



Fiscal Year 2020
Actuarial Valuation Report
for the
New York City
Police Pension Fund

JUNE 30, 2018 (LAG) ACTUARIAL VALUATION

prepared by the
New York City
Office of the Actuary

2020



OFFICE OF THE ACTUARY

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SHERRY S. CHAN
CHIEF ACTUARY

August 24, 2020

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

Re: Fiscal Year 2020 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2018 (Lag) actuarial valuation of the benefits under both the New York City Police Pension Fund (POLICE) and Group Life Insurance Plan (collectively, the Plan). This valuation, known as the June 30, 2018 (Lag) valuation, forms the basis for determining the statutorily-required contribution (Statutory Contribution) of \$2,458,907,408 for Fiscal Year 2020 (i.e. for the period beginning July 1, 2019 and ending June 30, 2020). 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, 2017 (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, 2018 (Lag) and June 30, 2017 (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, 2018 and June 30, 2017.

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 used for the June 30, 2018 valuation were presented in the report titled "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. There have been no changes since the prior year.

This Report does not present Governmental Accounting Standards Board (GASB) results. The Office of the Actuary will publish Fiscal Year 2020 GASB67 and GASB68 results in a report later this 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. Kevin Holloran - New York City Police Pension Fund
Mr. Anderson Huynh - New York City Office of the Actuary
Mr. Michael Samet - New York City Office of the Actuary
Keith Snow, Esq. - New York City Office of the Actuary
Mr. Stanley Thomas - New York City Police Pension Fund

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SECTION I - EXECUTIVE SUMMARY

This Report presents the results of the June 30, 2018 (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 2020 (i.e. July 1, 2019 to June 30, 2020),
- 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 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 September 7, 2018 to the Comptroller's Office. 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, 2018 (Lag) actuarial valuation and, for comparative purposes, the June 30, 2017 (Lag) actuarial valuation.

NEW YORK CITY POLICE PENSION FUND		
SUMMARY OF VALUATION RESULTS		
Valuation Date	June 30, 2018 (Lag)	June 30, 2017 (Lag)
Fiscal Year	2020	2019
Funded Status		
1. Accrued Liability ¹	\$ 48,024,797,912	\$ 47,696,249,723
2. Actuarial Value of Assets (AVA) ²	<u>36,098,314,000</u>	<u>34,162,505,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 11,926,483,912	\$ 13,533,744,723
4. Funded Ratio (AVA Basis) (2. / 1.)	75.2%	71.6%
5. Market Value of Assets (MVA) ²	37,958,867,000	35,423,525,000
6. Unfunded Accrued Liability (MVA Basis) (1. - 5.)	\$ 10,065,930,912	\$ 12,272,724,723
7. Funded Ratio (MVA Basis) (5. / 1.)	79.0%	74.3%
Contribution³		
1. Normal Cost	\$ 1,485,740,396	\$ 1,449,290,567
2. Amortization of Unfunded Accrued Liability	948,956,957	1,087,307,361
3. Administrative Expenses	<u>24,210,055</u>	<u>21,658,073</u>
4. Actuarial Contribution (1. + 2. + 3.)	\$ 2,458,907,408	\$ 2,558,256,001
5. Statutory Contribution (4.)	\$ 2,458,907,408	\$ 2,558,256,001
Participant Data		
1. Active Members		
a. Number	36,562	36,165
b. Annual Salary ⁴	\$ 4,053,204,563	\$ 3,968,885,246
c. Average Salary	\$ 110,858	\$ 109,744
2. Active Off Payroll Members ⁵	1,940	1,822
3. Terminated Vested Members	491	502
4. Retirees and Beneficiaries		
a. Number	50,124	49,799
b. Total Annual Benefits	\$ 2,587,367,794	\$ 2,493,041,013
c. Average Annual Benefit	\$ 51,619	\$ 50,062

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.

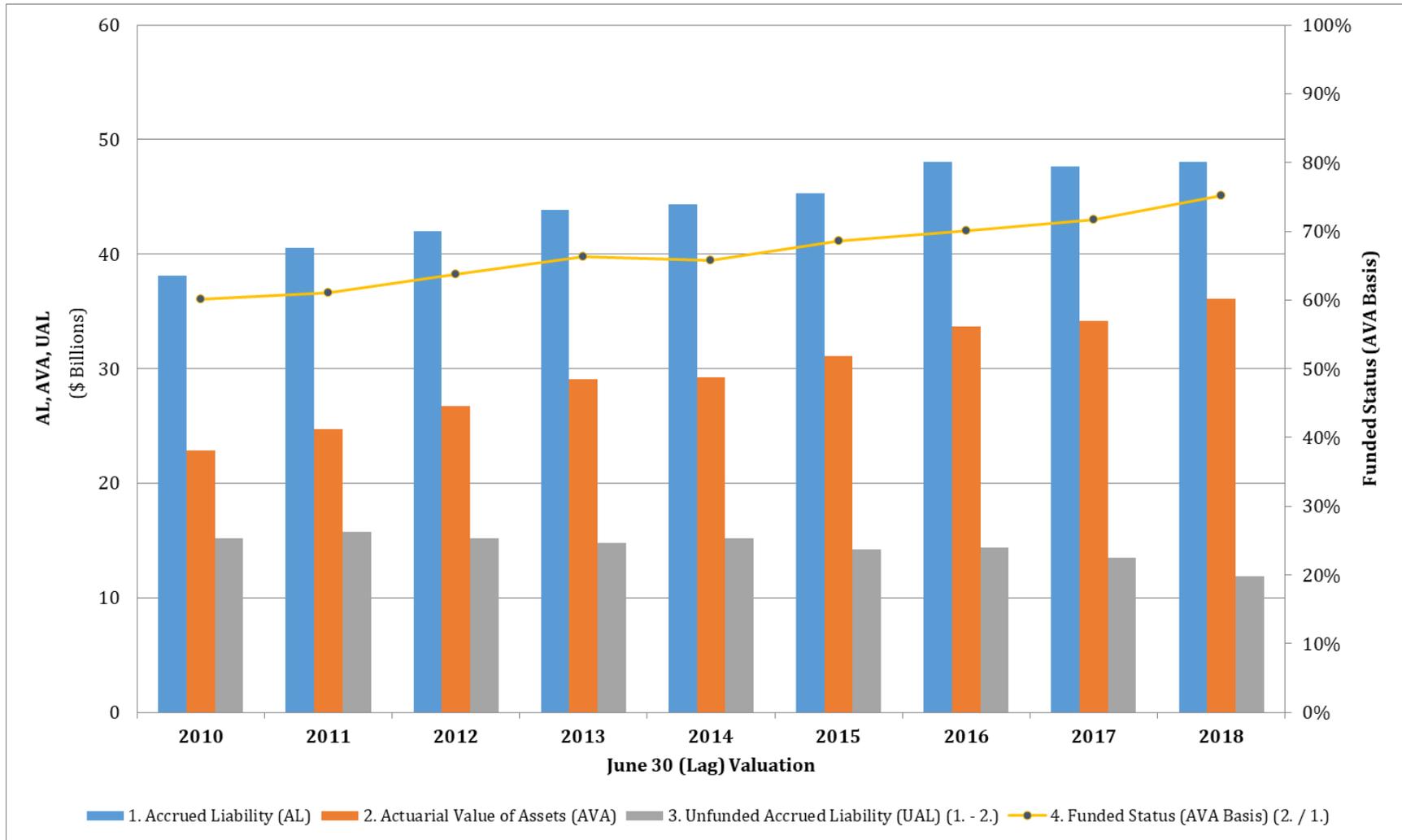
Table I-2
Actuarial Liabilities

NEW YORK CITY POLICE PENSION FUND		
ACTUARIAL LIABILITIES BY STATUS		
Valuation Date	June 30, 2018 (Lag)	June 30, 2017 (Lag)
Fiscal Year	2020	2019
Accrued Liability		
1. Active Members	\$ 16,169,364,385	\$ 15,584,859,906
2. Active Off Payroll Members ¹	69,981,429	57,076,208
3. Terminated Vested Members	77,488,066	72,186,203
4. Retirees and Beneficiaries	<u>30,702,751,350</u>	<u>29,780,499,097</u>
5. Accrued Liability Pre-Adjustments (1. to 4.)	\$ 47,019,585,230	\$ 45,494,621,414
6. Actuarial Adjustments ²	<u>1,005,212,682</u>	<u>2,201,628,309</u>
7. Total Accrued Liability (5. + 6.)	\$ 48,024,797,912	\$ 47,696,249,723
Present Value of Benefits		
1. Active Members	\$ 29,231,334,911	28,498,860,261
2. Active Off Payroll Members ¹	69,981,429	57,076,208
3. Terminated Vested Members	77,488,066	72,186,203
4. Retirees and Beneficiaries	<u>30,702,751,350</u>	<u>29,780,499,097</u>
5. Present Value of Benefits (1. to 4.)	\$ 60,081,555,756	\$ 58,408,621,769
6. Actuarial Adjustments ²	<u>2,000,551,823</u>	<u>3,192,414,233</u>
7. Total Present Value of Benefits (5. + 6.)	\$ 62,082,107,579	\$ 61,601,036,002

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, the 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, 2018	June 30, 2017
ASSETS		
Cash	\$ 4,789	\$ 107,908
Receivables		
Investment Securities Sold	\$ 546,611	\$ 694,085
Member Loans	232,882	234,570
Transferrable Earnings due from VSFs to QPP	0	326,195
Accrued Interest and Dividends	<u>5,754</u>	<u>3,238</u>
Total Receivables	\$ 785,247	\$ 1,258,088
INVESTMENTS AT FAIR VALUE		
Short-Term Investments		
Commercial Paper	\$ 360,326	\$ 246,623
Discount Notes	1,999	0
Short-term Investment Fund	339,461	218,581
U.S. Treasury Bills	61,471	0
Debt Securities	9,951,025	7,702,198
Equity Securities	11,946,234	6,518,200
Alternative Investments	7,922,588	7,209,973
Collective Trust Funds		
Fixed Income	0	731,787
Bank Loans	615,119	0
Corporate and Other	75,491	0
Domestic Equity	124,872	6,785,844
International Equity	6,273,065	6,552,823
Mortgage Debt Security	186,862	308,817
Treasury Inflation Protected Securities	1,744,591	1,592,909
U.S. Government and Agency	69,204	0
Collateral From Securities Lending	<u>4,832,615</u>	<u>3,853,421</u>
Total Investments	\$44,504,923	\$41,721,176
OTHER ASSETS	<u>6,583</u>	<u>17,667</u>
TOTAL ASSETS	\$45,301,542	\$43,104,839
LIABILITIES		
Accounts Payable	\$ 302,529	\$ 468,980
Payable for Investment Securities Purchased	629,892	556,363
Accrued Benefits Payable	91,639	84,111
Accrued Transfers to VSFs	1,486,000	2,718,439
Security Lending	<u>4,832,615</u>	<u>3,853,421</u>
TOTAL LIABILITIES	\$ 7,342,675	\$ 7,681,314
PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS	\$37,958,867	\$35,423,525

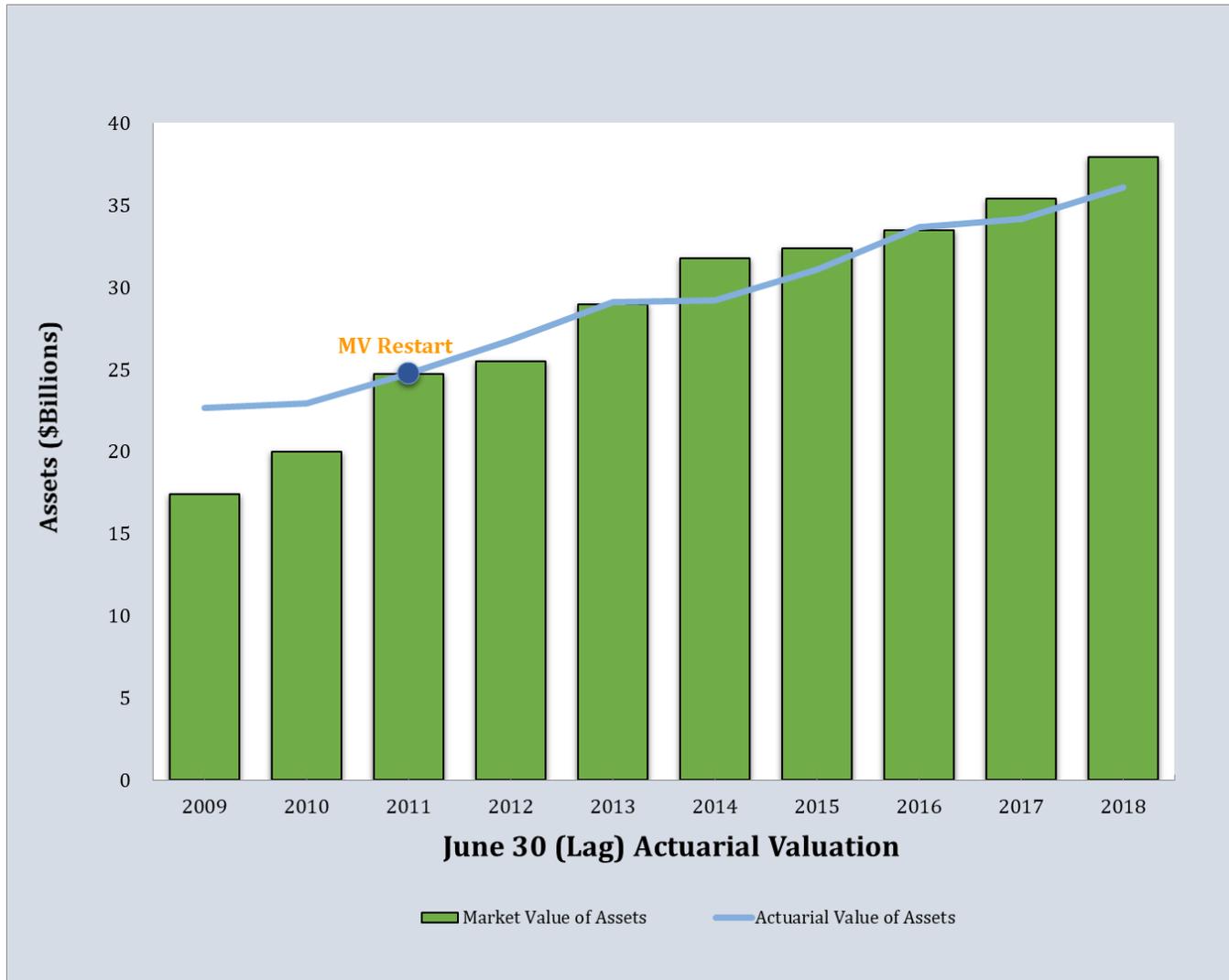
Table II-2
Statement of Changes in Plan Net Assets

