

Policemen's Annuity and Benefit Fund of Chicago

GASB Statement Nos. 67 and 68
Accounting and Financial
Reporting for Pensions
December 31, 2019





April 30, 2020

The Retirement Board of the
Policemen's Annuity and Benefit Fund
221 North LaSalle Street, Suite 1626
Chicago, Illinois 60601-1404

Members of the Board:

This report provides accounting and financial reporting information as of December 31, 2019, that is intended to comply with the Governmental Accounting Standards Board ("GASB") Statement Nos. 67 and 68 for the Policemen's Annuity and Benefit Fund of Chicago ("PABF" or "Fund"). These calculations have been made on a basis that is consistent with our understanding of these Statements.

GASB Statement No. 67 is the accounting standard that applies to the stand-alone financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the PABF benefits (described in Section E) was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than PABF only in its entirety and only with the permission of PABF.

This report is based upon information, furnished to us by PABF, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If the understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

This report complements the funding actuarial valuation report that was provided to PABF and should be considered in conjunction with that report. Please see the funding actuarial valuation report as of December 31, 2019, for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

The funding objective is to provide employer and employee contributions sufficient to provide the benefits of the Fund when due. Pursuant to Public Act ("P.A.") 99-0506, effective May 30, 2016, the funding policy was amended and requires City contributions to be equal to \$420 million in payment year 2016, \$464 million in payment year 2017, \$500 million in payment year 2018, \$557 million in payment year 2019 and \$579 million in payment year 2020. For payment years after 2020, the City is required to make level percent of pay contributions for plan years 2020 through 2055 that along with member contributions and investment earnings are expected to generate a projected funded ratio of 90% by plan year end 2055. The projections are based on an open group, level percent of pay financing and the Entry-Age Normal cost method.

This is a severely underfunded plan. Based on the results of the funding actuarial valuation report, the funded ratio is only 22.3% (using actuarial value of assets) and the unfunded liability is approximately \$11 billion as of December 31, 2019. The funded ratio based on the results of the funding actuarial valuation report is not projected to even reach 50% funded for another 23 years until 2042.

The funding policy defined in P.A. 99-0506 significantly defers contributions when compared to the provisions of the prior funding policy defined in P.A. 96-1495. The amount of annual contributions defined under P.A. 99-0506 does not even cover normal cost plus interest on the unfunded liability for the next 11 years. This means the unfunded liability is actually projected to increase to a high of \$12.2 billion in 2030, when contributions are finally sufficient to start reducing the unfunded liability.

We understand that P.A. 99-0506 defines the amount of City Contributions to the PABF. Nevertheless, we continue to recommend that the plan sponsor seriously consider making additional contributions (in excess of the statutory requirement) to ensure that there are sufficient assets available in the fund in all years to pay the promised benefits.

We also recommend that the Board perform projections which include pessimistic scenarios such as investment return lower than assumed, lower contributions received than expected, higher benefit payments than expected, etc., to more fully understand the impact of less than optimal future expectations.

This actuarial valuation assumes that the City will be able to make future contributions on a timely basis. We did not perform an analysis of the ability of the City to make future contributions. Such an analysis is not within the scope of our assignment or within our analytical skill set. Failure to receive City contributions on a timely basis could jeopardize the sustainability of the Fund.

The actuarial valuation results set forth in this report are based on the data and actuarial techniques described above, and upon the provisions of the Fund as of the actuarial valuation date. To the best of our knowledge, the information contained in this report is complete and accurate based on the statutes in effect as of December 31, 2019, and fairly presents the actuarial position of the Fund as of December 31, 2019, for purposes of complying with the financial reporting requirements under GASB Statement Nos. 67 and 68.



All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

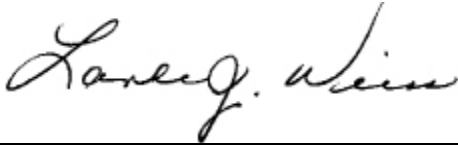
The actuarial assumptions used in this actuarial valuation are reasonable and appropriate for purposes of measuring the GASB Statement Nos. 67 and 68 pension liability as of December 31, 2019, under the current provisions.

This report should not be relied on for any purpose other than the purpose stated.

The signing actuaries are independent of the PABF and the plan sponsor.

Lance J. Weiss and Alex Rivera are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,



By

Lance J. Weiss, EA, MAAA, FCA
Senior Consultant and Team Leader



By

Alex Rivera, FSA, EA, MAAA, FCA
Senior Consultant

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Policemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.



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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2019

	2019
Actuarial Valuation Date	December 31, 2019
Measurement Date of the Net Pension Liability	December 31, 2019
Employer's Fiscal Year Ending Date (Reporting Date)	December 31, 2019

Membership

Number of	
- Retirees and Beneficiaries	13,771
- Inactive, Nonretired Members	707
- Active Members	13,353
- Total	27,831
Covered Payroll	\$ 1,228,986,864

Net Pension Liability

Total Pension Liability	\$ 14,789,602,350
Plan Fiduciary Net Position	3,162,428,863
Net Pension Liability	\$ 11,627,173,487
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	21.38%
Net Pension Liability as a Percentage of Covered Payroll	946.08%

Development of the Single Discount Rate

Single Discount Rate Beginning of Year	7.18%
Single Discount Rate End of Year	6.43%
Long-Term Expected Rate of Investment Return	6.75%
Long-Term Municipal Bond Rate Beginning of Year*	3.71%
Long-Term Municipal Bond Rate End of Year*	2.75%
Last Year Trust Assets are Available to Pay Assets	2075

Total Pension Expense	\$ 1,016,101,643
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Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred (Inflows) of Resources
Difference Between Expected and Actual Non-Investment Experience	\$ 558,793	\$ (410,749,794)
Changes in Assumptions	1,122,103,335	(176,011,075)
Net Difference Between Projected and Actual Earnings on Pension Plan Investments	231,775,278	(214,622,991)
Total	\$ 1,354,437,406	\$ (801,383,860)

*Source: The rates at the beginning and end of the year are the rates for fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of December 28, 2018, and December 31, 2019, respectively. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.



Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (“GASB”) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain non-actuarial information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan’s fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer’s contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, “Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer’s reporting period should be reported as a deferred outflow of resources related to pensions.” The information contained in this report does not incorporate any contributions made to the PABF subsequent to the measurement date of December 31, 2019.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan’s reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- A description of benefits provided by the plan;
- The type of employees and number of members covered by the pension plan;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- The pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- The composition of the pension plan's board and the authority under which benefit terms may be amended;
- A description of how fair value is determined;
- Information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables and insurance contracts excluded from plan assets; and
- Annual money-weighted rate of return.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- Sources of changes in the net pension liability;
- Information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability and the net pension liability as a percent of covered-employee payroll; and
- A comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

The tables may be built prospectively as the information becomes available.

Discussion

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of December 31, 2019, and a measurement date of December 31, 2019.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects: (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year mixed maturity general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 6.75%; the municipal bond rate is 2.75% (based on the most recent date available on or before the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 6.43%.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014, respectively; earlier application is encouraged by the GASB.

Recent Legislation

The following Public Act passed in 2019 by the 100th General Assembly, included changes to the Fund Provisions but did not impact the results of the actuarial valuation.

