June 30, 2021
Actuarial Valuation Report

for the

New York City
Police Pension Fund

prepared by the

New York City
Office of the Actuary

OFFICE OF THE ACTUARY

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MAREK TYSZKIEWICZ
CHIEF ACTUARY

October 4, 2023

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

Re: June 30, 2021 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2021 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, 2021 valuation, forms the basis for determining the statutorily required contribution (Statutory Contribution) of $2,333,707,108 for Fiscal Year 2023 (i.e., for the period beginning July 1, 2022 and ending June 30, 2023). 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, 2020 actuarial valuation are shown in this Report for comparative purposes. Other historical information that the Actuary believes useful is also included.

The June 30, 2021 and June 30, 2020 actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employers' payroll facilities. Financial information was provided by POLICE and the Office of the Comptroller as of June 30, 2021 and June 30, 2020.

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.
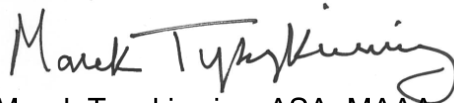
A summary of the benefits available under the terms of the Plan is shown in SECTION VIII – SUMMARY OF PLAN PROVISIONS. This valuation reflects the enactment of Chapter 782 of the Laws of 2022 which extends the eligibility of Special Accidental Death Benefits to parents of certain deceased members who died in the line-of-duty. All other 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 actuarial assumptions and methods are unchanged from the prior valuation.
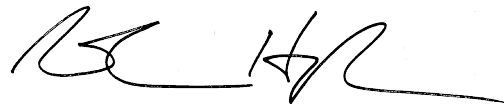
This Report does not present Governmental Accounting Standards Board (GASB) results. The Office of the Actuary publishes the Fiscal Year 2023 GASB67 and GASB68 results under separate cover. Reports published by the Office of the Actuary are available on the website www.nyc.gov/actuary.

Marek Tyszkiewicz is the Chief Actuary for, and independent of, the New York City Retirement Systems and Pension Funds. He is an Associate of the Society of Actuaries and a Member of the American Academy of Actuaries. Anderson Huynh is a Fellow of the Society of Actuaries, an Enrolled Actuary under the Employee Retirement Income Security Act of 1974, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. To the best of our 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,

Marek Tyszkiewicz, ASA, MAAA
Chief Actuary

Anderson Huynh, FSA, EA, MAAA, FCA
Assistant Deputy Chief Actuary

MT/eh

cc: Kevin Holloran - New York City Police Pension Fund
        Stanley Thomas - New York City Police Pension Fund

Table of Contents

SECTION I – EXECUTIVE SUMMARY

This Report presents the results of the June 30, 2021 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 2023 (i.e., July 1, 2022 to June 30, 2023),

- 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 transferrable earnings amounts for Fiscal Year 2021 as determined by the Actuary in a letter dated September 9, 2021 to the Comptroller's Office. All results are without regard to the Variable Supplements Funds (VSF), 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, 2021 actuarial valuation and, for comparative purposes, the June 30, 2020 actuarial valuation.

NEW YORK CITY POLICE PENSION FUND		
SUMMARY OF VALUATION RESULTS		
Valuation Date	**June 30, 2021**	**June 30, 2020**
Fiscal Year	**2023**	**2022**
Funded Status		
1. Accrued Liability[1]	$ 54,611,093,758	$ 52,485,567,383
2. Actuarial Value of Assets (AVA)[2]	45,531,133,000	44,398,420,584
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	$ 9,079,960,758	$ 8,087,146,799
4. Market Value of Assets (MVA)	51,293,938,000	41,293,014,000
5. Unfunded Accrued Liability (MVA Basis) (1. - 4.)	$ 3,317,155,758	$ 11,192,553,383
6. Funded Ratio (MVA Basis) (4. / 1.)	93.9%	78.7%
Contribution[3]		
1. Normal Cost	$ 1,458,845,775	$ 1,516,064,524
2. Amortization of Unfunded Accrued Liability	846,324,700	943,383,024
3. Administrative Expenses	28,536,633	30,686,755
4. Actuarial Contribution (1. + 2. + 3.)	$ 2,333,707,108	$ 2,490,134,303
5. Statutory Contribution (4.)	$ 2,333,707,108	$ 2,490,134,303
Participant Data		
1. Active Members		
a. Number	35,006	35,895
b. Annual Salary[4]	$ 4,262,625,521	$ 4,299,648,848
c. Average Salary	$ 121,768	$ 119,784
2. Terminated Nonvested Members	1,713	1,544
3. Deferred Vested Members	851	753
4. Retirees and Beneficiaries		
a. Number	52,837	51,465
b. Total Annual Benefits	$ 3,065,108,282	$ 2,860,164,965
c. Average Annual Benefit	$ 58,011	$ 55,575

[1] Includes unfunded Accrued Liability for VSFs, if any.

[2] AVA as of June 30, 2020 includes receivable contributions of $2,384,365,584; AVA as of June 30, 2021 does not include receivable contributions.

[3] Includes results for VSFs.

[4] Salaries shown are the base salary plus assumed overtime paid and reflect certain salary increases with retroactive effective dates, if any, that are not yet reflected in census data.

Table I-2
Actuarial Liabilities

NEW YORK CITY POLICE PENSION FUND		
ACTUARIAL LIABILITIES BY STATUS		
Valuation Date	**June 30, 2021**	**June 30, 2020**
Fiscal Year	**2023**	**2022**
Accrued Liability		
1. Active Members	$ 16,640,724,011	$ 17,538,528,730
2. Terminated Nonvested Members	6,598,882	5,605,481
3. Deferred Vested Members	185,548,819	174,891,626
4. Retirees and Beneficiaries	37,092,677,517	34,151,158,273
5. Unfunded VSF Accrued Liability	685,544,529	615,383,273
6. Total Accrued Liability	$ 54,611,093,758	$ 52,485,567,383
Present Value of Benefits		
1. Active Members	$ 29,547,724,257	$ 30,724,963,488
2. Terminated Nonvested Members	6,598,882	5,605,481
3. Deferred Vested Members	185,548,819	174,891,626
4. Retirees and Beneficiaries	37,092,677,517	34,151,158,273
5. VSF[1]	6,972,769,882	1,586,833,725
6. Total Present Value of Benefits	$ 73,805,319,357	$ 66,643,452,593

[1] VSF present value of benefits as of June 30, 2020 reflects only the unfunded portion of VSF present value of benefits; VSF present value of benefits as of June 30, 2021 reflects the total VSF present value of benefits.

Graph I-3
Historical Funded Status

Graph showing Historical Funded Status from 2012 to 2021. Left axis: AL, AVA, UAL ($ Billions), 0 to 60. Right axis: Funded Status (AVA Basis), 0% to 100%. X-axis: June 30 Valuation.

Legend:
- 1. Accrued Liability (AL)
- 2. Actuarial Value of Assets (AVA)
- 3. Unfunded Accrued Liability (UAL) (1. - 2.)
- 4. Funded Status (AVA Basis) (2. / 1.)
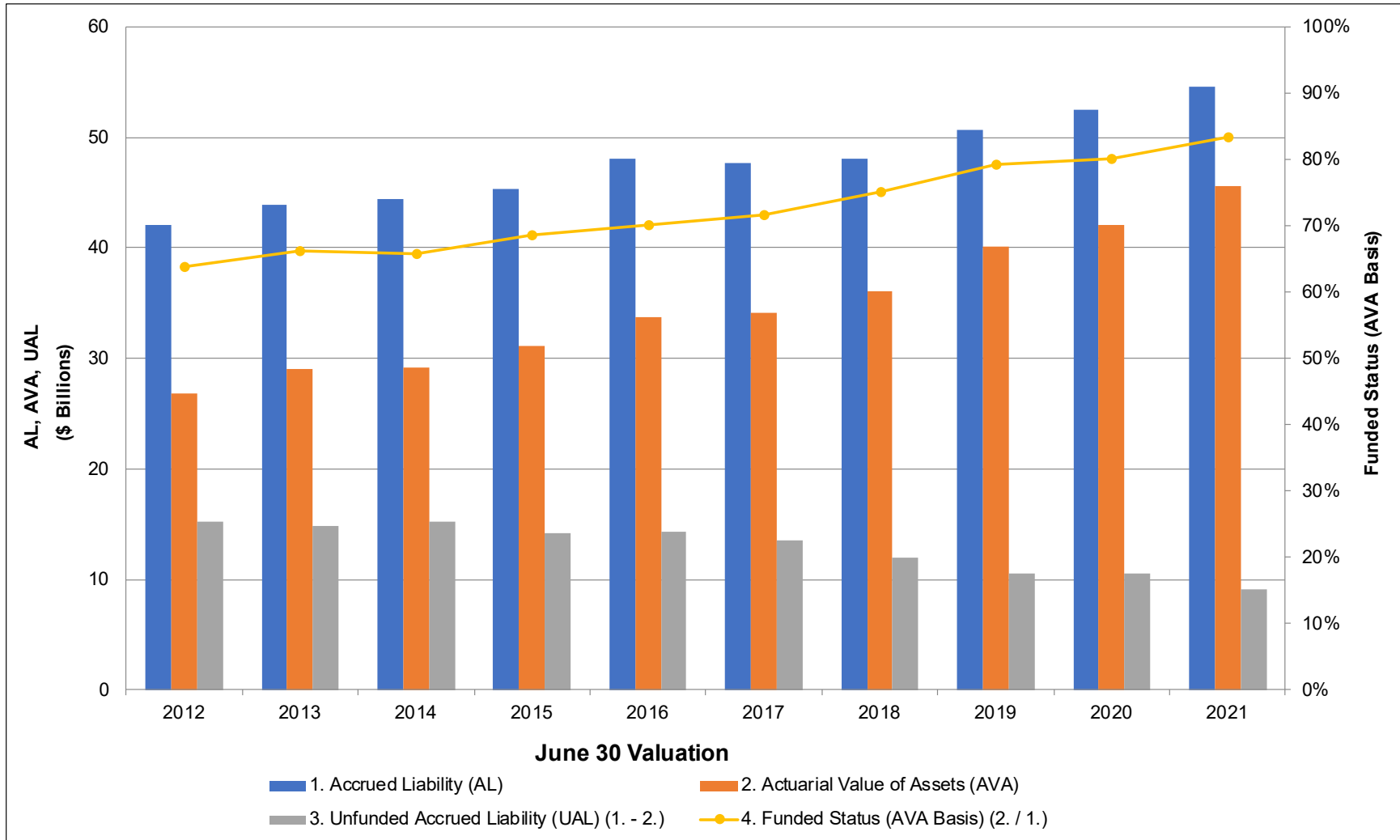
SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS

Information on the Market Value of Assets (MVA) of the Plan is provided by the Office of the Comptroller. An asset smoothing method is used to determine the Actuarial Value of Assets (AVA) of the Plan.

The Actuary reset the AVA to the MVA as of June 30, 2011 and as of June 30, 2019. Beginning with the June 30, 2020 actuarial valuation, the asset smoothing method recognizes investment returns greater or less than expected over a period of five years, phasing these gains and losses into the AVA at a rate of 20% per year.

The expected investment return is derived using the Actuarial Interest Rate of 7%, beginning-of-fiscal-year MVA, and net cash flows which are assumed to occur midyear.

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

Table II-1
Statement of Plan Net Assets

($ Thousands)		
	June 30, 2021	**June 30, 2020**
ASSETS		
Cash	$ 74,186	$ 9,815
Receivables		
Investment Securities Sold	$ 1,049,404	$ 608,688
Member Loans	174,712	218,592
Transferrable Earnings due from VSFs to QPP	0	0
Accrued Interest and Dividends	122,171	1,009
Other receivables	143,177	0
Total Receivables	$ 1,489,464	$ 828,289
INVESTMENTS AT FAIR VALUE		
Short-Term Investments		
Commercial Paper	$ 463,293	$ 238,555
Short-term Investment Fund	699,856	293,923
U.S. Treasury Bills	505,372	636,923
Debt Securities	14,092,545	10,781,708
Equity Securities	23,701,640	16,356,881
Alternative Investments	11,135,443	9,485,329
Collective Trust Funds		
Fixed Income	161,524	137,770
Bank Loans	1,859	514,197
Corporate and Other	9	11,597
Domestic Equity	149,857	356,956
International Equity	1,066,994	2,872,858
Mortgage Debt Security	211,531	205,647
Collateral From Securities Lending	5,461,797	3,430,138
Total Investments	$ 57,651,720	$ 45,322,482
OTHER ASSETS	9,062	9,716
TOTAL ASSETS	$ 59,224,432	$ 46,170,302
LIABILITIES		
Accounts Payable	$ 61,582	$ 49,637
Payables for Investment Securities Purchased	2,086,106	1,026,317
Accrued Benefits Payable	105,275	54,183
Accrued Transfers to VSFs	215,734	317,013
Security Lending	5,461,797	3,430,138
TOTAL LIABILITIES	$ 7,930,494	$ 4,877,288
PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS	$ 51,293,938	$ 41,293,014

Table II-2
Statement of Changes in Plan Net Assets

($ Thousands)	June 30, 2021	June 30, 2020
ADDITIONS		
Contributions		
Member Contributions	$ 255,789	$ 280,129
Employer Contributions	2,437,728	2,458,907
Total Contributions	$ 2,693,517	$ 2,739,036
Investment Income (Loss)		
Interest Income	$ 537,652	$ 421,859
Dividend Income	498,589	497,886
Net Appreciation (Depreciation) in Fair Value	9,991,705	1,191,629
Total Investment Income (Loss)	$ 11,027,946	$ 2,111,374
Less Investment Expenses	290,750	226,384
Net Income (Loss)	$ 10,737,196	$ 1,884,990
Securities Lending Transactions		
Securities Lending Income	$ 11,940	$ 12,194
Securities Lending Fees	(1,175)	(1,172)
Net Securities Lending Income (Loss)	$ 10,765	$ 11,022
Other		
Net Receipts from Other Retirement Systems	$ 1,988	$ 2,053
Transferrable Earnings due from VSFs to QPP	0	0
Litigation Income	2,401	4,435
TOTAL ADDITIONS	$ 13,445,867	$ 4,641,536
DEDUCTIONS		
Benefit Payments and Withdrawals	$ 3,313,298	$ 3,039,785
Accrued Transfers to VSFs	106,720	401,358
Administrative Expenses	24,925	26,803
TOTAL DEDUCTIONS	$ 3,444,943	$ 3,467,946
NET INCREASE (DECREASE) IN PLAN NET ASSETS	$ 10,000,924	$ 1,173,590
PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
Beginning of Year	$ 41,293,014	$ 40,119,424
End of Year	$ 51,293,938	$ 41,293,014

