - 1.f.)	\$ 210,890
6. Actuarial Asset (Gain)/Loss (3.g. - 4.)	\$ (169,398)
7. Total Actuarial (Gain)/Loss (5. + 6.)	\$ 41,492

¹ Includes results for Variable Supplements Funds.

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

SECTION V – SCHEDULE OF FUNDING PROGRESS

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

Table V-1
Schedule of Funding Progress

NEW YORK CITY POLICE PENSION FUND (\$ Thousands)						
June 30 (Lag) Valuation Date	(1) Actuarial Value of Assets (AVA)	(2) Accrued Liability (AL)	(3) Unfunded AL (UAL) (2) - (1)	(4) Funded Ratio (1) / (2)	(5) Covered Payroll	(6) UAL as % of Covered Payroll (3) / (5)
2008	\$21,393,152	\$21,393,152	\$0	100.0%	\$3,095,904	0.0%
2009	22,676,172	22,676,172	0	100.0%	3,261,118	0.0%
2010	22,908,732	38,134,430	15,225,698	60.1%	3,464,097	439.5%
2011	24,748,860	40,524,580	15,775,720	61.1%	3,480,066	453.3%
2012	26,777,077	42,015,625	15,238,548	63.7%	3,478,154	438.1%
2013	29,087,154	43,900,094	14,812,940	66.3%	3,607,607	410.6%
2014	29,212,981	44,384,022	15,171,041	65.8%	3,618,095	419.3%
2015	31,092,977	45,297,561	14,204,584	68.6%	3,564,030	398.6%
2016	33,692,647	48,059,916	14,367,269	70.1%	3,717,425	386.5%
2017	34,162,505	47,696,250	13,533,745	71.6%	3,968,885	341.0%

Effective June 30, 2010, AL is based on the Entry Age Normal cost method. Previously, the Frozen Initial Liability cost method was used. Salaries shown are base salaries plus assumed overtime paid and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

SECTION VI - VARIABLE SUPPLEMENTS FUNDS (VSF)

The New York City Police Pension Fund administers both the Police Officer's Variable Supplements Fund (POVSF) and the Police Superior Officers' Variable Supplements Fund (PSOVSF). The POVSF and PSOVSF (the Funds) operate pursuant to the provisions of Title 13, Chapter 2 of the Administrative Code of the City of New York (ACCNY) and provide supplemental benefits to retirees who were Police Officers and Police Superior Officers, respectively, of the New York City Police Department, Subchapter One Pension Fund or New York City Police Department, Subchapter Two Pension Fund and who retired for service with 20 or more years of service on or after October 1, 1968.

Table VI-1
VSF Accrued Liability

(\$ Thousands)		
Valuation Date	June 30, 2017	June 30, 2016
POVSF		
Active	\$ 533,793	\$ 530,988
Retiree	<u>1,581,226</u>	<u>1,552,515</u>
Total	\$ 2,115,019	\$ 2,083,503
PSOVSF		
Active	\$ 1,239,598	\$ 1,186,177
Retiree	<u>2,396,749</u>	<u>2,346,636</u>
Total	\$ 3,636,347	\$ 3,532,813
Total VSF AL	\$ 5,751,366	\$ 5,616,316

Table VI-2
VSF Member Data

VARIABLE SUPPLEMENTS FUNDS				
MEMBERS INCLUDED IN THE JUNE 30, 2017 (LAG) AND JUNE 30, 2016 (LAG) ACTUARIAL VALUATIONS				
	June 30, 2017		June 30, 2016	
	POVSF	PSOVSF	POVSF	PSOVSF
Actives				
Number	23,519	12,646	23,685	12,276
Average Age	34.7	42.8	34.7	42.8
Retirees				
Number	12,602	18,750	12,418	18,357
Average Age	62.1	61.4	61.9	61.0

Table VI-3
VSF Statement of Assets

(\$ Thousands)				
Valuation Date	June 30, 2017 ¹		June 30, 2016	
	MVA ²	AVA	MVA ³	AVA
POVSF	\$ 2,100,606	\$ 2,234,906	\$ 1,384,204	\$ 1,609,663
PSOVSF	<u>1,839,768</u>	<u>1,996,403</u>	<u>635,460</u>	<u>822,340</u>
Total	\$ 3,940,374	\$ 4,231,309	\$ 2,019,664	\$ 2,432,003

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

² Includes Accrued Benefits Payable of \$75,739,000 for POVSF and \$112,389,000 for PSOVSF.

³ Includes Accrued Benefits Payable of \$76,586,000 for POVSF and \$113,709,000 for PSOVSF.

Table VI-4
Development of VSF Actuarial Value of Assets as of June 30, 2017

(\$ Thousands)		
	POVSF	PSOVSF
1. Market Value of Assets (MVA)		
a. Beginning of Year (BOY) ¹	\$ 1,384,204	\$ 635,460
b. End of Year (EOY) ²	\$ 2,100,606	\$ 1,839,768
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	\$ (158,989)	\$ (255,886)
4. Transferable Earnings from VSFs to QPP ³	\$ 708,636	\$ 1,419,802
5. Net Cash Flow (2.c. + 3. + 4.)	\$ 549,647	\$ 1,163,916
6. Net Investment Income		
a. Investment Income	\$ 167,316	\$ 40,537
b. Investment Expenses	<u>(561)</u>	<u>(145)</u>
c. Total Net Investment Income	\$ 166,755	\$ 40,392
7. Average Invested Assets		
a. AVA @ BOY	\$ 1,609,663	\$ 822,340
b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2)	<u>(79,495)</u>	<u>(127,943)</u>
c. Total	\$ 1,530,168	\$ 694,397
8. Expected Rate of Return (AIR)	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	\$ 107,112	\$ 48,608
10. Unexpected Investment Return (UIR) (6.c. - 9.)	\$ 59,643	\$ (8,216)
11. Preliminary AVA @ EOY		
a. AVA @ BOY (prior to corridor limit)	\$ 1,609,663	\$ 822,340
b. Net Cash Flow (5.)	549,647	1,163,916
c. Expected Investment Return (9.)	107,112	48,608
d. Phase in of UIR		
15% * UIR for prior year	8,946	(1,232)
15% * UIR for second prior year	(39,384)	(26,551)
15% * UIR for third prior year	(7,283)	(6,808)
15% * UIR for fourth prior year	7,306	(162)
20% * UIR for fifth prior year	6,019	(353)
20% * UIR for sixth prior year	<u>(7,120)</u>	<u>(3,355)</u>
Total	\$ (31,516)	\$ (38,461)
e. Preliminary AVA (11.a. + 11.b. + 11.c. + 11.d.)	\$ 2,234,906	\$ 1,996,403
12. Corridor		
a. 80% of MVA	\$ 1,680,485	\$ 1,471,814
b. 120% of MVA	\$ 2,520,727	\$ 2,207,721
13. Final AVA @ EOY (11e. bounded by 12.)	\$ 2,234,906	\$ 1,996,403

¹ Includes Accrued Benefits Payable of \$76,586,000 for POVSF and \$113,709,000 for PSOVSF.

² Includes Accrued Benefits Payable of \$75,739,000 for POVSF and \$112,389,000 for PSOVSF.

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

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

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

(\$ Thousands)	Preliminary ¹	
Total POLICE Pension Fund		
1. FY2017 Equity Earnings	\$	4,131,024
2. FY2017 Hypothetical Earnings		559,486
3. FY2017 Excess Earnings (1. - 2.)		3,571,538
4. Deficit at June 30, 2016		517,237
5. Hypothetical Interest Rate (HIR)		2.415%
6. Deficit with interest (4. x (1+HIR))		529,728
7. Potential SKIM (3. - 6.), not less than 0.	\$	3,041,810
	POVSF	PSOVSF
Allocations to VSF		
8. Allocation Percentage	53.447%	46.553%
9. Potential SKIM (7. x 8.)	\$ 1,625,756	\$ 1,416,054
10. Accumulated Benefit Obligation	2,100,802	3,570,520
11. MVA Prior to SKIM	1,362,606	423,768
12. ABO Gate = (10. - 11.)	738,196	3,146,752
13. SKIM Payable (Lesser of 9 and 12, not less than zero)	738,196	1,416,054
14. Rounded Estimate, for FY17 Financial Statements ¹	\$ 738,000	\$ 1,416,000

¹ Included in MVA at June 30, 2017.

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

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

E. VSF DROP

Members who retire 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.

Summary of VSF Actuarial Assumptions and Methods

Assumptions not detailed below are as described in SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS.

1. **POVSF vs. PSOVSF Membership:** Amongst current active members, 50% of members who become eligible for VSF benefits are assumed to retire as Police Officers, while the remaining 50% are assumed to retire as Police Superior Officers.
2. **COLA:** 1.5% per year for Auto COLA, used to estimate future COLA on the first \$18,000 of POLICE 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 POVSF and the PSOVSF 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 POLICE to the POVSF and the PSOVSF are recognized through a methodology where the PV of future VSF transfers from POLICE to the POVSF and PSOVSF is included directly as an actuarial liability of POLICE. This amount is computed as the excess, if any, of the PV of benefits of the POVSF and PSOVSF over the AVA of the POVSF and PSOVSF, 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 POLICE transfer to the Funds a portion of the amount by which earnings on equity investments of POLICE exceed what the earnings would have been had such funds been invested at the Hypothetical Interest Rate, less any negative Cumulative Earnings Differentials and other limitations, determined as follows:
 - a. *Hypothetical Interest Rate:* 115% of the average of monthly yields of 10-year U.S. Treasury Notes
 - b. *Hypothetical Fixed Income Securities Earnings:* Investment earnings had equities been invested in fixed income securities earning the Hypothetical Interest Rate
 - c. *Earnings Differential:* Difference between actual equity investment earnings and Hypothetical Fixed Income Securities Earnings
 - d. *Cumulative Earnings Differential:* The current year's positive Earnings Differential, offset by any negative Earnings Differentials from prior years accumulated with interest at the corresponding year's Hypothetical Interest Rate

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

SECTION VII - RISK AND UNCERTAINTY

The actuarial assumptions and methods adopted by the Board of Trustees during the Fiscal Year 2019 are referred to as the “2019 A&M.” The Fiscal Year 2019 employer contribution is based on the Census data reported as of June 30, 2017 and on the 2019 A&M.

The funded status of POLICE 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.

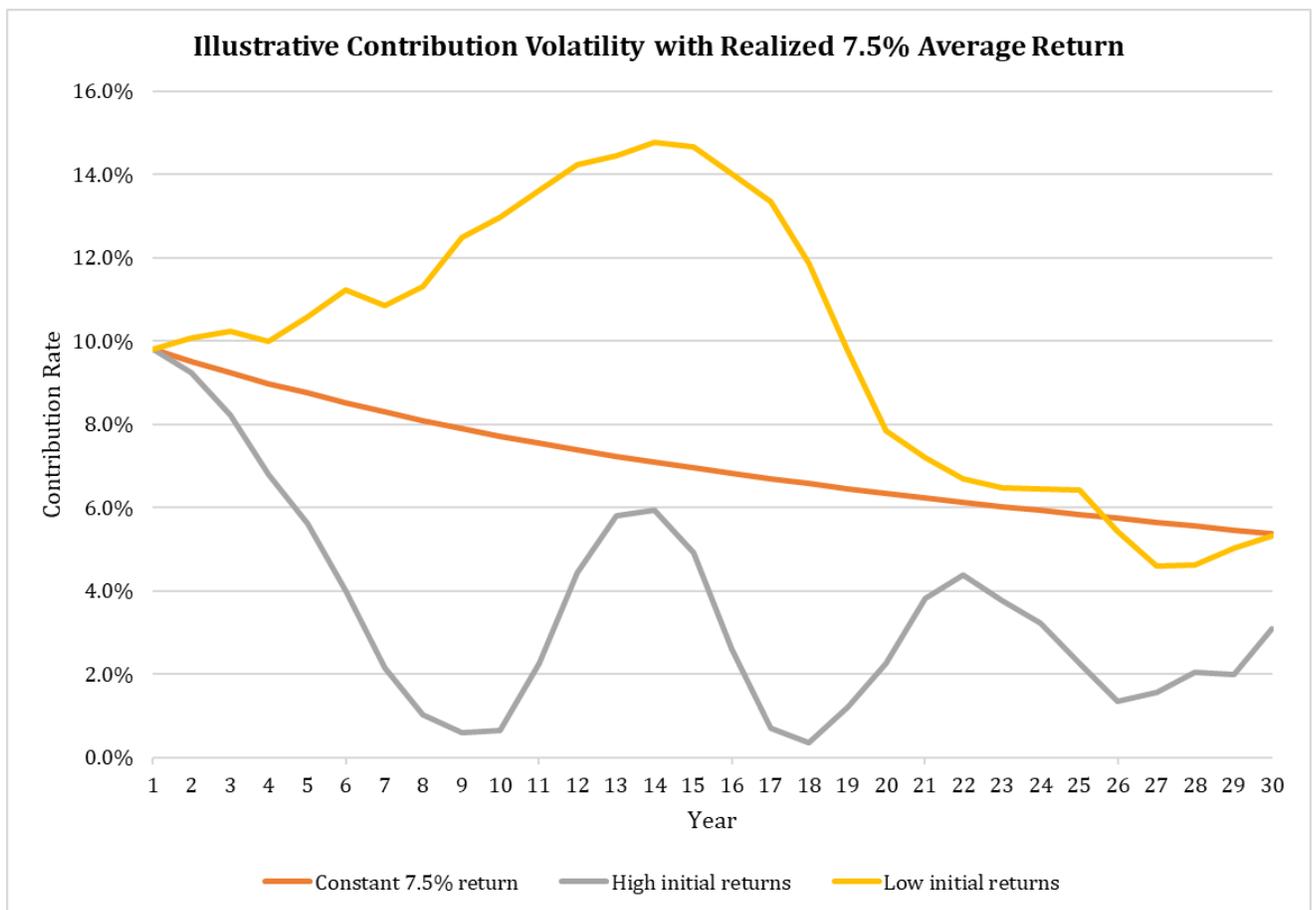
These risks have been separated, based on the Actuary’s professional judgement, into high, medium, and low risks.