P.A. 100-1173, effective June 1, 2019

Denied service credit applications for safety or investigative work filed between 1992 and 2008 may be reconsidered by the board.

P.A. 101-0387, effective August 16, 2019

Added provisions to felony convictions entered on or after January 1, 2019. Also states that applicants of duty or occupational disease disability retirements who are denied benefits and who challenge and prevail may seek litigation expense recovery.



Discussion

This report reflects cost for certain members who were hired before April 4, 2003, and retired after August 23, 1989, and are eligible to receive health insurance premium subsidies under the court order for the Underwood v. City of Chicago case. The healthcare insurance premium subsidy is \$55 per month if the eligible member is not receiving Medicare benefits or \$21 per month if the eligible member is receiving Medicare benefits.

Assumption Changes

The actuarial assumptions have changed from the prior actuarial valuation to reflect the results of the experience study performed for the period January 1, 2014 through December 31, 2018. The Board adopted new demographic and economic actuarial assumptions at their August 29, 2019, meeting to first be used in the December 31, 2019, actuarial valuation.

Following is a summary of the actuarial assumptions adopted by the Board as a result of the most recent experience study:

Economic Assumptions

- **Price inflation:** Decrease the price inflation from 2.75% to 2.25%.
- **Retiree Cost-of-Living Adjustment and Increases in the Pay Cap for Pensionable Pay for Participants Hired on and After January 1, 2011:** Reduce the assumed rate of COLA and increases in capped pay for participants hired on or after January 1, 2011, from 1.375% to 1.125% (from $\frac{1}{2}$ of 2.75% to $\frac{1}{2}$ of 2.25%).
- **Investment return:** Decrease the nominal investment return assumption from 7.25% to 6.75%.
- **General wage inflation and payroll growth assumption:** Maintain a general wage inflation assumption of 1.25% above inflation, or 3.50%. This assumption serves as the across-the-board portion of salary increases and the rate at which the pay at hire is assumed to increase in future years for projection purposes.
- **Salary increase:** Slightly increase the assumed salary increase rates.

Mortality Assumptions

- Update post-retirement mortality tables to the most recently published national “public sector” mortality tables, the Pub-2010 amount-weighted Safety Healthy Retiree mortality tables. We also assume mortality rates will improve in the future using a fully generational approach, with the most recently published projection scale, MP-2018. These new mortality tables are a move from a single-dimensional age-based table to a two-dimensional table, where the year a person was born also influences their mortality rate.
- Update pre-retirement mortality tables for active employees to the most recently published national “public sector” mortality tables, the Pub-2010 headcount-weighted Safety Employee

Discussion

mortality tables. We also assume mortality rates will improve in the future using a fully generational approach, with the most recently published projection scale, MP-2018.

- Apply scaling factors to the base mortality tables; i.e., Pub-2010 Mortality Tables, to partially reflect observed mortality experience to the extent it is credible.

Other Demographic Assumptions

- **Retirement rates:** Increase rates slightly at earlier ages of eligibility for retirement and decrease rates for other ages.
- **Turnover rates:** Decrease rates of termination during a member's second and third year of service and increase rates during a member's fourth through seventh year of service.
- **Disability rates:** Adjust the allocation between occupational disease disability, ordinary disability and duty disability and lower age-based rates across all ages.

Actuarial Methods and Policies

- **Cost method:** Continue to use the Entry Age Normal cost method, which is required by State Statute.
- **Amortization method:** The State Statute requires fixed City contributions for payment years 2016 through 2020 and level percentage of pay contributions thereafter, such that the funded ratio reaches 90% by the end of 2055. There is no separate amortization of the unfunded accrued liability that leads to a 100% funding of the accrued liability. This funding method may not comply with generally accepted actuarial principles for the funding of a retirement fund because the funding method targets 90% instead of 100%.
- **Asset smoothing method:** The asset smoothing method is also defined by State Statute. Gains and losses, the difference between the actual investment return and expected investment return, are smoothed in over a five-year period at a rate of 20% per year.
- **Administrative expenses:** Continue to include administrative expenses as an additional component of the normal cost. Administrative expenses are provided by PABF's staff. Future administrative expenses, for projection purposes, are assumed to increase at the assumed rate of inflation.
- **Dependent assumptions:** Decrease the current marriage assumption from 85% to 75% based on the demographics of the valuation census data over the experience study period. Maintain the age differential between males and females at three years. The male spouse is assumed to be three years older than the female spouse. No dependent assumptions are made for current retirees as actual eligible spouse data is provided.
- **Decrement timing:** Maintain middle-of-year decrement timing.
- **Pay Increase timing:** Maintain beginning-of-year pay increase timing.

SECTION B

FINANCIAL STATEMENTS

Auditor's Note: This information is intended to assist in preparation of the financial statements of the Policemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Pension Expense under GASB Statement No. 68

Fiscal Year Ended December 31, 2019

A. Expense

1. Service Cost Including Pension Plan Administrative Expense	\$ 240,383,419
2. Interest on the Total Pension Liability	944,738,703
3. Current-Period Benefit Changes	24,216,420
4. Employee Contributions (made negative for addition here)	(110,791,663)
5. Projected Earnings on Plan Investments (made negative for addition here)	(206,613,695)
6. Other Changes in Plan Fiduciary Net Position	(32,359)
7. Recognition of Outflow/(Inflow) of Resources due to Liabilities	(124,120,329)
8. Recognition of Outflow/(Inflow) of Resources due to Assumption Changes	188,794,775
9. Recognition of Outflow/(Inflow) of Resources due to Assets	59,526,372
10. Total Pension Expense	\$ 1,016,101,643

B. Reconciliation of Net Pension Liability

1. Net Pension Liability Beginning of Year	\$ 10,408,078,525
2. Pension Expense	1,016,101,643
3. Employer Contributions (made negative for addition here)	(581,936,012)
4. Change in Liability Experience Outflows/(Inflows) Recognized in Current Liabilities	56,110,102
5. Change in Assumption Changes Experience Outflows/(Inflows) Recognized in Current Liabilities	951,623,305
6. Change in Investment Experience Outflows/(Inflows) Recognized in Current Assets	(222,804,076)
7. Net Pension Liability End of Year	\$ 11,627,173,487



Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods

Fiscal Year Ended December 31, 2019

A. Outflows and (Inflows) of Resources Recognized in Current and Future Pension Expenses as of Plan Year End December 31, 2019