Table II-3
Development of Actuarial Value of Assets

($ Thousands)		
Valuation Date	**June 30, 2021**	**June 30, 2020**
1. Market Value of Assets (MVA)		
a. Beginning of Year (BOY)	$ 41,293,014	$ 40,119,424
b. End of Year (EOY)	$ 51,293,938	$ 41,293,014
2. Contributions		
a. Employee	$ 255,789	$ 280,129
b. Employer	2,437,728	2,458,907
c. Total Contributions	$ 2,693,517	$ 2,739,036
3. Net Investment Income		
a. Investment Income	$ 11,038,711	$ 2,122,396
b. Investment Expenses	(290,750)	(226,384)
c. Total Net Investment Income	$ 10,747,961	$ 1,896,012
4. Benefit Payments and Other Cash Flow	$ (3,333,834)	$ (3,060,100)
5. Preliminary Transferable Earnings from POLICE to VSFs - EOY	$ (106,720)	$ (401,358)
6. Net Cash Flow (2.c. + 4. + 5.)	$ (747,037)	$ (722,422)
7. Expected Investment Return (EIR)	$ 2,868,479	$ 2,797,313
8. Unexpected Investment Return (UIR) (3.c. - 7.)	$ 7,879,482	$ (901,301)
9. Preliminary AVA @ EOY		
a. AVA @ BOY (prior to corridor limit)	$ 42,014,055	$ 40,119,424
b. Net Cash Flow (6.)	$ (747,037)	$ (722,422)
c. Expected Investment Return (7.)	$ 2,868,479	$ 2,797,313
d. Phase in of UIR		
20% of UIR for prior year	$ 1,575,896	$ (180,260)
20% of UIR for second prior year	(180,260)	N/A
20% of UIR for third prior year	N/A	N/A
20% of UIR for fourth prior year	N/A	N/A
20% of UIR for fifth prior year	N/A	N/A
Total	$ 1,395,636	$ (180,260)
e. Preliminary AVA (9.a. + 9.b. + 9.c. + 9.d.)	$ 45,531,133	$ 42,014,055
10. Corridor		
a. Lower Corridor Bound (80% of 1.b.)	$ 41,035,150	$ 33,034,411
b. Upper Corridor Bound (120% of 1.b.)	$ 61,552,726	$ 49,551,617
11. AVA @EOY (9.e. bounded by 10.a. and 10.b.)	**$ 45,531,133**	**$ 42,014,055**

Graph II-4
Historical Market and Actuarial Value of Assets

Assets ($Billions)

AVA Restart

AVA Restart

June 30 Actuarial Valuation

█ Market Value of Assets   —— Actuarial Value of Assets

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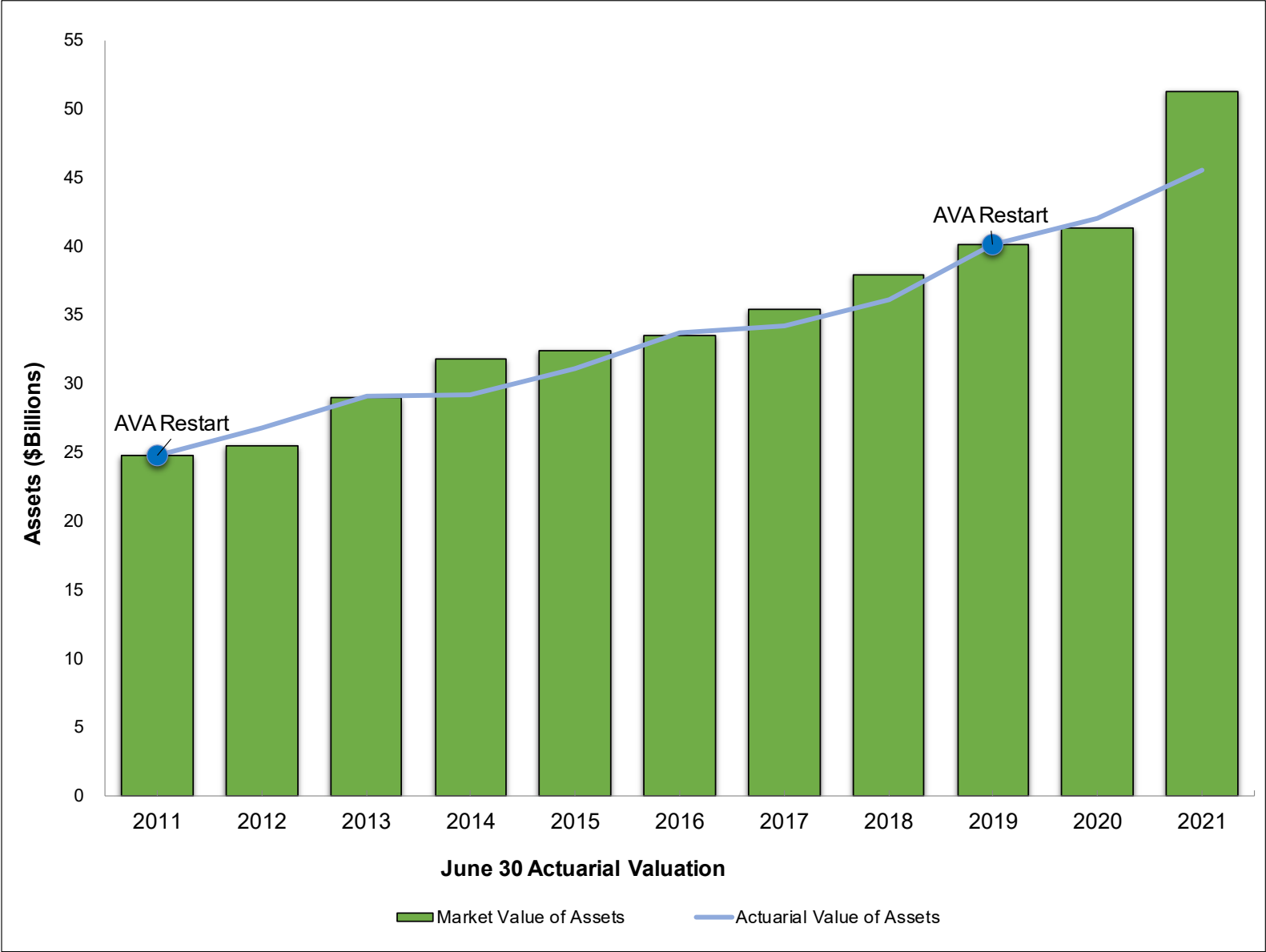
Graph II-5
Future Recognition of Unexpected Investment Return

$ Millions (y-axis)

Value label	Year
5,762.8	2021
4,367.2	2022
2,971.5	2023
1,575.9	2024
0.0	2025

Orange bar labels:
- (540.8) — 2021
- (360.5) — 2022
- (180.3) — 2023
- 0.0 — 2024

June 30 Valuation (x-axis)

Legend:
- Unrecognized 2021 Deferred Investment Gain/(Loss)
- Unrecognized 2020 Deferred Investment Gain/(Loss)
- Total Unrecognized Deferred Investment Gain/(Loss)
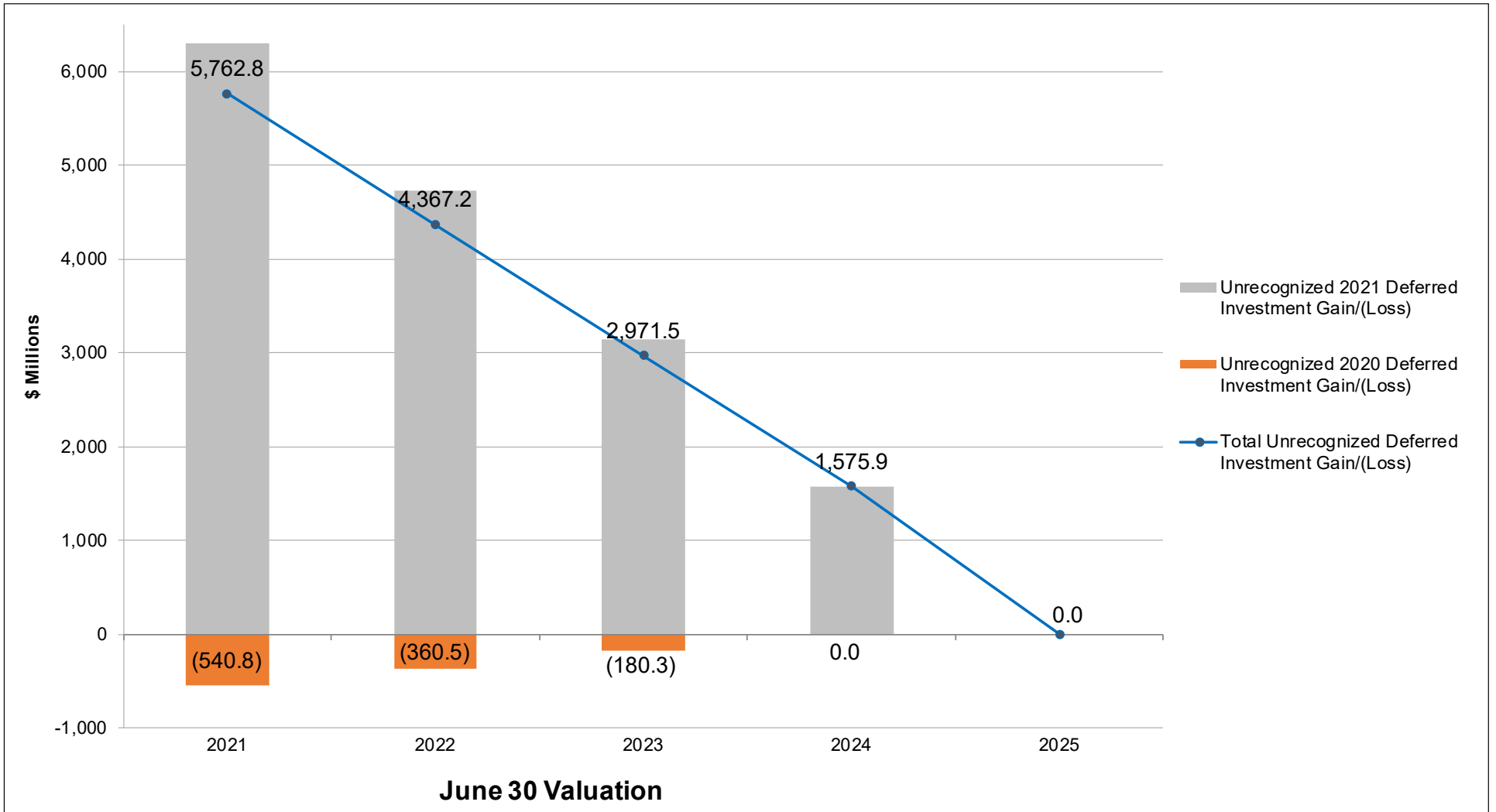
SECTION III – CONTRIBUTION DEVELOPMENT AND HISTORY

Table III-1
Statutory Contributions

Table III-1 shows the components of the Fiscal Year 2023 and the Fiscal Year 2022 Statutory Contributions.

COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS		
Valuation Date	**June 30, 2021**	**June 30, 2020**
Fiscal Year	**2023**	**2022**
Normal Cost	$ 1,458,845,775	$ 1,516,064,524
Unfunded Accrued Liability Amortization[1]	$ 846,324,700	$ 943,383,024
Administrative Expenses	$ 28,536,633	$ 30,686,755
Total Contribution to the New York City Police Pension Fund	$ **2,333,707,108**	$ **2,490,134,303**

[1] See Tables III-2 for additional details.

Table III-2
Schedule of Unfunded Accrued Liability Bases

The Initial Unfunded Accrued Liability (UAL) established with the 6/30/2010 valuation is being amortized as a level percent of pay (with payments increasing by 3% per year) over a 22-year period.

Increments to the UAL established after June 30, 2010 are amortized as level dollars over the following periods:

- Benefit Changes: Over the remaining working lifetimes of those impacted unless the amortization period is determined by statute.

- Assumption and Method Changes: Over a 20-year period.

- Actuarial Gains and Losses: Over a 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 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, 2021.

NEW YORK CITY POLICE PENSION FUND SCHEDULE OF UNFUNDED ACCRUED LIABILITY BASES					
Amortization Base	Date Established	Original $ Amount	Amortization Years	Payments Remaining	Amortization $ Payment
Initial UAL	6/30/10	13,211,374,581	22	11	1,373,987,667
(Gain)/Loss	6/30/11	276,060,031	15	5	32,652,194
(Gain)/Loss	6/30/12	(497,039,100)	15	6	(58,789,449)
(Gain)/Loss	6/30/13	(234,946,852)	15	7	(27,789,355)
(Gain)/Loss	6/30/14	(219,675,273)	15	8	(25,983,043)
Assumption Change[1]	6/30/14	706,645,098	20	13	70,722,523
(Gain)/Loss	6/30/15	(881,721,022)	15	9	(104,289,367)
(Gain)/Loss	6/30/16	21,224,294	15	10	2,510,395
SADB	6/30/16	395,717,583	15	10	46,805,208
Enhanced ADR	6/30/16	13,611,142	18	13	1,442,093
(Gain)/Loss	6/30/17	41,491,543	15	11	4,907,592
No VSF Escalation Offset	6/30/17	14,308,348	18	14	1,515,961
Non-Uniformed Service	6/30/17	55,368,731	20	16	5,541,419
Assumption Change[2]	6/30/17	(392,660,331)	20	16	(39,298,270)
Method Change[2]	6/30/17	(433,751,763)	20	16	(43,410,786)
(Gain)/Loss	6/30/18	(1,479,324,567)	15	12	(174,973,511)
(Gain)/Loss	6/30/19	(333,111,349)	15	13	(39,400,185)
Assumption Change[3]	6/30/19	96,750,593	20	18	9,683,002
Method Change[3]	6/30/19	(849,647,000)	20	18	(85,034,453)
(Gain)/Loss	6/30/20	275,639,445	15	14	32,602,448
(Gain)/Loss	6/30/21	(1,129,238,268)	15	14	(133,565,539)
415 Limit	6/30/21	(7,724,603)	2	1	(8,549,719)
SADB for Parents	6/30/21	42,593,036	15	14	5,037,875
TOTAL					846,324,700

[1] Change in post-retirement mortality assumptions including the change to the mortality improvement scale MP-2015.
[2] 2019 A&M.
[3] Revised 2021 A&M.