High Risk Types

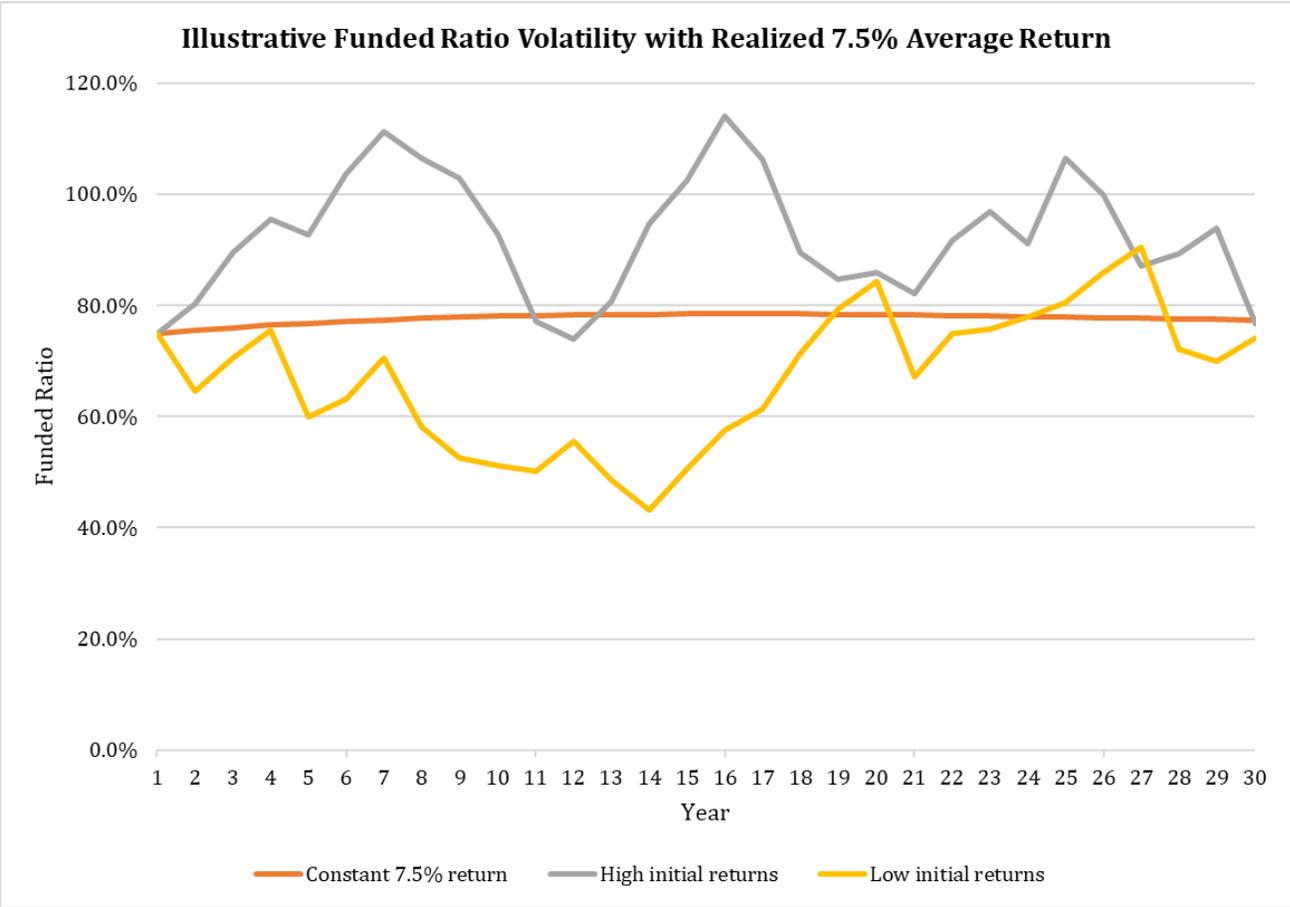
Investment Risk

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

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



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

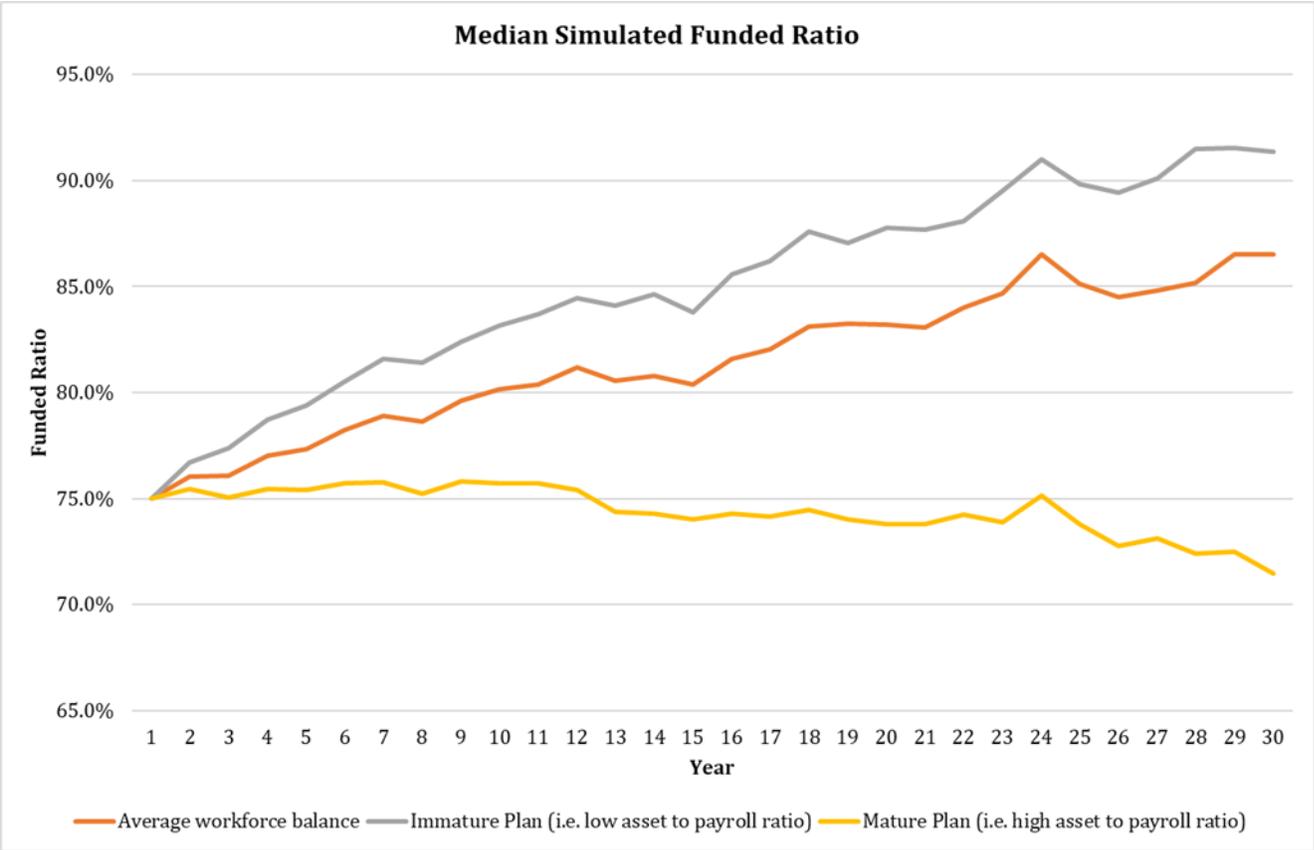
With respect to future fiscal years, it should be noted that POLICE is a mature retirement system. A mature pension fund has a significant ratio of retirees to active members and, usually, of assets to active member payroll and of Accrued Liability (AL) to active member payroll. These ratios, sometimes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

Valuation Date	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Fiscal Year	2019	2018
Volatility Ratios		
1. Market Value of Assets (MVA)	\$ 35,423,525,000	\$ 33,482,610,000
2. Actuarial Value of Assets (AVA)	34,162,505,000	33,692,647,000
3. Accrued Liability	47,696,249,723	48,059,916,306
4. Active Salary	3,968,885,246	3,717,425,239
5. Asset Volatility Ratio (MVA basis) (1. / 4.)	8.9	9.0
6. Asset Volatility Ratio (AVA basis) (2. / 4.)	8.6	9.1
7. Liability Volatility Ratio (3. / 4.)	12.0	12.9

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 another 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 67).

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. The sensitivity of the Accrued Liability, Unfunded Accrued Liability, Funded Ratio, and Normal Cost of the Plan are shown below:

NEW YORK CITY POLICE PENSION FUND	
SENSITIVITY ANALYSIS AS OF JUNE 30, 2017	
Valuation Date	June 30, 2017 (Lag)
Results at 7.0%	
1. Accrued Liability (AL)	\$ 47,696,249,723
2. Actuarial Value of Assets (AVA)	34,162,505,000
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 13,533,744,723
4. Funded Ratio (AVA Basis) (2. / 1.)	71.6%
5. Normal Cost	\$ 1,449,290,567
Results at 6.0%	
1. Accrued Liability (AL)	\$ 53,587,830,888
2. Actuarial Value of Assets (AVA)	34,162,505,000
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 19,425,325,888
4. Funded Ratio (AVA Basis) (2. / 1.)	63.8%
5. Normal Cost	\$ 1,767,883,537
Sensitivity Analysis for 1.0% Reduction in Interest Rate	
1. Increase in Accrued Liability	12.4%
2. Increase in Unfunded Accrued Liability	43.5%
3. Decrease in Funded Ratio	7.8%
4. Increase in Normal Cost	22.0%

Inflation Risk

POLICE faces risk in the event that inflation is higher than expected. Inflation is a key driver of the salary increase assumptions (affecting active members) and COLA assumptions (affecting both active members and pensioners/beneficiaries). More granular analysis is not currently available but will be considered in future years.

Longevity Risk

POLICE faces risk in its assumption of future mortality rates. Actuarial experience studies were used to develop the base mortality rates assumed in the valuation; Society of Actuaries mortality improvement scale MP-2018 was subsequently applied to these base rates.¹

This scale MP-2018 is an assumption regarding the *improvement* of future mortality rates as compared to mortality when the experience studies were completed. The scale was developed using large amounts of historical data from the Social Security Administration. Risk therefore exists that the mortality improvement inherent in the Plan population is higher than the improvement seen in the population provided by the Social Security Administration.

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

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

¹ Retirement Plans Experience Committee. “Mortality Improvement Scale MP-2018 Report.” *Society of Actuaries*.