Experience (Gain)/Loss	Original Balance	Date Established	Original Recognition Period/ Amortization Factor	Amount Recognized in Past Pension Expenses	Amount Recognized in Current Pension Expense	Deferred (Inflows) to be Recognized in Future Pension Expenses	Deferred Outflows to be Recognized in Future Pension Expenses
1. Differences Between Expected and Actual Non-Investment Experience	\$ (68,010,227)	December 31, 2019	6.6988	\$ -	\$ (10,152,618)	\$ (57,857,609)	\$ -
	(281,150,986)	December 31, 2018	6.2392	(45,062,349)	(45,062,349)	(191,026,288)	-
	(299,923,560)	December 31, 2017	5.8778	(102,053,456)	(51,026,728)	(146,843,376)	-
	1,801,353	December 31, 2016	5.7988	931,920	310,640	-	558,793
	(105,968,891)	December 31, 2015	5.8259	(72,757,096)	(18,189,274)	(15,022,521)	-
	<u>\$ (753,252,311)</u>		<u>6.0881</u>	<u>\$ (218,940,981)</u>	<u>\$ (124,120,329)</u>	<u>\$ (410,749,794)</u>	<u>\$ 558,793</u>
2. Assumption Changes	\$ 1,140,418,080	December 31, 2019	6.6988	\$ -	\$ 170,242,465	\$ -	\$ 970,175,615
	(259,051,713)	December 31, 2018	6.2392	(41,520,319)	(41,520,319)	(176,011,075)	-
	238,975,508	December 31, 2017	5.8778	81,314,974	40,657,487	-	117,003,047
	112,585,241	December 31, 2016	5.7988	58,245,426	19,415,142	-	34,924,673
	-	December 31, 2015	5.8259	-	-	-	-
	<u>\$ 1,232,927,116</u>		<u>6.0881</u>	<u>\$ 98,040,081</u>	<u>\$ 188,794,775</u>	<u>\$ (176,011,075)</u>	<u>\$ 1,122,103,335</u>
3. Difference Between Expected and Actual Investment Earnings	\$ (163,277,704)	December 31, 2019	5.0000	\$ -	\$ (32,655,541)	\$ (130,622,163)	\$ -
	361,516,575	December 31, 2018	5.0000	72,303,315	72,303,315	-	216,909,945
	(210,002,073)	December 31, 2017	5.0000	(84,000,830)	(42,000,415)	(84,000,828)	-
	74,326,665	December 31, 2016	5.0000	44,595,999	14,865,333	-	14,865,333
	235,068,400	December 31, 2015	5.0000	188,054,720	47,013,680	-	-
	<u>\$ 297,631,863</u>		<u>5.0000</u>	<u>\$ 220,953,204</u>	<u>\$ 59,526,372</u>	<u>\$ (214,622,991)</u>	<u>\$ 231,775,278</u>
4. Total	<u>\$ 777,306,668</u>			<u>\$ 100,052,304</u>	<u>\$ 124,200,818</u>	<u>\$ (801,383,860)</u>	<u>\$ 1,354,437,406</u>

B. Deferred Outflows and Deferred (Inflows) of Resources by Year to be Recognized in Future Pension Expenses

Year Ending December 31	Differences Between Expected and Actual Non-Investment Experience	Assumption Changes	Differences Between Expected and Actual Investment Experience	Year Ending December 31	Deferred Outflows of Resources	Deferred (Inflows) of Resources	Net Deferred Outflows/ (Inflows) of Resources
2020	\$ (120,953,576)	\$ 188,794,775	\$ 12,512,692	2020	\$ 317,794,382	\$ (237,440,491)	\$ 80,353,891
2021	(105,993,542)	184,889,164	(2,352,639)	2021	298,960,951	(222,417,968)	76,542,983
2022	(100,004,887)	164,410,219	39,647,774	2022	278,233,853	(174,180,747)	104,053,106
2023	(55,214,967)	128,722,146	(32,655,540)	2023	170,242,465	(129,390,826)	40,851,639
2024	(20,929,510)	160,312,666	-	2024	170,242,465	(30,859,309)	139,383,156
2025	(7,094,519)	118,963,290	-	2025	118,963,290	(7,094,519)	111,868,771
Thereafter	-	-	-	Thereafter	-	-	-
Total	<u>\$ (410,191,001)</u>	<u>\$ 946,092,260</u>	<u>\$ 17,152,287</u>	Total	<u>\$ 1,354,437,406</u>	<u>\$ (801,383,860)</u>	<u>\$ 553,053,546</u>

Numbers may not add due to rounding.



Statement of Fiduciary Net Position

Years Ended December 31, 2019, and 2018

	2019	2018
Assets		
Receivables		
Employer	\$ 596,940,465	\$ 581,515,035
Plan member	5,278,385	5,209,349
Due from Broker - net	104,154,584	135,126,612
Interest and dividends	3,282,673	6,555,825
Other receivables	-	-
Total receivables	<u>709,656,107</u>	<u>728,406,821</u>
Investments - at fair value		
Cash and short-term investments	169,263,807	108,459,254
Equities	1,335,759,347	1,098,656,068
Fixed income	565,581,107	705,429,666
Private equity	99,078,783	84,919,513
Real estate	124,951,531	90,782,832
Hedge funds	226,685,082	188,406,726
Infrastructure	74,947,075	92,520,576
Subtotal	<u>2,596,266,732</u>	<u>2,369,174,635</u>
Forward currency contracts	221,945	22,194,095
Securities lending cash collateral	76,812,922	112,851,289
Total investments - fair value	<u>2,673,301,599</u>	<u>2,504,220,019</u>
Total assets	<u>3,382,957,706</u>	<u>3,232,626,840</u>
Liabilities and net position		
Liabilities		
Due to brokers - net	134,304,522	204,454,518
Refunds, professional fees payable and other liabilities	6,776,923	7,898,508
OPEB liability	2,553,621	2,242,684
Securities lending cash collateral	76,812,922	112,851,289
Total liabilities	<u>220,447,988</u>	<u>327,446,999</u>
Deferred Inflow of Resources	<u>80,855</u>	<u>-</u>
Net Position - Restricted for Pension Benefits	<u>\$ 3,162,428,863</u>	<u>\$ 2,905,179,841</u>



Statement of Changes in Fiduciary Net Position

Years Ended December 31, 2019, and 2018

	<u>2019</u>	<u>2018</u>
Additions		
Contributions		
Employer	\$ 581,936,012	\$ 588,034,930
Plan Member	110,791,663	107,186,492
Other	32,359	1,600,348
Total Contributions	<u>692,760,034</u>	<u>696,821,770</u>
Investment Income		
Net appreciation in fair value of investments	326,767,920	(183,034,696)
Interest	18,569,323	21,282,711
Dividends	28,297,308	29,667,486
Real estate operating income - net	4,945,426	2,973,090
	<u>378,579,977</u>	<u>(129,111,409)</u>
Less investment expenses	(9,211,928)	(9,615,537)
Investment income - net	<u>369,368,049</u>	<u>(138,726,946)</u>
Securities lending		
Income	2,313,459	3,134,411
Lender (borrower) rebates	(1,615,043)	(2,282,406)
Management fees	(83,810)	(102,241)
Securities lending income - net	<u>614,606</u>	<u>749,764</u>
Total additions	<u>1,062,742,689</u>	<u>558,844,588</u>
Deductions		
Benefits	791,839,040	764,367,368
Refund Payments	8,828,904	6,737,073
Administrative and OPEB expenses	4,734,467	4,626,599
Total deductions	<u>805,402,411</u>	<u>775,731,040</u>
Net increase	257,340,278	(216,886,452)
Net Position Restricted for Pension Benefits		
Beginning of year	2,905,179,841	3,122,066,293
Adjustment as of January 1, 2019	(91,256)	-
End of year	<u>\$ 3,162,428,863</u>	<u>\$ 2,905,179,841</u>



SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note: This information is intended to assist in preparation of the financial statements of the Policemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Schedule of Changes in Net Pension Liability and Related Ratios Current Period Fiscal Year Ended December 31, 2019