(\$ Thousands)		
	June 30, 2018	June 30, 2017
ADDITIONS		
Contributions		
Member Contributions	\$ 267,031	\$ 276,301
Employer Contributions	2,415,153	2,293,840
Total Contributions	\$ 2,682,184	\$ 2,570,141
Investment Income (Loss)		
Interest Income	\$ 517,469	\$ 400,562
Dividend Income	485,726	485,237
Net Appreciation (Depreciation) in Fair Value	3,190,498	3,418,739
Total Investment Income (Loss)	\$ 4,193,693	\$ 4,304,538
Less Investment Expenses	285,243	245,288
Net Income (Loss)	\$ 3,908,450	\$ 4,059,250
Securities Lending Transactions		
Securities Lending Income	\$ 18,703	\$ 22,034
Securities Lending Fees	(1,870)	(1,537)
Net Securities Lending Income (Loss)	\$ 16,833	\$ 20,497
Net Investment Income (Loss)	\$ 3,925,283	\$ 4,079,747
Other		
Net Receipts from Other Retirement Systems	\$ 1,627	\$ 2,450
Transferrable Earnings due from VSFs to QPP	0	25,562
Litigation Income	1,781	7,931
TOTAL ADDITIONS	\$ 6,610,875	\$ 6,685,831
DEDUCTIONS		
Benefit Payments and Withdrawals	\$ 2,774,387	\$ 2,571,999
Accrued Transfers to VSFs	1,280,000	\$ 2,154,000
Administrative Expenses	21,146	18,917
TOTAL DEDUCTIONS	\$ 4,075,533	\$ 4,744,916
NET INCREASE (DECREASE) IN PLAN NET ASSETS	\$ 2,535,342	\$ 1,940,915
PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
Beginning of Year	\$ 35,423,525	\$ 33,482,610
End of Year	\$ 37,958,867	\$ 35,423,525

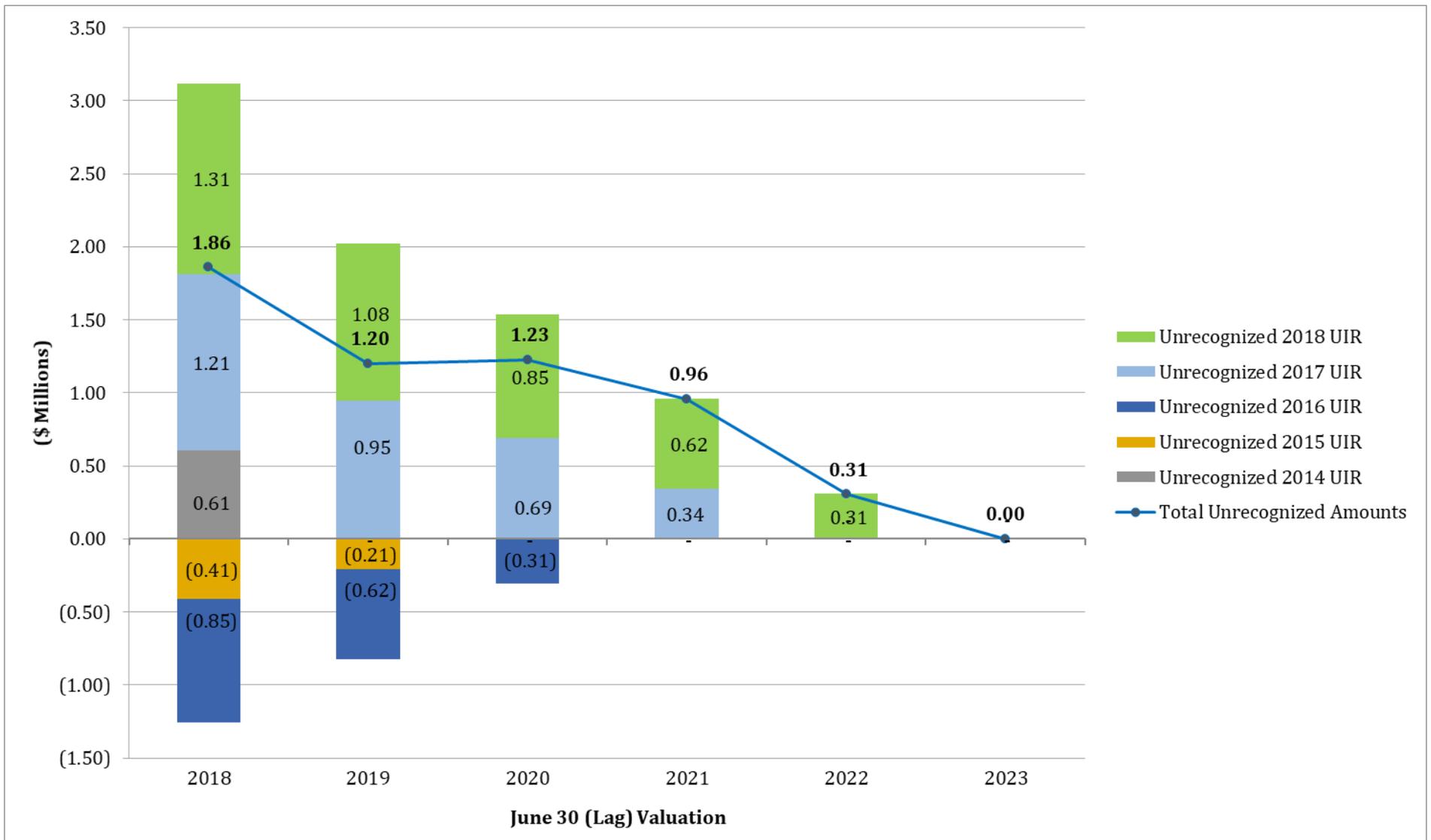
Table II-3
Development of Actuarial Value of Assets

(\$ Thousands)		
Valuation Date	June 30, 2018	June 30, 2017
1. Market Value of Assets (MVA)		
a. Beginning of Year (BOY)	\$ 35,423,525	\$ 33,482,610
b. End of Year (EOY)	\$ 37,958,867	\$ 35,423,525
2. Contributions		
a. Employee	\$ 267,031	\$ 276,301
b. Employer	<u>2,415,153</u>	<u>2,293,840</u>
c. Total Contributions	\$ 2,682,184	\$ 2,570,141
3. Benefit Payments and Other Cash Flow	\$ (2,792,125)	\$ (2,580,535)
4. Preliminary Transferable Earnings from POLICE to VSFs - EOY	\$ (1,280,000)	\$ (2,128,438)
5. Net Cash Flow (2.c. + 3. + 4.)	\$ (1,389,941)	\$ (2,138,832)
6. Net Investment Income		
a. Investment Income	\$ 4,210,526	\$ 4,325,035
b. Investment Expenses	<u>(285,243)</u>	<u>(245,288)</u>
c. Total Net Investment Income	\$ 3,925,283	\$ 4,079,747
7. Average Invested Assets		
a. AVA @ BOY	\$ 34,162,505	\$ 33,692,647
b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2)	<u>(54,971)</u>	<u>(5,197)</u>
c. Total	\$ 34,107,534	\$ 33,687,450
8. Expected Rate of Return (AIR)	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	\$ 2,387,527	\$ 2,358,122
10. Unexpected Investment Return (UIR) (6.c. - 9.)	\$ 1,537,756	\$ 1,721,625
11. Preliminary AVA @ EOY		
a. AVA @ BOY (prior to corridor limit)	\$ 34,162,505	\$ 33,692,647
b. Net Cash Flow (5.)	<u>(1,389,941)</u>	<u>(2,138,832)</u>
c. Expected Investment Return (9.)	2,387,527	2,358,122
d. Phase in of UIR		
15% * UIR for prior year	230,663	258,244
15% * UIR for second prior year	258,244	(230,648)
15% * UIR for third prior year	<u>(230,648)</u>	<u>(154,888)</u>
15% * UIR for fourth prior year	<u>(154,887)</u>	455,302
20% * UIR for fifth prior year	607,069	227,782
20% * UIR for sixth prior year	<u>227,782</u>	<u>(305,224)</u>
Total	\$ 938,223	\$ 250,568
e. Preliminary AVA (11.a. + 11.b. + 11.c. + 11.d.)	\$ 36,098,314	\$ 34,162,505
12. Corridor		
a. 80% of MVA	\$ 30,367,094	\$ 28,338,820
b. 120% of MVA	\$ 45,550,640	\$ 42,508,230
13. Final AVA @ EOY (11e. bounded by 12.)	\$ 36,098,314	\$ 34,162,505

Graph II-4
Historical Market and Actuarial Value of Assets



Graph II-5
Future Recognition of UIR as of June 30, 2018



SECTION III – CONTRIBUTION DEVELOPMENT AND HISTORY

Table III-1
Statutory Contributions

Table III-1 shows the components of the Fiscal Year 2020 and the Fiscal Year 2019 Statutory Contributions.

COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS		
Valuation Date	June 30, 2018 (Lag)	June 30, 2017 (Lag)
Fiscal Year	2020	2019
Normal Cost ¹	\$ 1,485,740,396	\$ 1,449,290,567
Amortization of Unfunded Accrued Liability		
-Initial UAL	1,257,393,353	1,220,770,246
-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 ²	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	4,907,592
-2017 No VSF Escalation Offset	1,515,961	1,515,961
-2017 Non-Uniformed Service	5,541,419	5,541,419
-2017 Assumption Changes ³	(39,298,270)	(39,298,270)
-2017 Method Changes ³	(43,410,786)	(43,410,786)
-2018 (Gain)/Loss	<u>(174,973,511)</u>	<u>NA</u>
Total	948,956,957	1,087,307,361
Administrative Expenses	24,210,055	21,658,073
Total Contribution to the New York City Police Pension Fund	\$ 2,458,907,408	\$ 2,558,256,001

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

² Change in post retirement mortality assumptions including the change to the mortality improvement scale MP-2015.

³ 2019 A&M.

Table III-2
Schedule of Unfunded Accrued Liability Bases

The Initial Unfunded Accrued Liability (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 UAL Bases as of June 30, 2018.

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, 2018
Initial UAL	6/30/10	\$ 13,211,374,581	22	\$ 1,257,393,353	13	\$ 11,870,347,592
(Gain)/Loss	6/30/11	\$ 276,060,031	15	\$ 32,652,194	7	\$ 170,118,672
(Gain)/Loss	6/30/12	\$ (497,039,100)	15	\$ (58,789,449)	8	\$ (339,372,214)
(Gain)/Loss	6/30/13	\$ (234,946,852)	15	\$ (27,789,355)	9	\$ (175,031,606)
(Gain)/Loss	6/30/14	\$ (219,675,273)	15	\$ (25,983,043)	10	\$ (176,423,628)
Assumption Change ¹	6/30/14	\$ 706,645,098	20	\$ 70,722,523	15	\$ 622,708,478
(Gain)/Loss	6/30/15	\$ (881,721,022)	15	\$ (104,289,367)	11	\$ (756,018,867)
(Gain)/Loss	6/30/16	\$ 21,224,294	15	\$ 2,510,395	12	\$ 19,276,031
SADB	6/30/16	\$ 395,717,583	15	\$ 46,805,208	12	\$ 359,393,074
Enhanced ADR	6/30/16	\$ 13,611,142	18	\$ 1,442,093	15	\$ 12,697,560
(Gain)/Loss	6/30/17	\$ 41,491,543	15	\$ 4,907,592	13	\$ 39,651,603
No VSF Escalation Offset	6/30/17	\$ 14,308,348	18	\$ 1,515,961	16	\$ 13,844,397
Non-Uniformed Service	6/30/17	\$ 55,368,731	20	\$ 5,541,419	18	\$ 53,887,451
Assumption Change ²	6/30/17	\$ (392,660,331)	20	\$ (39,298,270)	18	\$ (382,155,484)
Method Change ²	6/30/17	\$ (433,751,763)	20	\$ (43,410,786)	18	\$ (422,147,596)
(Gain)/Loss	6/30/18	\$ (1,479,324,567)	15	\$ (174,973,511)	14	\$ (1,479,324,567)

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

² 2019 A&M.

Graph III-3
Remaining UAL Amortizations as of June 30, 2018

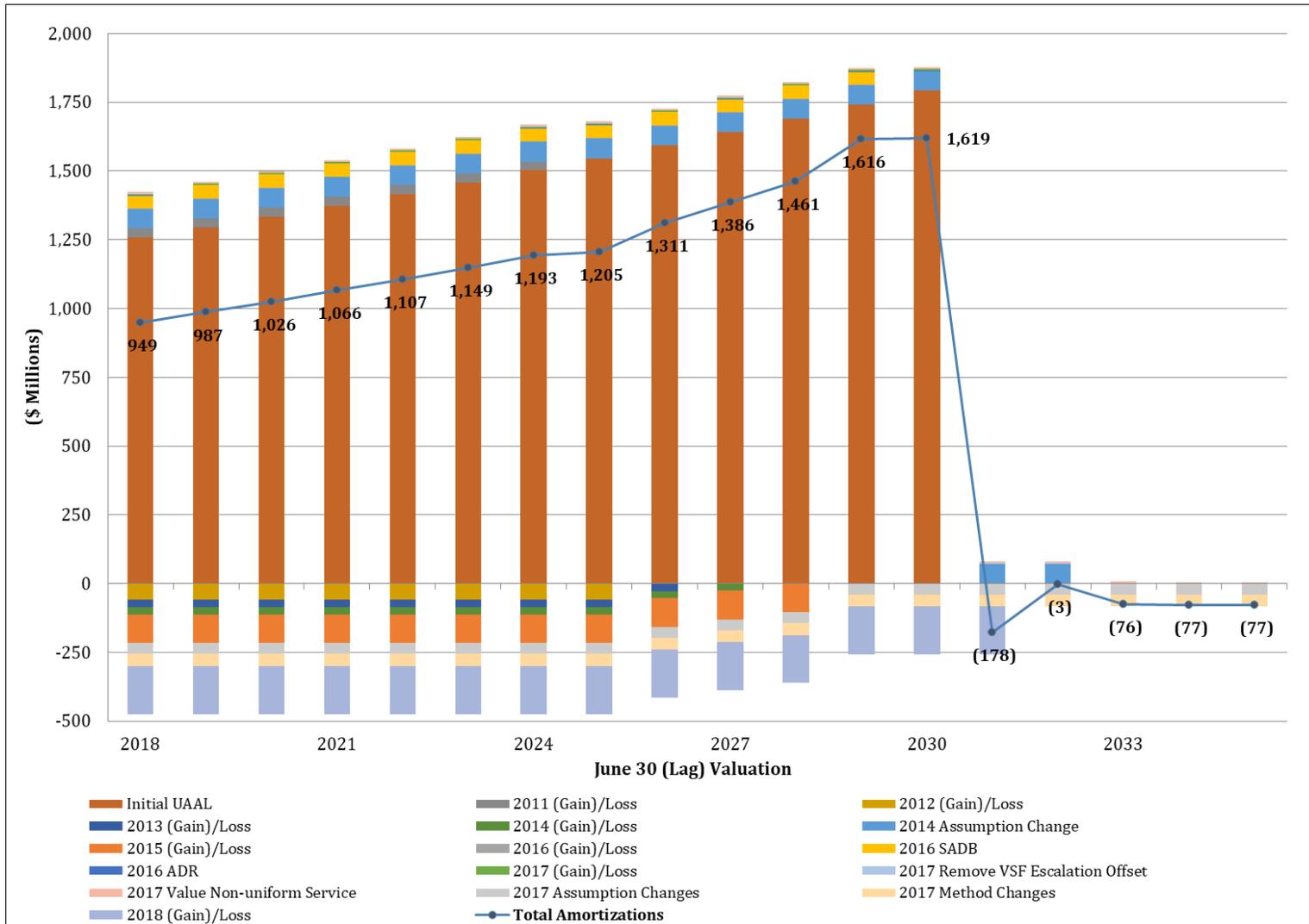


Table III-4
Reconciliation of Outstanding UAL Bases

June 30 (Lag) Valuation Date	Amounts (in \$ Thousands) Remaining to be Amortized, as of								
	2010	2011	2012	2013	2014	2015	2016	2017 ¹	2018
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	\$ 11,870,348
2011 (Gain)/Loss		276,060	295,384	282,285	268,270	253,273	237,226	188,490	170,119
2012 (Gain)/Loss			(497,039)	(531,832)	(508,248)	(483,013)	(456,011)	(370,286)	(339,372)
2013 (Gain)/Loss				(234,947)	(251,393)	(240,245)	(228,317)	(188,688)	(175,032)
2014 (Gain)/Loss					(219,675)	(235,053)	(224,629)	(188,357)	(176,424)
2014 Assumption Change					706,645	756,110	735,882	645,868	622,708
2015 (Gain)/Loss						(881,721)	(943,441)	(800,784)	(756,019)
2016 (Gain)/Loss							21,224	20,283	19,276
2016 SADB							395,717	378,170	359,393
2016 Enhanced ADR							13,611	13,170	12,698
2017 (Gain)/Loss								41,492	39,652
2017 Removal of VSF Escalation Offset								14,308	13,844
2017 Non-uniformed Service								55,369	53,887
2017 Assumption Changes								(392,660)	(382,155)
2017 Method Changes								(433,752)	(422,148)
2018 (Gain)/Loss									(1,479,325)
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	\$ 9,431,451