² Retirement Plans Experience Committee. “Mortality Improvement Scale BB Report” *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 POLICE 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 generally face low contribution risk. City benefits are constitutionally protected, and participating employers have historically contributed to the actuarial contribution as certified by the Actuary. The Actuary believes the City will continue to do so in future years. See Table III-5 – ACTUARIAL AND STATUTORY CONTRIBUTION HISTORY.

Contribution risk may also increase in future years 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.

Intergenerational Equity Risk

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

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

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

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

SECTION VIII – SUMMARY OF PLAN PROVISIONS

A. Effective Date:

March 29, 1940

B. Eligibility Requirements:

Tier 1: Prior to July 1, 1973.

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

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

Tier 3 Revised: April 1, 2012 to March 31, 2017 and did not elect to join Tier 3 Enhanced.

Tier 3 Enhanced: On or after April 1, 2017 and those in Tier 3 and Tier 3 Revised who elected to join.

Eligible service includes City service in positions in the competitive class of the civil service for probationary periods or permanent appointments in the Police force; or City service in a position of Police Surgeon classified in the non-competitive class of civil service.

C. Member Contributions:

Tier 1 and Tier 2: Required Member Contributions – Based upon age at entry and elected retirement age, credited with regular and special interest. Contributions are required for the first 20 years.

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

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

Enhanced Plan members are required to contribute an additional 1.0% of salary for a maximum of 25 years.

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

Tier 1 and Tier 2: The City of New York pays a portion of member contributions. Effective October 1, 2000, the rate of ITHP contributions is 5.0% of salary, accumulated with regular and additional interest. The member may elect to waive the ITHP reduction from the full member rate and contribute at the full member rate, which results in additional benefits attributable to the ITHP contributions.

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

E. Credited Service:

Credited service is classified as Allowable Police 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 Police Service includes service in Uniformed Transit Police Force, Uniformed Housing Police Force, Uniformed Correction Force, Uniformed Sanitation Force, and the New York Fire Department, provided all such service immediately precedes the Uniformed Police Force service.
- **Tier 3, Tier 3 Revised, and Tier 3 Enhanced:** Police service includes service in the uniformed force of the New York Fire Department and the New York State and Local Police and Fire Retirement System.
- Members may purchase, subject to limitations in the law, years of certain wartime military service, combined military service, and service as police officers in a foreign country for the United States Government, and authorized Child Care Leave.

F. Salary Base:

Tier 1: Final Salary (FS): The contract rate of base pay and holiday pay on the last day paid, plus any overtime, night differential, and worked vacation earned in the previous 12 months, plus applicable longevity pay.

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

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 Revised and Tier 3 Enhanced: Final Average Salary (FAS). The average total pensionable compensation earned by a member during any five consecutive years based on the month and day of retirement that provides the highest average wages. If the wages earned during any year included in the period exceed the average of the prior four years by more than 10%, the amount in excess of 10% shall be excluded. Additionally, if the member was on a leave of absence without pay (e.g. suspension) at any time during the five year period, that time, not in excess of 12 months, will be excluded from the calculation and the same period of time immediately preceding the five-year period will be included for the final average salary.

G. Service Retirement

1. Eligibility

The eligibility requirements for normal service retirement and early service retirement 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 Revised/3 Enhanced	22	20

2. Benefits

a. Tier 1 and Tier 2

- i. 50% of [FS (Tier 1) or FAS (Tier 2)] plus 1/60th 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 the required amounts.

- b. Tier 3, Tier 3 Revised, and Tier 3 Enhanced
 - i. 2.1% of FAS times number of years of Credited Service for first 20 years plus 4.0% of FAS times number of years of Credited Service in excess of 20 years (total benefit limited to 50% of FAS), less 50% of the Primary Social Security Retirement benefit at age 62.

H. Disability Retirement

1. Accidental Disability (ADR)

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

b. Benefits

- i. Tier 1 and Tier 2

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

- ii. Tier 3 and Tier 3 Revised

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

- iii. Tier 3 Enhanced Plan

75% of FAS.

2. Ordinary Disability (ODR)

- a. Eligibility

- i. Tier 1 and Tier 2

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

ii. Tier 3 and Tier 3 Revised:

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

b. Benefits

i. Tier 1 and Tier 2

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

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

Minimum Benefit:

Less than 10 years of service: $\frac{1}{3}$ of [FS (Tier 1) or FAS (Tier 2)]

10 or more years of service: $\frac{1}{2}$ of [FS (Tier 1) or FAS (Tier 2)],

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

ii. Tier 3, Tier 3 Revised, and Tier 3 Enhanced

The greater of:

(a) 33-1/3% of FAS

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

less 50% of the Primary Social Security Disability Benefit (non-Enhanced Plan only).

I. Death Benefits

1. Accidental Death Benefits

a. Eligibility for All Tiers: Immediate.

b. Benefits

i. Tier 1 and Tier 2

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

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

ii. Tier 3, Tier 3 Revised, and Tier 3 Enhanced

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

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

2. Ordinary Death Benefit

a. Eligibility

i. Tier 1: Immediate

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

b. Benefits

i. Tier 1

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

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

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

ii. Tier 2

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

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

iii. Tier 3, Tier 3 Revised, and Tier 3 Enhanced

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

- c. Form of Payment: 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 Retirement After Termination

1. Eligibility: Five years of Credited Service for all Tiers
2. Benefits: A vestee may elect a refund of accumulated member contributions, but would then lose entitlement to a vested benefit. The Benefit at Service Retirement Date:

a. Tier 1 and Tier 2

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

b. Tier 3

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

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

c. Tier 3 Revised and Tier 3 Enhanced

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

In addition, the benefit is reduced by 50% of the Primary Social Security Retirement benefit at age 62 (non-Enhanced Plan only).

K. Forms of Payment

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

L. Loans

Applicable to Tier 1 and Tier 2 only.

1. Eligibility: After three years of membership and up to the day of retirement.
2. Amount: Up to 90% of accumulated member contributions with a limit of \$50,000 for tax-free treatment under IRC Section 72(p).

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

Applicable to all members.

1. Eligibility
 - a. Service Retirees: Age 62 and retired 5 years or age 55 and retired 10 years.
 - b. Disability Retirees: Retired 5 years.
 - c. Beneficiaries receiving accidental death benefits: Receiving benefits for 5 years.
2. Amount

Starting with benefits for September 2001, the Auto COLA percentage is 50% of the increase in CPI-U based upon the 12 months ending March 31 prior to the Auto COLA effective on the ensuing September 1, rounded to the next higher 0.1%. Such percentage shall not be less than 1.0% nor greater than 3.0%. This percentage is applied to the first \$18,000 of the total retirement benefit (including all prior Auto COLAs).

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

N. Escalation

Applicable to (1) all Tier 3 and Tier 3 Revised members and (2) Tier 3 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 non-Enhanced Plan disability retiree first becomes eligible for ODR/ADR.
 - c. Death Benefits: The first day of the month following the day which a beneficiary first becomes eligible for a death benefit paid other than in a lump sum.

3. Amount

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

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

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

4. Partial Escalation

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

O. WTC Disability Benefits

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

P. WTC Death Benefits

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

Q. Changes Since the Prior Valuation

None.

SECTION IX - CHAPTER AMENDMENTS

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

- **Chapter 59 of the Laws of 2017** (Chapter 59/17), Part SSS, signed into law on April 10, 2017, changes the Accidental Disability Retirement and Ordinary Disability Retirement benefits for current Tier 3 and Tier 3 Revised members who elect to participate in the Enhanced Disability Benefits. 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 1% of wages.
 - The Enhanced Accidental Disability Benefit is equal to 75% of FAS5.
 - The Enhanced Ordinary Disability Benefit is equal to the greater of:
 - 33-1/3% of FAS5, or
 - 2% of FAS5 multiplied by years of credited service (not in excess of 22 years).
- **Chapter 76 of the Laws of 2017** (Chapter 76/17) grants a 3% COLA increase to beneficiaries receiving Special Accidental Death Benefits pursuant to GML 208-f. (Similar legislation was enacted in each of the previous years.)
- **Chapter 326 of the Laws of 2016** (Chapter 326/16) extends the deadline to file a Notice of Participation in the World Trade Center Rescue, Recovery, and Cleanup Operations to September 11, 2018.
- **Chapter 41 of the Laws of 2016** (Chapter 41/16) provides up to three years of service credit to members of public retirement systems of the State of New York for military service. Chapter 41/16 removes the requirement that such military service occur during specified periods of hostilities. This law will be reflected in future valuations as participants request military service credit.
- **Chapter 489 of the Laws of 2013** (Chapter 489/13), addressed limitations in existing disability provisions intended to protect public employees who suffered injuries or illnesses in WTC rescue, recovery, and cleanup operations.
- **Chapter 3 of the Laws of 2013** (Chapter 3/13), effective retroactive to July 1, 2011, enacted new actuarial assumptions and methods that require State legislation.

SECTION X - SUBSEQUENT EVENTS

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

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

SECTION XI - ACTUARIAL ASSUMPTIONS AND METHODS

The Actuary issued a Report entitled, "Proposed Changes in Actuarial Assumptions and Methods Used in Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2018 for the New York City Police Pension Fund," dated January 2, 2019. The actuarial assumptions and methods described in that report were adopted by the Board of Trustees at the March 13, 2019 Board meeting and are referred to as the "2019 A&M."

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

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

NEW YORK CITY POLICE PENSION FUND		
PROBABILITIES OF SERVICE RETIREMENT RETIREMENT WITH FULL COLA/ESCALATION FOR THOSE ELIGIBLE FOR UNREDUCED		
Age	Years of Service Since First Eligible	
	Year 1	Ultimate
19	0.00%	0.00%
20	0.00%	0.00%
21	0.00%	0.00%
22	0.00%	0.00%
23	0.00%	0.00%
24	0.00%	0.00%
25	0.00%	0.00%
26	0.00%	0.00%
27	0.00%	0.00%
28	0.00%	0.00%
29	0.00%	0.00%
30	0.00%	0.00%
31	0.00%	0.00%
32	0.00%	0.00%
33	0.00%	0.00%
34	0.00%	0.00%
35	0.00%	0.00%
36	45.00%	0.00%
37	45.00%	10.00%
38	45.00%	10.00%
39	45.00%	10.00%
40	45.00%	10.00%
41	45.00%	10.00%
42	45.00%	10.00%
43	45.00%	10.00%
44	45.00%	10.00%
45	45.00%	10.00%
46	45.00%	11.00%
47	45.00%	12.00%
48	45.00%	13.00%
49	45.00%	14.00%
50	45.00%	15.00%
51	45.00%	15.00%
52	45.00%	15.00%
53	45.00%	15.00%
54	45.00%	15.00%
55	45.00%	15.00%
56	45.00%	15.00%
57	45.00%	15.00%
58	45.00%	15.00%
59	45.00%	15.00%
60	45.00%	20.00%
61	45.00%	30.00%
62	45.00%*	50.00%*
63	100.00%	100.00%

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

Table XI-1b
Early Service Retirement

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

Table XI-2
Active Termination Rates

NEW YORK CITY POLICE PENSION FUND	
PROBABILITIES OF TERMINATION	
Years Of Service	Probability of Termination
0	3.000%
1	2.250%
2	1.500%
3	1.500%
4	1.500%
5	1.500%
6	1.350%
7	1.200%
8	1.050%
9	0.900%
10	0.750%
11	0.600%
12	0.450%
13	0.380%
14	0.300%
15	0.230%
16	0.150%
17	0.150%
18	0.150%
19	0.150%
20	N/A