A. Total Pension Liability

1. Service Cost Including Pension Plan Administrative Expense	\$ 240,383,419
2. Interest on the Total Pension Liability	944,738,703
3. Changes of benefit terms	24,216,420
4. Difference between expected and actual experience of the Total Pension Liability	(68,010,227)
5. Changes of assumptions	1,140,418,080
6. Benefit payments, including refunds of employee contributions	(800,667,944)
7. Pension Plan Administrative Expenses	(4,734,467)
8. Net change in total pension liability	1,476,343,984
9. Total pension liability – beginning	13,313,258,366
10. Total pension liability – ending	\$ 14,789,602,350

B. Plan Fiduciary Net Position

1. Contributions – employer	581,936,012
2. Contributions – employee	110,791,663
3. Net investment income	369,982,655
4. Benefit payments, including refunds of employee contributions	(800,667,944)
5. Pension Plan Administrative Expense	(4,734,467)
6. Other	32,359
7. Net change in plan fiduciary net position	257,340,278
8. Plan fiduciary net position – beginning	2,905,179,841
8a. Adjustment as of January 1, 2019	(91,256)
9. Plan fiduciary net position – ending	\$ 3,162,428,863

C. Net Pension Liability

\$ 11,627,173,487

D. Plan Fiduciary Net Position as a Percentage of the Total Pension Liability

21.38%

E. Covered-Employee Payroll

\$ 1,228,986,864

F. Net Pension Liability as a Percentage of Covered Employee Payroll

946.08%



Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal year ending December 31,	2019	2018	2017	2016	2015	2014
Total Pension Liability						
Service Cost Including Pension Plan Administrative Expense	\$ 240,383,419	\$ 242,998,341	\$ 237,333,255	\$ 220,569,553	\$ 213,584,647	\$ 199,435,084
Interest on the Total Pension Liability	944,738,703	931,731,201	917,720,267	851,098,457	832,972,131	791,693,017
Benefit Changes	24,216,420	-	-	606,249,791	-	-
Difference between Expected and Actual Experience	(68,010,227)	(281,150,986)	(299,923,560)	1,801,353	(105,968,891)	-
Assumption Changes	1,140,418,080	(259,051,713)	238,975,508	112,585,241	-	845,070,287
Benefit Payments	(791,839,040)	(764,367,368)	(737,873,928)	(696,491,103)	(668,950,080)	(645,688,934)
Refunds	(8,828,904)	(6,737,073)	(10,017,655)	(10,704,842)	(7,826,847)	(8,991,636)
Pension Plan Administrative Expense	(4,734,467)	(4,626,599)	(4,843,012)	(4,749,762)	(4,508,519)	(4,240,625)
Net Change in Total Pension Liability	1,476,343,984	(141,204,197)	341,370,875	1,080,358,688	259,302,441	1,177,277,193
Total Pension Liability - Beginning	13,313,258,366	13,454,462,563	13,113,091,688	12,032,733,000	11,773,430,559	10,596,153,366
Total Pension Liability - Ending (a)	\$ 14,789,602,350	\$ 13,313,258,366	\$ 13,454,462,563	\$ 13,113,091,688	\$ 12,032,733,000	\$ 11,773,430,559
Plan Fiduciary Net Position						
Employer Contributions	\$ 581,936,012	\$ 588,034,930	\$ 494,483,191	\$ 272,427,716	\$ 572,836,100	\$ 177,417,827
Employee Contributions	110,791,663	107,186,492	103,011,250	101,475,864	107,626,311	95,675,538
Pension Plan Net Investment Income	369,982,655	(137,977,182)	412,190,404	142,699,124	(5,333,795)	181,901,293
Benefit Payments	(791,839,040)	(764,367,368)	(737,873,928)	(696,491,103)	(668,950,080)	(645,688,934)
Refunds	(8,828,904)	(6,737,073)	(10,017,655)	(10,704,842)	(7,826,847)	(8,991,636)
Pension Plan Administrative Expense	(4,734,467)	(4,626,599)	(4,843,012)	(4,749,762)	(4,508,519)	(4,240,625)
Other	32,359	1,600,348	97,239	1,412,770	3,091,545	740,305
Net Change in Plan Fiduciary Net Position	257,340,278	(216,886,452)	257,047,489	(193,930,233)	(3,065,285)	(203,186,232)
Plan Fiduciary Net Position - Beginning	2,905,179,841	3,122,066,293	2,865,018,804	3,058,949,037	3,062,014,322	3,265,200,554
Adjustment as of January 1, 2019	(91,256)	-	-	-	-	-
Plan Fiduciary Net Position - Ending (b)	\$ 3,162,428,863	\$ 2,905,179,841	\$ 3,122,066,293	\$ 2,865,018,804	\$ 3,058,949,037	\$ 3,062,014,322
Net Pension Liability - Ending (a) - (b)	11,627,173,487	10,408,078,525	10,332,396,270	10,248,072,884	8,973,783,963	8,711,416,237
Plan Fiduciary Net Position as a Percentage						
of Total Pension Liability	21.38%	21.82%	23.20%	21.85%	25.42%	26.01%
Covered Employee Payroll	\$ 1,228,986,864	\$ 1,205,324,445	\$ 1,150,406,094	\$ 1,119,526,987	\$ 1,086,607,979	\$ 1,074,333,319
Net Pension Liability as a Percentage						
of Covered Employee Payroll	946.08%	863.51%	898.15%	915.39%	825.85%	810.87%

Ten fiscal years will be built prospectively.

Please see the following page for additional notes relating to the Schedule of Changes in Net Pension Liability and Related Ratios.



Schedules of Required Supplementary Information

Additional Notes to the Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

The beginning of year total pension liability for fiscal year 2019 used a Single Discount Rate of 7.18% and the benefit provisions, actuarial assumptions, and funding policy in effect as of the December 31, 2018, funding actuarial valuation. The Single Discount Rate of 7.18% was based on a long-term expected rate of return on pension plan investments of 7.25% used in the December 31, 2018, funding actuarial valuation for the years 2018 through 2079 and a long-term municipal bond rate as of December 28, 2018, of 3.71% for subsequent years.

The end of year total pension liability for fiscal year 2019 uses a Single Discount Rate of 6.43% and the benefit provisions, actuarial assumptions, and funding policy in effect as of the December 31, 2019, funding actuarial valuation. The Single Discount Rate of 6.43% was based on a long-term expected rate of return on pension plan investments of 6.75% used in the December 31, 2019, funding actuarial valuation for the years 2019 through 2075 and a long-term municipal bond rate as of December 31, 2019, of 2.75% for subsequent years.

The increase in the total pension liability for fiscal year 2019 due to assumption changes and methods includes the impact of changing the actuarial assumptions used in the actuarial valuation, to reflect the results of the experience study performed for the period January 1, 2014 through December 31, 2018 that became effective December 31, 2019, and the change in the municipal bond rate from December 28, 2018 to December 31, 2019. Changes in actuarial assumptions and methods led to the change in the Single Discount Rate from 7.18% to 6.43% (based on the long-term expected rate of return on pension plan investments of 7.25% used in the December 31, 2018, funding actuarial valuation and 6.75% used in the December 31, 2019, funding actuarial valuation and the long-term municipal bond rate of 3.71% as of December 28, 2018, and 2.75% as of December 31, 2019, respectively). This change was measured at the end of the year using the benefit provisions in effect as of December 31, 2019.