Graph III-3
Remaining UAL Amortizations as of June 30, 2021

Fiscal Year Ending	Amortization Payment Total ($ Millions)	Schedule of Amortization Payments (Credits)
2023	846	
2024	896	
2025	939	
2026	982	
2027	995	
2028	1,100	
2029	1,175	
2030	1,251	
2031	1,406	
2032	1,409	
2033	(389)	
2034	(214)	
2035	(247)	
2036	(281)	
2037	(153)	
2038	(75)	
2039	(75)	
2040	0	
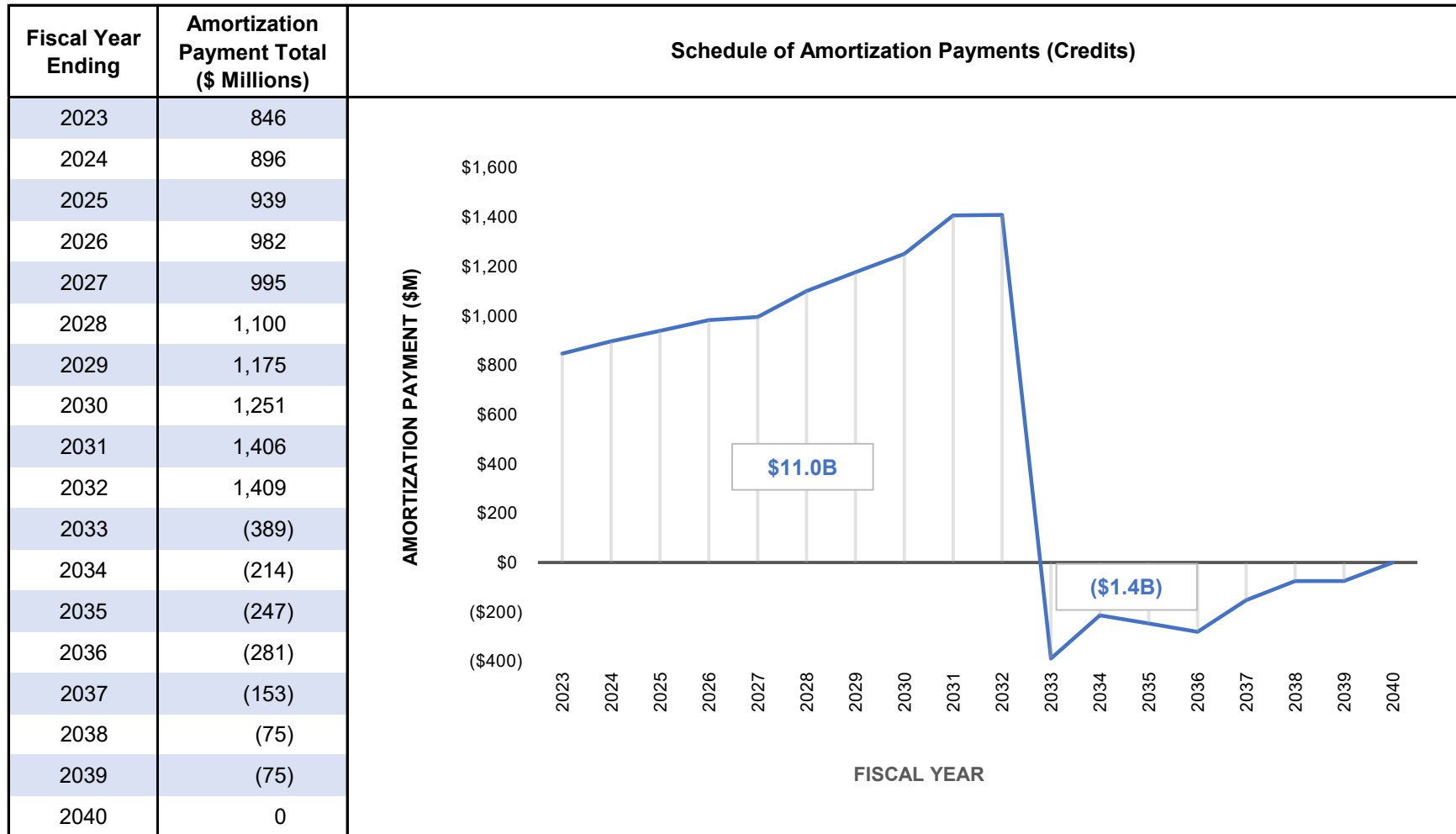
Table III-4
Reconciliation of Outstanding UAL Bases

Cost Component	Date Established	Original Amount	Amort Years	Outstanding Balance 6/30/2021	FY 2022 Payment on 12/31/2021	Outstanding Balance 6/30/2022	FY 2023 Payment on 12/31/2022	Additional Payments
Initial UAL	6/30/10	$13,211,374,581	22	$11,810,304,849	$1,333,968,608	$11,257,158,331	$1,373,987,667	9
(Gain)/Loss	6/30/11	276,060,031	15	138,487,004	32,652,194	114,405,402	32,652,194	3
(Gain)/Loss	6/30/12	(497,039,100)	15	(289,864,137)	(58,789,449)	(249,342,348)	(58,789,449)	4
(Gain)/Loss	6/30/13	(234,946,852)	15	(154,917,992)	(27,789,355)	(137,016,719)	(27,789,355)	5
(Gain)/Loss	6/30/14	(219,675,273)	15	(160,490,997)	(25,983,043)	(144,848,298)	(25,983,043)	6
Assumption Change[1]	6/30/14	706,645,098	20	611,411,853	70,722,523	581,054,736	70,722,523	11
(Gain)/Loss	6/30/15	(881,721,022)	15	(702,848,658)	(104,289,367)	(644,170,304)	(104,289,367)	7
(Gain)/Loss	6/30/16	21,224,294	15	18,238,648	2,510,395	16,918,581	2,510,395	8
SADB	6/30/16	395,717,583	15	340,051,506	46,805,208	315,439,428	46,805,208	8
Enhanced ADR	6/30/16	13,611,142	18	12,467,212	1,442,093	11,848,204	1,442,093	11
(Gain)/Loss	6/30/17	41,491,543	15	38,066,661	4,907,592	35,654,875	4,907,592	9
No VSF Escalation Offset	6/30/17	14,308,348	18	13,713,969	1,515,961	13,105,825	1,515,961	12
Non-Uniformed Service	6/30/17	55,368,731	20	54,149,021	5,541,419	52,207,364	5,541,419	14
Assumption Change[2]	6/30/17	(392,660,331)	20	(384,010,474)	(39,298,270)	(370,240,761)	(39,298,270)	14
Method Change[2]	6/30/17	(433,751,763)	20	(424,196,712)	(43,410,786)	(408,986,016)	(43,410,786)	14
(Gain)/Loss	6/30/18	(1,479,324,567)	15	(1,437,578,611)	(174,973,511)	(1,357,215,107)	(174,973,511)	10
(Gain)/Loss	6/30/19	(333,111,349)	15	(340,623,315)	(39,400,185)	(323,711,079)	(39,400,185)	11
Assumption Change[3]	6/30/19	96,750,593	20	100,753,579	9,683,002	97,790,154	9,683,002	16
Method Change[3]	6/30/19	(849,647,000)	20	(884,800,528)	(85,034,453)	(858,776,243)	(85,034,453)	16
(Gain)/Loss	6/30/20	275,639,445	15	294,934,206	32,602,448	281,855,366	32,602,448	12
Admin Expenses	6/30/20	27,725,239	2	29,666,006	30,686,755	0	0	0
Normal Cost	7/1/20	1,369,752,238	2	1,465,634,882	1,516,064,524	0	0	0
(Gain)/Loss	6/30/21	(1,129,238,268)	15	(1,129,238,268)	0	(1,208,284,947)	(133,565,539)	13
415 Limit	6/30/21	(7,724,603)	2	(7,724,603)	0	(8,265,325)	(8,549,719)	0
SADB for Parents	6/30/21	42,593,036	15	42,593,036	0	45,574,549	5,037,875	13
Admin Expenses	6/30/21	25,782,621	2	25,782,621	0	27,587,404	28,536,633	0
Normal Cost	7/1/21	1,318,055,554	2	0	0	1,410,319,443	1,458,845,775	0
TOTAL				$9,079,960,758	$2,490,134,303	$8,550,062,515	$2,333,707,108	

Payment for amortization bases, normal costs and adminstrative expenses are deferred 1.5 years to the middle of the fiscal year under the One-Year Lag Methodology. The number of amortization payments is one less than the number of years amortized. Required contributions are the sum of all cost components after interest adjustments due to the lag.

Table III-4
Reconciliation of Outstanding UAL Bases (cont'd)

Cost Component	Outstanding Balance 6/30/2021	FY 2022 Payment on 12/31/2021	Outstanding Balance 6/30/2022	FY 2023 Payment on 12/31/2022
Initial UAL	$11,810,304,849	$1,333,968,608	$11,257,158,331	$1,373,987,667
Method Change	(1,308,997,240)	(128,445,239)	(1,267,762,259)	(128,445,239)
Assumption Change	328,154,958	41,107,255	308,604,129	41,107,255
Plan Change	462,974,744	55,304,681	438,175,370	60,342,556
415 Limit	(7,724,603)	0	(8,265,325)	(8,549,719)
(Gain)/Loss	(3,725,835,459)	(358,552,281)	(3,615,754,578)	(492,117,820)
Normal Cost	1,465,634,882	1,516,064,524	1,410,319,443	1,458,845,775
Admin Expenses	55,448,627	30,686,755	27,587,404	28,536,633
TOTAL	$ 9,079,960,758	$2,490,134,303	$8,550,062,515	$ 2,333,707,108

	6/30/2021
(A) Actuarial Accrued Liability	$ 54,611,093,758
(B) Actuarial Value of Assets	45,531,133,000
(C) Unfunded Accrued Liabilities (A) - (B)	$ 9,079,960,758

	FY 2023
Normal Cost	$ 1,458,845,775
UAL Payment	846,324,700
Admin Expenses	28,536,633
Total	$ 2,333,707,108

Table III-5
Actuarial and Statutory Contribution History

Table III-5 compares the Statutory Contributions to the Actuarial Contributions for Fiscal Years 2014 through 2023.

($ Thousands)			
Fiscal Year Ended June 30	**Actuarial Contribution Certified**	**Statutory Contribution Contributed**	**Percentage of Actuarial Contribution Contributed**
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%
2021	2,437,728	2,437,728	100.0%
2022	2,490,134	2,490,134	100.0%
2023	2,333,707	2,333,707	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 2014 through 2023.

CITY RATES ($ Thousands)			
Fiscal Year Ended June 30	**Actuarial Contribution**	**Salary[1] at Beginning of Fiscal Year**	**City Rate**
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%
2021	2,437,728	4,288,264	56.8%
2022	2,490,134	4,349,379	57.3%
2023	2,333,707	4,324,289	54.0%

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

SECTION IV - (GAIN)/LOSS ANALYSIS

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

		QPP	VSF	Total
NEW YORK CITY POLICE PENSION FUND				
DEVELOPMENT OF EXPERIENCE (GAIN) / LOSS				
JUNE 30, 2021				
($ Thousands)				
1. Expected Accrued Liability (AL)				
a. AL at June 30, 2020	$	51,870,184 $	5,943,201 $	57,813,385
b. Normal Cost and Administrative Expenses at June 30, 2020		1,535,223	105,906	1,641,129
c. Interest on 1.a. and 1.b. to June 30, 2021		3,738,378	423,437	4,161,815
d. Fiscal Year 2021 Benefit Payments		(3,313,298)	(528,021)	(3,841,319)
e. Interest on 1.d. to June 30, 2021		(114,004)	(18,168)	(132,172)
f. Expected AL at June 30, 2021	$	53,716,483 $	5,926,355 $	59,642,838
2. Actual AL at June 30, 2021[1]	$	53,890,681 $	6,021,376 $	59,912,057
3. Expected Actuarial Value of Assets (AVA)				
a. AVA at June 30, 2020	$	42,014,055 $	5,327,818 $	47,341,873
b. Interest on 3.a. to June 30, 2021		2,940,984	372,947	3,313,931
c. Total Contributions Paid in Fiscal Year 2021[2]		2,590,347	103,170	2,693,517
d. Interest on 3.c. to June 30, 2021		89,129	3,550	92,679
e. Fiscal Year 2021 Benefit Payments		(3,313,298)	(528,021)	(3,841,319)
f. Interest on 3.e. to June 30, 2021		(114,004)	(18,168)	(132,172)
g. Change in VSF Assets in Excess of Liabilities at June 30, 2021		0	58,931	58,931
h. Expected AVA at June 30, 2021	$	44,207,213 $	5,320,227 $	49,527,440
4. Actual AVA at June 30, 2021	$	45,531,133 $	5,394,764 $	50,925,897
5. Liability (Gain) / Loss (2. - 1.f.)	$	174,198 $	95,021 $	269,219
6. Actuarial Asset (Gain) / Loss (3.h. - 4.)	$	(1,323,920) $	(74,537) $	(1,398,457)
7. Total Actuarial (Gain) / Loss (5. + 6.)	$	(1,149,722) $	20,484 $	(1,129,238)

[1] Actual accrued liability used to determine (gain)/loss excludes any new plan changes reflected in the valuation.

[2] Contributions include SKIM amounts transferred from QPP to VSF.

SECTION V – SCHEDULE OF FUNDING PROGRESS

A schedule of funding progress is provided below. This schedule of funding progress was previously required by GASB25, which has been superseded by GASB67, 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 Valuation Date	**(1) Actuarial Value of Assets (AVA)[1]**	**(2) Accrued Liability (AL)**	**(3) Unfunded AL (UAL) (2) - (1)**	**(4) Funded Ratio (1) / (2)**	**(5) Covered Payroll[1]**	**(6) UAL as a % of Covered Payroll (3) / (5)**
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%
2019	40,119,424	50,614,796	10,495,372	79.3%	4,244,805	247.3%
2020	42,014,055	52,485,567	10,471,512	80.0%	4,299,649	243.5%
2021	45,531,133	54,611,094	9,079,961	83.4%	4,262,626	213.0%

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

SECTION VI – Variable Supplements Fund

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 (NYPD), Subchapter One Pension Fund or NYPD, 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, 2021**	**June 30, 2020**
POVSF		
Active	$ 416,770	$ 446,209
Retiree	1,675,837	1,617,090
Total	$ 2,092,607	$ 2,063,299
PSOVSF		
Active	$ 1,257,842	$ 1,357,706
Retiree	2,670,927	2,522,196
Total	$ 3,928,769	$ 3,879,902
Total VSF AL	$ 6,021,376	$ 5,943,201

Table VI-2
VSF Member Data

VARIABLE SUPPLEMENTS FUNDS MEMBERS INCLUDED IN THE JUNE 30, 2021 AND JUNE 30, 2020 ACTUARIAL VALUATIONS				
	June 30, 2021		**June 30, 2020**	
	POVSF	**PSOVSF**	**POVSF**	**PSOVSF**
Actives				
Number	23,132	11,874	23,357	12,538
Average Age	35.0	42.5	35.1	42.9
Retirees				
Number	13,378	21,101	12,976	19,999
Average Age	62.7	62.3	62.8	62.4

Table VI-3
VSF Statement of Assets

($ Thousands)				
Valuation Date	June 30, 2021[1]		June 30, 2020[2]	
	MVA[3]	AVA	MVA[4]	AVA
POVSF	$ 2,323,129	$ 2,151,539	$ 1,952,107	$ 2,061,624
PSOVSF	3,648,903	3,243,225	3,217,735	3,266,194
Total	$ 5,972,032	$ 5,394,764	$ 5,169,842	$ 5,327,818

[1] Includes preliminary SKIM amounts as determined by the Actuary in a letter dated September 9, 2021 to the Comptroller's Office.

[2] Includes preliminary SKIM amounts as determined by the Actuary in a letter dated August 28, 2020 to the Comptroller's Office.