**Table XI-3
Active Disability Rates**

NEW YORK CITY POLICE PENSION FUND					
PROBABILITIES OF DISABILITY RETIREMENT					
		Accidental Disability			
		Tier 1 and Tier 2		Tier 3 and Tier 3 Revised	
Age	Ordinary Disability	Not Eligible for WTC Benefits	Eligible for WTC Benefits	Enhanced Plan	Non-Enhanced Plan
15	0.0360%	0.098%	0.168%	0.098%	0.098%
16	0.0360%	0.098%	0.168%	0.098%	0.098%
17	0.0360%	0.098%	0.168%	0.098%	0.098%
18	0.0360%	0.098%	0.168%	0.098%	0.098%
19	0.0360%	0.098%	0.168%	0.098%	0.098%
20	0.0400%	0.105%	0.180%	0.105%	0.105%
21	0.0440%	0.112%	0.192%	0.112%	0.112%
22	0.0480%	0.119%	0.204%	0.119%	0.119%
23	0.0520%	0.126%	0.216%	0.126%	0.126%
24	0.0560%	0.133%	0.228%	0.133%	0.133%
25	0.0600%	0.140%	0.240%	0.140%	0.140%
26	0.0640%	0.182%	0.312%	0.182%	0.182%
27	0.0680%	0.224%	0.384%	0.224%	0.224%
28	0.0720%	0.266%	0.456%	0.266%	0.266%
29	0.0760%	0.308%	0.528%	0.308%	0.308%
30	0.0800%	0.350%	0.600%	0.350%	0.350%
31	0.0840%	0.420%	0.720%	0.420%	0.420%
32	0.0880%	0.490%	0.840%	0.490%	0.490%
33	0.0920%	0.560%	0.960%	0.560%	0.560%
34	0.0960%	0.630%	1.080%	0.630%	0.630%
35	0.1000%	0.700%	1.200%	0.700%	0.700%
36	0.1040%	0.735%	1.260%	0.735%	0.728%
37	0.1080%	0.770%	1.320%	0.770%	0.756%
38	0.1120%	0.805%	1.380%	0.805%	0.784%
39	0.1160%	0.840%	1.440%	0.840%	0.812%
40	0.1200%	0.875%	1.500%	0.875%	0.840%
41	0.1240%	0.910%	1.560%	0.910%	0.854%
42	0.1280%	0.945%	1.620%	0.945%	0.868%
43	0.1320%	0.980%	1.680%	0.980%	0.882%
44	0.1360%	1.015%	1.740%	1.015%	0.896%
45	0.1400%	1.050%	1.800%	1.050%	0.910%
46	0.1440%	1.120%	1.920%	1.120%	0.938%
47	0.1480%	1.190%	2.040%	1.190%	0.966%
48	0.1520%	1.260%	2.160%	1.260%	0.994%
49	0.1560%	1.330%	2.280%	1.330%	1.022%
50	0.1600%	1.400%	2.400%	1.400%	1.050%
51	0.2000%	1.540%	2.640%	1.540%	1.120%
52	0.2400%	1.680%	2.880%	1.680%	1.190%
53	0.3200%	1.820%	3.120%	1.820%	1.260%
54	0.4800%	1.960%	3.360%	1.960%	1.330%
55	0.6400%	2.100%	3.600%	2.100%	1.400%
56	0.8000%	2.380%	4.080%	2.380%	1.540%
57	1.6000%	2.660%	4.560%	2.660%	1.680%
58	2.4000%	2.940%	5.040%	2.940%	1.820%
59	3.2000%	3.220%	5.520%	3.220%	1.960%
60	4.8000%	3.500%	6.000%	3.500%	2.100%
61	6.4000%	4.200%	7.200%	4.200%	2.240%
62	8.0000%*	4.900%*	8.400%*	4.900%*	2.450%*
63	N/A	N/A	N/A	N/A	N/A

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

Table XI-4
Active Mortality Rates

NEW YORK CITY POLICE PENSION FUND			
PROBABILITIES OF ACTIVE MEMBER MORTALITY			
	Ordinary Death		Accidental Death
Age	Males	Females	All
15	0.040%	0.030%	0.010%
16	0.040%	0.030%	0.010%
17	0.040%	0.030%	0.010%
18	0.040%	0.030%	0.010%
19	0.040%	0.030%	0.010%
20	0.040%	0.030%	0.010%
21	0.040%	0.030%	0.010%
22	0.040%	0.030%	0.010%
23	0.040%	0.030%	0.010%
24	0.040%	0.030%	0.010%
25	0.040%	0.030%	0.010%
26	0.040%	0.030%	0.010%
27	0.040%	0.030%	0.010%
28	0.040%	0.030%	0.010%
29	0.040%	0.030%	0.010%
30	0.040%	0.030%	0.010%
31	0.040%	0.030%	0.011%
32	0.040%	0.030%	0.012%
33	0.040%	0.030%	0.013%
34	0.040%	0.030%	0.014%
35	0.040%	0.030%	0.015%
36	0.042%	0.032%	0.016%
37	0.044%	0.034%	0.017%
38	0.046%	0.036%	0.018%
39	0.048%	0.038%	0.019%
40	0.050%	0.040%	0.020%
41	0.060%	0.046%	0.021%
42	0.070%	0.052%	0.022%
43	0.080%	0.058%	0.023%
44	0.090%	0.064%	0.024%
45	0.100%	0.070%	0.025%
46	0.110%	0.076%	0.026%
47	0.120%	0.082%	0.027%
48	0.130%	0.088%	0.028%
49	0.140%	0.094%	0.029%
50	0.150%	0.100%	0.030%
51	0.160%	0.110%	0.031%
52	0.170%	0.120%	0.032%
53	0.180%	0.130%	0.033%
54	0.190%	0.140%	0.034%
55	0.200%	0.150%	0.035%
56	0.220%	0.160%	0.036%
57	0.240%	0.170%	0.037%
58	0.260%	0.180%	0.038%
59	0.280%	0.190%	0.039%
60	0.300%	0.200%	0.040%
61	0.320%	0.220%	0.041%
62	0.340%*	0.240%*	0.0420%*
63	N/A	N/A	N/A

*Proposed probabilities are N/A for Tier 3, Tier 3 Revised, and Tier 3 Enhanced members.

Table XI-5
Service Retiree Mortality

NEW YORK CITY POLICE PENSION FUND					
PROBABILITIES OF MORTALITY FOR SERVICE RETIREES					
BASE TABLE					
Age	Males	Females	Age	Males	Females
15	0.0100%	0.0084%	68	1.4988%	1.0632%
16	0.0135%	0.0103%	69	1.6917%	1.1644%
17	0.0181%	0.0112%	70	1.8929%	1.2629%
18	0.0217%	0.0131%	71	2.1028%	1.4563%
19	0.0240%	0.0140%	72	2.3212%	1.6586%
20	0.0251%	0.0142%	73	2.5833%	1.8689%
21	0.0268%	0.0150%	74	2.8558%	2.0889%
22	0.0284%	0.0158%	75	3.1397%	2.3314%
23	0.0301%	0.0168%	76	3.4343%	2.6045%
24	0.0315%	0.0179%	77	3.7415%	2.8700%
25	0.0327%	0.0191%	78	4.2304%	3.1787%
26	0.0342%	0.0204%	79	4.7399%	3.4795%
27	0.0354%	0.0217%	80	5.2682%	3.8105%
28	0.0371%	0.0231%	81	5.7202%	4.3289%
29	0.0394%	0.0247%	82	6.1782%	4.8678%
30	0.0427%	0.0265%	83	7.0179%	5.4288%
31	0.0492%	0.0316%	84	7.8631%	5.9122%
32	0.0556%	0.0360%	85	8.7167%	6.3661%
33	0.0616%	0.0398%	86	9.5810%	7.1650%
34	0.0669%	0.0427%	87	10.4516%	8.0050%
35	0.0724%	0.0455%	88	11.8437%	8.8541%
36	0.0755%	0.0474%	89	13.2486%	9.6498%
37	0.0779%	0.0497%	90	14.6752%	10.5687%
38	0.0808%	0.0521%	91	16.3354%	12.0267%
39	0.0845%	0.0551%	92	18.0374%	13.4340%
40	0.0901%	0.0588%	93	19.7642%	14.8636%
41	0.1003%	0.0633%	94	21.5622%	16.4543%
42	0.1106%	0.0702%	95	23.4692%	17.7952%
43	0.1212%	0.0792%	96	25.3619%	19.0707%
44	0.1323%	0.0907%	97	27.1816%	20.2419%
45	0.1439%	0.1052%	98	29.0095%	21.1759%
46	0.1563%	0.1228%	99	30.6920%	21.8544%
47	0.1693%	0.1427%	100	32.1584%	22.1859%
48	0.1827%	0.1652%	101	33.7521%	23.0680%
49	0.1964%	0.1865%	102	35.1259%	24.0803%
50	0.2104%	0.1992%	103	36.3671%	25.2770%
51	0.2802%	0.2104%	104	37.3834%	26.6309%
52	0.3506%	0.2186%	105	38.1051%	28.0912%
53	0.4209%	0.2250%	106	38.4698%	29.6244%
54	0.4903%	0.2863%	107	38.6325%	31.1943%
55	0.5297%	0.3409%	108	38.8076%	32.7579%
56	0.5857%	0.3910%	109	38.9794%	34.2712%
57	0.6387%	0.4376%	110	50.0000%	50.0000%
58	0.6875%	0.4613%	111	50.0000%	50.0000%
59	0.7316%	0.5005%	112	50.0000%	50.0000%
60	0.7720%	0.5393%	113	50.0000%	50.0000%
61	0.8439%	0.5785%	114	50.0000%	50.0000%
62	0.9155%	0.6152%	115	50.0000%	50.0000%
63	0.9888%	0.6536%	116	50.0000%	50.0000%
64	1.0644%	0.7279%	117	50.0000%	50.0000%
65	1.1433%	0.8032%	118	50.0000%	50.0000%
66	1.2263%	0.8884%	119	50.0000%	50.0000%
67	1.3135%	0.9736%	120	100.0000%	100.0000%

Table XI-6
Disabled Retiree Mortality

NEW YORK CITY POLICE PENSION FUND					
PROBABILITIES OF MORTALITY FOR DISABLED RETIREES					
BASE TABLE					
Age	Males	Females	Age	Males	Females
15	0.0138%	0.0095%	68	1.8368%	1.2141%
16	0.0187%	0.0117%	69	2.0342%	1.3912%
17	0.0252%	0.0127%	70	2.2544%	1.5837%
18	0.0301%	0.0148%	71	2.5045%	1.7848%
19	0.0334%	0.0159%	72	2.7644%	1.9944%
20	0.0347%	0.0168%	73	3.0535%	2.2258%
21	0.0371%	0.0185%	74	3.3359%	2.4880%
22	0.0402%	0.0205%	75	3.6300%	2.7766%
23	0.0431%	0.0227%	76	4.1253%	3.0785%
24	0.0467%	0.0251%	77	4.6178%	3.3525%
25	0.0503%	0.0274%	78	5.1289%	3.6752%
26	0.0544%	0.0298%	79	5.5682%	4.1794%
27	0.0586%	0.0322%	80	6.0116%	4.7030%
28	0.0633%	0.0348%	81	6.7832%	5.2484%
29	0.0681%	0.0374%	82	7.6009%	5.7185%
30	0.0730%	0.0400%	83	8.4279%	6.1948%
31	0.0781%	0.0425%	84	9.2040%	7.0110%
32	0.0830%	0.0450%	85	10.1002%	7.8321%
33	0.0898%	0.0476%	86	11.5115%	8.6046%
34	0.0933%	0.0491%	87	12.7944%	9.3702%
35	0.0972%	0.0512%	88	14.1662%	10.2595%
36	0.1019%	0.0534%	89	15.7578%	11.5941%
37	0.1080%	0.0563%	90	17.3856%	12.9378%
38	0.1153%	0.0590%	91	19.0388%	14.3081%
39	0.1286%	0.0629%	92	20.6360%	15.3704%
40	0.1417%	0.0688%	93	22.5718%	16.4875%
41	0.1550%	0.0766%	94	24.4562%	17.6613%
42	0.1690%	0.0865%	95	26.1404%	18.7606%
43	0.1838%	0.0992%	96	28.0695%	19.7397%
44	0.1997%	0.1148%	97	29.6855%	20.6328%
45	0.2170%	0.1330%	98	30.9177%	21.2676%
46	0.2279%	0.1538%	99	32.6552%	21.8544%
47	0.2387%	0.1769%	100	33.9880%	22.1859%
48	0.2492%	0.2017%	101	34.9681%	23.0680%
49	0.3237%	0.2316%	102	35.9346%	24.0803%
50	0.3948%	0.2637%	103	36.6434%	25.2770%
51	0.4620%	0.2870%	104	37.3834%	26.6309%
52	0.5249%	0.3323%	105	38.1051%	28.0912%
53	0.5528%	0.3677%	106	38.4698%	29.6244%
54	0.5891%	0.4196%	107	38.6325%	31.1943%
55	0.6260%	0.4722%	108	38.8076%	32.7579%
56	0.6814%	0.5135%	109	38.9794%	34.2712%
57	0.7288%	0.5258%	110	50.0000%	50.0000%
58	0.7710%	0.5452%	111	50.0000%	50.0000%
59	0.8525%	0.5823%	112	50.0000%	50.0000%
60	0.9273%	0.6153%	113	50.0000%	50.0000%
61	1.0007%	0.6486%	114	50.0000%	50.0000%
62	1.0735%	0.7169%	115	50.0000%	50.0000%
63	1.1411%	0.7851%	116	50.0000%	50.0000%
64	1.2250%	0.8630%	117	50.0000%	50.0000%
65	1.3055%	0.9419%	118	50.0000%	50.0000%
66	1.4653%	1.0252%	119	50.0000%	50.0000%
67	1.6473%	1.1204%	120	100.0000%	100.0000%