Schedules of Required Supplementary Information

Schedule of the Net Pension Liability Multiyear

<u>FY Ending December 31,</u>	<u>Total Pension Liability</u>	<u>Plan Net Position</u>	<u>Net Pension Liability</u>	<u>Plan Net Position as a % of Total Pension Liability</u>	<u>Covered Payroll ¹</u>	<u>Net Pension Liability as a % of Covered Payroll</u>
2014	\$ 11,773,430,559	\$ 3,062,014,322	\$ 8,711,416,237	26.01%	\$ 1,074,333,318	810.87%
2015	12,032,733,000	3,058,949,037	8,973,783,963	25.42%	1,086,607,979	825.85%
2016	13,113,091,688	2,865,018,804	10,248,072,884	21.85%	1,119,526,987	915.39%
2017	13,454,462,563	3,122,066,293	10,332,396,270	23.20%	1,150,406,094	898.15%
2018	13,313,258,366	2,905,179,841	10,408,078,525	21.82%	1,205,324,445	863.51%
2019	14,789,602,350	3,162,428,863	11,627,173,487	21.38%	1,228,986,864	946.08%

¹ Covered payroll is the amount in force as of the actuarial valuation date and likely differs from actual payroll paid during the fiscal year.

Ten fiscal years will be built prospectively.



Schedule of Contributions Multiyear Last 10 Fiscal Years

FY Ending December 31,	Actuarial Determined Contribution ¹	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll ²	Actual Contribution as a % of Covered Payroll	Statutory Contribution
2010	\$ 363,624,570	\$ 174,500,507	\$ 189,124,063	\$ 1,048,084,301	16.65%	\$177,060,837
2011	402,751,961	174,034,600	228,717,361	1,034,403,526	16.82%	176,068,606
2012	431,010,173	197,885,552	233,124,621	1,015,170,686	19.49%	204,329,314
2013	474,177,604	179,521,259	294,656,345	1,015,426,128	17.68%	182,716,690
2014	491,651,208	178,158,132	313,493,076	1,074,333,318	16.58%	178,773,877
2015	785,500,836	575,927,645	209,573,191	1,086,607,979	53.00%	410,558,466
2016	785,695,084	273,840,486	511,854,598	1,119,526,987	24.46%	454,844,486
2017	910,938,497	494,580,430	416,358,067	1,150,406,094	42.99%	500,000,000
2018	924,653,899	589,635,278	335,018,621	1,205,324,445	48.92%	557,000,000
2019	933,769,914	581,968,371	351,801,543	1,228,986,864	47.35%	579,000,000

¹ The PABF Statutory Funding Policy does not conform to Actuarial Standards of Practice; therefore, for fiscal years 2015 and after, the actuarially determined contribution is equal to the normal cost plus a 30-year level dollar amortization of the unfunded actuarial liability. Prior to 2015 the actuarially determined contribution was equal to the "ARC" which was equal to the normal cost plus a 30-year open level percent amortization of the unfunded actuarial liability.

² Covered payroll shown is the amount in force as of the actuarial valuation date and likely differs from actual payroll paid during the fiscal year.



Notes to Schedule of Contributions

Valuation Date: December 31, 2019

Methods and Assumptions Used to Determine Contribution Rates as of the Valuation Date:

Actuarial Cost Method	Entry-Age Normal
Amortization Method	Prior to 2015, the total City contribution was generated by a tax equal to 2.00 times the contributions made by the policemen to the Fund two years prior to the year of the tax levy. For tax levy years 2015-2019, the statutory contributions are equal to \$420 million, \$464 million, \$500 million, \$557 million and \$579 million respectively. For tax levy years on and after 2020, the statutory contributions are equal to a level percentage of pay contribution determined so that the Plan attains a 90 percent funded ratio by the end of 2055 on an open group basis.
Remaining Amortization Period	Not Applicable. An amortization payment is not directly calculated. The amortization payment is the difference between the total statutory contribution and the employer normal cost contribution.
Asset Valuation Method	5-year smoothed market
Inflation	2.25 percent as of the December 31, 2019, actuarial valuation.
Salary Increases	Salary increase rates based on wage inflation rate of 3.50% plus service based increases consistent with bargaining contracts.
Postretirement Benefit Increases	A retiree born before January 1, 1966, with at least 20 years of service or receiving a mandatory retirement minimum annuity, receives an increase of 3 percent of the original annuity, starting on the first of the month following the first anniversary of his retirement or the first of the month following attainment of age 55, whichever is later, and shall not be subject to a 30 percent maximum increase. For retirees born on and after January 1, 1966, automatic increases are 1.5 percent of the original annuity, commencing at age 60, or the first anniversary of retirement, if later, to a maximum of 30 percent. For participants who first became members on or after January 1, 2011, increases are equal to the lesser of 3.00 percent and 50 percent of CPI-U of the original benefit, commencing at age 60.
Investment Rate of Return	6.75 percent as of the December 31, 2019, actuarial valuation.
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the December 31, 2019, actuarial valuation pursuant to an experience study of the period January 1, 2014 through December 31, 2018.
Mortality	Post-Retirement Healthy mortality rates: Sex distinct Pub-2010 Amount-weighted Safety Healthy Retiree Mortality Tables weighted 119% for males and 102% for females, set forward one year for males. Pre-Retirement mortality rates: Sex distinct Pub-2010 Amount-weighted Safety Employee Mortality Tables weighted 100% for males and 100% for females. Disabled Mortality: Sex distinct Pub-2010 Amount-weighted Safety Healthy Retiree Mortality Tables weighted 129% for males and 112% for females, set forward one year for males. Future mortality improvements are reflected by projecting the base mortality tables forward using the MP-2018 projection scale.

Other Information:

Notes The actuarial valuation is based on the statutes in effect as of December 31, 2019.

Methods and Assumptions Used for Accounting Purposes as of the Valuation Date:

Actuarial Cost Method	Entry-Age Normal
Asset Valuation Method	Market value
Discount Rate	7.18 percent as of the December 31, 2018, actuarial valuation. 6.43 percent as of the December 31, 2019, actuarial valuation.



SECTION D

NOTES TO FINANCIAL STATEMENTS

Auditor's Note: This information is intended to assist in preparation of the financial statements of the Policemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumptions

Single Discount Rate

A Single Discount Rate of 6.43% was used to measure the total pension liability. This Single Discount Rate was based on an expected rate of return on pension plan investments of 6.75% and a municipal bond rate of 2.75%. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made under the statutory funding policy. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments only through the year 2075. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year 2075, and the municipal bond rate was applied to all benefit payments after that date.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 6.43%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

1% Decrease	Current Single Discount Rate Assumption	1% Increase
5.43%	6.43%	7.43%
\$ 13,463,655,386	\$ 11,627,173,487	\$ 10,096,272,975

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	13,771
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	707
Active Plan Members	<u>13,353</u>
Total Plan Members	27,831

Additional information about the member data used is included in the December 31, 2019, funding actuarial valuation report.

SECTION E

SUMMARY OF BENEFITS

Summary of Benefits

Plan Descriptions (as of December 31, 2019)

PARTICIPANTS

An employee in the police department of the City of Chicago appointed and sworn or designated by law as a peace officer with the title of policeman, policewoman, chief surgeon, police surgeon, police dog catcher, police kennelman, police matron, and members of the police force of the police department.