[3] Includes Accrued Benefits Payable for 6/30/2021 of $81,336,000 for POVSF and $128,309,000 for PSOVSF.

[4] Includes Accrued Benefits Payable for 6/30/2020 of $78,659,000 for POVSF and $121,306,000 for PSOVSF.

Table VI-4
Development of VSF Actuarial Value of Assets

($ Thousands)	June 30, 2021		June 30, 2020	
	POVSF	**PSOVSF**	**POVSF**	**PSOVSF**
1. Market Value of Assets (MVA)				
a. Beginning of Year (BOY)[1]	$ 1,952,107	$ 3,217,735	$ 1,976,399	$ 3,097,356
b. End of Year (EOY)[2]	$ 2,323,129	$ 3,648,903	$ 1,952,107	$ 3,217,735
2. Contributions				
a. Employee	$ 0	$ 0	$ 0	$ 0
b. Employer	0	0	0	0
c. Total Contributions	$ 0	$ 0	$ 0	$ 0
3. Net Investment Income				
a. Investment Income	$ 448,815	$ 768,197	$ (3,223)	$ 148,059
b. Investment Expenses	(1,196)	(2,074)	(998)	(1,545)
c. Total Net Investment Income	$ 447,619	$ 766,123	$ (4,221)	$ 146,514
4. Benefit Payments and Other Cash Flow	$ (179,833)	$ (338,439)	$ (164,879)	$ (282,685)
5. Preliminary Transferable Earnings from POLICE to VSFs - EOY[3]	$ 103,236	$ 3,484	$ 144,808	$ 256,550
6. Net Cash Flow (2.c. + 4. + 5.)	$ (76,597)	$ (334,955)	$ (20,071)	$ (26,135)
7. Expected Investment Return (EIR)	$ 130,459	$ 213,596	$ 132,675	$ 207,088
8. Unexpected Investment Return (UIR) (3.c. - 7.)	$ 317,160	$ 552,527	$ (136,896)	$ (60,574)
9. AVA @ EOY				
a. AVA @ BOY	$ 2,061,624	$ 3,266,194	$ 1,976,399	$ 3,097,356
b. Net Cash Flow (6.)	$ (76,597)	$ (334,955)	$ (20,071)	$ (26,135)
c. Expected Investment Return (7.)	$ 130,459	$ 213,596	$ 132,675	$ 207,088
d. Phase in of UIR				
20% * UIR for prior year	$ 63,432	$ 110,505	$ (27,379)	$ (12,115)
20% * UIR for second prior year	$ (27,379)	$ (12,115)	N/A	N/A
20% * UIR for third prior year	N/A	N/A	N/A	N/A
20% * UIR for fourth prior year	N/A	N/A	N/A	N/A
20% * UIR for fifth prior year	N/A	N/A	N/A	N/A
Total	$ 36,053	$ 98,390	$ (27,379)	$ (12,115)
e. AVA @ EOY (9.a. + 9.b. + 9.c. + 9.d.)	**$ 2,151,539**	**$ 3,243,225**	**$ 2,061,624**	**$ 3,266,194**

[1] Includes Accrued Benefits Payable for 6/30/2020 of $78,659,000 for POVSF and $121,306,000 for PSOVSF and Accrued Benefits Payable for 6/30/2019 of $77,820,000 for POVSF and $118,052,000 for PSOVSF.

[2] Includes Accrued Benefits Payable for 6/30/2021 of $81,336,000 for POVSF and $128,309,000 for PSOVSF and Accrued Benefits Payable for 6/30/2020 of $78,659,000 for POVSF and $121,306,000 for PSOVSF.

[3] Reflects preliminary SKIM amounts as determined by the Actuary in a letter dated September 9, 2021 for 6/30/2021 and a letter dated August 28, 2020 for 6/30/2020 to the Comptroller's Office.

Table VI-5

Table VI-5
Preliminary Transferrable Earnings Calculation as of June 30, 2021

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

($ Thousands)	Preliminary	
Total POLICE Pension Fund		
1. FY2021 Equity Earnings	$	9,880,848
2. FY2021 Hypothetical Earnings		348,277
3. FY2021 Excess Earnings (1. - 2.)		9,532,571
4. Deficit at June 30, 2020		0
5. Hypothetical Interest Rate (HIR)		1.272%
6. Deficit with interest (4. x (1+HIR))		0
7. Potential Transferrable Earnings (3. - 6.), not less than zero	$	9,532,571

	POVSF	PSOVSF
Allocations to VSF		
8. Allocation Percentage	49.937%	50.063%
9. Potential Transferrable Earnings (7. x 8.)	$ 4,760,280	$ 4,772,291
10. APV of Accumulated Plan Benefits	1,915,616	3,601,491
11. MVA Prior to Transferrable Earnings	2,323,129	3,648,903
12. Unfunded APV of Accumulated Plan Benefits (10. - 11.), not less than zero	0	0
13. Transferrable Earnings Payable (Lesser of 9. and 12., not less than zero)	0	0
14. Rounded Estimate, for FY21 Financial Statements[1]	$ 0	$ 0

[1] Included in MVA at June 30, 2021.

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 Adjustment (COLA) Benefits

Any AutoCOLA payable to a retiree reduces VSF benefits by an amount equal to such AutoCOLA 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 AutoCOLA, 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. **Asset Smoothing Method**: Information on the MVA of the VSF is provided by the Office of the Comptroller. The same Asset Smoothing Method is used to determine the 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 present value (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 Entry Age Normal (EAN) cost method, a portion of the PV of future VSF transfers is reflected in the PV of Future Normal Costs (PVFNC) and a portion is reflected in the UAL.

5. **Transferrable Earnings 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 PV 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, certain demographic characteristics of the Plan, and other factors. Risks faced by the Plan are described in this Section and have been separated into high, medium, and other risk categories.

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. For POLICE this assumed investment return is 7%.

The graph below illustrates the potential FY23 employer contributions for a range of investment return outcomes if returns had differed from the assumed rate of return (i.e., from -2% to 38%). In addition, the actual investment return and employer contribution are shown.

FY23 Employer Contribution

- $2,631.4
- Assumed 7.0%: $2,533.7
- Actual 26.05%: $2,333.7
- $2,210.0

Y-axis: ($ Millions), from 2,100 to 2,700

X-axis: **FY21 Return on MVA**, from -2% to 38%
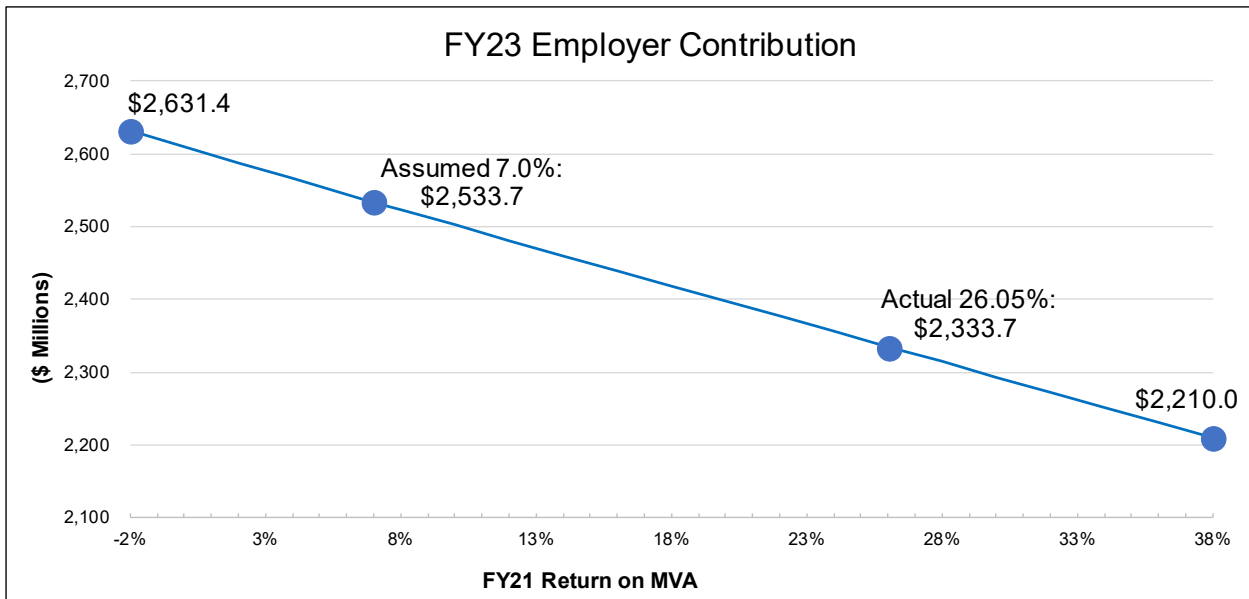
Investment Risk: The Risk of Volatile Realized Returns

Even when long-term investment returns meet actuarial assumptions, investment volatility can contribute substantially to contribution and funded status volatility. The following charts illustrate the impact of investment return volatility on employer contributions and funded ratios based on 5,000 30-year investment return trials. Each stochastic investment return within each 30-year trial was generated from a normal distribution with an expected return of 7% and a standard deviation of 12%. Note that individual asset classes within the portfolio were NOT separately modeled and no attempt was made to rebalance the asset classes during the 30-year trials. The actual investment return for the next valuation year was known prior to the publication of this report and was incorporated into this projection.

The yellow line in the charts show the results if investment returns were exactly 7% as expected. The two solid lines show results for the indicated percentile range and together frame a range of results based on all 5,000 trials. The two dashed lines illustrate sample results from among the 5,000 trials.

EMPLOYER CONTRIBUTION VOLATILITY ILLUSTRATION
(7% Expected Return with 12% Standard Deviation)
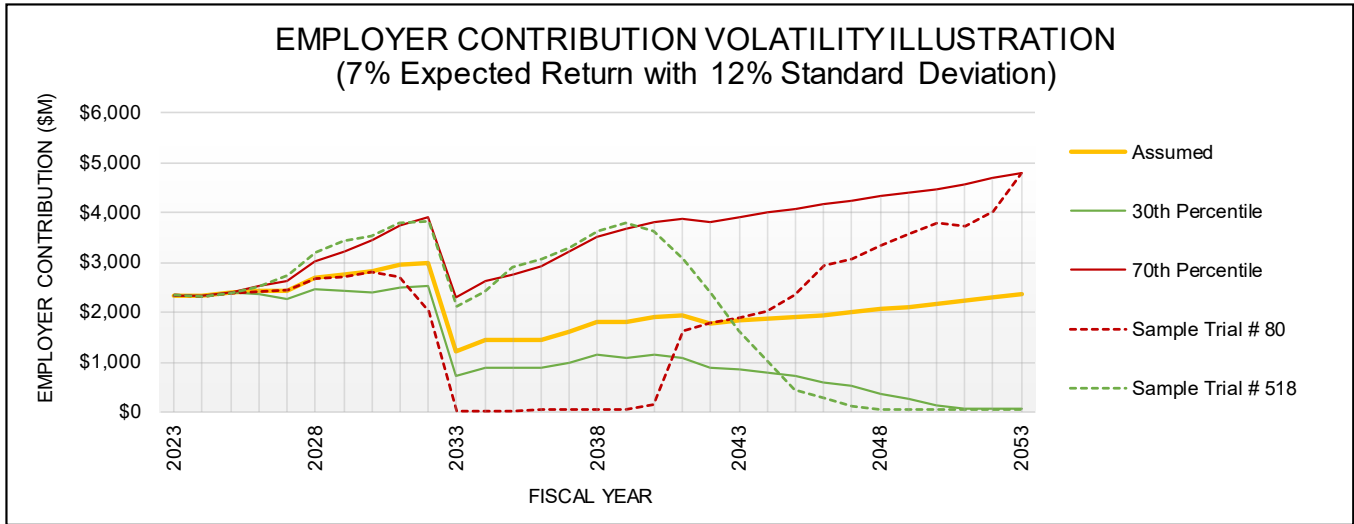
Please note how in the two sample trials above (the dotted lines), the actual employer contribution fluctuates above and below the assumed contribution rate due to investment return volatility.

The impact on the funded status for these two trials can also be seen below, where for example, the green dotted line approaches 100% funding at the end of the 30-year period (below) with a corresponding employer contribution approaching $0 (above). The converse is shown in the red dotted line where at the end of the 30-year period, the employer contribution rate approaches $5B (above) with a corresponding funded ratio of 73% (below).

On average, the 5,000 trials result in the yellow assumed line with a funded status of 100% achieved around the fiscal year ending in 2032.

MVA FUNDED RATIO VOLATILITY ILLUSTRATION
(7% Expected Return with 12% Standard Deviation)
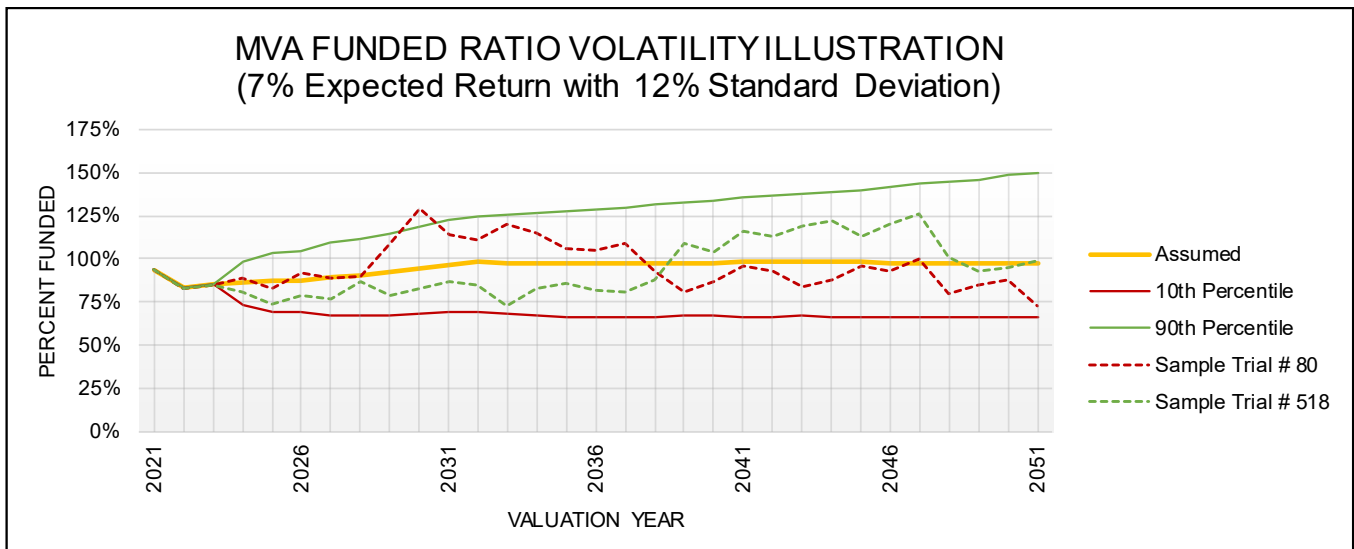
Maturity Risk: The Risk of Demographic Imbalance