Table XI-7
Beneficiary Mortality

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

**Table XI-8
Salary Scale**

NEW YORK CITY POLICE PENSION FUND		
ANNUAL RATES OF MERIT AND SALARY INCREASE		
Years of Service	Merit Increase	Salary Increase*
0	0.00%	3.00%
1	5.00%	8.00%
2	11.00%	14.00%
3	14.00%	17.00%
4	20.00%	23.00%
5	38.00%	41.00%
6	1.60%	4.60%
7	1.80%	4.80%
8	2.00%	5.00%
9	3.60%	6.60%
10	2.30%	5.30%
11	2.20%	5.20%
12	2.10%	5.10%
13	2.00%	5.00%
14	3.30%	6.30%
15	1.70%	4.70%
16	1.60%	4.60%
17	1.50%	4.50%
18	1.40%	4.40%
19	2.70%	5.70%
20	1.20%	4.20%
21	1.00%	4.00%
22	0.90%	3.90%
23	0.80%	3.80%
24	0.70%	3.70%
25	0.60%	3.60%
26	0.50%	3.50%
27	0.50%	3.50%
28	0.50%	3.50%
29	0.50%	3.50%
30+	0.50%	3.50%

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

**Table XI-9
Overtime Assumptions**

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

Additional Assumptions and Methods

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

	Adjustment Factor	
	Male	Female
Service Retiree	0.910	0.910
Disabled Retiree	0.876	0.876
Beneficiary	0.890	0.951

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

The AAVM recognizes investment returns greater or less than expected over a period of six years.

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

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

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

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

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

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

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

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

Under EAN, the explicit UALs that are developed each year are generally financed over fixed periods. Ideally, these periods are reasonably consistent with the expected future working lifetimes of all active participants. For more information, see Page 12.

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

9. **Lump Sum Death Benefits:** Liabilities for group life lump sum death benefits are calculated under the One-Year Term Cost method.
10. **Allowances for Administrative Expenses:** The Employer Contribution for a fiscal year is increased by the interest-adjusted amount of administrative expenses paid from POLICE during the second prior fiscal year.
11. **WTC Disability and Death Benefits:** Obligations attributable to the WTC Disability Law and to the WTC Death Benefits Law are determined through the use of explicit assumptions in the 2019 A&M, and through estimation techniques for post-retirement reclassifications.
12. **One-year Lag Methodology (OYLM):** One-year Lag Methodology uses a June 30, XX-2 valuation date to determine Fiscal Year XX employer contributions.

This methodology requires adjustments to certain components used to determine the Fiscal Year XX employer contributions as follows:

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

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

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

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

- The handling of the VSF offset due to escalation for Tier 3, Tier 3 Revised, and Tier 3 Enhanced members. Future VSF payments were previously offset by expected escalation on members' pension. Beginning with this valuation, an offset for future escalation is no longer included.
- Beginning with this valuation, non-uniformed service by individual is collected and valued accordingly for Tier 1 and Tier 2 members.

SECTION XII - SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2017 (Lag) and June 30, 2016 (Lag) actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employer's payroll facilities. Financial information was provided by the Office of the Comptroller as of June 30, 2017 and June 30, 2016.

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

Table XII-1
Status Reconciliation

CHANGES IN THE NUMBER OF ACTIVES AND PENSIONERS DURING THE FISCAL YEAR CLASSIFIED BY STATUS										
Status	(1) Active Members	(2) Active Off Payroll	(3) Deferred Vested	(4) Service Pension	(5) Ordinary Disability	(6) Accidental Disability	(7) Accidental Death	(8) Other Beneficiary	(9) Pensioners Subtotal (4) to (8)	(10) Grand Total (1) + (2) + (3) + (9)
Number at June 30, 2016	35,961	1,659	574	32,491	2,996	12,430	389	845	49,151	87,345
New Entrants	2,108	80	0	0	0	0	18	2	20	2,208
Rehires	91	(79)	(4)	(8)	0	0	0	0	(8)	0
Leaving Active Payroll	(328)	328	0	0	0	0	0	0	0	0
Vested Termination	(45)	(3)	48	0	0	0	0	0	0	0
Non-Vested Termination / Cashout	(194)	(160)	(15)	0	0	0	0	0	0	(369)
Accidental Death (from Active)	(5)	0	0	0	0	0	5	0	5	0
Ordinary Death (from Active)	(30)	0	(2)	0	0	0	0	0	0	(32)
Service Retirement	(1,145)	(3)	(97)	1,245	0	0	0	0	1,245	0
Ordinary Disability Retirement	(39)	0	(1)	0	40	0	0	0	40	0
Accidental Disability Retirement	(209)	0	(1)	0	0	210	0	0	210	0
Reclassifications	0	0	0	(81)	(5)	79	21	(14)	0	0
Death with Beneficiary	0	0	0	(39)	(4)	(12)	0	55	0	0
Death without Beneficiary	0	0	0	(515)	(92)	(195)	(7)	(51)	(860)	(860)
Off Pension Payroll	0	0	0	0	0	0	(1)	(3)	(4)	(4)
Net Change	204	163	(72)	602	(61)	82	36	(11)	648	943
Number at June 30, 2017	36,165	1,822	502	33,093	2,935	12,512	425	834	49,799	88,288

Graph XII-2
Headcount Summary by Status

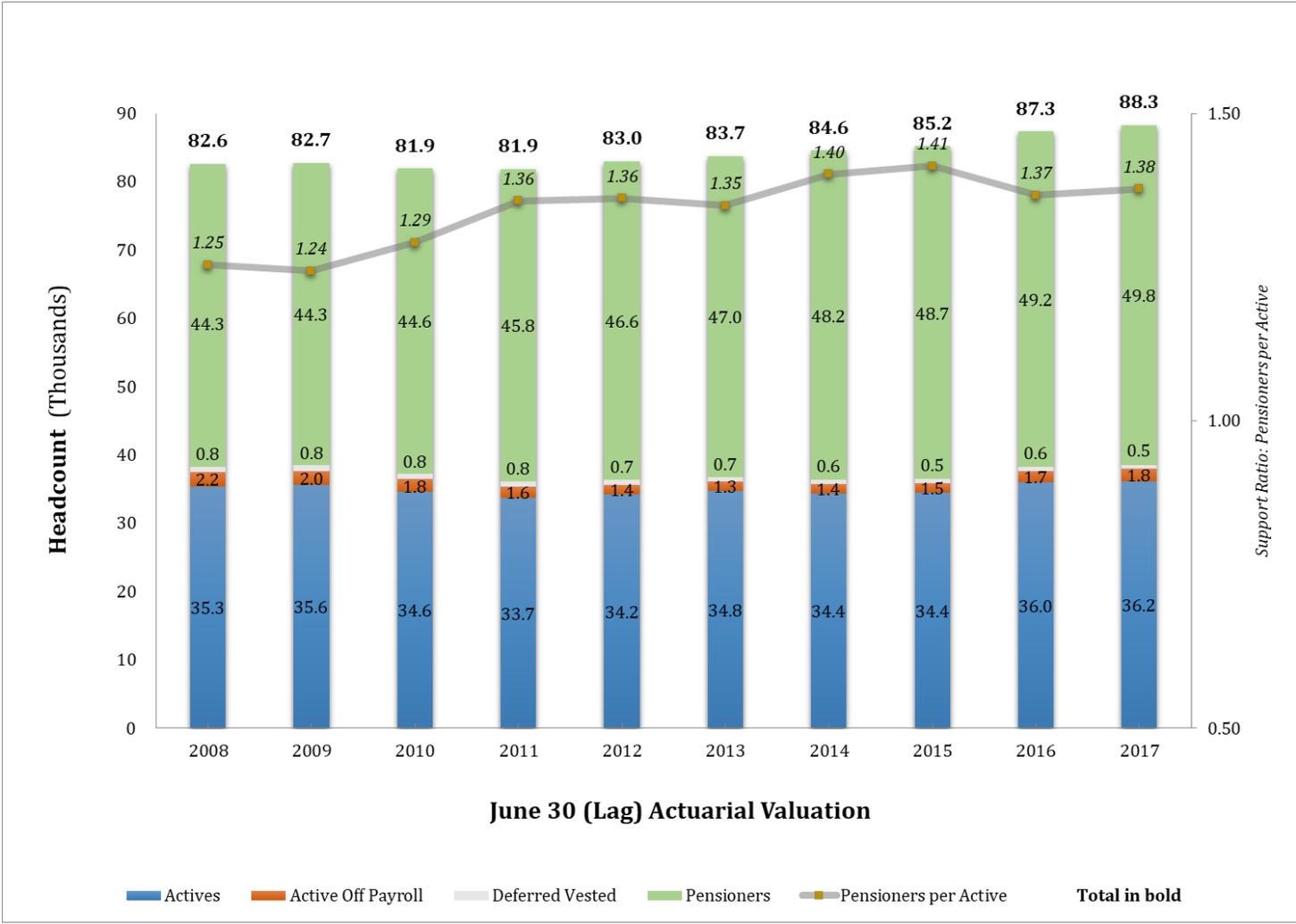


Table XII-3
Summary of Active Membership

NEW YORK CITY POLICE PENSION FUND		
ACTIVE MEMBERS INCLUDED IN THE JUNE 30, 2017 (LAG) AND THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATIONS		
	June 30, 2017 (Lag)	June 30, 2016 (Lag)
Number		
Males	29,813	29,770
Females	<u>6,352</u>	<u>6,191</u>
Total	36,165	35,961
Annual Salary ¹		
Males	\$ 3,298,631,050	\$ 3,098,053,696
Females	<u>670,254,196</u>	<u>619,371,543</u>
Total	\$ 3,968,885,246	\$ 3,717,425,239
Average Salary ¹		
Males	\$ 110,644	\$ 104,066
Females	105,519	100,044
Total Average	\$ 109,744	\$ 103,374
Average Age		
Males	37.6	37.5
Females	37.4	37.4
Total Average	37.5	37.5
Average Past Service		
Males	11.7	11.5
Females	10.7	10.7
Total Average	11.5	11.4