SERVICE

In computing service rendered by a police officer, the following periods shall be counted, in addition to all periods during which he performed the duties of his position, as periods of service for annuity purposes only: All periods of (a) vacation; (b) leave of absence with pay; (c) military service; (d) disability for which the police officer receives disability benefit. The calculation of service is based on a day-to-day basis for most purposes. For the purpose of calculating benefits under the Dominant Formula, one year of Service is credited for a year in any portion of which a police officer is compensated.

RETIREMENT

Eligibility

Attainment of age 50 with at least 10 years of service.

For participants who first became members on or after January 1, 2011, attainment of age 55 with at least 10 years of service. Participants may retire at attainment of age 50 with 10 years of service with a reduced benefit.

Mandatory

Effective in plan year 2003, retirement is mandatory for a participant who has attained age 63.

Accumulation Annuity

At age 50 or more, with 10 or more years of service, the employee is entitled to an annuity based on the sums accumulated for age and service annuity plus 1/10 of the sum accumulated from the contributions by the City for the age and service annuity for each completed year of service after the first 10 years. At age 50 or more with 20 or more years, the employee is entitled to an annuity based on all sums accumulated.



Summary of Benefits

Formula Minimum Annuity

While there are several alternative formulas available with 20 or more years of service, the Dominant Formula is 50% of highest average salary (including duty availability pay) in 48 consecutive months within the last 10 years of service plus 2.5% for each year or fraction of service over 20 years, limited to 75% of average salary.

Mandatory Retirement Minimum Annuity

A police officer who is required to withdraw from service due to attainment of mandatory retirement age who has less than 20 years of service credit may elect to receive an annuity equal to 30% of average salary for the first 10 years of service, plus 2% of average salary for each completed year of service in excess of 10, to a maximum of 48% of average salary. This benefit qualifies for post retirement increases.

Post-Retirement Increase

A retiree born before January 1, 1966, with at least 20 years of service or receiving a mandatory retirement minimum annuity, receives an increase of 3% of the original annuity, starting on the first of the month following the first anniversary of his retirement or the first of the month following attainment of age 55, whichever is later, and shall not be subject to a 30% maximum increase. For retirees born on and after January 1, 1966, automatic increases are 1.5% of the original annuity, commencing at age 60, or the first anniversary of retirement, if later, to a maximum of 30%.

For participants who first became members on or after January 1, 2011, increases are equal to the lesser of 3.00% and 50% of CPI-U of the original benefit, commencing at age 60.

Summary of Benefits

Minimum Annuity

Beginning with the monthly annuity payment due on January 1, 2016, the fixed and granted monthly annuity payment for any policeman who retired from the service before January 1, 2016, at age 50 or over with 20 or more years of service, and for any policeman who retired from service due to termination of disability and who is entitled to an annuity on January 1, 2016, shall be no less than 125% of the Federal Poverty Level.

For participants who first became members on or after January 1, 2011, the member is entitled to an annuity based on an accrual rate of 2.5% of the final average salary for each fraction of service. Maximum is 75% of the final average salary. Final average salary is calculated using salary from the eight highest consecutive years within the last 10 years of service prior to retirement. Pensionable salary is limited to \$106,800 in 2011, increased by the lesser of 3% and one-half of the annual unadjusted percentage increase in the Consumer Price Index-U (but not less than zero) as measured in the preceding 12-month period ending with the September preceding the November 1, which is the date that the new amount will be calculated and made available to the pension funds.

For participants who first became members on or after January 1, 2011, who retire after age 50 but before age 55 is attained, the member is entitled to an annuity based on an accrual rate of 2.5% of the final average salary for each fraction of service, reduced by one half of one percent per month for retirement prior to age 55, subject to a maximum benefit of 75%.

Reversionary Annuity

A member, prior to retirement, may elect to reduce his own annuity, and provide a reversionary annuity, to begin upon the officer's death, for the officer's spouse.

Summary of Benefits

SURVIVOR INCOME BENEFITS PAYABLE ON DEATH

Death in Service (Non-Duty): Generally, a money-purchase benefit is provided, based on total salary deductions and City contributions. However, if a policeman dies in service after December 31, 1985, with at least 1.5 years of service, the widow's annuity is the greater of (a) 30% of the annual maximum salary attached to the classified civil service position of a first class patrolman at the time of his death (without dollar limit) or (b) 50% of the benefit accrued by the policeman at date of death.

The lifetime benefit is payable until death.

Death in Service (Duty Related)

Compensation Annuity 75% of the member's salary attached to the civil service position that would ordinarily have been paid to such member as though in active discharge of his duties at the time of death payable until the date the policeman would have attained age 63.

Supplemental Annuity Payable for life and is equal to the difference between the money purchase annuity for the spouse and an amount equal to 75% of the annual salary (including all salary increases and longevity raises) the police officer would have been receiving when he attained age 63 if the police officer had continued in service at the same rank last held in the department.

Death after Retirement If a police officer retires on or after January 1, 1986, and subsequently dies, the widow's annuity is 40% before 1988 and 50% on and after January 1, 1988, of the retired policeman's annuity at the time of death (without dollar limit).

Maximum Annuity \$500 a month (after discount for age difference) under both the accumulation method and the old formula method. There is no dollar limit on the 30%, 40%, or 50% benefit.

Summary of Benefits

Minimum Annuity

The minimum widow's annuity shall be no less than 125% of the Federal Poverty Level.

For participants who first became members on or after January 1, 2011, widow benefits are equal to 66-2/3% of the officer's earned annuity at the date of death. Automatic increases to the annuity are equal to the lesser of 3.00% and 50% of CPI-U, commencing when the survivor reaches age 60, and applied to the original granted retirement annuity.

CHILDREN'S ANNUITIES

Eligibility

Payable at death of the policeman to all unmarried children less than 18 years of age.

Benefit

10% of the annual maximum salary of a first class patrolman during widow (widower) life, 15% otherwise.

Payable Until

Age 18. If the child is disabled, benefit is payable for life or as long as such disablement exists.

Family Maximum

60% (non-duty death) or 100% (duty death) of the salary that would ordinarily been paid to the policeman, if he had been in the active discharge of his duties.

Parent's Annuities Eligibility

Payable to a dependent parent at the death of a policeman who is in either active service, or receiving a disability benefit, or on leave of absence, or in receipt of an annuity granted after 20 years of service, or waiting to start receiving an annuity granted for 20 years of service. The benefit is only payable if there are no surviving spouses or children eligible for benefits.

Benefit

18% of the current salary attached to the rank at separation from service.

Payable until

Death of the dependent parent.

DUTY DISABILITY BENEFIT

Eligibility

Disabling condition incurred in the performance of duty.



Summary of Benefits

Benefit	75% of salary at the time the disability is allowed plus \$100.00 per month for each unmarried child less than age 18, (total amount of child's benefits shall not exceed 25% of salary). Beginning January 1, 2000, after seven years of payment, the benefit shall not be less than 60% of the current salary attached to the rank held by the policemen at the time of disability. Payable to employee's age 63 or by operation of law, whichever is later. Salary deductions are contributed by the City.
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OCCUPATIONAL DISEASE DISABILITY BENEFIT

Eligibility	Heart attack or any disability heart disease after 10 years of service.
Benefit	65% of salary attached to the rank held by the police officer at the time of his or her removal from the police department payroll with a minimum after 10 years of 50% of the current salary attached to the rank. Each natural or legally adopted unmarried child of the officer under the age of 18 is entitled to a benefit of \$100 per month. This benefit is not terminated at age 18 if the child is then dependent by reason of physical or mental disability. Salary deductions are contributed by the City.