June 30 (Lag) Valuation Date	2010	2011	2012	2013	2014	2015	2016	2017	2018
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	\$ 48,024,798
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	36,098,314
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	11,926,484
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	2,473,159
5. PV Future Administrative Expense Reimbursement	0	34,979	35,014	36,501	37,473	37,833	38,929	19,568	21,874
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	\$ 9,431,451

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 2011 through 2020.

(\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution Certified	Statutory Contribution Contributed	Percentage of Actuarial Contribution Contributed
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%
2020	2,458,907	2,458,907	100.0%

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

Table III-6 shows the City Rates defined to be the contributions as a percentage of salary for the Fiscal Years 2011 through 2020.

CITY RATES (\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution	Salary ¹ at Beginning of Fiscal Year	City Rate
2011	\$ 2,083,633	\$ 3,252,706	64.1%
2012	2,385,731	3,448,765	69.2%
2013	2,424,690	3,459,872	70.1%
2014	2,320,910	3,420,312	67.9%
2015	2,309,619	3,512,778	65.7%
2016	2,393,940	3,540,326	67.6%
2017	2,293,840	3,509,985	65.4%
2018	2,415,153	3,673,054	65.8%
2019	2,558,256	3,994,618	64.0%
2020	2,458,907	4,084,569	60.2%

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, 2017 (Lag) actuarial valuation and the June 30, 2018 (Lag) actuarial valuation.¹

DEVELOPMENT OF EXPERIENCE (GAIN)/LOSS	
JUNE 30, 2018	
(\$ Thousands)	
1.	Expected Accrued Liability (AL)
	a. AL at June 30, 2017 \$ 51,927,559
	b. Total Normal Cost and Administrative Expenses at June 30, 2017 1,588,014
	c. Interest on 1.a. and 1.b. to June 30, 2018 3,746,090
	d. Fiscal Year 2018 Benefit Payments (3,197,971)
	e. Interest on 1.d. to June 30, 2018 <u>(110,036)</u>
	f. Expected AL at June 30, 2018 \$ 53,953,656
2.	Actual AL at June 30, 2018 \$ 53,304,980
3.	Expected Total Actuarial Value of Assets (AVA)
	a. Total AVA at June 30, 2017 \$ 38,393,814
	b. Interest on 3.a. to June 30, 2018 2,687,567
	c. Total Contributions Paid in Fiscal Year 2018 2,682,184
	d. Interest on 3.c. to June 30, 2018 92,289
	e. Fiscal Year 2018 Benefit Payments (3,197,971)
	f. Interest on 3.e. to June 30, 2018 <u>(110,036)</u>
	g. Expected Total AVA at June 30, 2018 \$ 40,547,847
4.	Actual Total AVA at June 30, 2018 \$ 41,378,496
5.	Liability (Gain)/Loss (2. - 1.f.) \$ (648,676)
6.	Actuarial Asset (Gain)/Loss (3.g. - 4.) \$ (830,649)
7.	Total Actuarial (Gain)/Loss (5. + 6.) \$ (1,479,325)

¹ Includes results for the Variable Supplements Funds.

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 a % of Covered Payroll (3) / (5)
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%
2018	36,098,314	48,024,798	11,926,484	75.2%	4,053,205	294.2%

Effective June 30, 2010, AL is based on the Entry Age Normal cost method. Previously, the Frozen Initial Liability cost method was used. Salaries 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, 2018	June 30, 2017
POVSF		
Active	\$ 437,054	\$ 533,793
Retiree	<u>1,586,911</u>	<u>1,581,226</u>
Total	\$ 2,023,965	\$ 2,115,019
PSOVSF		
Active	\$ 1,375,012	\$ 1,239,598
Retiree	<u>2,417,808</u>	<u>2,396,749</u>
Total	\$ 3,792,820	\$ 3,636,347
Total VSF AL	\$ 5,816,785	\$ 5,751,366

Table VI-2
VSF Member Data

VARIABLE SUPPLEMENTS FUNDS				
MEMBERS INCLUDED IN THE JUNE 30, 2018 (LAG) AND JUNE 30, 2017 (LAG) ACTUARIAL VALUATIONS				
	June 30, 2018		June 30, 2017	
	POVSF	PSOVSF	POVSF	PSOVSF
Actives				
Number	23,841	12,721	23,519	12,646
Average Age	34.8	43.0	34.7	42.8
Retirees				
Number	12,675	19,005	12,602	18,750
Average Age	62.4	61.8	62.1	61.4

Table VI-3
VSF Statement of Assets

(\$ Thousands)				
Valuation Date	June 30, 2018 ¹		June 30, 2017 ²	
	MVA ³	AVA	MVA ⁴	AVA
POVSF	\$ 2,068,782	\$ 2,309,025	\$ 2,100,606	\$ 2,234,906
PSOVSF	<u>2,771,210</u>	<u>2,971,157</u>	<u>1,839,768</u>	<u>1,996,403</u>
Total	\$ 4,839,992	\$ 5,280,182	\$ 3,940,374	\$ 4,231,309

¹ Includes preliminary SKIM amounts as determined by the Actuary in a letter dated September 7, 2018 to the Comptroller's Office.

² Includes preliminary SKIM amounts as determined by the Actuary in a letter dated September 15, 2017 to the Comptroller's Office.

³ Includes Accrued Benefits Payable of \$76,906,000 for POVSF and \$115,640,000 for PSOVSF.

⁴ Includes Accrued Benefits Payable of \$75,739,000 for POVSF and \$112,389,000 for PSOVSF.

Table VI-4
Development of VSF Actuarial Value of Assets

(\$ Thousands)				
	June 30, 2018		June 30, 2017	
	POVSF	PSOVSF	POVSF	PSOVSF
1. Market Value of Assets (MVA)				
a. Beginning of Year (BOY) ¹	\$ 2,100,606	\$ 1,839,768	\$ 1,384,204	\$ 635,460
b. End of Year (EOY) ²	\$ 2,068,782	\$ 2,771,210	\$ 2,100,606	\$ 1,839,768
2. Contributions				
a. Employee	\$ 0	\$ 0	\$ 0	\$ 0
b. Employer	0	0	0	0
c. Total Contributions	\$ 0	\$ 0	\$ 0	\$ 0
3. Benefit Payments and Other Cash Flow	\$ (162,118)	\$ (256,991)	\$ (158,989)	\$ (255,886)
4. Preliminary Transferable Earnings from POLICE to VSFs - EOY³	\$ 130,000	\$ 1,150,000	\$ 708,636	\$ 1,419,802
5. Net Cash Flow (2.c. + 3. + 4.)	\$ (32,118)	\$ 893,009	\$ 549,647	\$ 1,163,916
6. Net Investment Income				
a. Investment Income	\$ 1,420	\$ 39,012	\$ 167,316	\$ 40,537
b. Investment Expenses	(1,126)	(579)	(561)	(145)
c. Total Net Investment Income	\$ 294	\$ 38,433	\$ 166,755	\$ 40,392
7. Average Invested Assets				
a. AVA @ BOY	\$ 2,234,906	\$ 1,996,403	\$ 1,609,663	\$ 822,340
b. 1/2 Net Cash Flow before SKIM ((2.c. + 3.) / 2)	(81,059)	(128,496)	(79,495)	(127,943)
c. Total	\$ 2,153,847	\$ 1,867,907	\$ 1,530,168	\$ 694,397
8. Expected Rate of Return (AIR)	7.00%	7.00%	7.00%	7.00%
9. Expected Investment Return (EIR) (7.c. x 8.)	\$ 150,769	\$ 130,753	\$ 107,112	\$ 48,608
10. Unexpected Investment Return (UIR) (6.c. - 9.)	\$ (150,475)	\$ (92,320)	\$ 59,643	\$ (8,216)
11. Preliminary AVA @ EOY				
a. AVA @ BOY	\$ 2,234,906	\$ 1,996,403	\$ 1,609,663	\$ 822,340
b. Net Cash Flow (5.)	(32,118)	893,009	549,647	1,163,916
c. Expected Investment Return (9.)	150,769	130,753	107,112	48,608
d. Phase in of UIR				
15% * UIR for prior year	(22,571)	(13,848)	8,946	(1,232)
15% * UIR for second prior year	8,946	(1,232)	(39,384)	(26,551)
15% * UIR for third prior year	(39,384)	(26,551)	(7,283)	(6,808)
15% * UIR for fourth prior year	(7,283)	(6,808)	7,306	(162)
20% * UIR for fifth prior year	9,741	(216)	6,019	(353)
20% * UIR for sixth prior year	6,019	(353)	(7,120)	(3,355)
Total	\$ (44,532)	\$ (49,008)	\$ (31,516)	\$ (38,461)
e. Preliminary AVA (11.a. + 11.b. + 11.c. + 11.d.)	\$ 2,309,025	\$ 2,971,157	\$ 2,234,906	\$ 1,996,403
12. Final AVA at EOY (11.e.)	\$ 2,309,025	\$ 2,971,157	\$ 2,234,906	\$ 1,996,403

¹ Includes Accrued Benefits Payable for 6/30/2017 of \$75,739,000 for POVSF and \$112,389,000 for PSOVSF and Accrued Benefits Payable for 6/30/2016 of \$76,586,000 for POVSF and \$113,709,000 for PSOVSF.

² Includes Accrued Benefits Payable for 6/30/2018 of \$76,906,000 for POVSF and \$115,640,000 for PSOVSF and Accrued Benefits Payable for 6/30/2017 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 September 7, 2018 for 6/30/2018 and a letter dated September 15, 2017 for 6/30/2017 to the Comptroller's Office.

Table VI-5
Preliminary SKIM Calculation as of June 30, 2018

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

(\$ Thousands)	Preliminary¹	
Total POLICE Pension Fund		
1. FY2018 Equity Earnings	\$	3,213,956
2. FY2018 Hypothetical Earnings		775,087
3. FY2018 Excess Earnings (1. - 2.)		2,438,869
4. Deficit at June 30, 2017		0
5. Hypothetical Interest Rate (HIR)		2.959%
6. Deficit with interest (4. x (1+HIR))		0
7. Potential SKIM (3. - 6.), not less than zero	\$	2,438,869
	POVSF	PSOVSF
Allocations to VSF		
8. Allocation Percentage	52.834%	47.166%
9. Potential SKIM (7. x 8.)	\$ 1,288,552	\$ 1,150,317
10. APV of Accumulated Plan Benefits	2,005,975	3,768,696
11. MVA Prior to SKIM	1,875,414	1,479,727
12. Unfunded APV of Accumulated Plan Benefits (10. - 11.), not less than zero	130,561	2,288,969
13. SKIM Payable (Lesser of 9. and 12., not less than zero)	130,561	1,150,317
14. Rounded Estimate, for FY18 Financial Statements ¹	\$ 130,000	\$ 1,150,000

¹ Included in MVA at June 30, 2018.

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

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, 40% of members who become eligible for VSF benefits are assumed to retire as Police Officers, while the remaining 60% 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, except there is no corridor of 80% to 120% of the MVA for the VSFs. For more information, see SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS.
4. **Liability Method:** The obligations of 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 12-month average of monthly 10-year U.S. Treasury Note yields
 - 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 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 to not allow assets to exceed the actuarial present value of accumulated plan benefits of the VSFs

SECTION VII - RISK AND UNCERTAINTY

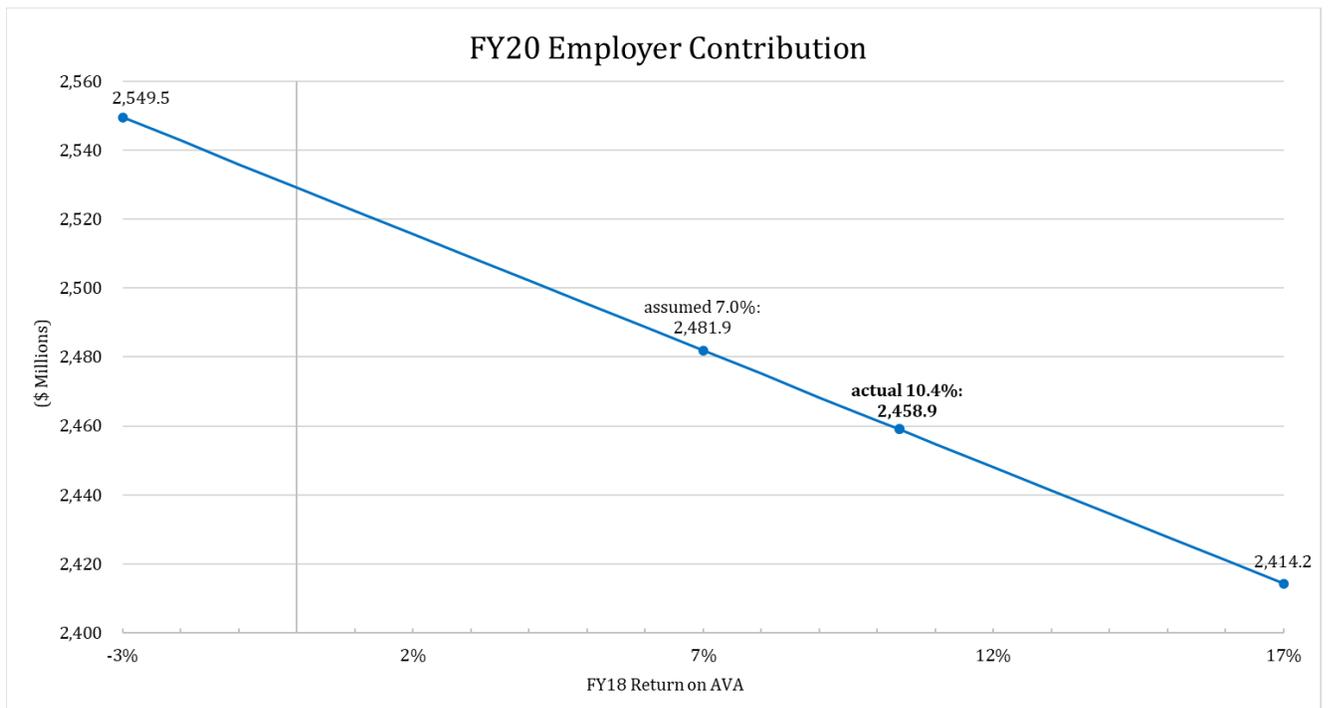
The funded status of POLICE depends highly on the realization of the actuarial assumptions used, as well as certain demographic characteristics of the Plan and other exogenous factors. Risks faced by the Plan are described in this Section. These risks have been separated, based on the Actuary's professional judgement, into high, medium, and other risks.