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.
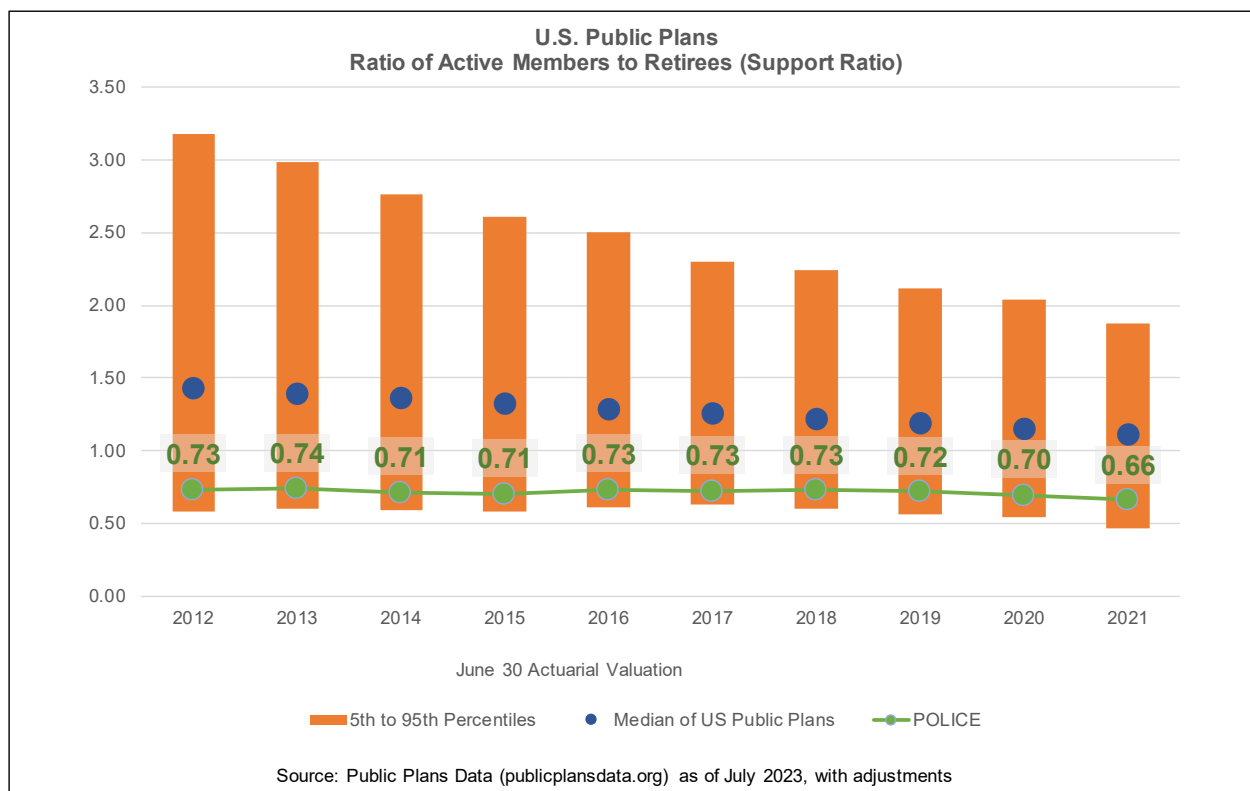
The chart above shows U.S. public pension plan Support Ratios in comparison to the Plan's. The median Support Ratio amongst US public pensions has declined from 1.43 in the 2012 valuation year to 1.12 in the 2021 valuation year. Over that same period, the Plan's Support Ratio declined from 0.73 to 0.66, meaning 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 Systems[1] (NYCRS) are included for comparison. The ratio for POLICE has been between 54-68% for the past few years, indicating that POLICE is a mature retirement system.
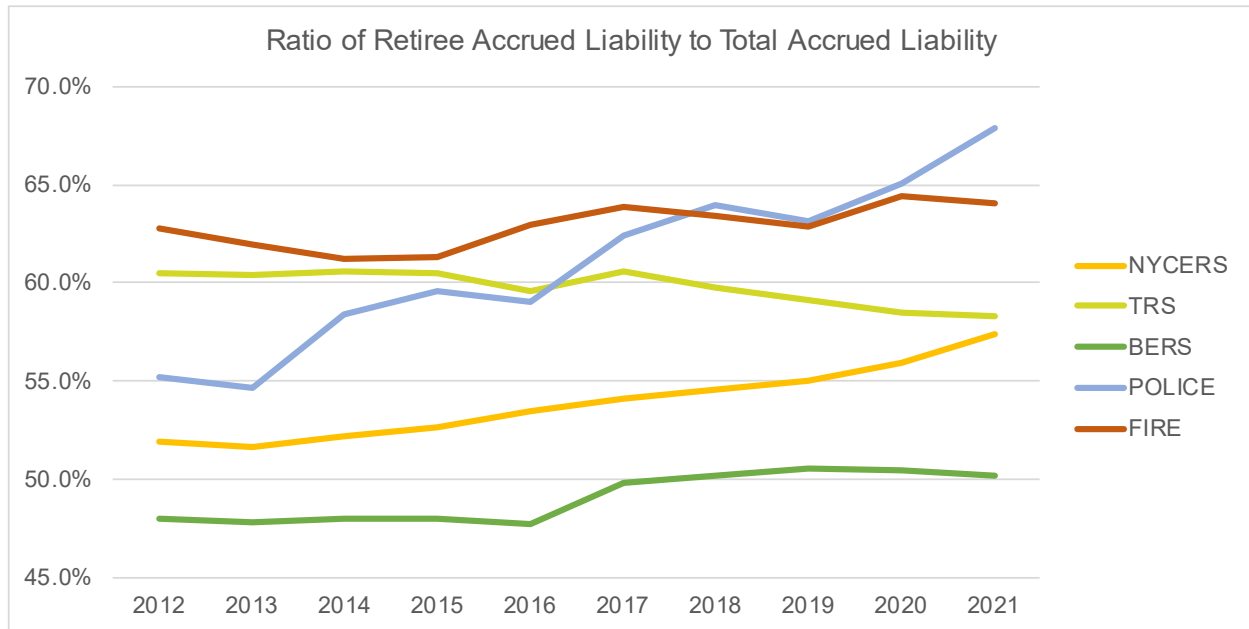
Asset Volatility Ratio

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.

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

U.S. Public Plans
Asset Volatility Ratio

Source: Public Plans Data (publicplansdata.org) as of July 2023, with adjustments
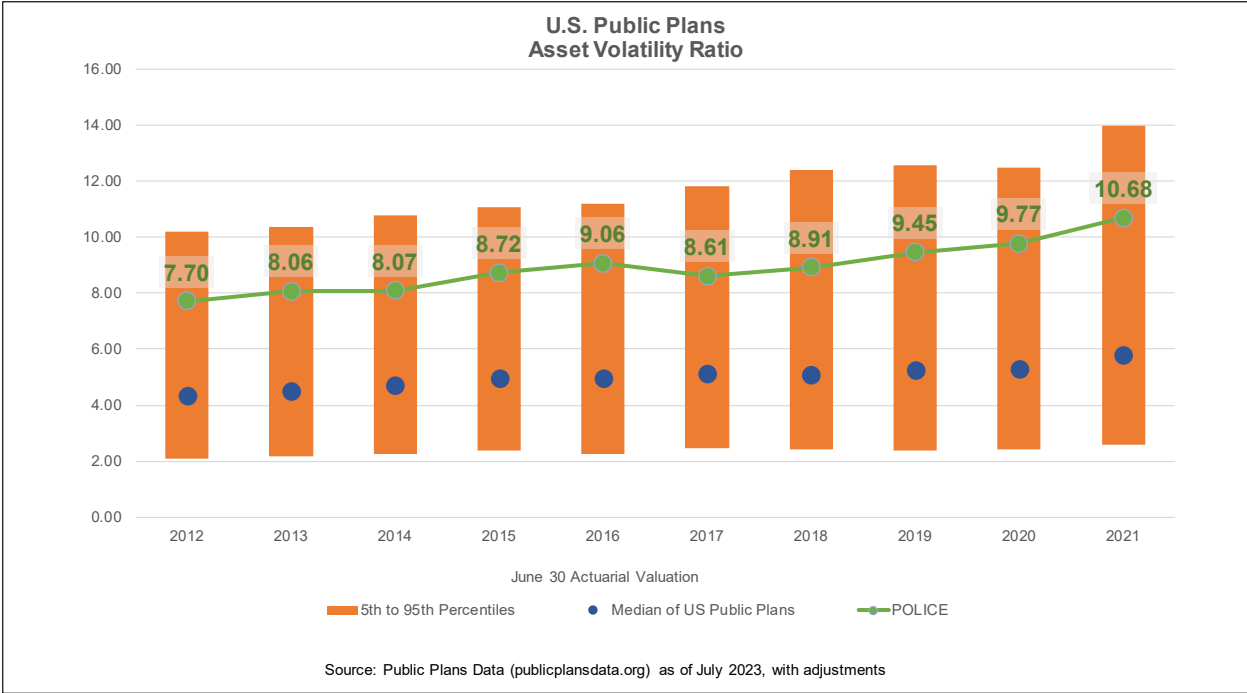
As a plan approaches maturity, AVRs tend to increase, and the plan's actuarially determined contribution becomes more sensitive to investment losses. For example, the same percentage of investment losses in more mature plans with a larger asset base can increase contributions as a percentage of payroll 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 five and six. 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 and/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, UAL, Normal Cost, and resulting contribution of the Plan. The sensitivity of the Accrued Liability, UAL, and Normal Cost of the Plan are shown below:

NEW YORK CITY POLICE PENSION FUND	
SENSITIVITY ANALYSIS AS OF JUNE 30, 2021	
Valuation Date	**June 30, 2021**
Results at 7.0%	
1. Accrued Liability (AL)	$ 54,611,093,758
2. Actuarial Value of Assets (AVA)	45,531,133,000
3. Unfunded Accrued Liability (1. - 2.)	$ 9,079,960,758
4. Normal Cost	$ 1,458,845,775
Results at 6.0%	
1. Accrued Liability (AL)	$ 61,496,144,287
2. Actuarial Value of Assets (AVA)	45,531,133,000
3. Unfunded Accrued Liability (1. - 2.)	$ 15,965,011,287
4. Normal Cost	$ 1,803,991,208
Sensitivity Analysis for 1.0% Reduction in Interest Rate	
1. Increase in Accrued Liability	12.6%
2. Increase in Unfunded Accrued Liability	75.8%
3. Increase in Normal Cost	23.7%

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-2020 was subsequently applied to these base rates.[1]

This scale MP-2020 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 FY2022, NYC settled 12,188 claims and lawsuits for $1.5 billion. On occasion, these settlements involve NYCRS. The 1996 case *Gulino v. Board of Education* awards damages to plaintiffs that in some cases include counterfactual service and salary in NYCRS. It remains a continuing risk that litigation may expand the scope of pension benefits beyond what is intended or codified in statute.

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

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[1] Retirement Plans Experience Committee. "Mortality Improvement Scale MP-2020 Report," "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/reports/annual-claims-report

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.

Other Risk Types

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 Consumer Price Index (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.

The NYCRS and Pension Funds face low contribution risk. Participating employers have historically contributed the actuarial contribution as certified by the Actuary. The Actuary believes the City will continue to do so in future years. See Table III-5 ACTUARIAL AND STATUTORY CONTRIBUTION HISTORY.

Contribution risk may also increase in future years if the actuarial contribution determined for the Plan grows to be a larger part of the City budget. The five NYCRS and Pension Funds currently require contributions of approximately 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 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 (AMC) – Effective April 10, 2017, Tier 3 Enhanced Plan Members are required to contribute an additional 1.0% of salary for a maximum of 25 years. Chapter 59/17 states that the AMC rate for Tier 3 Enhanced Plan members is required to be reviewed by the Actuary every 3 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 City 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 City 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 FAS.

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 FAS.

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 Retirement (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 Retirement (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:

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

  b. Benefits

    i. Tier 1 and Tier 2

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

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

Minimum Benefit:

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

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

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

    ii. Tier 3, 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 (New York City-paid)

   a. Eligibility: No age or service requirement. Death due to the performance of duties while an active member.

   b. Benefits

      i. Tier 1 and Tier 2

         50% of the average of the FS 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.

2. Special Accidental Death Benefits (New York State-paid)

   a. Eligibility: No age or service requirement. Death due to the performance of duties while an active member. Payable only to the surviving spouse, eligible parent, or children until age 18 (or age 23, if a full-time student), if there is no surviving spouse.

   b. Benefits: A monthly pension is payable to the beneficiary in an amount that when added to the New York City-paid Accidental Death Benefit (outlined in 1.) and any payable Social Security benefit is equal to the decedent's last year's wages including overtime and any other type of pensionable earnings.

3. 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

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

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

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

    ii. Tier 2

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

      However, if a member would have been eligible for a service retirement benefit at the date of death, the beneficiary may elect to receive the pension reserve had the member retired on the 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. 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 or beneficiaries of an Accidental Death benefit. 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

1. Eligibility:

    a. Tier 3 and Tier 3 Revised members receiving service, vesting, disability retirement, and survivor benefits.

    b. Tier 3 Enhanced Plan members receiving vested or service retirement benefits.

    c. All members above receive COLA, if greater.

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. World Trade Center (WTC) Disability Benefits

Certain active, vested, and retired members of the Plan, who participated in the Rescue, Recovery, or Cleanup 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 ADR.

P. WTC Death Benefits

Certain active, vested, and retired members of the Plan, who participated in the Rescue, Recovery, or Cleanup 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. Others

None.

SECTION IX – CHAPTER AMENDMENTS

The June 30, 2021 actuarial valuation results reflect the following Chapter amendments from the prior five years.

- **Chapter 782 of the Laws of 2022** (Chapter 782/22) extends eligibility of Special Accidental Death Benefits to parents of certain deceased members who died in the line-of-duty.

- **Chapter 424 of the Laws of 2021** (Chapter 424/21) expands eligibility of certain public service employees for participation in the WTC Rescue, Recovery, or Clean-up Operations.

- **Chapter 327 of the Laws of 2021** (Chapter 327/21) grants a 3% COLA increase to beneficiaries receiving Special Accidental Death Benefits pursuant to Section 208(f) of the General Municipal Law. (Similar legislation was enacted in each of the previous years.)

- **Chapter 89 of the Laws of 2020** (Chapter 89/20) provides death benefits to statutory beneficiaries of members whose death was a result of or was attributed to COVID-19. **Chapter 78 of the Laws of 2021** (Chapter 78/21) amends Chapter 89/20 by extending the eligibility window of these death benefits through December 31, 2022.

- **Chapter 431 of the Laws of 2019** (Chapter 431/19) allows New York City Police Pension Fund (POLICE) members subject to Article 14 of the RSSL (Tier 3, Tier 3 Revised, and Tier 3 Enhanced) to purchase prior service as a cadet in the NYPD and use the appointment date as a cadet to determine the initial date of POLICE membership for plan or tier eligibility provided such purchase of service is made within five years of the effective date.