ORDINARY DISABILITY BENEFIT

Eligibility	Disabling condition other than duty or occupational related.
Benefit	50% of salary at the time of injury, payable for a period not more than 25% of service (excluding any previous disability time) rendered prior to injury, nor more than five years. Disability shall cease at age 63. Salary deductions are contributed by the City.

DEATH BENEFIT

Eligibility	Payable upon the death of a police officer whose death occurs while in active service; on authorized leave of absence; within 60 days of receipt of salary; while receiving duty or ordinary disability benefit; occurring within 60 days of termination of such benefit; or occurring on retirement while in receipt of annuity and separation was effective after 20 years of service. This benefit is payable to beneficiaries or, if none, to estate.
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Summary of Benefits

Benefit

Death in Service:

Age at Death	Benefit
49 and under	\$12,000
50-62	\$12,000 less \$400 for each year by which age at death exceeds 49

Death after Retirement:

Age at Death	Benefit
50 and over	\$6,000

If death results from injury incurred in performance of duty before retirement on annuity, the benefit payable is \$12,000 regardless of the attained age.

REFUNDS

Policemen

Without regard to service and under age 50, or with less than 10 years of service and under age 57 at withdrawal: a refund of all salary deductions together with 1.5% simple interest until the date of withdrawal.

For Spouse's Annuity

Upon retirement an unmarried policeman will receive a refund of contributions for spouse's annuity, accumulated at 3% compounded annually.

Of Remaining Amounts

If at death of a retired policeman the total member contributions paid while active exceed the total retirement benefits paid to date of death, the difference is payable.

CONTRIBUTIONS

Salary Deductions

Employee	7 %
Spouse	1½%
Annuity Increase	½%
	9 %

City Contributions ¹

Employee	9-5/7%	
Spouse	2%	
Annuity Increase	½%	
	12-3/14%	Unallocated

¹ Credited to Participant's Accumulation Annuity and Widow's Annuity Account



Summary of Benefits

In addition to the above contributions, a contribution is made to support the Death Benefit. Policemen contribute \$2.50 per month. City contributes a total of \$224,000 for all policemen.

Prior to 2015, the total City contribution is generated by a tax equal to double the contributions by the policemen to the Fund two years prior to the year of the tax levy.

Under P.A. 99-0506, City contributions are equal to \$420 million in payment year 2016, \$464 million in payment year 2017, \$500 million in payment year 2018, \$557 million in payment year 2019, and \$579 million in payment year 2020. For payment years after 2020, the City is required to make level percent of pay contributions for plan years 2020 through 2055 that along with member contributions and investment earnings are expected to generate a projected funded ratio of 90% by plan year end 2055.

"PICK UP" OF EMPLOYEE SALARY DEDUCTIONS

Beginning January 1, 1982, the employee contributions were "picked up" by the employer. The W-2 salary is therefore reduced by the amount of contribution. For pension purposes the salary remains unchanged. Income tax will be paid when a refund or annuity is received. For the purpose of benefits, refunds or contributions, these contributions will be treated as employee contributions.

SALARY CAP AND COLA DEVELOPMENT FOR MEMBERS HIRED ON OR AFTER JANUARY 1, 2011

Year Ending	CPI-U	½ CPI-U	COLA	Maximum Annual Pensionable Earnings
2011			3.00%	\$106,800.00
2012	3.90%	1.95%	1.95%	\$108,882.60
2013	2.00%	1.00%	1.00%	\$109,971.43
2014	1.20%	0.60%	0.60%	\$110,631.26
2015	1.70%	0.85%	0.85%	\$111,571.63
2016	0.00%	0.00%	0.00%	\$111,571.63
2017	1.50%	0.75%	0.75%	\$112,408.42
2018	2.20%	1.10%	1.10%	\$113,644.91
2019	2.30%	1.15%	1.15%	\$114,951.83
2020	1.70%	0.85%	0.85%	\$115,928.92

Summary of Benefits

Health Insurance Premium Subsidies

Pursuant to the court order *Underwood, et. al., v. City of Chicago, et. al.*, PABF provides retiree health insurance premium subsidies to certain eligible annuitants.

To be eligible for the PABF paid subsidy, the annuitant must meet the following eligibility requirements to receive partial reimbursement for healthcare costs:

- 1) Annuitant must have retired on or after August 23, 1989;
- 2) Annuitant must have been hired prior to April 4, 2003; And
- 3) Annuitant must have either:
 - a) participated in a group healthcare plan for which the Fund offers to deduct health insurance premiums from monthly annuities in accordance with the 1983 and 1985 amendments to the Illinois Pension Code Statutes (currently either the Blue Cross/Blue Shield plans sponsored by the City of Chicago; the Aetna plans sponsored by the Labor Benefits Association; or the United American Insurance Co. plans sponsored by the Chicago Police Sergeants' Association);
 - OR
 - b) for the period between January 1, 2017, and December 31, 2019, participated in any health insurance plan and paid their healthcare insurance premiums themselves, either through an account on which the annuitant is named or an account established for the benefit of the annuitant.

Eligible annuitants are entitled to receive a health insurance premium subsidy payable from PABF for the lifetime of the employee annuitant in the amount of \$55 per month if the annuitant is not receiving Medicare benefits or \$21 per month if the annuitant is receiving Medicare benefits.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Actuarial Cost Method and Actuarial Assumptions

I. ACTUARIAL COST METHOD

An Actuarial Cost Method is a set of techniques used by the actuary to develop contribution levels under a retirement plan. The Actuarial Cost Method used in this valuation for statutory funding and State reporting purposes and GASB accounting purposes is the Entry Age Normal cost method.

Under the Entry Age Normal Cost Method, each participant's projected benefit is allocated on a level percent of pay basis from entry age to assumed exit age. The Actuarial Accrued Liability is the portion of the present value associated with pay prior to the valuation date. The Normal Cost is the portion of the present value associated with pay during the current plan year.

To the extent that current assets and future Normal Costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued Liability ("UAAL") develops. The UAAL is generally amortized over a fixed period of time (e.g., 30 years) from the date incurred. The total contribution developed under this method is the sum of the Normal Cost and the payment toward the UAAL.

II. CURRENT ACTUARIAL ASSUMPTIONS

The current actuarial assumptions were adopted and became effective December 31, 2019, and were based on an experience study for the period January 1, 2014 to December 31, 2018.

Demographic Assumptions

Post-Retirement Mortality

Scaling factors of 119% for males, and 102% for females of the Pub-2010 Amount-weighted Safety Healthy Retiree Mortality Tables, sex distinct, set forward one-year for males, with generational mortality improvement using MP-2018 2-dimensional mortality improvement scales recently released by the SOA. This assumption provides a margin for mortality improvements.