High Risk Types

Investment Risk: The Risk of Not Realizing Expected Returns

The most substantial risk for most pension systems, POLICE included, is the risk of investment returns being less than assumed. Generally speaking, as risk-free investment return rates have fallen in recent decades, more aggressive asset allocations have been taken to achieve long-term rates of return commensurate with the actuarial assumption of 7.0%.

The graph below illustrates the potential FY20 employer contributions if the FY18 investment return had differed from the actual rate, by up to 10%.¹

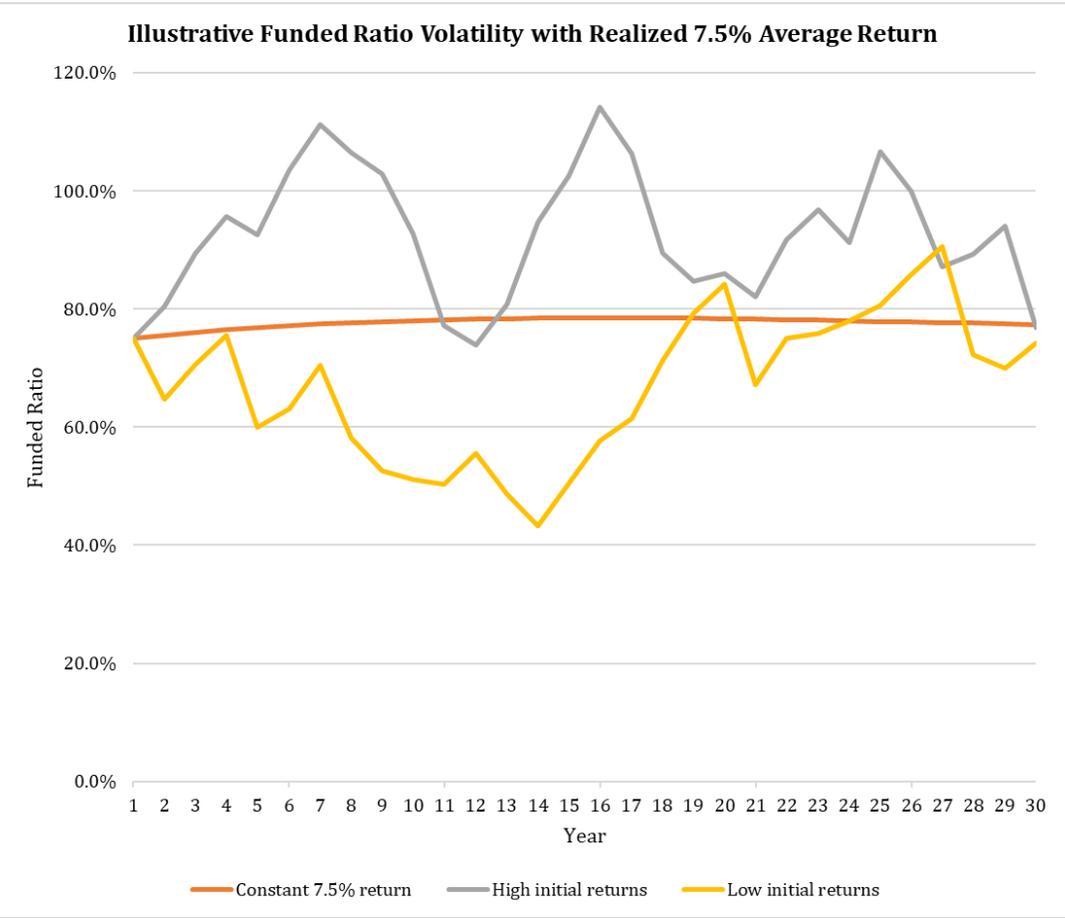
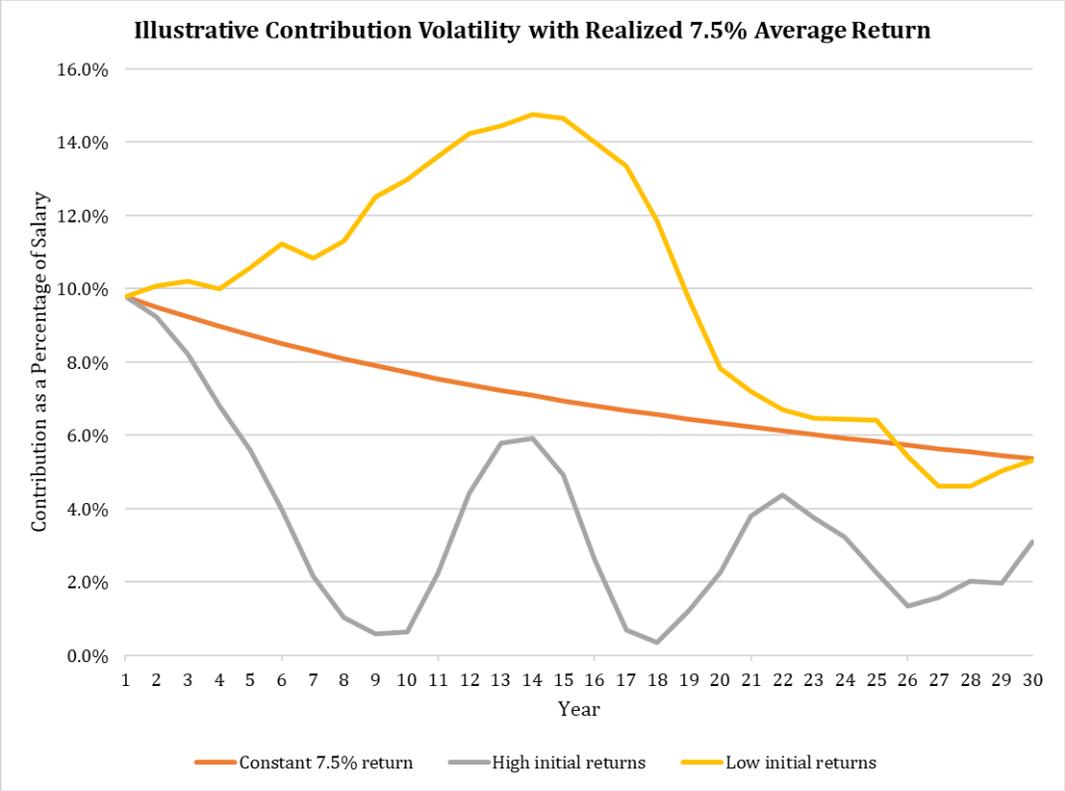


Investment Risk: The Risk of Volatile Realized Returns

Even when long-term investment returns meet actuarial assumptions, investment return volatility can contribute substantially to contribution and funded status volatility. While not yet 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.²

¹ The actual rate of return displayed in this graph is calculated as the overall rate of return for POLICE when combining the Plan and the VSFs together.

² Yin, Yiment; Boyd, Don. Pension Simulation Project. *The Nelson A. Rockefeller Institute of Government*.

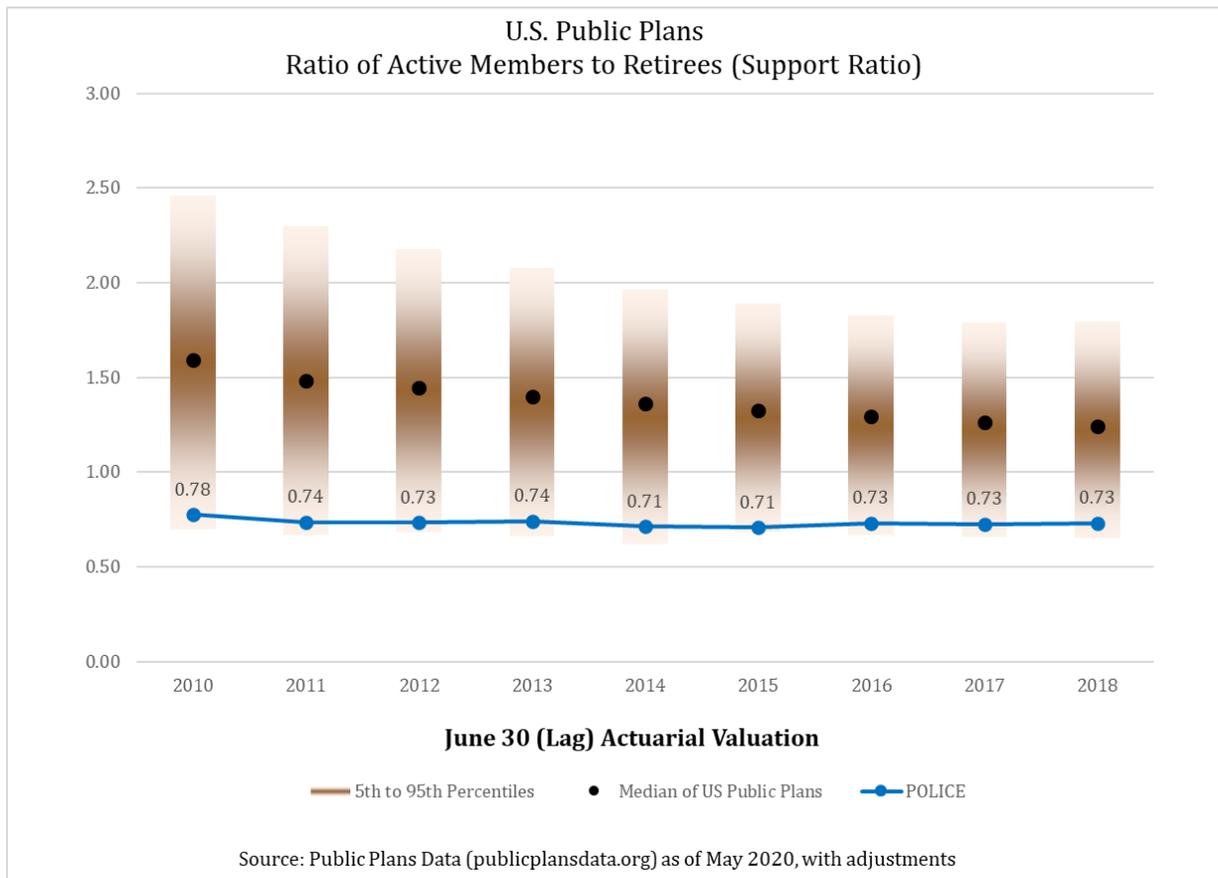


Maturity Risk: The Risk of Demographic Imbalance

In this subsection, the maturity of the Plan is examined with several metrics.

Ratio of Active Members to Retirees (Support Ratio)

A plan's Support Ratio (i.e. the ratio of active members to retirees) is an indicator of the Plan's maturity level. In a plan's early years, the ratio is very high as the plan contains mostly active members. As it matures, more active members transition to retirement, leading to a decrease in the Support Ratio over time that can result in a ratio near or below one. For POLICE, this ratio has been below one, meaning fewer active workers exist to support pensioner payments.

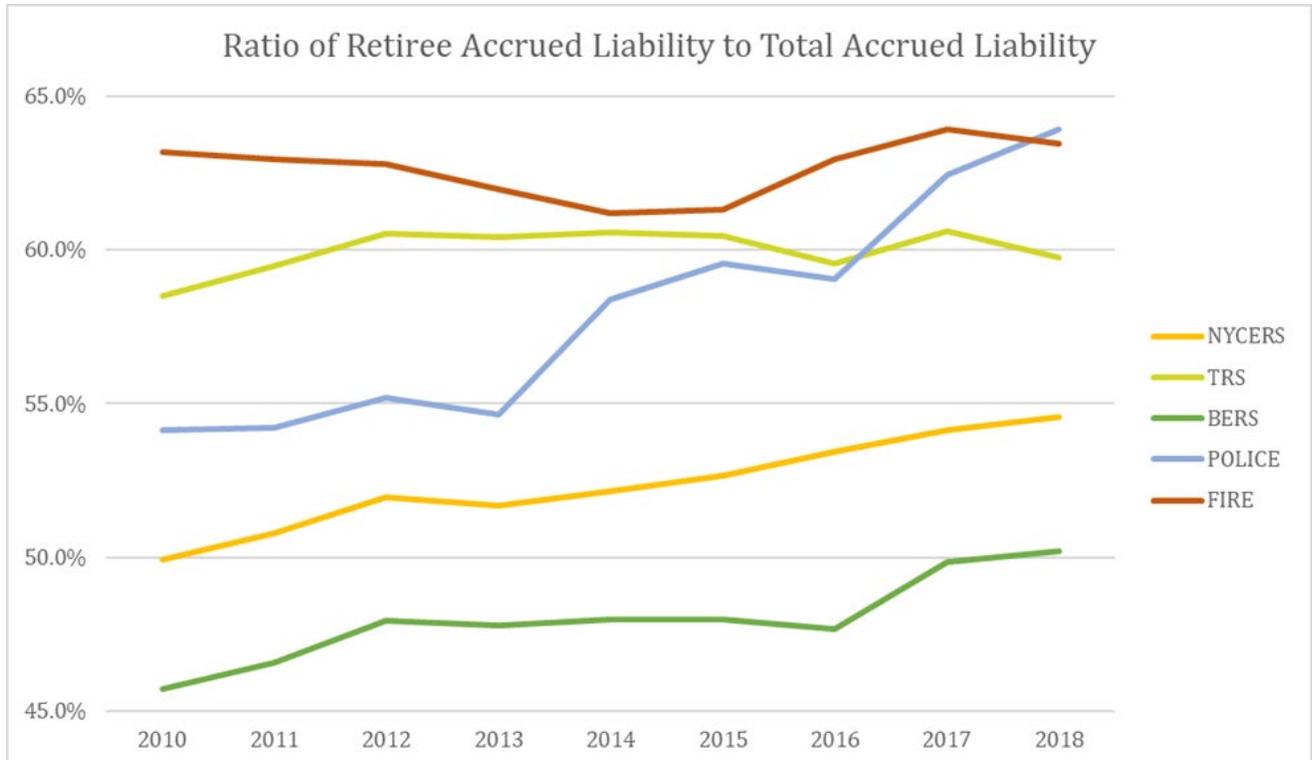


The chart above shows U.S. public pension plan Support Ratios in comparison to the Plan's. The median Support Ratio amongst US public pensions has declined from 1.59 in the 2010 valuation year to 1.24 in the 2018 valuation year. Over that same period, the Plan's Support Ratio declined from 0.78 to 0.73, meaning that fewer active workers exist to support guaranteed pensioner payments.