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

Graph XII-4
Active Membership by Tier

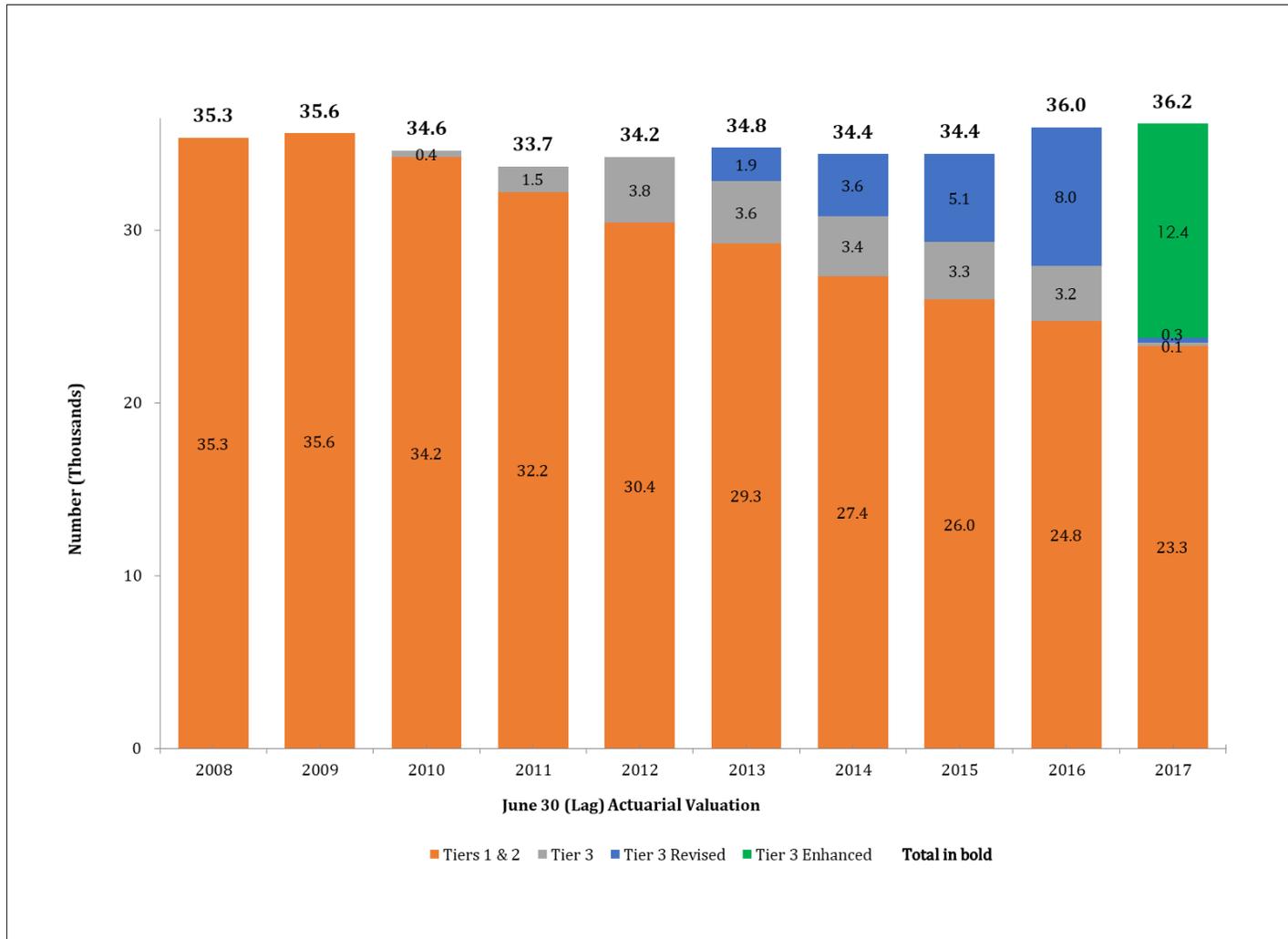


Table XII-5
Schedule of Active Member Salary Data

June 30 (Lag) Actuarial Valuation	Number	Annual Salary	Average Annual Salary	Percentage Increase/ (Decrease) In Avg. Salary
2008 (Lag)	35,337	\$3,095,903,827	\$87,611	3.4%
2009 (Lag)	35,608	3,261,118,111	91,584	4.5%
2010 (Lag)	34,597	3,464,096,750	100,127	9.3%
2011 (Lag)	33,705	3,480,066,072	103,251	3.1%
2012 (Lag)	34,240	3,478,153,934	101,582	(1.6%)
2013 (Lag)	34,775	3,607,606,894	103,741	2.1%
2014 (Lag)	34,402	3,618,095,284	105,171	1.4%
2015 (Lag)	34,435	3,564,029,659	103,500	(1.6%)
2016 (Lag)	35,961	3,717,425,239	103,374	(0.1%)
2017 (Lag)	36,165	3,968,885,246	109,744	6.2%

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

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2017

ALL TIERS: MALES											
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	1,418	0	0	0	0	0	0	0	0	0	1,418
25 TO 29	3,939	943	2	0	0	0	0	0	0	0	4,884
30 TO 34	1,814	2,785	1,755	7	0	0	0	0	0	0	6,361
35 TO 39	673	978	3,299	1,039	3	0	0	0	0	0	5,992
40 TO 44	126	349	1,344	2,267	659	4	0	0	0	0	4,749
45 TO 49	1	46	585	1,093	1,538	658	5	0	0	0	3,926
50 TO 54	3	1	58	354	578	590	286	0	0	0	1,870
55 TO 59	2	0	1	33	101	110	174	88	0	0	509
60 TO 64	0	2	1	6	6	6	30	38	1	0	90
65 TO 69	0	2	0	4	2	1	1	0	0	0	10
70 & UP	0	0	2	1	0	0	0	0	1	0	4
TOTAL	7,976	5,106	7,047	4,804	2,887	1,369	496	126	2	0	29,813

<i>SALARIES (IN THOUSANDS):</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	83,946	0	0	0	0	0	0	0	0	0	83,946
25 TO 29	263,061	101,069	156	0	0	0	0	0	0	0	364,286
30 TO 34	126,603	317,761	215,453	824	0	0	0	0	0	0	660,641
35 TO 39	47,214	110,747	407,346	134,710	416	0	0	0	0	0	700,433
40 TO 44	9,325	39,769	163,596	298,235	94,067	517	0	0	0	0	605,508
45 TO 49	74	5,324	72,008	140,948	216,316	98,458	777	0	0	0	533,905
50 TO 54	391	120	6,984	45,634	78,482	84,858	43,093	0	0	0	259,562
55 TO 59	258	0	146	4,273	13,543	14,600	25,505	15,496	0	0	73,822
60 TO 64	0	293	160	843	914	816	4,298	6,589	195	0	14,107
65 TO 69	0	293	0	547	374	224	224	0	0	0	1,663
70 & UP	0	0	294	303	0	0	0	0	162	0	759
TOTAL *	530,872	575,375	866,144	626,315	404,112	199,473	73,898	22,085	357	0	3,298,631

<i>AVERAGE SALARIES: **</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	59,200	0	0	0	0	0	0	0	0	0	59,200
25 TO 29	66,784	107,178	78,105	0	0	0	0	0	0	0	74,588
30 TO 34	69,792	114,097	122,765	117,714	0	0	0	0	0	0	103,858
35 TO 39	70,154	113,238	123,476	129,654	138,832	0	0	0	0	0	116,895
40 TO 44	74,004	113,952	121,723	131,555	142,742	129,187	0	0	0	0	127,502
45 TO 49	73,694	115,747	123,091	128,955	140,648	149,632	155,321	0	0	0	135,992
50 TO 54	130,407	119,744	120,422	128,909	135,781	143,828	150,676	0	0	0	138,803
55 TO 59	129,116	0	146,334	129,475	134,087	132,729	146,582	176,094	0	0	145,033
60 TO 64	0	146,334	159,616	140,460	152,273	135,976	143,280	173,384	195,072	0	156,740
65 TO 69	0	146,334	0	136,690	187,123	224,453	224,453	0	0	0	166,258
70 & UP	0	0	146,855	302,854	0	0	0	0	161,976	0	189,635
TOTAL	66,559	112,686	122,910	130,374	139,976	145,707	148,988	175,277	178,524	0	110,644

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

* Total may not add up due to rounding.

** Average based on unrounded salary.

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

ALL TIERS: FEMALES											
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	239	0	0	0	0	0	0	0	0	0	239
25 TO 29	887	152	0	0	0	0	0	0	0	0	1,039
30 TO 34	503	516	336	0	0	0	0	0	0	0	1,355
35 TO 39	211	238	753	221	0	0	0	0	0	0	1,423
40 TO 44	31	92	379	543	69	2	0	0	0	0	1,116
45 TO 49	0	11	149	349	223	64	0	0	0	0	796
50 TO 54	0	0	8	98	90	94	19	0	0	0	309
55 TO 59	1	1	0	4	18	24	13	7	0	0	68
60 TO 64	0	0	0	0	0	0	2	5	0	0	7
65 TO 69	0	0	0	0	0	0	0	0	0	0	0
70 & UP	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1,872	1,010	1,625	1,215	400	184	34	12	0	0	6,352

<i>SALARIES (IN THOUSANDS):</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	13,927	0	0	0	0	0	0	0	0	0	13,927
25 TO 29	57,814	16,574	0	0	0	0	0	0	0	0	74,388
30 TO 34	33,628	58,050	39,717	0	0	0	0	0	0	0	131,395
35 TO 39	14,218	26,128	90,481	28,016	0	0	0	0	0	0	158,843
40 TO 44	2,242	10,132	45,239	70,326	9,579	261	0	0	0	0	137,779
45 TO 49	0	1,276	17,748	44,087	30,484	8,915	0	0	0	0	102,511
50 TO 54	0	0	938	12,187	12,177	13,089	2,768	0	0	0	41,158
55 TO 59	116	146	0	497	2,380	3,001	1,767	1,301	0	0	9,208
60 TO 64	0	0	0	0	0	0	295	750	0	0	1,045
65 TO 69	0	0	0	0	0	0	0	0	0	0	0
70 & UP	0	0	0	0	0	0	0	0	0	0	0
TOTAL *	121,945	112,306	194,124	155,113	54,620	25,266	4,830	2,050	0	0	670,254

<i>AVERAGE SALARIES: **</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	58,271	0	0	0	0	0	0	0	0	0	58,271
25 TO 29	65,179	109,042	0	0	0	0	0	0	0	0	71,596
30 TO 34	66,856	112,499	118,207	0	0	0	0	0	0	0	96,971
35 TO 39	67,383	109,781	120,160	126,771	0	0	0	0	0	0	111,625
40 TO 44	72,318	110,131	119,364	129,513	138,831	130,606	0	0	0	0	123,458
45 TO 49	0	115,988	119,117	126,323	136,701	139,300	0	0	0	0	128,782
50 TO 54	0	0	117,274	124,360	135,296	139,240	145,671	0	0	0	133,199
55 TO 59	116,435	146,334	0	124,130	132,221	125,039	135,942	185,798	0	0	135,412
60 TO 64	0	0	0	0	0	0	147,638	149,914	0	0	149,264
65 TO 69	0	0	0	0	0	0	0	0	0	0	0
70 & UP	0	0	0	0	0	0	0	0	0	0	0
TOTAL	65,141	111,194	119,461	127,665	136,551	137,315	142,067	170,846	0	0	105,519

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

* Total may not add up due to rounding.

** Average based on unrounded salary.

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

ALL TIERS: ALL MEMBERS										
AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
<i>NUMBER:</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	1,657	0	0	0	0	0	0	0	0	1,657
25 TO 29	4,826	1,095	2	0	0	0	0	0	0	5,923
30 TO 34	2,317	3,301	2,091	7	0	0	0	0	0	7,716
35 TO 39	884	1,216	4,052	1,260	3	0	0	0	0	7,415
40 TO 44	157	441	1,723	2,810	728	6	0	0	0	5,865
45 TO 49	1	57	734	1,442	1,761	722	5	0	0	4,722
50 TO 54	3	1	66	452	668	684	305	0	0	2,179
55 TO 59	3	1	1	37	119	134	187	95	0	577
60 TO 64	0	2	1	6	6	6	32	43	1	97
65 TO 69	0	2	0	4	2	1	1	0	0	10
70 & UP	0	0	2	1	0	0	0	0	1	4
TOTAL	9,848	6,116	8,672	6,019	3,287	1,553	530	138	2	36,165

<i>SALARIES (IN THOUSANDS):</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	97,873	0	0	0	0	0	0	0	0	97,873
25 TO 29	320,875	117,643	156	0	0	0	0	0	0	438,674
30 TO 34	160,231	375,810	255,170	824	0	0	0	0	0	792,036
35 TO 39	61,431	136,874	497,827	162,727	416	0	0	0	0	859,276
40 TO 44	11,566	49,901	208,835	368,560	103,646	778	0	0	0	743,288
45 TO 49	74	6,600	89,757	185,035	246,801	107,373	777	0	0	636,415
50 TO 54	391	120	7,923	57,821	90,658	97,947	45,861	0	0	300,721
55 TO 59	375	146	146	4,769	15,923	17,601	27,273	16,797	0	83,030
60 TO 64	0	293	160	843	914	816	4,594	7,338	195	15,151
65 TO 69	0	293	0	547	374	224	224	0	0	1,663
70 & UP	0	0	294	303	0	0	0	0	162	759
TOTAL *	652,817	687,681	1,060,268	781,428	458,732	224,739	78,728	24,135	357	3,968,885