- **Chapter 266 of the Laws of 2018** (Chapter 266/18) extends the deadline to file a Notice of Participation in the WTC Rescue, Recovery, and Cleanup Operations to September 11, 2022.

- **Chapter 59 of the Laws of 2017** (Chapter 59/17), Part SSS, signed into law on April 10, 2017, changes the ADR and ODR 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.

SECTION X – SUBSEQUENT EVENTS

The following legislation was adopted after the June 30, 2021 valuation date and could have an impact on future years' valuations:

- **Chapter 55 of the Laws of 2023** (Chapter 55/23), Part JJ, permits Tier 3, Tier 3 Revised, and Tier 3 Enhanced members of POLICE to borrow from their accumulated total member contributions.

- **Chapter 783 of the Laws of 2022** (Chapter 783/22) amends Chapter 78/21 and Chapter 89/20 by extending the eligibility window of these death benefits through December 31, 2024.

- **Chapter 528 of the Laws of 2022** (Chapter 528/22) and **Chapter 213 of the Laws of 2023** (Chapter 213/23) extend the 3% COLA increase to beneficiaries receiving Special Accidental Death Benefits. Note that the June 30, 2021 valuation assumes that future legislation on this 3% COLA increase will continue to pass in subsequent years. For more information on this COLA assumption, see page 66.

SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS

The results in this valuation report are based upon standard actuarial models (including but not limited to EAN and related parameters) that are widely used in actuarial practice. The models are intended to calculate the liabilities associated with these plan provisions using data and assumptions as of the measurement date, and using actuarial assumptions and methods further described below. Most of this liability and cashflow modeling is currently implemented using ProVal, an actuarial valuation and projection software program developed by Winklevoss Technologies. These results are reviewed for accuracy, reasonability, and consistency with prior results, consistent with the requirements of Actuarial Standard of Practice 56. The model is also reviewed extensively when significant changes are made to the software and additionally typically biennially by outside actuarial auditors hired by the New York City Comptroller.

Pension payments that exceed the International Revenue Code Section 415 Limit which have been or are expected to be made from the Excess Benefit Plan are excluded from this valuation. There were no other changes in actuarial assumptions and methods compared to the June 30, 2020 valuation.

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%

[1]100% for Tier 3, Tier 3 Revised, and Tier 3 Enhanced members.

Table XI-1b
Early Service Retirement

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

Table XI-2
Active Termination Rates

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

Table XI-3
Active Disability Rates

	NEW YORK CITY POLICE PENSION FUND			
	PROBABILITIES OF DISABILITY RETIREMENT			
		Accidental Disability		
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

[1]N/A for Tier 3, Tier 3 Revised, and Tier 3 Enhanced members.

Table XI-4
Active Mortality Rates

	NEW YORK CITY POLICE PENSION FUND		
	PROBABILITIES OF MORTALITY FOR ACTIVE MEMBERS BASE RATES		
	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

[1]Proposed probabilities are N/A for Tier 3, Tier 3 Revised, and Tier 3 Enhanced members.

Table XI-5
Service Retiree Mortality

	NEW YORK CITY POLICE PENSION FUND				
	PROBABILITIES OF MORTALITY FOR SERVICE RETIREES BASE RATES				
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 RATES					
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 RATES				
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%

[1]Salary Increase is the General Wage Increase of 3.00% plus the Merit Increase.

Table XI-9
Overtime Assumptions

	NEW YORK CITY POLICE PENSION FUND				
	OVERTIME ASSUMPTION				
Years of Service	All Tiers Baseline	Tier 1 & Tier 2 Dual Service	Tier 1 & Tier 2 Dual Disability	Tier 3, Tier 3 Revised, & 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. **Actuarial Interest Rate (AIR)**: 7.0% per annum, net of investment expenses.

2. **Mortality Assumption**: The mortality base tables are projected from 2012 using mortality improvement table MP-2020. The post-commencement 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

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

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

5. **Loans**: Except for Death Benefits, it is assumed that Tier 1 and 2 members take a loan at retirement equal to 25% of their member contribution balances.

6. **Inflation**: The long-term CPI inflation rate is assumed to be 2.5% per year. AutoCOLA is assumed to be 1.5% per year, and Escalation is assumed at 2.5% per year. Beneficiaries receiving Special Accidental Death Benefits, if any, are assumed to receive increases at 3.0% per year.

7. **Form of Payment**: Retiring members are assumed to elect the Maximum Retirement Allowance (i.e., single life annuity) form of payment.

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

   The Actuary reset the AVA to the Market Value as of June 30, 2019.

   Beginning with the June 30, 2020 actuarial valuation, the AAVM recognizes investment returns greater or less than expected over a period of five years.

   In accordance with this AAVM, any investment return over or under the expected 7% return on the MVA is phased into the AVA over a five-year period at 20% per year.

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.

9. **Actuarial Cost Method**: The EAN cost method of funding is used by the Actuary to calculate the Employer Contribution.

   Under this method, the Present Value of Future Benefits (PVFB) of each individual included in the actuarial valuation is allocated on a level basis over the expected 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 PVFNC or future member contributions is the Accrued Liability.

   The excess, if any, of the AL over the AVA is the 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.

   The explicit UALs that are developed under EAN each year are financed over fixed periods. 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).

10. **Allowances for Administrative Expenses**: The Employer Contribution for a fiscal year is increased by the interest-adjusted amount of administrative expenses paid from POLICE during the second prior fiscal year.

11. **WTC Disability and Death Benefits**: Obligations attributable to the WTC Disability Benefits Law and to the WTC Death Benefits Law are determined through estimation techniques for post-retirement reclassifications.

12. **One-year Lag Methodology (OYLM)**: The One-year Lag Methodology uses a June 30, XX valuation date to determine the Fiscal Year XX+2 employer contributions as follows:

a. Normal Cost

The normal cost as of July 1, XX (calculated in the June 30, XX valuation) is rolled forward with the assumed AIR of 7.0% to the mid-point of Fiscal Year XX+2 (i.e., December 31, XX+1).

b. Administrative Expenses

A reimbursement for administrative expenses deducted from plan assets during the year ending June 30, XX is rolled forward with the assumed AIR of 7.0% to the mid-point of Fiscal Year XX+2.

c. UAL Payments

New amortization bases for gains and losses, method and assumption changes, and any benefit improvements are established each year XX such that the UAL as of June 30, XX is equal to the sum of the:

1) Outstanding prior amortization bases;

2) Unpaid prior year normal cost with interest;

3) Unreimbursed administrative expenses with interest, and

4) New amortization bases.

The UAL payment is the sum of the payments on the amortization bases scheduled for Fiscal Year XX+2.

13. **Excess Benefit Plan**: The valuation excludes liabilities and costs, if any, associated with benefits in excess of the Internal Revenue Code (IRC) Section 415 limitation.

SECTION XII – SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2021 and June 30, 2020 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, 2021 and June 30, 2020.

Beginning on June 30, 2020, POLICE members who are no longer on payroll but not otherwise classified have been classified as Active, Terminated Nonvested, or Deferred Vested members, using actuarial judgment and consideration of available data, including leave of absence data when available.

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

	(1) Active Members	(2) Terminated Nonvested	(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)
CHANGES IN MEMBERSHIP DURING THE FISCAL YEAR CLASSIFIED BY STATUS										
Status										
Number at June 30, 2020	**35,895**	**1,544**	**753**	34,749	2,624	12,707	514	871	**51,465**	**89,657**
New Entrants	**2,200**	**100**	**0**	1	0	1	26	2	**30**	**2,330**
Rehires	**24**	**(23)**	**0**	0	(1)	0	0	0	**(1)**	**0**
Terminated Nonvested	**(287)**	**287**	**0**	0	0	0	0	0	**0**	**0**
Vested Termination	**(280)**	**0**	**280**	0	0	0	0	0	**0**	**0**
Withdrawal / Cashout	**(217)**	**(195)**	**(139)**	0	0	0	0	0	**0**	**(551)**
Accidental Death	**(1)**	**0**	**0**	0	0	0	1	0	**1**	**0**
Ordinary Death	**(19)**	**0**	**0**	0	0	0	0	0	**0**	**(19)**
Service Retirement	**(2,153)**	**0**	**(42)**	2,195	0	0	0	0	**2,195**	**0**
Ordinary Disability Retirement	**(18)**	**0**	**0**	0	18	0	0	0	**18**	**0**
Accidental Disability Retirement	**(138)**	**0**	**(1)**	0	0	139	0	0	**139**	**0**
Reclassifications	**0**	**0**	**0**	(63)	(1)	60	4	0	**0**	**0**
Pensioner Death with Beneficiary	**0**	**0**	**0**	(41)	(2)	(19)	0	62	**0**	**0**
Pensioner Death without Beneficiary	**0**	**0**	**0**	(596)	(125)	(225)	(12)	(48)	**(1,006)**	**(1,006)**
Pension Payroll Adjustment	**0**	**0**	**0**	0	0	0	(3)	(1)	**(4)**	**(4)**
Net Change	**(889)**	**169**	**98**	1,496	(111)	(44)	16	15	**1,372**	**750**
Number at June 30, 2021	**35,006**	**1,713**	**851**	36,245	2,513	12,663	530	886	**52,837**	**90,407**

Graph XII-2
Headcount Summary by Status

Legend: Actives (light blue), Terminated Nonvested[1] (orange), Deferred Vested (dark blue), Pensioners (yellow), **Total in bold**

June 30 Actuarial Valuation	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total	**83.0**	**83.7**	**84.6**	**85.2**	**87.3**	**88.3**	**89.1**	**89.3**	**89.7**	**90.4**
Pensioners	46.6	47.0	48.2	48.7	49.2	49.8	50.1	50.7	51.5	52.8
Deferred Vested	0.7	0.7	0.6	0.5	0.6	0.5	0.5	0.5	0.8	0.9
Terminated Nonvested	1.4	1.3	1.4	1.5	1.7	1.8	1.9	1.6	1.5	1.7
Actives	34.2	34.8	34.4	34.4	36.0	36.2	36.6	36.4	35.9	35.0

Headcount (Thousands)

[1] Active Off Payroll prior to June 30, 2020.

Table XII-3
Summary of Active Membership

	June 30, 2021	June 30, 2020
NEW YORK CITY POLICE PENSION FUND ACTIVE MEMBERS INCLUDED IN THE JUNE 30, 2021 AND THE JUNE 30, 2020 ACTUARIAL VALUATIONS		
Number		
Males	28,351	29,279
Females	6,655	6,616
Total	35,006	35,895
Annual Salary[1]		
Males	$ 3,500,848,588	$ 3,551,862,022
Females	761,776,933	747,786,826
Total	$ 4,262,625,521	$ 4,299,648,848
Average Salary[1]		
Males	$ 123,482	$ 121,311
Females	114,467	113,027
Total Average	$ 121,768	$ 119,784
Average Age		
Males	37.6	38.0
Females	37.0	37.4
Total Average	37.5	37.9
Average Past Service		
Males	11.7	12.1
Females	10.3	10.7
Total Average	11.4	11.8

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

Graph XII-4
Active Membership by Tier

Graph showing active membership by tier from 2012 to 2021 (June 30 Actuarial Valuation), with values in thousands.

Year	Tiers 1 & 2	Tier 3	Tier 3 Revised	Tier 3 Enhanced	Total (bold)
2012	30.4	3.8			34.2
2013	29.3	3.6	1.9		34.8
2014	27.4	3.4	3.6		34.4
2015	26.0	3.3	5.1		34.4
2016	24.8	3.2	8.0		36.0
2017	23.3	0.1	0.3	12.4	36.2
2018	22.1	0.1	0.2	14.1	36.6
2019	20.7	0.1	0.2	15.4	36.4
2020	19.3	0.1	0.2	16.3	35.9
2021	17.0	0.1	0.2	17.7	35.0

Legend: Tiers 1 & 2 · Tier 3 · Tier 3 Revised · Tier 3 Enhanced · **Total in bold**

Y-axis: Number (Thousands)

X-axis: **June 30 Actuarial Valuation**

73

Table XII-5
Schedule of Active Member Salary Data

June 30 Actuarial Valuation	Number	Annual Salary	Average Annual Salary	Percentage Increase/ (Decrease) In Avg. Salary
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%
2019	36,401	4,244,805,002	116,612	5.2%
2020	35,895	4,299,648,848	119,784	2.7%
2021	35,006	4,262,625,521	121,768	1.7%

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, 2021

	MALE TOTAL									
AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
NUMBER:										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	992	0	0	0	0	0	0	0	0	**992**
25 TO 29	2,976	1,146	0	0	0	0	0	0	0	**4,122**
30 TO 34	1,275	3,414	935	1	0	0	0	0	0	**5,625**
35 TO 39	446	1,602	2,716	1,704	3	0	0	0	0	**6,471**
40 TO 44	69	610	903	3,231	577	1	0	0	0	**5,391**
45 TO 49	2	106	329	1,310	1,149	262	2	0	0	**3,160**
50 TO 54	3	1	34	546	523	514	165	1	0	**1,787**
55 TO 59	0	2	1	39	133	218	138	125	0	**656**
60 TO 64	1	2	0	1	9	15	24	58	21	**131**
65 TO 69	0	0	2	1	2	1	0	0	0	**6**
70 & UP	0	0	2	2	3	2	0	1	0	**10**
TOTAL	5,764	6,883	4,922	6,835	2,399	1,013	329	185	21	28,351
SALARIES (IN THOUSANDS):										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	54,841	0	0	0	0	0	0	0	0	**54,841**
25 TO 29	186,965	123,929	0	0	0	0	0	0	0	**310,894**
30 TO 34	82,157	418,776	128,191	124	0	0	0	0	0	**629,247**
35 TO 39	28,932	199,562	380,535	249,698	434	0	0	0	0	**859,161**
40 TO 44	4,747	76,364	123,059	476,145	88,788	140	0	0	0	**769,244**
45 TO 49	194	13,634	44,633	187,663	180,162	43,512	301	0	0	**470,100**
50 TO 54	414	147	4,582	78,546	79,269	84,155	29,420	163	0	**276,696**
55 TO 59	0	339	135	5,395	20,087	33,728	23,983	21,610	0	**105,278**
60 TO 64	139	325	0	162	1,423	2,324	3,645	10,331	4,255	**22,604**
65 TO 69	0	0	325	177	345	164	0	0	0	**1,012**
70 & UP	0	0	324	326	473	407	0	241	0	**1,772**
TOTAL[1]	358,389	833,076	681,784	998,237	370,982	164,431	57,350	32,345	4,255	3,500,849
AVERAGE SALARIES: [2]										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	55,283	0	0	0	0	0	0	0	0	**55,283**
25 TO 29	62,824	108,141	0	0	0	0	0	0	0	**75,423**
30 TO 34	64,437	122,664	137,103	124,240	0	0	0	0	0	**111,866**
35 TO 39	64,870	124,571	140,109	146,536	144,667	0	0	0	0	**132,771**
40 TO 44	68,802	125,188	136,278	147,368	153,878	140,188	0	0	0	**142,690**
45 TO 49	97,164	128,626	135,662	143,255	156,799	166,076	150,678	0	0	**148,766**
50 TO 54	137,925	146,621	134,779	143,857	151,566	163,725	178,305	163,182	0	**154,838**
55 TO 59	0	169,330	135,020	138,344	151,031	154,717	173,792	172,878	0	**160,484**
60 TO 64	139,195	162,432	0	162,322	158,078	154,953	151,856	178,120	202,617	**172,549**
65 TO 69	0	0	162,322	177,212	172,737	164,407	0	0	0	**168,623**
70 & UP	0	0	162,207	162,844	157,784	203,500	0	241,116	0	**177,157**
TOTAL	62,177	121,034	138,518	146,048	154,640	162,321	174,315	174,838	202,617	123,482