Because the Plan's Support Ratio is below the median, POLICE's contributions for active members form a smaller proportion of the total actuarial contribution than other pension funds in the U.S. with average maturity.

Ratio of Retiree Accrued Liability to Total Accrued Liability

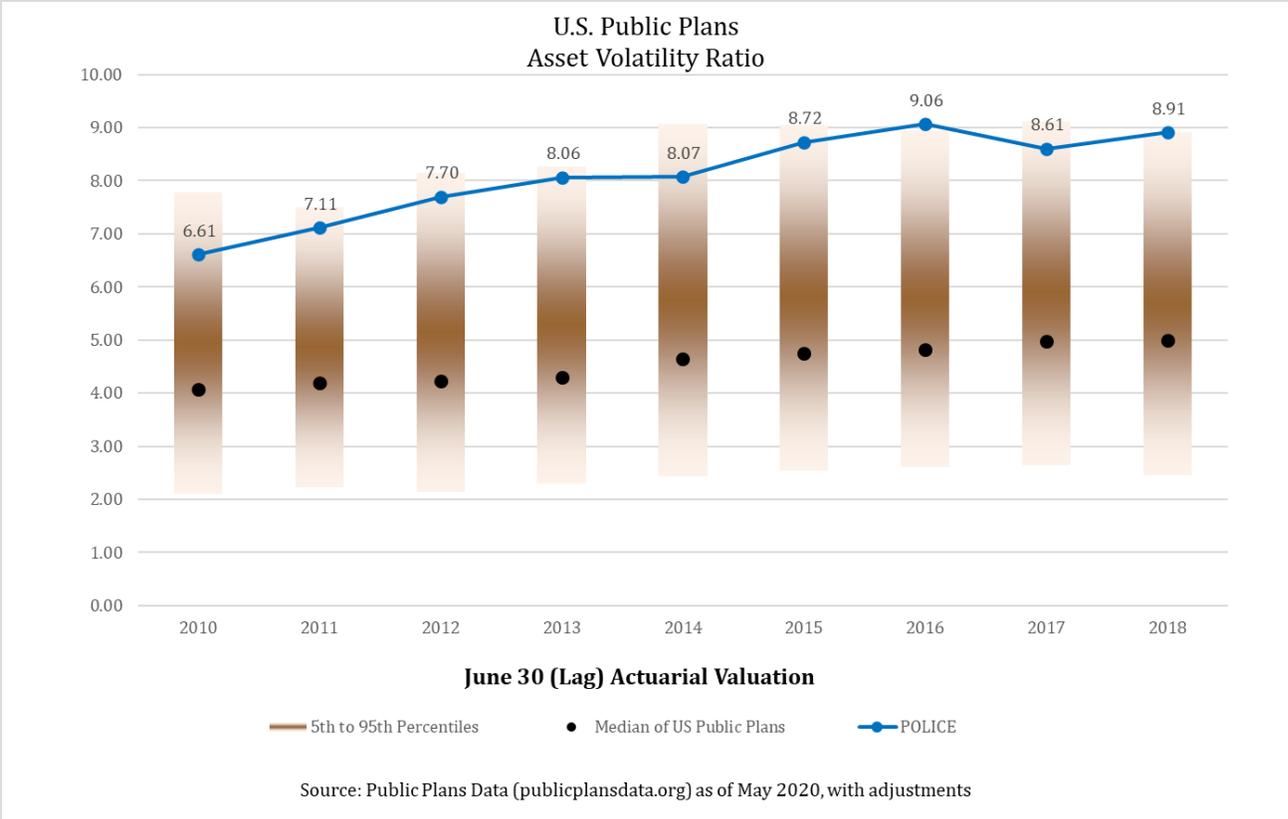
We can also consider the ratio of the Plan's retiree liability to its total liability. A new pension plan begins with this ratio at zero; as the plan matures, the ratio increases. Mature plans often have ratios above 60%. This measure is shown in the graph below for POLICE; the other New York City Retirement Systems¹ are included for comparison purposes. The ratio for POLICE has been between 55-65% for the past few years, indicating that POLICE is a mature retirement system.



Asset Volatility Ratio

Another way to look at plan maturity is the Asset Volatility Ratio (AVR), or ratio of assets to payroll. This ratio tends to rise as plans mature because assets generally need to accumulate to provide for benefit payments. The chart below compares the AVR (on an AVA basis) for POLICE to the population of public pension systems.

¹ New York City Employees' Retirement System (NYCERS); Teachers' Retirement System (TRS); Board of Education Retirement System (BERS); New York City Fire Pension Fund (FIRE)



As a plan approaches maturity, AVRs tend to increase, and the plan’s actuarially-determined contribution becomes more sensitive to investment losses. For example, the same percentage of investment losses in more mature plans with a larger asset base can increase contributions as a percentage of payroll more than in less mature plans, leading to additional volatility. Therefore, mature plans may wish to consider more conservative investment strategies. Typical AVRs for a mature retirement system are between 5 and 6. As shown in the tables above, for POLICE, since ratios are greater than the average, POLICE is considered a mature plan under this measure.

Medium Risk Types

Interest Rate Risk: The Risk of Reduction in the Long-Term Rate of Return

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% is highly dependent on the allocation of Plan assets.

If market conditions or the allocation of Plan assets no longer support a long-term rate of return assumption of 7.0%, the Actuarial Interest Rate (AIR) may have to be reduced, which can significantly increase the Accrued Liability, Unfunded Accrued Liability, Normal Cost, and resulting contribution of the Plan. The sensitivity of the Accrued Liability, the 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, 2018	
Valuation Date	June 30, 2018 (Lag)
Results at 7.0%	
1. Accrued Liability (AL)	\$ 48,024,797,912
2. Actuarial Value of Assets (AVA)	<u>36,098,314,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 11,926,483,912
4. Funded Ratio (AVA Basis) (2. / 1.)	75.2%
5. Normal Cost	\$ 1,485,740,396
Results at 6.0%	
1. Accrued Liability (AL)	\$ 54,092,593,028
2. Actuarial Value of Assets (AVA)	<u>36,098,314,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 17,994,279,028
4. Funded Ratio (AVA Basis) (2. / 1.)	66.7%
5. Normal Cost	\$ 1,839,481,133
Sensitivity Analysis for 1.0% Reduction in Interest Rate	
1. Increase in Accrued Liability	12.6%
2. Increase in Unfunded Accrued Liability	50.9%
3. Decrease in Funded Ratio	8.5%
4. Increase in Normal Cost	23.8%

Longevity Risk: The Risk of Higher than Assumed Mortality Improvement

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 such that the mortality improvement inherent in the Plan population is higher than the improvement seen in the population provided by the Social Security Administration. When mortality improvement is higher than assumed, plan participants will live longer than expected, and the plan will pay more pension benefits than had been previously funded.

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 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%.

Litigation Risk: The Risk of Legal Claims and Lawsuits

It is not uncommon for New York City to be a defendant in legal claims and lawsuits.³ In its most recent claims report, the Comptroller reports that in FY2018, NYC settled 14,094 claims and lawsuits for \$1.0 billion. On occasion, these settlements involve NYCERS. The 1996 case *Gulino v. Board of Education* awards damages to plaintiffs that in some cases include counterfactual service and salary in NYCERS. It remains a continuing risk that litigation may expand the scope of pension benefits beyond what is intended or codified in statute.

¹ Retirement Plans Experience Committee. “Mortality Improvement Scale MP-2018 Report” and “Mortality Improvement Scale MP-2014 report.” *Society of Actuaries*.

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

³ <https://comptroller.nyc.gov/wp-content/uploads/documents/Claims-Report-FY-2018.pdf>

Other Risk Types

Credit/Solvency Risk: The Risk of Potential Insolvency of Contributing Entities

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 faces low credit risk as the main contributing entity to POLICE.

Inflation Risk: The Risk of Higher than Assumed Inflation

POLICE faces risk if 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). A quantitative analysis is not available at this time. Notably, however, the pensioner COLA is limited to half of CPI on the first \$18,000 of annual benefits, which limits the risk exposure to inflation.

Contribution Risk: The Risk that Future Contributions Are Less Than the Actuarially-Determined Contributions

Public pension systems can suffer from contribution risk when sponsoring governmental entities fail to make contributions as determined by the actuary under their funding policies. A 2018 study¹ which used data from 50 states and 230 retirement systems, found that since 2007 the shortfall between actual contributions to state pension plans and minimum actuarial funding standards was \$200 billion.²

The New York City Retirement Systems and Pension Funds face low contribution risk. City benefits are constitutionally protected, and participating employers have historically contributed to the actuarial contribution as certified by the Actuary. The Actuary believes the City will continue to do so in future years. See Table III-5 ACTUARIAL AND STATUTORY CONTRIBUTION HISTORY.

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

Agency/Political Risk: The Risk of Stakeholder Influences

With assumed long-term asset returns and gradual amortization of unfunded liabilities, the funded status of the Plan is expected to improve over time. 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. These situations create cases where

¹ The Pew Charitable Trusts. *"The State Pension Funding Gap: 2018."*

² Accounting standards changed in 2014. From 2007 to 2013, the shortfall is calculated between the actuarial recommended contribution and actual employer contributions. From 2014 to 2018, the shortfall represents the gap between the net amortization benchmark and employer contributions.

promises for future funding can be disregarded for political expediency or other priorities. In other cases, certain plan provisions or administrative practices intended to provide occasional clarity or relief become commonplace or intentionally sought for the benefit of members at the expense of taxpayers.

Intergenerational Equity Risk: The Risk of Inequity in the Actuarially-Determined Contributions

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 past and future taxpayers. The reverse can also be true if aggressive or unrealistic assumptions are used. As the Plan is ongoing, taxpayers across all generations should be expected to offer similar funding contributions over the lifetime of the Plan.

Additionally, in future years of higher or lower funded status, changes in the statute may take place that can improve or diminish plan provisions. If so, intergenerational equity risk could increase as taxpayers and plan members at that time may receive preferential or less preferential treatment over the taxpayers and plan members prior to and subsequent to them.

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.

Additional Member Contributions – 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: 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: 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	22	20
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, Tier 3 Revised, and Tier 3 Enhanced:

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

b. Benefits

i. Tier 1 and Tier 2

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

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

Minimum Benefit:

Less than 10 years of service: $\frac{1}{3}$ 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 day before 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 (COLA)

Annuity payments are increased annually on September 1st, but only after a pensioner has attained the applicable eligibility threshold. Some beneficiaries are not eligible for COLA increases. The COLA increase is equal to a base benefit times a COLA percentage. The COLA increase for a spouse receiving a joint & survivor annuity is one half of the COLA increase that would have been applicable to the member had he or she survived.

1. Eligibility Thresholds:
 - a. Service Retirement and Vested Retirement: The earlier of (i) and (ii):
 - i. Attainment of age 62 and 5 years since commencement
 - ii. Attainment of age 55 and 10 years since commencement
 - b. Disability Retirement: 5 years since commencement
 - c. Beneficiaries of an Accidental Death benefit: 5 years since commencement

2. Eligible beneficiaries: Spouses receiving a joint & survivor annuity. All others are non-eligible.
3. Base Benefit: The lesser of \$18,000 and the maximum retirement allowance plus the sum of prior years' COLA increases.
4. COLA percentage: 50% of the Consumer Price Index (CPI-U) based upon the 12 months ending March 31 prior to each September 1 effective date, rounded to the next higher 0.1%. Such percentage shall not be less than 1.0% nor greater than 3.0%.

N. Escalation

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

1. Eligibility: Service, vesting, disability retirement, and survivor benefits.
2. Full Escalation Date
 - a. Vested and Service Pensions: The first day of the month following the day which a member completes or would have completed 25 years of service.
 - b. Disability Pensions: The first day of the month following the day which a non-Enhanced Plan disability retiree first becomes eligible for ODR/ADR.
 - c. Death Benefits: The first day of the month following the day which a beneficiary first becomes eligible for a death benefit paid other than in a lump sum.
3. Amount

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

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

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

4. Partial Escalation

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

O. WTC Disability Benefits

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

P. WTC Death Benefits

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

Q. Changes Since the Prior Valuation

None.

SECTION IX - CHAPTER AMENDMENTS

The Chapter amendments enacted during the past five years that had a significant impact on the June 30, 2018 (Lag) actuarial valuation results include:

- **Chapter 179 of the Laws of 2018** (Chapter 179/18) 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 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 Plan. Members as of April 1, 2017 and later are mandated into the Enhanced Disability Benefits Plan.
- **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.

SECTION X - SUBSEQUENT EVENTS

The Board of Trustees, 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 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% ¹	50.00% ¹
63	100.00%	100.00%

¹100% 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		
Age	Ordinary Disability	Tier 1 & Tier 2 Eligible for WTC Benefits	Tier 1 & Tier 2 Not Eligible for WTC AND Tier 3 Enhanced Plan	Tier 3 & Tier 3 Revised Non-Enhanced Plan
15	0.0360%	0.168%	0.098%	0.098%
16	0.0360%	0.168%	0.098%	0.098%
17	0.0360%	0.168%	0.098%	0.098%
18	0.0360%	0.168%	0.098%	0.098%
19	0.0360%	0.168%	0.098%	0.098%
20	0.0400%	0.180%	0.105%	0.105%
21	0.0440%	0.192%	0.112%	0.112%
22	0.0480%	0.204%	0.119%	0.119%
23	0.0520%	0.216%	0.126%	0.126%
24	0.0560%	0.228%	0.133%	0.133%
25	0.0600%	0.240%	0.140%	0.140%
26	0.0640%	0.312%	0.182%	0.182%
27	0.0680%	0.384%	0.224%	0.224%
28	0.0720%	0.456%	0.266%	0.266%
29	0.0760%	0.528%	0.308%	0.308%
30	0.0800%	0.600%	0.350%	0.350%
31	0.0840%	0.720%	0.420%	0.420%
32	0.0880%	0.840%	0.490%	0.490%
33	0.0920%	0.960%	0.560%	0.560%
34	0.0960%	1.080%	0.630%	0.630%
35	0.1000%	1.200%	0.700%	0.700%
36	0.1040%	1.260%	0.735%	0.728%
37	0.1080%	1.320%	0.770%	0.756%
38	0.1120%	1.380%	0.805%	0.784%
39	0.1160%	1.440%	0.840%	0.812%
40	0.1200%	1.500%	0.875%	0.840%
41	0.1240%	1.560%	0.910%	0.854%
42	0.1280%	1.620%	0.945%	0.868%
43	0.1320%	1.680%	0.980%	0.882%
44	0.1360%	1.740%	1.015%	0.896%
45	0.1400%	1.800%	1.050%	0.910%
46	0.1440%	1.920%	1.120%	0.938%
47	0.1480%	2.040%	1.190%	0.966%
48	0.1520%	2.160%	1.260%	0.994%
49	0.1560%	2.280%	1.330%	1.022%
50	0.1600%	2.400%	1.400%	1.050%
51	0.2000%	2.640%	1.540%	1.120%
52	0.2400%	2.880%	1.680%	1.190%
53	0.3200%	3.120%	1.820%	1.260%
54	0.4800%	3.360%	1.960%	1.330%
55	0.6400%	3.600%	2.100%	1.400%
56	0.8000%	4.080%	2.380%	1.540%
57	1.6000%	4.560%	2.660%	1.680%
58	2.4000%	5.040%	2.940%	1.820%
59	3.2000%	5.520%	3.220%	1.960%
60	4.8000%	6.000%	3.500%	2.100%
61	6.4000%	7.200%	4.200%	2.240%
62	8.0000% ¹	8.4000% ¹	4.900% ¹	2.450% ¹
63	N/A	N/A	N/A	N/A

¹N/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% ¹	0.240% ¹	0.0420% ¹
63	N/A	N/A	N/A

¹Proposed 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 ¹
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%

¹Salary 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, & Tier 3 Enhanced Dual Service	Tier 3, Tier 3 Revised, & Tier 3 Enhanced Dual Disability
0-15	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%

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 (AIR):** 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 Actuary reset the Actuarial Value of Assets to market value as of June 30, 2011.