<i>AVERAGE SALARIES: **</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	59,066	0	0	0	0	0	0	0	0	59,066
25 TO 29	66,489	107,437	78,105	0	0	0	0	0	0	74,063
30 TO 34	69,155	113,847	122,033	117,714	0	0	0	0	0	102,649
35 TO 39	69,493	112,561	122,860	129,148	138,832	0	0	0	0	115,883
40 TO 44	73,671	113,155	121,204	131,160	142,371	129,660	0	0	0	126,733
45 TO 49	73,694	115,793	122,284	128,318	140,148	148,716	155,321	0	0	134,777
50 TO 54	130,407	119,744	120,040	127,923	135,716	143,197	150,364	0	0	138,009
55 TO 59	124,889	146,334	146,334	128,897	133,805	131,352	145,843	176,809	0	143,899
60 TO 64	0	146,334	159,616	140,460	152,273	135,976	143,552	170,655	195,072	156,201
65 TO 69	0	146,334	0	136,690	187,123	224,453	224,453	0	0	166,258
70 & UP	0	0	146,855	302,854	0	0	0	0	161,976	189,635
TOTAL	66,289	112,440	122,263	129,827	139,560	144,713	148,544	174,892	178,524	109,744

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

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-7
Summary of Non-Pensioner Membership

TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2017							TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2016				
TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
I	M	3	612,255	204,085	74.0	35.0	3	587,746	195,915	73.0	34.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		3	612,255	204,085	74.0	35.0	3	587,746	195,915	73.0	34.0
II	M	19,281	2,485,222,388	128,895	41.9	16.2	20,484	2,475,613,278	120,856	41.3	15.5
II	F	4,050	500,462,965	123,571	41.5	15.0	4,265	493,379,104	115,681	40.9	14.3
		23,331	2,985,685,353	127,971	41.8	16.0	24,749	2,968,992,382	119,964	41.2	15.3
III	M	124	13,709,950	110,564	32.1	6.6	2,727	237,652,688	87,148	31.2	5.2
III	F	22	2,233,534	101,524	33.9	6.2	484	42,811,695	88,454	31.7	5.3
		146	15,943,484	109,202	32.4	6.5	3,211	280,464,383	87,345	31.3	5.2
III Revised	M	231	15,802,716	68,410	29.3	2.6	6,556	384,199,984	58,603	28.3	1.8
III Revised	F	46	2,956,108	64,263	30.7	2.1	1,442	83,180,744	57,684	29.0	1.7
		277	18,758,824	67,721	29.5	2.5	7,998	467,380,728	58,437	28.5	1.8
III Enhanced	M	10,174	783,283,741	76,989	29.6	3.3	0	0	0	0.0	0.0
III Enhanced	F	2,234	164,601,589	73,680	30.1	3.1	0	0	0	0.0	0.0
		12,408	947,885,330	76,393	29.7	3.3	0	0	0	0.0	0.0
ALL TIERS		36,165	3,968,885,246	109,744	37.5	11.5	35,961	3,717,425,239	103,374	37.5	11.4

JUNE 30, 2017 MEMBERS ALSO PRESENT AS OF JUNE 30, 2016							JUNE 30, 2016 MEMBERS ALSO PRESENT AS OF JUNE 30, 2017				
TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
I	M	3	612,255	204,085	74.0	35.0	3	587,746	195,915	73.0	34.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		3	612,255	204,085	74.0	35.0	3	587,746	195,915	73.0	34.0
II	M	19,210	2,478,719,318	129,033	41.9	16.2	19,210	2,315,050,778	120,513	40.9	15.1
II	F	4,003	495,970,832	123,900	41.5	15.1	4,003	461,791,068	115,361	40.5	14.0
		23,213	2,974,690,150	128,148	41.8	16.0	23,213	2,776,841,846	119,624	40.8	14.9
III	M	123	13,637,091	110,871	32.1	6.6	123	11,549,660	93,900	31.1	5.6
III	F	18	1,878,503	104,361	33.8	6.4	18	1,669,700	92,761	32.8	5.4
		141	15,515,594	110,040	32.3	6.6	141	13,219,360	93,754	31.3	5.6
III Revised	M	200	14,022,572	70,113	29.7	2.8	200	11,863,341	59,317	28.7	1.8
III Revised	F	34	2,293,150	67,446	30.9	2.7	34	1,990,026	58,530	29.9	1.7
		234	16,315,722	69,725	29.9	2.8	234	13,853,367	59,202	28.9	1.8
ALL TIERS		23,591	3,007,133,721	127,470	41.7	15.8	23,591	2,804,502,319	118,880	40.7	14.7

ADDITIONS DURING THE YEAR ¹							SEPARATIONS FROM MEMBERSHIP DURING THE YEAR ¹				
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	0	0	0	0.0	0.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	0	0	0	0.0	0.0
II	M	71	6,503,070	91,593	35.6	9.1	1,274	160,562,500	126,030	47.1	21.1
II	F	47	4,492,133	95,577	36.9	10.1	262	31,588,036	120,565	45.9	19.0
		118	10,995,203	93,180	36.1	9.5	1,536	192,150,536	125,098	46.9	20.8
III	M	1	72,859	72,859	30.0	6.0	2,604	226,103,028	86,829	31.2	5.2
III	F	4	355,031	88,758	34.3	5.0	466	41,141,995	88,288	31.7	5.3
		5	427,890	85,578	33.4	5.2	3,070	267,245,023	87,050	31.3	5.2
III Revised	M	31	1,780,144	57,424	26.5	0.9	6,356	372,336,643	58,580	28.3	1.8
III Revised	F	12	662,958	55,247	30.2	0.5	1,408	81,190,718	57,664	29.0	1.7
		43	2,443,102	56,816	27.6	0.8	7,764	453,527,361	58,414	28.4	1.8
III Enhanced	M	10,174	783,283,741	76,989	29.6	3.3	0	0	0	0.0	0.0
III Enhanced	F	2,234	164,601,589	73,680	30.1	3.1	0	0	0	0.0	0.0
		12,408	947,885,330	76,393	29.7	3.3	0	0	0	0.0	0.0
ALL TIERS		12,574	961,751,525	76,487	29.8	3.3	12,370	912,922,920	73,801	31.4	5.0

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

¹ Separations and additions do not include new member withdrawals.

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

STATUS	TIER 1		TIER 2		TIER 3		TIER 3 REVISED		TIER 3 ENHANCED		ALL TIERS	
	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY
MALES:												
ACTIVES	3	612,255	19,281	2,485,222,388	124	13,709,950	231	15,802,716	10,174	783,283,741	29,813	3,298,631,050
INACTIVES	0	0	919	48,482,437	90	5,441,765	428	20,764,786	32	1,695,837	1,469	76,384,825
VESTED	0	0	363	29,786,125	18	1,311,941	0	0	0	0	381	31,098,066
ALL STATUS	3	612,255	20,563	2,563,490,950	232	20,463,656	659	36,567,502	10,206	784,979,578	31,663	3,406,113,941
FEMALES:												
ACTIVES	0	0	4,050	500,462,965	22	2,233,534	46	2,956,108	2,234	164,601,589	6,352	670,254,196
INACTIVES	0	0	191	10,819,930	19	927,370	133	6,045,880	10	531,878	353	18,325,058
VESTED	0	0	120	9,314,018	1	63,553	0	0	0	0	121	9,377,571
ALL STATUS	0	0	4,361	520,596,913	42	3,224,457	179	9,001,988	2,244	165,133,467	6,826	697,956,825
TOTAL:												
ACTIVES	3	612,255	23,331	2,985,685,353	146	15,943,484	277	18,758,824	12,408	947,885,330	36,165	3,968,885,246
INACTIVES	0	0	1,110	59,302,367	109	6,369,135	561	26,810,666	42	2,227,715	1,822	94,709,883
VESTED	0	0	483	39,100,143	19	1,375,494	0	0	0	0	502	40,475,637
ALL STATUS	3	612,255	24,924	3,084,087,863	274	23,688,113	838	45,569,490	12,450	950,113,045	38,489	4,104,070,766

Table XII-9
Summary of Pensioner Membership

Group	June 30, 2017 (Lag)				June 30, 2016 (Lag)			
	Number	Annual Amounts Payable			Number	Annual Amounts Payable		
		Plan Benefit	Supplementation	Total		Plan Benefit	Supplementation	Total
Service Pensioners	33,093	\$ 1,504,676,355	\$ 79,379,529	\$ 1,584,055,884	32,491	\$ 1,418,427,751	\$ 80,747,524	\$ 1,499,175,275
Ordinary Disability Pensioners	2,935	78,901,403	17,390,609	\$ 96,292,012	2,996	79,462,595	17,777,763	\$ 97,240,358
Accidental Disability Pensioners	12,512	687,525,707	62,904,773	\$ 750,430,480	12,430	662,301,712	63,117,096	\$ 725,418,808
Beneficiaries of Members Killed in the Line-of-Duty	425	38,974,386	2,051,997	\$ 41,026,383	389	33,631,981	2,155,970	\$ 35,787,951
Other Beneficiaries	834	19,011,386	2,224,868	\$ 21,236,254	845	18,936,804	2,252,153	\$ 21,188,957
Total	49,799	\$ 2,329,089,237	\$ 163,951,776	\$ 2,493,041,013	49,151	\$ 2,212,760,843	\$ 166,050,506	\$ 2,378,811,349

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

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>ACCIDENTAL DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	92	6,027,032	65,511	14	907,689	64,835	106	6,934,721	65,422
35 TO 39	255	18,117,672	71,050	61	3,947,920	64,720	316	22,065,592	69,828
40 TO 44	498	37,663,092	75,629	86	5,764,668	67,031	584	43,427,760	74,363
45 TO 49	1,559	122,141,545	78,346	218	14,518,353	66,598	1,777	136,659,898	76,905
50 TO 54	1,962	142,174,359	72,464	353	22,819,511	64,645	2,315	164,993,870	71,272
55 TO 59	1,549	96,768,626	62,472	278	16,738,699	60,211	1,827	113,507,325	62,128
60 TO 64	768	46,235,773	60,203	108	5,646,196	52,280	876	51,881,969	59,226
65 TO 69	1,128	53,611,456	47,528	40	1,886,391	47,160	1,168	55,497,847	47,515
70 TO 74	1,689	73,724,383	43,650	38	1,482,744	39,020	1,727	75,207,127	43,548
75 TO 79	1,024	44,606,184	43,561	18	759,976	42,221	1,042	45,366,160	43,538
80 TO 84	432	19,658,305	45,505	8	295,586	36,948	440	19,953,891	45,350
85 TO 89	225	10,294,806	45,755	4	149,390	37,348	229	10,444,196	45,608
90 & UP	103	4,404,999	42,767	2	85,125	42,563	105	4,490,124	42,763
TOTAL	11,284	675,428,232	59,857	1,228	75,002,248	61,077	12,512	750,430,480	59,977
<i>ORDINARY DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	14	495,777	35,413	5	135,725	27,145	19	631,502	33,237
35 TO 39	50	1,816,580	36,332	18	622,490	34,583	68	2,439,070	35,869
40 TO 44	86	3,344,577	38,890	43	1,557,513	36,221	129	4,902,090	38,001
45 TO 49	224	8,026,990	35,835	111	3,691,172	33,254	335	11,718,162	34,980
50 TO 54	212	6,487,866	30,603	130	3,622,713	27,867	342	10,110,579	29,563
55 TO 59	149	4,120,137	27,652	95	2,587,464	27,236	244	6,707,601	27,490
60 TO 64	88	2,317,368	26,334	45	1,113,103	24,736	133	3,430,471	25,793
65 TO 69	209	6,097,720	29,176	26	594,659	22,872	235	6,692,379	28,478
70 TO 74	432	10,826,446	25,061	13	280,506	21,577	445	11,106,952	24,959
75 TO 79	328	9,912,885	30,222	8	180,447	22,556	336	10,093,332	30,040
80 TO 84	209	8,926,951	42,713	11	269,901	24,536	220	9,196,852	41,804
85 TO 89	275	12,379,275	45,016	3	122,517	40,839	278	12,501,792	44,970
90 & UP	145	6,516,080	44,938	6	245,150	40,858	151	6,761,230	44,776
TOTAL	2,421	81,268,652	33,568	514	15,023,360	29,228	2,935	96,292,012	32,808
<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	2	114,240	57,120	1	46,800	46,800	3	161,040	53,680
40 TO 44	354	21,341,680	60,287	83	4,215,643	50,791	437	25,557,323	58,484
45 TO 49	3,247	199,457,627	61,428	661	35,110,811	53,118	3,908	234,568,438	60,023
50 TO 54	5,848	336,486,806	57,539	1,292	65,046,718	50,346	7,140	401,533,524	56,237
55 TO 59	5,702	292,102,497	51,228	1,152	52,980,149	45,990	6,854	345,082,646	50,348
60 TO 64	2,864	139,507,354	48,711	565	24,454,038	43,281	3,429	163,961,392	47,816
65 TO 69	2,337	102,602,421	43,903	144	5,784,479	40,170	2,481	108,386,900	43,687
70 TO 74	3,299	129,012,854	39,107	80	2,857,166	35,715	3,379	131,870,020	39,026
75 TO 79	2,718	93,577,959	34,429	59	2,189,146	37,104	2,777	95,767,105	34,486
80 TO 84	1,361	41,046,308	30,159	33	1,139,867	34,541	1,394	42,186,175	30,263
85 TO 89	884	24,602,893	27,831	11	279,984	25,453	895	24,882,877	27,802
90 & UP	380	9,715,030	25,566	16	383,414	23,963	396	10,098,444	25,501
TOTAL	28,996	1,389,567,669	47,923	4,097	194,488,215	47,471	33,093	1,584,055,884	47,867