Note: Age is nearest birthday. 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, 2021 (cont'd)

	FEMALE TOTAL									
AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
NUMBER:										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	210	0	0	0	0	0	0	0	0	**210**
25 TO 29	819	216	0	0	0	0	0	0	0	**1,035**
30 TO 34	503	785	165	0	0	0	0	0	0	**1,453**
35 TO 39	204	434	508	325	0	0	0	0	0	**1,471**
40 TO 44	26	194	233	757	109	0	0	0	0	**1,319**
45 TO 49	1	31	83	366	204	24	1	0	0	**710**
50 TO 54	1	0	17	145	128	64	12	0	0	**367**
55 TO 59	0	0	0	5	27	21	17	3	0	**73**
60 TO 64	1	0	1	0	1	3	3	8	0	**17**
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	1,765	1,660	1,007	1,598	469	112	33	11	0	**6,655**
SALARIES (IN THOUSANDS):										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	11,724	0	0	0	0	0	0	0	0	**11,724**
25 TO 29	50,379	22,596	0	0	0	0	0	0	0	**72,976**
30 TO 34	32,115	92,866	22,305	0	0	0	0	0	0	**147,286**
35 TO 39	12,929	52,110	69,363	45,784	0	0	0	0	0	**180,187**
40 TO 44	1,871	23,650	31,306	108,000	16,336	0	0	0	0	**181,162**
45 TO 49	63	3,934	11,131	51,334	30,842	3,993	176	0	0	**101,474**
50 TO 54	139	0	2,233	20,160	19,004	9,773	1,992	0	0	**53,301**
55 TO 59	0	0	0	676	3,747	3,424	2,743	462	0	**11,052**
60 TO 64	147	0	161	0	190	413	410	1,293	0	**2,614**
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]	109,368	195,157	136,500	225,955	70,119	17,603	5,321	1,755	0	**761,777**
AVERAGE SALARIES: [2]										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	55,830	0	0	0	0	0	0	0	0	**55,830**
25 TO 29	61,513	104,613	0	0	0	0	0	0	0	**70,508**
30 TO 34	63,847	118,301	135,180	0	0	0	0	0	0	**101,367**
35 TO 39	63,378	120,069	136,542	140,875	0	0	0	0	0	**122,493**
40 TO 44	71,971	121,905	134,360	142,669	149,867	0	0	0	0	**137,348**
45 TO 49	63,196	126,910	134,111	140,257	151,187	166,372	176,166	0	0	**142,921**
50 TO 54	139,113	0	131,382	139,032	148,471	152,700	165,991	0	0	**145,235**
55 TO 59	0	0	0	135,292	138,776	163,050	161,380	153,833	0	**151,403**
60 TO 64	146,539	0	161,280	0	190,138	137,684	136,653	161,642	0	**153,770**
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	61,965	117,564	135,551	141,399	149,508	157,168	161,257	159,512	0	**114,467**

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

[1] Total may not add up due to rounding.

[2] Average based on unrounded salary.

	TOTAL (ALL TIERS, ALL MEMBERS)									
AGE \ SVC	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
NUMBER:										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	1,202	0	0	0	0	0	0	0	0	**1,202**
25 TO 29	3,795	1,362	0	0	0	0	0	0	0	**5,157**
30 TO 34	1,778	4,199	1,100	1	0	0	0	0	0	**7,078**
35 TO 39	650	2,036	3,224	2,029	3	0	0	0	0	**7,942**
40 TO 44	95	804	1,136	3,988	686	1	0	0	0	**6,710**
45 TO 49	3	137	412	1,676	1,353	286	3	0	0	**3,870**
50 TO 54	4	1	51	691	651	578	177	1	0	**2,154**
55 TO 59	0	2	1	44	160	239	155	128	0	**729**
60 TO 64	2	2	1	1	10	18	27	66	21	**148**
65 TO 69	0	0	2	1	2	1	0	0	0	**6**
70 & UP	0	0	2	2	3	2	0	1	0	**10**
TOTAL	7,529	8,543	5,929	8,433	2,868	1,125	362	196	21	35,006
SALARIES (IN THOUSANDS):										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	66,565	0	0	0	0	0	0	0	0	**66,565**
25 TO 29	237,344	146,526	0	0	0	0	0	0	0	**383,870**
30 TO 34	114,272	511,642	150,495	124	0	0	0	0	0	**776,533**
35 TO 39	41,861	251,672	449,898	295,482	434	0	0	0	0	**1,039,348**
40 TO 44	6,619	100,014	154,365	584,145	105,123	140	0	0	0	**950,406**
45 TO 49	258	17,569	55,764	238,998	211,004	47,505	478	0	0	**571,574**
50 TO 54	553	147	6,816	98,706	98,274	93,927	31,412	163	0	**329,998**
55 TO 59	0	339	135	6,072	23,834	37,152	26,727	22,071	0	**116,330**
60 TO 64	286	325	161	162	1,613	2,737	4,055	11,624	4,255	**25,218**
65 TO 69	0	0	325	177	345	164	0	0	0	**1,012**
70 & UP	0	0	324	326	473	407	0	241	0	**1,772**
TOTAL[1]	467,757	1,028,233	818,284	1,224,192	441,101	182,034	62,671	34,100	4,255	4,262,626
AVERAGE SALARIES: [2]										
UNDER 20	0	0	0	0	0	0	0	0	0	**0**
20 TO 24	55,379	0	0	0	0	0	0	0	0	**55,379**
25 TO 29	62,541	107,581	0	0	0	0	0	0	0	**74,437**
30 TO 34	64,270	121,849	136,814	124,240	0	0	0	0	0	**109,711**
35 TO 39	64,402	123,611	139,547	145,629	144,667	0	0	0	0	**130,867**
40 TO 44	69,669	124,396	135,885	146,476	153,241	140,188	0	0	0	**141,640**
45 TO 49	85,841	128,237	135,349	142,600	155,953	166,100	159,174	0	0	**147,694**
50 TO 54	138,222	146,621	133,646	142,845	150,958	162,504	177,470	163,182	0	**153,202**
55 TO 59	0	169,330	135,020	137,997	148,963	155,450	172,431	172,432	0	**159,575**
60 TO 64	142,867	162,432	161,280	162,322	161,284	152,075	150,167	176,123	202,617	**170,392**
65 TO 69	0	0	162,322	177,212	172,737	164,407	0	0	0	**168,623**
70 & UP	0	0	162,207	162,844	157,784	203,500	0	241,116	0	**177,157**
TOTAL	62,127	120,360	138,014	145,167	153,801	161,808	173,124	173,978	202,617	121,768

Note: Age is nearest birthday. Service is nearest year.
[1] Total may not add up due to rounding.
[2] Average based on unrounded salary.

Table XII-7
Detailed Reconciliation of Active Membership

TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2021

TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	1	242,592	242,592	70.0	29.0
1	F	0	0	0	0.0	0.0
		1	242,592	242,592	70.0	29.0
2	M	13,992	2,076,391,062	148,398	43.7	18.1
2	F	3,050	432,490,071	141,800	43.2	16.9
		17,042	2,508,881,133	147,218	43.6	17.9
3	M	81	11,205,691	138,342	36.6	10.4
3	F	11	1,464,851	133,168	39.4	10.0
		92	12,670,542	137,723	36.9	10.4
3 Revised	M	141	17,070,792	121,069	33.7	6.6
3 Revised	F	22	2,498,476	113,567	34.0	6.8
		163	19,569,268	120,057	33.7	6.6
3 Enhanced	M	14,136	1,395,938,451	98,751	31.7	5.4
3 Enhanced	F	3,572	325,323,535	91,076	31.8	4.7
		17,708	1,721,261,986	97,203	31.7	5.3
ALL TIERS		35,006	4,262,625,521	121,768	37.5	11.4

TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2020

TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	2	420,755	210,378	81.0	42.5
1	F	0	0	0	0.0	0.0
		2	420,755	210,378	81.0	42.5
2	M	15,937	2,290,008,826	143,691	43.5	17.9
2	F	3,409	466,771,534	136,923	43.0	16.6
		19,346	2,756,780,360	142,499	43.4	17.7
3	M	84	10,966,706	130,556	35.5	9.5
3	F	12	1,532,350	127,696	38.3	8.9
		96	12,499,056	130,199	35.8	9.4
3 Revised	M	149	16,094,301	108,015	32.5	5.7
3 Revised	F	23	2,467,951	107,302	33.1	5.8
		172	18,562,252	107,920	32.6	5.7
3 Enhanced	M	13,107	1,234,371,434	94,177	31.3	5.0
3 Enhanced	F	3,172	277,014,991	87,331	31.4	4.4
		16,279	1,511,386,425	92,843	31.3	4.9
ALL TIERS		35,895	4,299,648,848	119,784	37.9	11.8

JUNE 30, 2021 MEMBERS ALSO PRESENT AS OF JUNE 30, 2020

TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	1	242,592	242,592	70.0	29.0
1	F	0	0	0	0.0	0.0
		1	242,592	242,592	70.0	29.0
2	M	13,926	2,068,247,798	148,517	43.7	18.1
2	F	3,019	428,385,928	141,897	43.3	16.9
		16,945	2,496,633,726	147,337	43.6	17.9
3	M	81	11,205,691	138,342	36.6	10.4
3	F	11	1,464,851	133,168	39.4	10.0
		92	12,670,542	137,723	36.9	10.4
3 Revised	M	141	17,070,792	121,069	33.7	6.6
3 Revised	F	22	2,498,476	113,567	34.0	6.8
		163	19,569,268	120,057	33.7	6.6
3 Enhanced	M	12,495	1,309,285,896	104,785	32.3	6.0
3 Enhanced	F	3,076	298,861,736	97,159	32.4	5.4
		15,571	1,608,147,632	103,278	32.4	5.9
ALL TIERS		32,772	4,137,263,760	126,244	38.2	12.1

JUNE 30, 2020 MEMBERS ALSO PRESENT AS OF JUNE 30, 2021

TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	1	242,592	242,592	69.0	28.0
1	F	0	0	0	0.0	0.0
		1	242,592	242,592	69.0	28.0
2	M	13,926	1,989,826,819	142,886	42.7	17.1
2	F	3,019	410,544,863	135,987	42.3	15.9
		16,945	2,400,371,682	141,657	42.6	16.9
3	M	81	10,574,357	130,548	35.6	9.4
3	F	11	1,419,293	129,027	38.4	9.0
		92	11,993,650	130,366	35.9	9.4
3 Revised	M	141	15,339,957	108,794	32.7	5.7
3 Revised	F	22	2,344,808	106,582	33.0	5.8
		163	17,684,765	108,495	32.7	5.7
3 Enhanced	M	12,495	1,182,737,644	94,657	31.3	5.0
3 Enhanced	F	3,076	268,150,901	87,175	31.4	4.4
		15,571	1,450,888,545	93,179	31.4	4.9
ALL TIERS		32,772	3,881,181,234	118,430	37.2	11.1

ADDITIONS DURING THE YEAR[1]

TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	0	0	0	0.0	0.0
1	F	0	0	0	0.0	0.0
		0	0	0	0.0	0.0
2	M	66	8,143,264	123,383	36.1	9.9
2	F	31	4,104,143	132,392	36.2	11.1
		97	12,247,407	126,262	36.2	10.3
3	M	0	0	0	0.0	0.0
3	F	0	0	0	0.0	0.0
		0	0	0	0.0	0.0
3 Revised	M	0	0	0	0.0	0.0
3 Revised	F	0	0	0	0.0	0.0
		0	0	0	0.0	0.0
3 Enhanced	M	1,641	86,652,555	52,805	26.8	0.7
3 Enhanced	F	496	26,461,799	53,350	27.9	0.6
		2,137	113,114,354	52,931	27.1	0.7
ALL TIERS		2,234	125,361,761	56,115	27.5	1.1

SEPARATIONS FROM MEMBERSHIP DURING THE YEAR[1]

TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	1	178,163	178,163	93.0	57.0
1	F	0	0	0	0.0	0.0
		1	178,163	178,163	93.0	57.0
2	M	2,011	300,182,007	149,270	49.2	23.8
2	F	390	56,226,671	144,171	48.6	22.2
		2,401	356,408,678	148,442	49.1	23.5
3	M	3	392,349	130,783	32.7	10.3
3	F	1	113,057	113,057	37.0	8.0
		4	505,406	126,352	33.7	9.7
3 Revised	M	8	754,344	94,293	30.1	5.6
3 Revised	F	1	123,143	123,143	35.0	7.0
		9	877,487	97,499	30.7	5.8
3 Enhanced	M	612	51,633,790	84,369	29.8	4.2
3 Enhanced	F	96	8,864,090	92,334	31.5	5.6
		708	60,497,880	85,449	30.0	4.4
ALL TIERS		3,123	418,467,614	133,995	44.7	19.2