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

In accordance with this AAVM, the 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. **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.
10. **WTC Disability and Death Benefits:** Obligations attributable to the WTC Disability Benefits 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.
11. **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:

a. 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.

b. 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.

SECTION XII - SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2018 (Lag) and June 30, 2017 (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, 2018 and June 30, 2017.

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, 2017	36,165	1,822	502	33,093	2,935	12,512	425	834	49,799	88,288
New Entrants	1,970	76	0	1	2	0	19	4	26	2,072
Rehires	99	(92)	(2)	(3)	0	0	0	0	(3)	2
Leaving Active Payroll	(309)	309	0	0	0	0	0	0	0	0
Vested Termination	(45)	(1)	46	0	0	0	0	0	0	0
Non-Vested Termination / Cashout	(153)	(172)	(2)	0	0	0	0	0	0	(327)
Accidental Death (from Active)	(2)	0	0	0	0	0	2	0	2	0
Ordinary Death (from Active)	(19)	0	0	0	0	0	0	0	0	(19)
Service Retirement	(935)	(2)	(52)	989	0	0	0	0	989	0
Ordinary Disability Retirement	(39)	0	(1)	0	40	0	0	0	40	0
Accidental Disability Retirement	(170)	0	0	0	0	170	0	0	170	0
Reclassifications	0	0	0	(96)	(10)	97	14	(5)	0	0
Death with Beneficiary	0	0	0	(36)	(3)	(15)	0	54	0	0
Death without Beneficiary	0	0	0	(532)	(103)	(208)	(9)	(46)	(898)	(898)
Off Pension Payroll	0	0	0	0	0	0	0	(1)	(1)	(1)
	0	0	0	0	0	0	0	0	0	0
Net Change	397	118	(11)	323	(74)	44	26	6	325	829
Number at June 30, 2018	36,562	1,940	491	33,416	2,861	12,556	451	840	50,124	89,117

Graph XII-2
Headcount Summary by Status

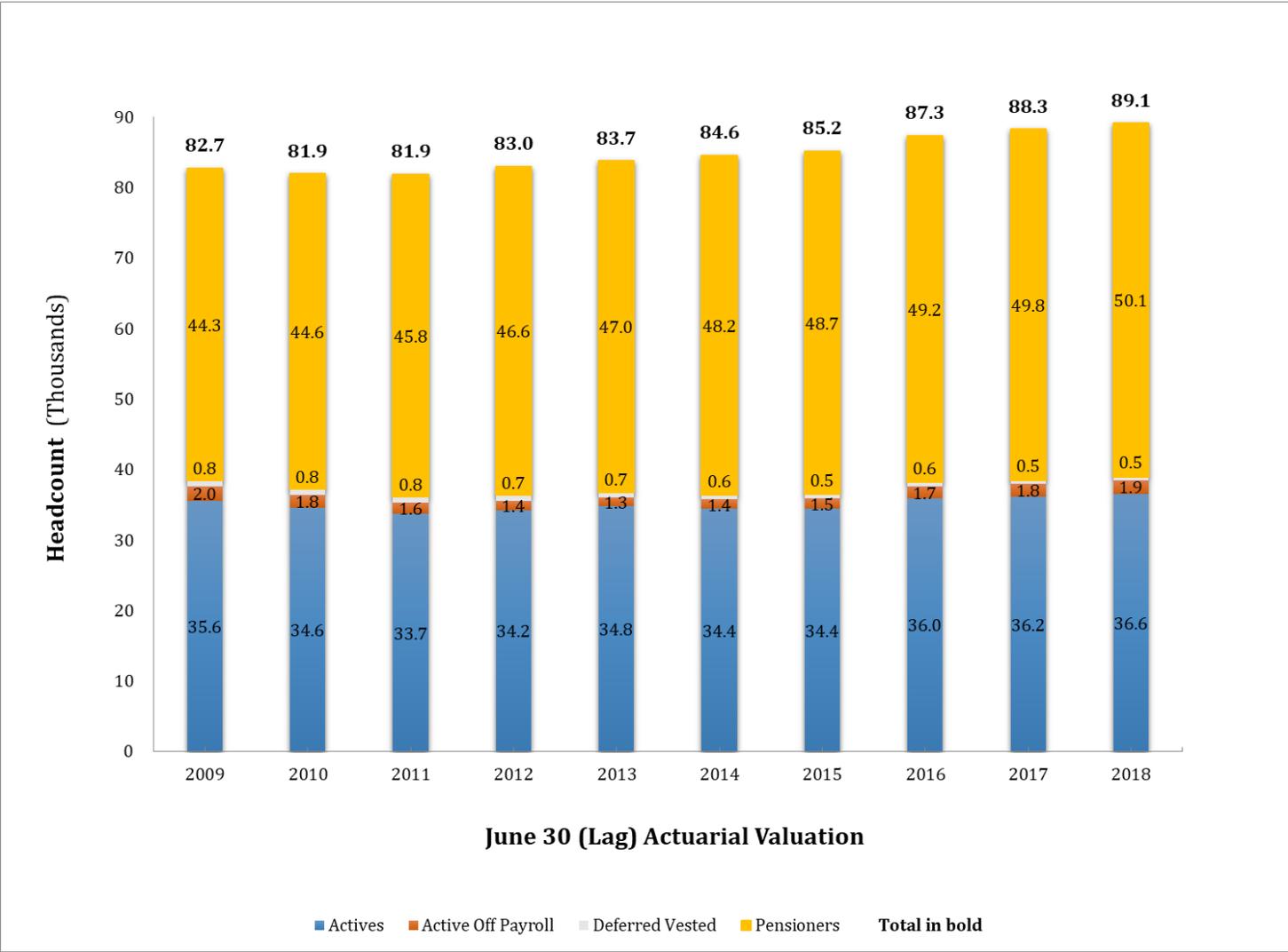


Table XII-3
Summary of Active Membership

NEW YORK CITY POLICE PENSION FUND		
ACTIVE MEMBERS INCLUDED IN THE JUNE 30, 2018 (LAG) AND THE JUNE 30, 2017 (LAG) ACTUARIAL VALUATIONS		
	June 30, 2018 (Lag)	June 30, 2017 (Lag)
Number		
Males	30,042	29,813
Females	<u>6,520</u>	<u>6,352</u>
Total	36,562	36,165
Annual Salary ¹		
Males	\$ 3,363,262,639	\$ 3,298,631,050
Females	<u>689,941,924</u>	<u>670,254,196</u>
Total	\$ 4,053,204,563	\$ 3,968,885,246
Average Salary ¹		
Males	\$ 111,952	\$ 110,644
Females	105,819	105,519
Total Average	\$ 110,858	\$ 109,744
Average Age		
Males	37.7	37.6
Females	37.4	37.4
Total Average	37.7	37.5
Average Past Service		
Males	11.8	11.7
Females	10.7	10.7
Total Average	11.6	11.5

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

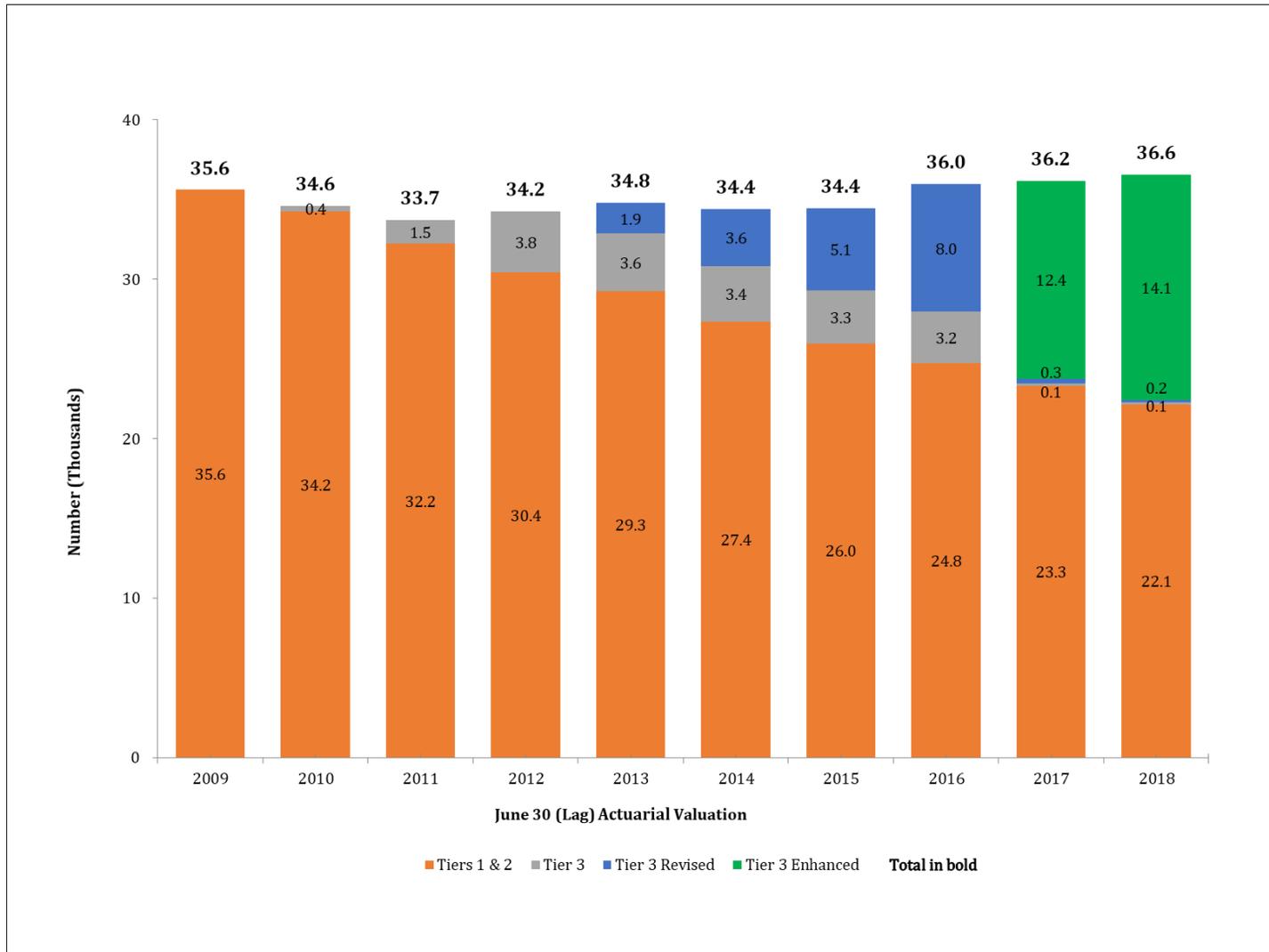


Table XII-5
Schedule of Active Member Salary Data

June 30 (Lag) Actuarial Valuation	Number	Annual Salary	Average Annual Salary	Percentage Increase/ (Decrease) In Avg. Salary
2009	35,608	3,261,118,111	91,584	4.5%
2010	34,597	3,464,096,750	100,127	9.3%
2011	33,705	3,480,066,072	103,251	3.1%
2012	34,240	3,478,153,934	101,582	(1.6%)
2013	34,775	3,607,606,894	103,741	2.1%
2014	34,402	3,618,095,284	105,171	1.4%
2015	34,435	3,564,029,659	103,500	(1.6%)
2016	35,961	3,717,425,239	103,374	(0.1%)
2017	36,165	3,968,885,246	109,744	6.2%
2018	36,562	4,053,204,563	110,858	1.0%

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, 2018

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
20 TO 24	1,101	0	0	0	0	0	0	0	0	1,101
25 TO 29	3,626	957	7	0	0	0	0	0	0	4,590
30 TO 34	1,612	2,785	1,812	4	0	0	0	0	0	6,213
35 TO 39	566	978	3,672	1,005	6	0	0	0	0	6,227
40 TO 44	116	392	1,576	2,164	742	2	0	0	0	4,992
45 TO 49	5	33	581	1,067	1,607	648	4	0	0	3,945
50 TO 54	2	1	57	391	667	756	291	0	0	2,165
55 TO 59	0	2	2	23	149	176	200	91	0	643
60 TO 64	1	0	2	9	10	10	43	70	6	151
65 TO 69	0	1	1	3	2	1	1	0	0	9
70 & UP	0	0	1	3	1	0	0	0	1	6
TOTAL	7,029	5,149	7,711	4,669	3,184	1,593	539	161	7	30,042

<i>SALARIES (IN THOUSANDS):</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	62,015	0	0	0	0	0	0	0	0	62,015
25 TO 29	235,389	96,273	680	0	0	0	0	0	0	332,343
30 TO 34	108,388	306,721	224,383	518	0	0	0	0	0	640,010
35 TO 39	37,881	106,359	459,552	131,578	780	0	0	0	0	736,150
40 TO 44	8,191	42,557	193,592	284,776	105,135	303	0	0	0	634,554
45 TO 49	398	3,822	71,881	137,712	226,477	97,030	568	0	0	537,888
50 TO 54	270	121	7,038	49,903	90,959	109,525	44,037	0	0	301,852
55 TO 59	0	282	262	2,976	19,877	24,285	29,718	15,146	0	92,545
60 TO 64	130	0	292	1,242	1,419	1,296	6,059	11,844	1,210	23,492
65 TO 69	0	147	147	416	310	230	229	0	0	1,479
70 & UP	0	0	147	475	149	0	0	0	163	934
TOTAL ¹	452,663	556,283	957,974	609,596	445,106	232,669	80,610	26,989	1,373	3,363,263

<i>AVERAGE SALARIES: ²</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	56,326	0	0	0	0	0	0	0	0	56,326
25 TO 29	64,917	100,599	97,134	0	0	0	0	0	0	72,406
30 TO 34	67,238	110,133	123,832	129,500	0	0	0	0	0	103,011
35 TO 39	66,928	108,752	125,150	130,923	130,061	0	0	0	0	118,219
40 TO 44	70,611	108,564	122,837	131,597	141,691	151,403	0	0	0	127,114
45 TO 49	79,623	115,820	123,719	129,065	140,931	149,738	141,916	0	0	136,347
50 TO 54	134,953	120,515	123,474	127,630	136,370	144,875	151,329	0	0	139,424
55 TO 59	0	141,120	130,812	129,407	133,401	137,981	148,588	166,436	0	143,927
60 TO 64	129,882	0	146,198	137,949	141,933	129,586	140,911	169,198	201,678	155,577
65 TO 69	0	147,086	147,165	138,652	154,917	230,343	228,942	0	0	164,369
70 & UP	0	0	147,086	158,452	149,132	0	0	0	162,747	155,720
TOTAL	64,399	108,037	124,235	130,562	139,795	146,057	149,555	167,637	196,116	111,952

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

¹ Total may not add up due to rounding.