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2017 (cont'd)

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>ACCIDENTAL DEATH:</i>									
UNDER 30	0	0	0	4	557,120	139,280	4	557,120	139,280
30 TO 34	0	0	0	3	374,889	124,963	3	374,889	124,963
35 TO 39	1	97,119	97,119	4	398,859	99,715	5	495,978	99,196
40 TO 44	1	97,905	97,905	18	2,102,256	116,792	19	2,200,161	115,798
45 TO 49	3	304,273	101,424	36	4,382,033	121,723	39	4,686,306	120,162
50 TO 54	7	666,535	95,219	60	6,721,912	112,032	67	7,388,447	110,275
55 TO 59	6	760,016	126,669	47	5,779,498	122,968	53	6,539,514	123,387
60 TO 64	1	39,086	39,086	36	4,065,990	112,944	37	4,105,076	110,948
65 TO 69	1	99,792	99,792	50	4,179,367	83,587	51	4,279,159	83,905
70 TO 74	3	307,700	102,567	59	5,056,987	85,712	62	5,364,687	86,527
75 TO 79	4	170,540	42,635	32	2,110,733	65,960	36	2,281,273	63,369
80 TO 84	3	146,253	48,751	20	1,262,246	63,112	23	1,408,499	61,239
85 TO 89	1	30,068	30,068	22	1,160,331	52,742	23	1,190,399	51,756
90 & UP	1	33,969	33,969	2	120,906	60,453	3	154,875	51,625
TOTAL	32	2,753,256	86,039	393	38,273,127	97,387	425	41,026,383	96,533
<i>OTHER BENEFICIARIES:</i>									
UNDER 30	6	180,280	30,047	8	188,250	23,531	14	368,530	26,324
30 TO 34	2	44,406	22,203	2	50,342	25,171	4	94,748	23,687
35 TO 39	1	13,585	13,585	4	87,441	21,860	5	101,026	20,205
40 TO 44	0	0	0	5	173,306	34,661	5	173,306	34,661
45 TO 49	4	142,756	35,689	24	977,255	40,719	28	1,120,011	40,000
50 TO 54	7	287,371	41,053	38	1,254,224	33,006	45	1,541,595	34,258
55 TO 59	3	73,199	24,400	58	2,363,268	40,746	61	2,436,467	39,942
60 TO 64	2	52,617	26,309	54	1,519,745	28,143	56	1,572,362	28,078
65 TO 69	0	0	0	80	2,094,651	26,183	80	2,094,651	26,183
70 TO 74	1	19,546	19,546	113	3,132,917	27,725	114	3,152,463	27,653
75 TO 79	1	29,448	29,448	108	2,777,633	25,719	109	2,807,081	25,753
80 TO 84	0	0	0	94	2,235,427	23,781	94	2,235,427	23,781
85 TO 89	0	0	0	99	1,953,567	19,733	99	1,953,567	19,733
90 & UP	0	0	0	120	1,585,020	13,209	120	1,585,020	13,209
TOTAL	27	843,208	31,230	807	20,393,046	25,270	834	21,236,254	25,463
<i>ALL PENSIONERS AND BENEFICIARIES:</i>									
UNDER 30	6	180,280	30,047	12	745,370	62,114	18	925,650	51,425
30 TO 34	108	6,567,215	60,808	24	1,468,645	61,194	132	8,035,860	60,878
35 TO 39	309	20,159,196	65,240	88	5,103,510	57,994	397	25,262,706	63,634
40 TO 44	939	62,447,254	66,504	235	13,813,386	58,780	1,174	76,260,640	64,958
45 TO 49	5,037	330,073,191	65,530	1,050	58,679,624	55,885	6,087	388,752,815	63,866
50 TO 54	8,036	486,102,937	60,491	1,873	99,465,078	53,105	9,909	585,568,015	59,095
55 TO 59	7,409	393,824,475	53,155	1,630	80,449,078	49,355	9,039	474,273,553	52,470
60 TO 64	3,723	188,152,198	50,538	808	36,799,072	45,543	4,531	224,951,270	49,647
65 TO 69	3,675	162,411,389	44,194	340	14,539,547	42,763	4,015	176,950,936	44,072
70 TO 74	5,424	213,890,929	39,434	303	12,810,320	42,278	5,727	226,701,249	39,585
75 TO 79	4,075	148,297,016	36,392	225	8,017,935	35,635	4,300	156,314,951	36,352
80 TO 84	2,005	69,777,817	34,802	166	5,203,027	31,344	2,171	74,980,844	34,537
85 TO 89	1,385	47,307,042	34,157	139	3,665,789	26,373	1,524	50,972,831	33,447
90 & UP	629	20,670,078	32,862	146	2,419,615	16,573	775	23,089,693	29,793
TOTAL	42,760	2,149,861,017	50,277	7,039	343,179,996	48,754	49,799	2,493,041,013	50,062

Graph XII-11
Pensioner Average Benefits

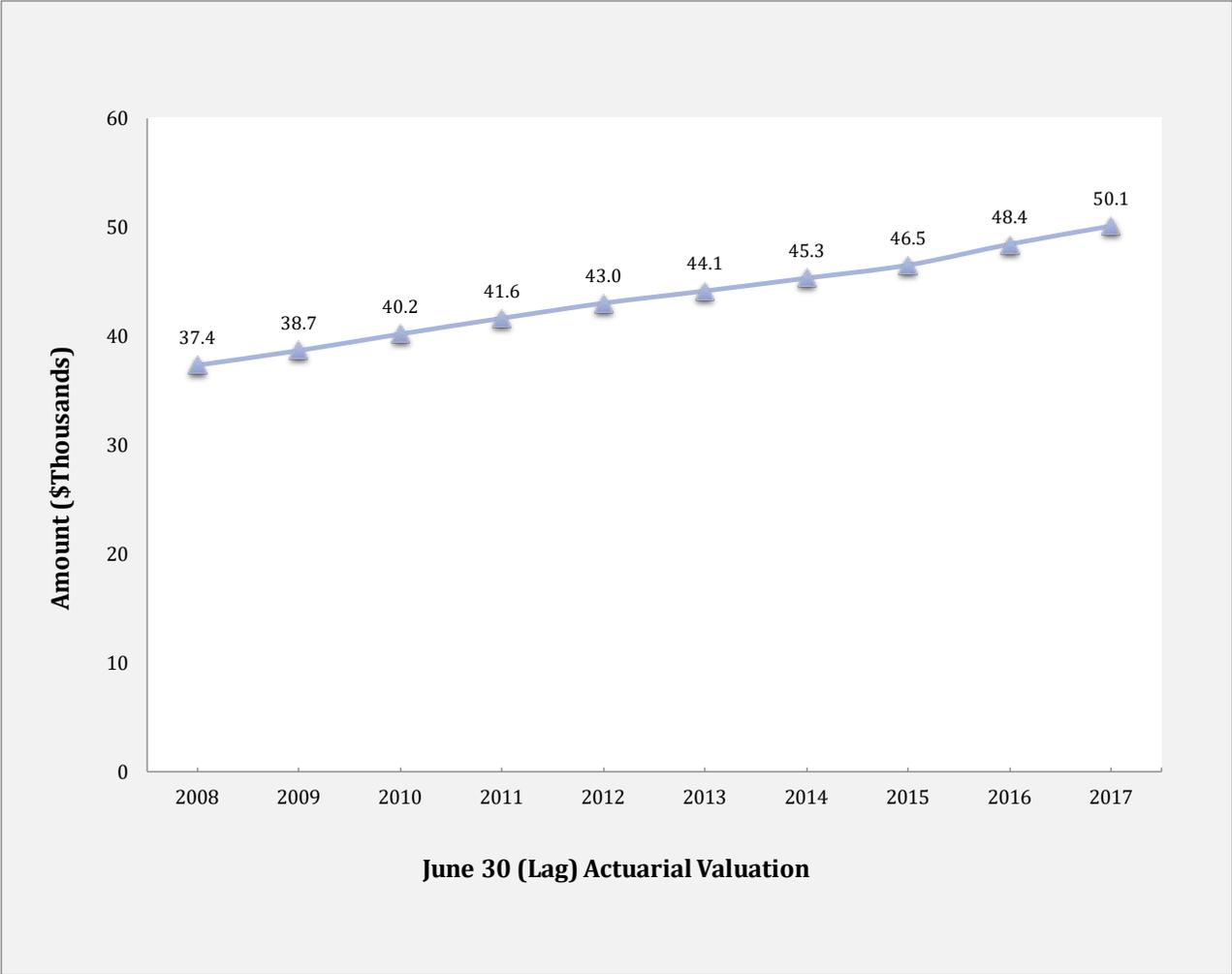


Table XII-12
Reconciliation of Pensioner and Beneficiary Data

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 ²		
2008	1,541	\$92,191,424	982	\$27,012,317	44,290	\$1,654,461,099	4.1%	\$37,355
2009	1,025	89,094,934	1,030	30,086,313	44,285	1,713,469,720	3.6%	38,692
2010	1,355	110,403,824	1,006	29,554,813	44,634	1,794,318,731	4.7%	40,201
2011	2,142	141,323,253	1,021	30,315,285	45,755	1,905,326,699	6.2%	41,642
2012	1,893	133,158,449	1,010	32,287,109	46,638	2,006,198,039	5.3%	43,016
2013	1,346	99,488,158	1,034	33,621,831	46,950	2,072,064,366	3.3%	44,133
2014	2,220	144,660,995	958	32,759,640	48,212	2,183,965,721	5.4%	45,299
2015	1,574	117,371,844	1,083	37,069,856	48,703	2,264,267,709	3.7%	46,491
2016	1,458	151,061,292	1,010	36,517,652	49,151	2,378,811,349	5.1%	48,398
2017	1,681	153,211,878	1,033	38,982,214	49,799	2,493,041,013	4.8%	50,062

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

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

APPENDIX: ACRONYMS AND ABBREVIATIONS

2019 A&M	Actuarial Assumptions and Methods proposed by the Actuary and adopted by the Board of Trustees during Fiscal Year 2019
AAVM	Actuarial Asset Valuation Method
ABO	Accumulated Benefit Obligation
ACCNY	Administrative Code of the City of New York
AIR	Actuarial Interest Rate
AL	Accrued Liability
AVA	Actuarial Value of Assets
CAFR	Comprehensive Annual Financial Report
COLA	Cost-of-Living Adjustment
EAN	Entry Age Normal cost method
EIR	Expected Investment Return
FAS	Final Average Salary
FS	Final Salary
GASB	Governmental Accounting Standards Board
GASB25	Governmental Accounting Standards Board Statement No. 25
GASB67	Governmental Accounting Standards Board Statement No. 67
GASB68	Governmental Accounting Standards Board Statement No. 68
IRC	Internal Revenue Code
ITHP	Increased-Take-Home-Pay
MVA	Market Value of Assets
OYLM	One-Year Lag Methodology
POLICE	New York City Police Pension Fund
POVSF	Police Officer's Variable Supplements Fund
PSOVSF	Police Superior Officers' Variable Supplements Fund
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 Fund
WTC	World Trade Center