Note: Age is nearest birthday. 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, 2020 and are no longer members on June 30, 2021. Members are included as separations and additions if the tier or gender has changed.
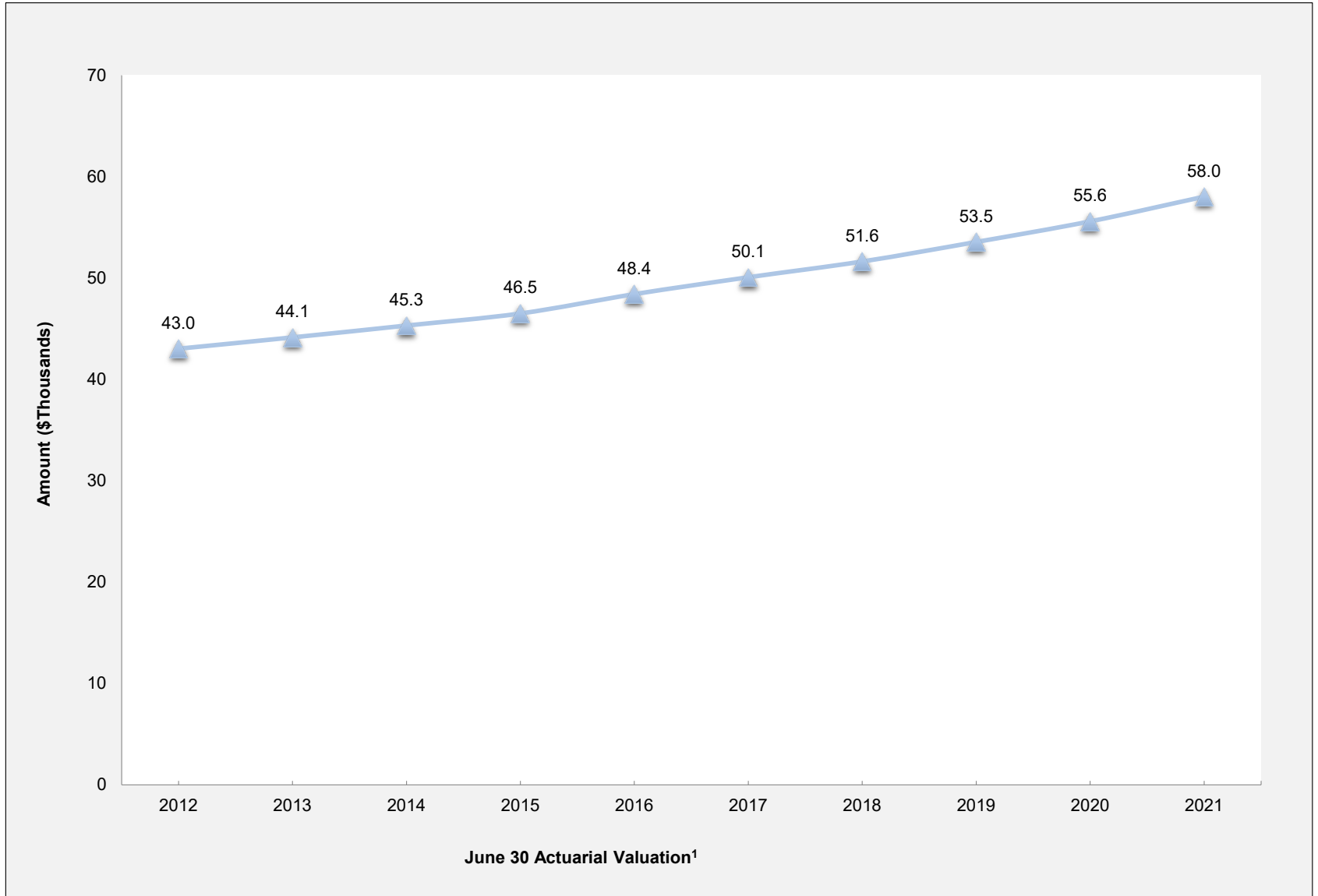
Table XII-8
Distribution of Pension Benefits as of June 30, 2021

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
SERVICE RETIREMENT:									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	0	0	0	0	0	0
40 TO 44	279	18,359,621	65,805	68	4,258,522	62,625	347	22,618,143	65,182
45 TO 49	1,868	135,116,120	72,332	463	29,506,387	63,729	2,331	164,622,507	70,623
50 TO 54	5,386	398,810,216	74,046	1,102	70,333,682	63,824	6,488	469,143,898	72,309
55 TO 59	6,747	435,307,712	64,519	1,478	83,225,462	56,310	8,225	518,533,174	63,044
60 TO 64	5,543	307,778,641	55,526	1,122	55,474,683	49,443	6,665	363,253,324	54,502
65 TO 69	2,652	136,294,451	51,393	508	22,576,740	44,442	3,160	158,871,191	50,276
70 TO 74	2,256	100,179,647	44,406	117	4,759,236	40,677	2,373	104,938,883	44,222
75 TO 79	3,003	119,313,177	39,731	75	2,755,149	36,735	3,078	122,068,326	39,658
80 TO 84	2,067	72,506,969	35,078	41	1,547,542	37,745	2,108	74,054,511	35,130
85 TO 89	914	28,353,938	31,022	26	951,813	36,608	940	29,305,751	31,176
90 & UP	513	15,358,235	29,938	17	444,851	26,168	530	15,803,086	29,817
TOTAL	31,228	1,767,378,727	56,596	5,017	275,834,067	54,980	36,245	2,043,212,794	56,372
ORDINARY DISABILITY:									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	3	151,920	50,640	1	44,520	44,520	4	196,440	49,110
35 TO 39	38	1,805,833	47,522	14	563,095	40,221	52	2,368,928	45,556
40 TO 44	77	3,261,856	42,362	39	1,734,359	44,471	116	4,996,215	43,071
45 TO 49	93	3,948,075	42,452	51	1,990,486	39,029	144	5,938,561	41,240
50 TO 54	226	8,452,668	37,401	120	4,131,415	34,428	346	12,584,083	36,370
55 TO 59	203	6,547,613	32,254	128	3,609,587	28,200	331	10,157,200	30,686
60 TO 64	132	3,644,194	27,608	84	2,318,427	27,600	216	5,962,621	27,605
65 TO 69	71	1,845,495	25,993	39	1,005,308	25,777	110	2,850,803	25,916
70 TO 74	218	6,533,038	29,968	20	460,020	23,001	238	6,993,058	29,383
75 TO 79	371	9,746,674	26,271	13	294,449	22,650	384	10,041,123	26,149
80 TO 84	262	8,930,607	34,086	5	106,551	21,310	267	9,037,158	33,847
85 TO 89	127	6,019,119	47,395	5	148,740	29,748	132	6,167,859	46,726
90 & UP	170	8,002,017	47,071	3	110,404	36,801	173	8,112,421	46,893
TOTAL	1,991	68,889,109	34,600	522	16,517,361	31,642	2,513	85,406,470	33,986
ACCIDENTAL DISABILITY:									
UNDER 30	0	0	0	1	43,971	43,971	1	43,971	43,971
30 TO 34	21	1,158,880	55,185	5	247,586	49,517	26	1,406,466	54,095
35 TO 39	207	16,291,039	78,701	33	2,395,865	72,602	240	18,686,904	77,862
40 TO 44	402	33,332,397	82,916	97	7,288,494	75,139	499	40,620,891	81,405
45 TO 49	695	60,657,155	87,276	129	10,173,182	78,862	824	70,830,337	85,959
50 TO 54	1,798	154,678,664	86,028	267	20,117,991	75,348	2,065	174,796,655	84,647
55 TO 59	2,097	163,442,840	77,941	385	26,836,090	69,704	2,482	190,278,930	76,664
60 TO 64	1,545	102,975,030	66,651	253	15,777,269	62,361	1,798	118,752,299	66,047
65 TO 69	740	47,032,607	63,558	91	4,776,106	52,485	831	51,808,713	62,345
70 TO 74	1,123	55,129,596	49,091	40	1,823,182	45,580	1,163	56,952,778	48,971
75 TO 79	1,501	66,711,692	44,445	37	1,506,334	40,712	1,538	68,218,026	44,355
80 TO 84	776	34,936,763	45,022	12	527,951	43,996	788	35,464,714	45,006
85 TO 89	274	13,352,295	48,731	6	222,334	37,056	280	13,574,629	48,481
90 & UP	125	5,824,976	46,600	3	93,741	31,247	128	5,918,717	46,240
TOTAL	11,304	755,523,934	66,837	1,359	91,830,096	67,572	12,663	847,354,030	66,916

Table XII-8
Distribution of Pension Benefits as of June 30, 2021 (cont'd)

	MALE			FEMALE			TOTAL		
AGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
ACCIDENTAL DEATH:									
UNDER 30	4	531,471	132,868	15	1,956,526	130,435	19	2,487,997	130,947
30 TO 34	0	0	0	1	119,369	119,369	1	119,369	119,369
35 TO 39	1	130,814	130,814	6	817,097	136,183	7	947,911	135,416
40 TO 44	0	0	0	11	1,365,318	124,120	11	1,365,318	124,120
45 TO 49	2	213,847	106,924	27	3,687,569	136,577	29	3,901,416	134,532
50 TO 54	3	400,786	133,595	54	6,758,772	125,162	57	7,159,558	125,606
55 TO 59	7	751,576	107,368	87	11,408,951	131,137	94	12,160,527	129,367
60 TO 64	7	860,560	122,937	73	9,341,017	127,959	80	10,201,577	127,520
65 TO 69	5	445,350	89,070	38	4,570,396	120,274	43	5,015,746	116,645
70 TO 74	4	444,247	111,062	54	5,647,182	104,577	58	6,091,429	105,025
75 TO 79	1	109,150	109,150	64	6,903,056	107,860	65	7,012,206	107,880
80 TO 84	2	288,862	144,431	32	2,860,794	89,400	34	3,149,656	92,637
85 TO 89	2	153,093	76,547	14	1,487,276	106,234	16	1,640,369	102,523
90 & UP	3	267,843	89,281	13	981,687	75,514	16	1,249,530	78,096
TOTAL	**41**	**4,597,599**	**112,137**	**489**	**57,905,010**	**118,415**	**530**	**62,502,609**	**117,929**
OTHER BENEFICIARIES:									
UNDER 30	8	427,427	53,428	9	430,620	47,847	17	858,047	50,473
30 TO 34	5	151,675	30,335	7	212,635	30,376	12	364,310	30,359
35 TO 39	3	79,223	26,408	2	76,357	38,179	5	155,580	31,116
40 TO 44	1	13,585	13,585	14	552,690	39,478	15	566,275	37,752
45 TO 49	2	74,911	37,456	16	803,103	50,194	18	878,014	48,779
50 TO 54	7	312,383	44,626	37	1,601,007	43,270	44	1,913,390	43,486
55 TO 59	6	179,196	29,866	61	2,533,099	41,526	67	2,712,295	40,482
60 TO 64	3	142,276	47,425	64	2,300,051	35,938	67	2,442,327	36,453
65 TO 69	2	53,013	26,507	74	2,288,879	30,931	76	2,341,892	30,814
70 TO 74	1	34,595	34,595	106	2,980,110	28,114	107	3,014,705	28,175
75 TO 79	2	40,238	20,119	140	3,795,021	27,107	142	3,835,259	27,009
80 TO 84	0	0	0	118	3,241,592	27,471	118	3,241,592	27,471
85 TO 89	0	0	0	88	2,263,996	25,727	88	2,263,996	25,727
90 & UP	0	0	0	110	2,044,697	18,588	110	2,044,697	18,588
TOTAL	**40**	**1,508,522**	**37,713**	**846**	**25,123,857**	**29,697**	**886**	**26,632,379**	**30,059**
ALL PENSIONERS AND BENEFICIARIES:									
UNDER 30	12	958,898	79,908	25	2,431,117	97,245	37	3,390,015	91,622
30 TO 34	29	1,462,475	50,430	14	624,110	44,579	43	2,086,585	48,525
35 TO 39	249	18,306,909	73,522	55	3,852,414	70,044	304	22,159,323	72,893
40 TO 44	759	54,967,459	72,421	229	15,199,383	66,373	988	70,166,842	71,019
45 TO 49	2,660	200,010,108	75,192	686	46,160,727	67,290	3,346	246,170,835	73,572
50 TO 54	7,420	562,654,717	75,829	1,580	102,942,867	65,154	9,000	665,597,584	73,955
55 TO 59	9,060	606,228,937	66,913	2,139	127,613,189	59,660	11,199	733,842,126	65,527
60 TO 64	7,230	415,400,701	57,455	1,596	85,211,447	53,391	8,826	500,612,148	56,720
65 TO 69	3,470	185,670,916	53,507	750	35,217,429	46,957	4,220	220,888,345	52,343
70 TO 74	3,602	162,321,123	45,064	337	15,669,730	46,498	3,939	177,990,853	45,187
75 TO 79	4,878	195,920,931	40,164	329	15,254,009	46,365	5,207	211,174,940	40,556
80 TO 84	3,107	116,663,201	37,549	208	8,284,430	39,829	3,315	124,947,631	37,692
85 TO 89	1,317	47,878,445	36,354	139	5,074,159	36,505	1,456	52,952,604	36,369
90 & UP	811	29,453,071	36,317	146	3,675,380	25,174	957	33,128,451	34,617
TOTAL	**44,604**	**2,597,897,891**	**58,244**	**8,233**	**467,210,391**	**56,748**	**52,837**	**3,065,108,282**	**58,011**

Graph XII-9
Pensioner Average Benefits

June 30 Actuarial Valuation[1]

[1] Disclosed 2020 allowances updated to reflect only allowances presented in census data.

Table XII-10
Reconciliation of Pensioner and Beneficiary Data

	SCHEDULE OF PENSIONERS AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS							
	Added to Rolls		Removed from Rolls		End of Year Rolls		% Increase in Annual Allowances	Average Annual Allowances
June 30 Actuarial Valuation	Number	Annual Allowances[1]	Number	Annual Allowances	Number	Annual Allowances[1]		
2012	1,893	133,158,449	1,010	32,287,109	46,638	2,006,198,039	5.3%	43,016
2013	1,346	99,488,158	1,034	33,621,831	46,950	2,072,064,366	3.3%	44,133
2014	2,220	144,660,995	958	32,759,640	48,212	2,183,965,721	5.4%	45,299
2015	1,574	117,371,844	1,083	37,069,856	48,703	2,264,267,709	3.7%	46,491
2016	1,458	151,061,292	1,010	36,517,652	49,151	2,378,811,349	5.1%	48,398
2017	1,681	153,211,878	1,033	38,982,214	49,799	2,493,041,013	4.8%	50,062
2018	1,401	137,291,868	1,076	42,965,087	50,124	2,587,367,794	3.8%	51,619
2019	1,729	170,887,518	1,126	42,117,897	50,727	2,716,137,415	5.0%	53,544
2020[2]	1,905	190,247,384	1,167	46,219,834	51,465	2,860,164,965	5.3%	55,575
2021	2,523	251,377,662	1,151	46,434,345	52,837	3,065,108,282	7.2%	58,011

[1] Allowances shown are those presented in census data. Beginning 2016, SADB payments to beneficiaries are included.

[2] Disclosed 2020 allowances updated to reflect only allowances presented in census data.

APPENDIX: ACRONYMS AND ABBREVIATIONS

Revised 2021 A&M	Actuarial Assumptions and Methods proposed by the Actuary and adopted by the Board of Trustees during Fiscal Year 2021
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
ADR	Accidental Disability Retirement
AIR	Actuarial Interest Rate
AMC	Additional Member Contributions
AVR	Asset Volatility Ratio
AVA	Actuarial Value of Assets
BERS	Board of Education Retirement System
COLA	Cost-of-Living Adjustment
CPI	Consumer Price Index
EAN	Entry Age Normal cost method
FAS	Final Average Salary
FIRE	Fire Pension Fund
FS	Final Salary
GASB	Governmental Accounting Standards Board
IRC	Internal Revenue Code
ITHP	Increased-Take-Home-Pay
MVA	Market Value of Assets
NYCERS	New York City Employees' Retirement System
NYCRS	New York City Retirement Systems
NYPD	New York City Police Department
ODR	Ordinary Disability Retirement
OYLM	One-Year Lag Methodology
POLICE	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
TRS	Teachers' Retirement System
UAL	Unfunded Accrued Liability
VSF	Variable Supplements Fund
WTC	World Trade Center