² Average based on unrounded salary.

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2018 (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
20 TO 24	198	0	0	0	0	0	0	0	0	198
25 TO 29	841	144	0	0	0	0	0	0	0	985
30 TO 34	509	552	303	0	0	0	0	0	0	1,364
35 TO 39	202	205	836	179	0	0	0	0	0	1,422
40 TO 44	35	104	435	539	108	0	0	0	0	1,221
45 TO 49	0	8	177	326	279	66	0	0	0	856
50 TO 54	0	0	6	121	120	97	23	0	0	367
55 TO 59	1	0	1	4	24	39	18	8	0	95
60 TO 64	0	0	0	0	1	1	5	5	0	12
65 TO 69	0	0	0	0	0	0	0	0	0	0
70 & UP	0	0	0	0	0	0	0	0	0	0
TOTAL	1,786	1,013	1,758	1,169	532	203	46	13	0	6,520

<i>SALARIES (IN THOUSANDS):</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	10,773	0	0	0	0	0	0	0	0	10,773
25 TO 29	53,241	14,178	0	0	0	0	0	0	0	67,419
30 TO 34	32,804	59,346	36,121	0	0	0	0	0	0	128,272
35 TO 39	13,250	21,767	101,161	22,807	0	0	0	0	0	158,985
40 TO 44	2,462	10,990	52,542	69,573	15,172	0	0	0	0	150,738
45 TO 49	0	913	21,175	41,005	37,821	9,255	0	0	0	110,169
50 TO 54	0	0	716	15,289	16,164	13,366	3,440	0	0	48,976
55 TO 59	123	0	147	470	3,280	5,070	2,497	1,224	0	12,811
60 TO 64	0	0	0	0	162	120	718	799	0	1,799
65 TO 69	0	0	0	0	0	0	0	0	0	0
70 & UP	0	0	0	0	0	0	0	0	0	0
TOTAL¹	112,653	107,194	211,863	149,144	72,599	27,811	6,655	2,023	0	689,942

<i>AVERAGE SALARIES: ²</i>										
UNDER 20	0	0	0	0	0	0	0	0	0	0
20 TO 24	54,408	0	0	0	0	0	0	0	0	54,408
25 TO 29	63,307	98,457	0	0	0	0	0	0	0	68,446
30 TO 34	64,449	107,512	119,212	0	0	0	0	0	0	94,041
35 TO 39	65,595	106,179	121,006	127,415	0	0	0	0	0	111,804
40 TO 44	70,334	105,668	120,787	129,077	140,485	0	0	0	0	123,455
45 TO 49	0	114,143	119,633	125,783	135,560	140,220	0	0	0	128,702
50 TO 54	0	0	119,410	126,354	134,702	137,795	149,559	0	0	133,448
55 TO 59	123,106	0	147,086	117,604	136,649	130,003	138,699	152,986	0	134,850
60 TO 64	0	0	0	0	161,792	119,878	143,616	159,885	0	149,932
65 TO 69	0	0	0	0	0	0	0	0	0	0
70 & UP	0	0	0	0	0	0	0	0	0	0
TOTAL	63,076	105,818	120,514	127,583	136,464	136,998	144,663	155,640	0	105,819

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

¹ Total may not add up due to rounding.

² Average based on unrounded salary.

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2018 (cont'd)

ALL TIERS: ALL MEMBERS											
AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS	
<i>NUMBER:</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	1,299	0	0	0	0	0	0	0	0	0	1,299
25 TO 29	4,467	1,101	7	0	0	0	0	0	0	0	5,575
30 TO 34	2,121	3,337	2,115	4	0	0	0	0	0	0	7,577
35 TO 39	768	1,183	4,508	1,184	6	0	0	0	0	0	7,649
40 TO 44	151	496	2,011	2,703	850	2	0	0	0	0	6,213
45 TO 49	5	41	758	1,393	1,886	714	4	0	0	0	4,801
50 TO 54	2	1	63	512	787	853	314	0	0	0	2,532
55 TO 59	1	2	3	27	173	215	218	99	0	0	738
60 TO 64	1	0	2	9	11	11	48	75	6	0	163
65 TO 69	0	1	1	3	2	1	1	0	0	0	9
70 & UP	0	0	1	3	1	0	0	0	1	0	6
TOTAL	8,815	6,162	9,469	5,838	3,716	1,796	585	174	7	36,562	

<i>SALARIES (IN THOUSANDS):</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	72,788	0	0	0	0	0	0	0	0	0	72,788
25 TO 29	288,631	110,451	680	0	0	0	0	0	0	0	399,762
30 TO 34	141,192	366,068	260,504	518	0	0	0	0	0	0	768,282
35 TO 39	51,131	128,126	560,713	154,385	780	0	0	0	0	0	895,135
40 TO 44	10,653	53,547	246,134	354,349	120,307	303	0	0	0	0	785,292
45 TO 49	398	4,735	93,056	178,717	264,298	106,285	568	0	0	0	648,057
50 TO 54	270	121	7,754	65,192	107,123	122,891	47,477	0	0	0	350,828
55 TO 59	123	282	409	3,447	23,156	29,355	32,214	16,370	0	0	105,356
60 TO 64	130	0	292	1,242	1,581	1,416	6,777	12,643	1,210	0	25,291
65 TO 69	0	147	147	416	310	230	229	0	0	0	1,479
70 & UP	0	0	147	475	149	0	0	0	163	0	934
TOTAL ¹	565,316	663,476	1,169,837	758,740	517,705	260,480	87,265	29,013	1,373	4,053,205	

<i>AVERAGE SALARIES: ²</i>											
UNDER 20	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	56,034	0	0	0	0	0	0	0	0	0	56,034
25 TO 29	64,614	100,319	97,134	0	0	0	0	0	0	0	71,706
30 TO 34	66,569	109,700	123,170	129,500	0	0	0	0	0	0	101,397
35 TO 39	66,577	108,306	124,382	130,393	130,061	0	0	0	0	0	117,026
40 TO 44	70,547	107,957	122,394	131,095	141,538	151,403	0	0	0	0	126,395
45 TO 49	79,623	115,493	122,765	128,296	140,137	148,858	141,916	0	0	0	134,984
50 TO 54	134,953	120,515	123,087	127,328	136,116	144,070	151,199	0	0	0	138,558
55 TO 59	123,106	141,120	136,236	127,658	133,851	136,534	147,772	165,349	0	0	142,758
60 TO 64	129,882	0	146,198	137,949	143,739	128,704	141,193	168,577	201,678	0	155,161
65 TO 69	0	147,086	147,165	138,652	154,917	230,343	228,942	0	0	0	164,369
70 & UP	0	0	147,086	158,452	149,132	0	0	0	162,747	0	155,720
TOTAL	64,131	107,672	123,544	129,966	139,318	145,033	149,170	166,740	196,116	110,858	

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

¹ Total may not add up due to rounding.

² Average based on unrounded salary.

Table XII-7
Summary of Non-Pensioner Membership

TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2018							TOTAL ACTIVE MEMBERS 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	2	393,090	196,545	79.0	40.5	3	612,255	204,085	74.0	35.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		2	393,090	196,545	79.0	40.5	3	612,255	204,085	74.0	35.0
II	M	18,285	2,399,087,602	131,205	42.5	16.9	19,281	2,485,222,388	128,895	41.9	16.2
II	F	3,856	483,895,398	125,492	42.2	15.7	4,050	500,462,965	123,571	41.5	15.0
		22,141	2,882,983,000	130,210	42.5	16.7	23,331	2,985,685,353	127,971	41.8	16.0
III	M	106	12,588,273	118,757	33.0	7.7	124	13,709,950	110,564	32.1	6.6
III	F	15	1,730,616	115,374	34.9	7.3	22	2,233,534	101,524	33.9	6.2
		121	14,318,889	118,338	33.3	7.6	146	15,943,484	109,202	32.4	6.5
III Revised	M	155	11,933,773	76,992	30.6	3.7	231	15,802,716	68,410	29.3	2.6
III Revised	F	32	2,580,650	80,645	31.3	3.6	46	2,956,108	64,263	30.7	2.1
		187	14,514,423	77,617	30.8	3.7	277	18,758,824	67,721	29.5	2.5
III Enhanced	M	11,494	939,259,901	81,717	30.1	3.8	10,174	783,283,741	76,989	29.6	3.3
III Enhanced	F	2,617	201,735,260	77,086	30.5	3.5	2,234	164,601,589	73,680	30.1	3.1
		14,111	1,140,995,161	80,859	30.2	3.8	12,408	947,885,330	76,393	29.7	3.3
ALL TIERS		36,562	4,053,204,563	110,858	37.7	11.6	36,165	3,968,885,246	109,744	37.5	11.5

JUNE 30, 2018 MEMBERS ALSO PRESENT AS OF JUNE 30, 2017							JUNE 30, 2017 MEMBERS ALSO PRESENT AS OF JUNE 30, 2018				
TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
I	M	2	393,090	196,545	79.0	40.5	2	387,802	193,901	78.0	39.5
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		2	393,090	196,545	79.0	40.5	2	387,802	193,901	78.0	39.5
II	M	18,240	2,394,310,547	131,267	42.6	16.9	18,240	2,346,900,541	128,668	41.6	15.9
II	F	3,823	480,415,005	125,664	42.2	15.8	3,823	471,184,614	123,250	41.2	14.7
		22,063	2,874,725,552	130,296	42.5	16.7	22,063	2,818,085,155	127,729	41.5	15.7
III	M	106	12,588,273	118,757	33.0	7.7	106	11,795,798	111,281	32.0	6.7
III	F	15	1,730,616	115,374	34.9	7.3	15	1,543,209	102,881	33.9	6.3
		121	14,318,889	118,338	33.3	7.6	121	13,339,007	110,240	32.3	6.6
III Revised	M	150	11,505,931	76,706	30.6	3.7	150	10,144,559	67,630	29.6	2.6
III Revised	F	31	2,504,704	80,797	31.4	3.6	31	2,088,081	67,357	30.4	2.6
		181	14,010,635	77,407	30.7	3.6	181	12,232,640	67,584	29.7	2.6
III Enhanced	M	9,913	855,443,677	86,295	30.7	4.4	9,913	764,747,994	77,146	29.7	3.4
III Enhanced	F	2,181	178,915,532	82,034	31.1	4.1	2,181	160,727,006	73,694	30.1	3.1
		12,094	1,034,359,209	85,527	30.8	4.3	12,094	925,475,000	76,523	29.8	3.3
ALL TIERS		34,461	3,937,807,375	114,269	38.3	12.3	34,461	3,769,519,604	109,385	37.3	11.2

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	1	224,453	224,453	66.0	26.0
I	F	0	0	0	0.0	0.0	0	0	0	0.0	0.0
		0	0	0	0.0	0.0	1	224,453	224,453	66.0	26.0
II	M	45	4,777,055	106,157	36.9	11.8	1,041	138,321,847	132,874	47.2	21.7
II	F	33	3,480,393	105,466	38.1	12.2	227	29,278,351	128,980	45.5	19.4
		78	8,257,448	105,865	37.4	11.9	1,268	167,600,198	132,177	46.9	21.3
III	M	0	0	0	0.0	0.0	18	1,914,152	106,342	32.6	6.3
III	F	0	0	0	0.0	0.0	7	690,325	98,618	33.9	6.0
		0	0	0	0.0	0.0	25	2,604,477	104,179	32.9	6.2
III Revised	M	5	427,842	85,568	33.4	4.8	81	5,658,157	69,854	28.7	2.4
III Revised	F	1	75,946	75,946	30.0	5.0	15	868,027	57,868	31.3	1.1
		6	503,788	83,965	32.8	4.8	96	6,526,184	67,981	29.1	2.2
III Enhanced	M	1,581	83,816,224	53,015	26.7	0.6	261	18,535,747	71,018	28.3	2.7
III Enhanced	F	436	22,819,728	52,339	27.6	0.6	53	3,874,583	73,105	29.0	3.1
		2,017	106,635,952	52,869	26.9	0.6	314	22,410,330	71,370	28.5	2.8
ALL TIERS		2,101	115,397,188	54,925	27.3	1.0	1,704	199,365,642	116,999	42.3	16.6

Note: Age is nearest birthdate. Service is nearest year. The member is considered also present if active with the same tier and gender as of both valuation dates.

¹ Separations and additions do not include members who joined after June 30, 2017 and are no longer members on June 30, 2018. Members are included as separations and additions if the tier or gender has changed.

Table XII-8
Summary of Non-Pensioner Membership as of June 30, 2018

STATUS	TIER 1		TIER 2		TIER 3		TIER 3 REVISED		TIER 3 ENHANCED		ALL TIERS	
	NUMBER	SALARY ¹	NUMBER	SALARY ¹	NUMBER	SALARY ¹	NUMBER	SALARY ¹	NUMBER	SALARY ¹	NUMBER	SALARY ¹
MALES:												
ACTIVES	2	393,090	18,285	2,399,087,602	106	12,588,273	155	11,933,773	11,494	939,259,901	30,042	3,363,262,639
ACTIVE OFF PAYROLL	0	0	934	50,487,655	68	3,996,969	335	16,386,979	212	12,284,612	1,549	83,156,215
VESTED	0	0	352	30,075,291	18	1,346,839	0	0	8	716,601	378	32,138,731
ALL STATUS	2	393,090	19,571	2,479,650,548	192	17,932,081	490	28,320,752	11,714	952,261,114	31,969	3,478,557,585
FEMALES:												
ACTIVES	0	0	3,856	483,895,398	15	1,730,616	32	2,580,650	2,617	201,735,260	6,520	689,941,924
ACTIVE OFF PAYROLL	0	0	200	11,959,602	19	995,791	101	4,519,502	71	3,783,964	391	21,258,859
VESTED	0	0	109	8,806,600	1	63,553	0	0	3	242,576	113	9,112,729
ALL STATUS	0	0	4,165	504,661,600	35	2,789,960	133	7,100,152	2,691	205,761,800	7,024	720,313,512
TOTAL:												
ACTIVES	2	393,090	22,141	2,882,983,000	121	14,318,889	187	14,514,423	14,111	1,140,995,161	36,562	4,053,204,563
ACTIVE OFF PAYROLL	0	0	1,134	62,447,257	87	4,992,760	436	20,906,481	283	16,068,576	1,940	104,415,074
VESTED	0	0	461	38,881,891	19	1,410,392	0	0	11	959,177	491	41,251,460
ALL STATUS	2	393,090	23,736	2,984,312,148	227	20,722,041	623	35,420,904	14,405	1,158,022,914	38,993	4,198,871,097

¹Salary shown for Active Off Payroll and Vested members is the salary when last on payroll.

Table XII-9
Summary of Pensioner Membership

Group	June 30, 2018 (Lag)				June 30, 2017 (Lag)			
	Number	Annual Amounts Payable			Number	Annual Amounts Payable		
		Plan Benefit	Supplementation	Total		Plan Benefit	Supplementation	Total
Service Pensioners	33,416	1,572,586,057	79,064,137	\$ 1,651,650,194	33,093	\$ 1,504,676,355	\$ 79,379,529	\$ 1,584,055,884
Ordinary Disability Pensioners	2,861	77,522,122	16,984,088	\$ 94,506,210	2,935	78,901,403	17,390,609	\$ 96,292,012
Accidental Disability Pensioners	12,556	710,599,182	63,176,422	\$ 773,775,604	12,512	687,525,707	62,904,773	\$ 750,430,480
Beneficiaries of Members Killed in the Line-of-Duty	451	42,760,944	2,111,102	\$ 44,872,046	425	38,974,386	2,051,997	\$ 41,026,383
Other Beneficiaries	840	20,408,591	2,155,149	\$ 22,563,740	834	19,011,386	2,224,868	\$ 21,236,254
Total	50,124	\$ 2,423,876,896	\$ 163,490,898	\$ 2,587,367,794	49,799	\$ 2,329,089,237	\$ 163,951,776	\$ 2,493,041,013

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2018

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	58	3,831,524	66,061	11	715,269	65,024	69	4,546,793	65,896
35 TO 39	239	17,317,328	72,457	51	3,376,114	66,198	290	20,693,442	71,357
40 TO 44	426	33,133,086	77,777	83	5,739,223	69,147	509	38,872,309	76,370
45 TO 49	1,271	102,542,763	80,679	187	12,993,661	69,485	1,458	115,536,424	79,243
50 TO 54	1,916	147,921,552	77,203	314	21,026,409	66,963	2,230	168,947,961	75,761
55 TO 59	1,806	119,488,795	66,162	326	20,786,154	63,761	2,132	140,274,949	65,795
60 TO 64	991	61,147,995	61,703	152	8,347,203	54,916	1,143	69,495,198	60,801
65 TO 69	871	43,729,088	50,206	55	2,890,842	52,561	926	46,619,930	50,345
70 TO 74	1,505	67,421,906	44,799	36	1,359,361	37,760	1,541	68,781,267	44,634
75 TO 79	1,352	59,277,974	43,845	25	1,078,118	43,125	1,377	60,356,092	43,832
80 TO 84	508	22,764,896	44,813	10	380,805	38,081	518	23,145,701	44,683
85 TO 89	233	10,935,677	46,934	3	105,665	35,222	236	11,041,342	46,785
90 & UP	124	5,334,059	43,017	3	130,137	43,379	127	5,464,196	43,025
TOTAL	11,300	694,846,643	61,491	1,256	78,928,961	62,842	12,556	773,775,604	61,626
<i>ORDINARY DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	9	342,994	38,110	3	65,094	21,698	12	408,088	34,007
35 TO 39	49	1,941,208	39,616	17	699,729	41,161	66	2,640,937	40,014
40 TO 44	71	2,900,351	40,850	43	1,588,758	36,948	114	4,489,109	39,378
45 TO 49	195	7,224,464	37,049	93	3,191,388	34,316	288	10,415,852	36,166
50 TO 54	212	7,018,804	33,108	130	3,939,245	30,302	342	10,958,049	32,041
55 TO 59	183	5,294,084	28,929	104	2,815,144	27,069	287	8,109,228	28,255
60 TO 64	94	2,463,697	26,210	59	1,537,442	26,058	153	4,001,139	26,151
65 TO 69	135	4,334,612	32,108	27	648,325	24,012	162	4,982,937	30,759
70 TO 74	360	8,758,993	24,331	16	347,610	21,726	376	9,106,603	24,220
75 TO 79	405	11,657,972	28,785	10	231,479	23,148	415	11,889,451	28,649
80 TO 84	216	8,400,060	38,889	11	238,026	21,639	227	8,638,086	38,053
85 TO 89	218	10,044,810	46,077	5	199,275	39,855	223	10,244,085	45,938
90 & UP	190	8,376,195	44,085	6	246,451	41,075	196	8,622,646	43,993
TOTAL	2,337	78,758,244	33,701	524	15,747,966	30,053	2,861	94,506,210	33,033
<i>SERVICE RETIREMENT:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	0	0	0	0	0	0
40 TO 44	193	10,874,283	56,343	49	2,802,313	57,190	242	13,676,596	56,515
45 TO 49	2,592	164,636,264	63,517	554	30,075,156	54,287	3,146	194,711,420	61,892
50 TO 54	5,420	334,935,830	61,796	1,148	61,054,138	53,183	6,568	395,989,968	60,291
55 TO 59	6,196	331,504,097	53,503	1,324	63,545,417	47,995	7,520	395,049,514	52,533
60 TO 64	3,646	183,893,501	50,437	716	32,644,634	45,593	4,362	216,538,135	49,642
65 TO 69	2,188	100,246,713	45,817	224	9,189,627	41,025	2,412	109,436,340	45,372
70 TO 74	2,819	115,651,954	41,026	86	3,244,264	37,724	2,905	118,896,218	40,928
75 TO 79	3,227	116,693,794	36,162	64	2,309,181	36,081	3,291	119,002,975	36,160
80 TO 84	1,577	49,380,467	31,313	28	1,065,184	38,042	1,605	50,445,651	31,430
85 TO 89	850	24,162,063	28,426	19	543,601	28,611	869	24,705,664	28,430
90 & UP	481	12,833,395	26,681	15	364,318	24,288	496	13,197,713	26,608
TOTAL	29,189	1,444,812,361	49,499	4,227	206,837,833	48,933	33,416	1,651,650,194	49,427

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2018 (cont'd)

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>ACCIDENTAL DEATH:</i>									
UNDER 30	2	144,695	72,348	5	681,211	136,242	7	825,906	117,987
30 TO 34	0	0	0	1	140,848	140,848	1	140,848	140,848
35 TO 39	1	119,688	119,688	7	755,655	107,951	8	875,343	109,418
40 TO 44	2	206,041	103,021	20	2,257,002	112,850	22	2,463,043	111,957
45 TO 49	3	270,651	90,217	29	3,544,256	122,216	32	3,814,907	119,216
50 TO 54	6	663,665	110,611	62	7,417,616	119,639	68	8,081,281	118,842
55 TO 59	8	946,648	118,331	54	6,341,120	117,428	62	7,287,768	117,545
60 TO 64	2	138,707	69,354	44	5,214,505	118,511	46	5,353,212	116,374
65 TO 69	2	211,117	105,559	45	4,010,274	89,117	47	4,221,391	89,817
70 TO 74	3	316,794	105,598	50	4,417,524	88,350	53	4,734,318	89,327
75 TO 79	2	74,545	37,273	50	3,935,878	78,718	52	4,010,423	77,124
80 TO 84	3	180,737	60,246	20	1,327,953	66,398	23	1,508,690	65,595
85 TO 89	1	28,266	28,266	20	1,057,308	52,865	21	1,085,574	51,694
90 & UP	3	108,150	36,050	6	361,192	60,199	9	469,342	52,149
TOTAL	38	3,409,704	89,729	413	41,462,342	100,393	451	44,872,046	99,495
<i>OTHER BENEFICIARIES:</i>									
UNDER 30	5	173,815	34,763	9	225,214	25,024	14	399,029	28,502
30 TO 34	4	109,230	27,308	1	24,371	24,371	5	133,601	26,720
35 TO 39	0	0	0	7	187,647	26,807	7	187,647	26,807
40 TO 44	1	13,585	13,585	7	319,927	45,704	8	333,512	41,689
45 TO 49	4	155,158	38,790	19	787,051	41,424	23	942,209	40,966
50 TO 54	6	247,725	41,288	39	1,517,262	38,904	45	1,764,987	39,222
55 TO 59	5	154,620	30,924	53	2,168,240	40,910	58	2,322,860	40,049
60 TO 64	0	0	0	58	1,790,939	30,878	58	1,790,939	30,878
65 TO 69	2	52,719	26,360	72	1,914,750	26,594	74	1,967,469	26,587
70 TO 74	0	0	0	110	3,031,141	27,556	110	3,031,141	27,556
75 TO 79	1	19,550	19,550	122	3,209,065	26,304	123	3,228,615	26,249
80 TO 84	0	0	0	102	2,691,398	26,386	102	2,691,398	26,386
85 TO 89	0	0	0	93	1,909,050	20,527	93	1,909,050	20,527
90 & UP	0	0	0	120	1,861,283	15,511	120	1,861,283	15,511
TOTAL	28	926,402	33,086	812	21,637,338	26,647	840	22,563,740	26,862
<i>ALL PENSIONERS AND BENEFICIARIES:</i>									
UNDER 30	7	318,510	45,501	14	906,425	64,745	21	1,224,935	58,330
30 TO 34	71	4,283,748	60,334	16	945,582	59,099	87	5,229,330	60,107
35 TO 39	289	19,378,224	67,053	82	5,019,145	61,209	371	24,397,369	65,761
40 TO 44	693	47,127,346	68,005	202	12,707,223	62,907	895	59,834,569	66,854
45 TO 49	4,065	274,829,300	67,609	882	50,591,512	57,360	4,947	325,420,812	65,781
50 TO 54	7,560	490,787,576	64,919	1,693	94,954,670	56,087	9,253	585,742,246	63,303
55 TO 59	8,198	457,388,244	55,793	1,861	95,656,075	51,400	10,059	553,044,319	54,980
60 TO 64	4,733	247,643,900	52,323	1,029	49,534,723	48,139	5,762	297,178,623	51,576
65 TO 69	3,198	148,574,249	46,458	423	18,653,818	44,099	3,621	167,228,067	46,183
70 TO 74	4,687	192,149,647	40,996	298	12,399,900	41,610	4,985	204,549,547	41,033
75 TO 79	4,987	187,723,835	37,643	271	10,763,721	39,719	5,258	198,487,556	37,750
80 TO 84	2,304	80,726,160	35,037	171	5,703,366	33,353	2,475	86,429,526	34,921
85 TO 89	1,302	45,170,816	34,693	140	3,814,899	27,249	1,442	48,985,715	33,971
90 & UP	798	26,651,799	33,398	150	2,963,381	19,756	948	29,615,180	31,240
TOTAL	42,892	2,222,753,354	51,822	7,232	364,614,440	50,417	50,124	2,587,367,794	51,619

**Graph XII-11
Pensioner Average Benefits**

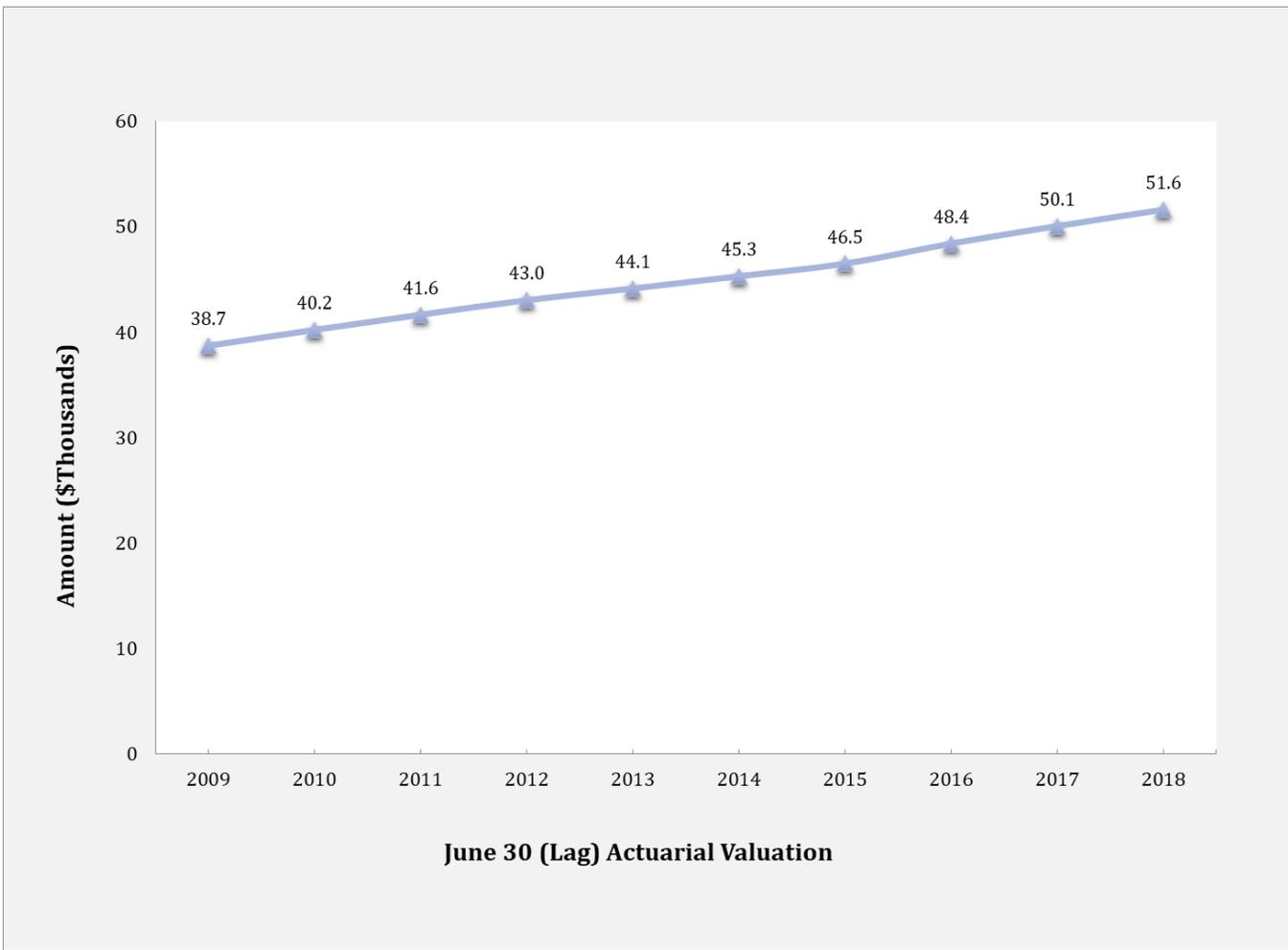


Table XII-12
Reconciliation of Pensioner and Beneficiary Data

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		
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 ³	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
2018	1,401	137,291,868	1,076	42,965,087	50,124	2,587,367,794	3.8%	51,619

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.

³ Beginning in 2016, SADB payments to beneficiaries are included.

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
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