Disabled Mortality

Scaling factors of 129% for males, and 112% for females of the Pub-2010 Amount-weighted Safety Healthy Retiree Mortality Tables, sex distinct, set forward one-year for males, with generational mortality improvement using MP-2018 2-dimensional mortality improvement scales recently released by the SOA. This assumption provides a margin for mortality improvements.

Pre-Retirement Mortality

Scaling factors of 100% for males, and 100% for females of the Pub-2010 Amount-weighted Safety Employee Mortality Tables, sex distinct, with generational mortality improvement using MP-2018 2-dimensional mortality improvement scales recently released by the SOA. This assumption provides a margin for mortality improvements.

Actuarial Cost Method and Actuarial Assumptions

We use what is termed “the limited fluctuation credibility procedure” to determine the appropriate scaling factor of the base mortality tables for each gender and each member classification. We used a liability weighted basis. In each case, the partial credibility factor (or “Z-factor”) is computed based on the experience of the specific group being studied. This Z-factor is a measure of the credibility of the pertinent group.

The Best Fit is the ratio of actual to expected deaths using the base table. The final scale is then determined as the weighted average of the Best Fit and 100% based on the Z-factor. For example, the Z-factor for male retirees is 97%, suggesting that the data for this group is 97% credible (there were not enough deaths among active members to be completely credible). The Best Fit for this group would be to scale the base tables by 119%. The final scale of 119% is the credibility-weighted average ($119\% = 97\% \times 119\% + 3\% \times 100\%$). Factors for females are determined similarly.

Age	Future Life Expectancy (years) in 2019		Future Life Expectancy (years) in 2030	
	Postretirement		Postretirement	
	Male	Female	Male	Female
35	48.58	53.31	49.63	54.33
40	43.31	47.98	44.34	49.00
45	38.11	42.69	39.12	43.69
50	32.99	37.45	33.97	38.44
55	27.98	32.33	28.95	33.31
60	23.20	27.45	24.12	28.37
65	18.76	22.81	19.59	23.66
70	14.69	18.41	15.41	19.19
75	11.02	14.33	11.65	15.06

Actuarial Cost Method and Actuarial Assumptions

Rate of Retirement: The table below shows the assumed rates of retirement.

Attained Age	Tier 1	Tier 2
50	0.05	0.02
51	0.05	0.02
52	0.05	0.02
53	0.05	0.02
54	0.05	0.03
55	0.22	0.24
56	0.22	0.24
57	0.22	0.24
58	0.22	0.24
59	0.22	0.24
60	0.22	0.22
61	0.27	0.27
62	0.27	0.27
63	1.00	1.00
64	1.00	1.00
65	1.00	1.00

Rate of Termination: The table below shows the assumed rates of termination.

Years of Service	Rate
0	0.030
1	0.025
2	0.017
3	0.015
4	0.014
5	0.014
6	0.013
7	0.010
8	0.009
9	0.009
10	0.009
11	0.008
12	0.007
13	0.006
14 +	0.006

Actuarial Cost Method and Actuarial Assumptions

Rate of Disability: The rate at which members are assumed to become disabled under the provisions of the Fund. The rates assumed are as follows:

Attained Age	Rates
20-24	0.0002
25-29	0.0004
30-34	0.0007
35-39	0.0015
40-44	0.0026
45-49	0.0032
50-54	0.0042
55-59	0.0042
60-64	0.0043

Of the participants who become disabled in the future, the following distribution of disability types is assumed:

Duty Disability:	40%
Occupational Disease Disability:	10%
Ordinary Disability:	50%

Economic Assumptions

Investment Return: 6.75% per year, compounded annually, net of investment expenses. The 6.75% assumption is composed of a 2.25% inflation assumption and a 4.50% real rate of return assumption.

General Inflation: 2.25% per year, compounded annually.

This assumption serves as the basis for the determination of annual increases in pension and the pensionable salary cap for Tier Two members.

Wage Inflation and Payroll Growth: 3.50% per year, compounded annually.

Actuarial Cost Method and Actuarial Assumptions

Future Salary Increases: The assumed base rate of individual salary increase is 3.50% per year (underlying wage inflation assumption), plus an additional percentage based on the following service scale:

Years of Service*	Base Rates	Wage Inflation	Total Rates
0	0.00%	3.50%	3.50%
1	38.50%	3.50%	42.00%
2	4.00%	3.50%	7.50%
3	3.50%	3.50%	7.00%
4	3.50%	3.50%	7.00%
5	3.50%	3.50%	7.00%
6-9	0.00%	3.50%	3.50%
10	4.00%	3.50%	7.50%
11-14	0.00%	3.50%	3.50%
15	4.00%	3.50%	7.50%
16-19	0.00%	3.50%	3.50%
20	4.00%	3.50%	7.50%
21-24	0.00%	3.50%	3.50%
25	4.00%	3.50%	7.50%
26-29	0.00%	3.50%	3.50%
30	4.00%	3.50%	7.50%

* Includes increases at 12 and 18 months of service.

Asset Value: The Actuarial Value of Assets is smoothed by using a five-year phase-in of each year's unexpected investment gains and losses.

Expenses: Statutory funding projections include an explicit administrative expense assumption of \$4,734,000 for plan year end December 31, 2019, increased by 2.25% per year.

Projection Assumptions

Active Population: Active members who terminate, retire, become disabled, or die during the year are replaced by new entrants such that the number of active members remains level during the projection period based on the most recent actuarial valuation. The number of active members as of the valuation at December 31, 2019, is 13,353.

New Entrant Profile: The entry age of future new entrants, which is summarized below, is based on the profile of current active members hired over the last five years with



Actuarial Cost Method and Actuarial Assumptions

one or more years of service as of December 31, 2019. These members were hired from January 1, 2015, through December 31, 2018.

Entry Age	Number
Under 20	3
20 to 25	1,000
25 to 30	1,285
30 to 35	663
35 to 40	307
40 to 55	5

Approximately 74% of the new entrants are assumed to be male.

New Entrant Pay:

Based on the most recent employment contract, new entrants were assumed to earn \$48,078 for the plan year ending December 31, 2019. This amount does not include duty availability pay. The new entrant pay for members hired after 2019 is assumed to increase by the wage inflation assumption of 3.50% plus duty availability pay after three years, increased by CPI compounded.

New Entrant Pay Increases:

Pay for a specific new entrant is assumed to increase in the future by the wage inflation and the service based increases disclosed in this actuarial valuation.

The projections assume a pay cap of \$115,928.92 for plan year 2020, increasing by 1.125% per year after plan year 2020. The annual increase of 1.125% per year is based on 50% of the CPI-U increase which is assumed to be 2.25% per year.

Other Assumptions

Marital Status:

It is assumed that 75% of active members have an eligible spouse. The male spouse is assumed to be three years older than the female spouse. No assumption is made about other dependents.

Reciprocal Service:

No assumption for reciprocal service.

Benefit Service:

Exact fractional years of service are used to determine the amount of benefit payable.

Decrement Timing:

All decrements are assumed to occur mid-year.

Decrement Relativity:

Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.



Actuarial Cost Method and Actuarial Assumptions

Decrement Operation:	Turnover decrements do not operate after member reaches retirement eligibility for a minimum annuity formula benefit.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
Pay Increase Timing:	Beginning of the (fiscal) year.
Tax Levy Loss:	No tax levy loss is assumed.
Health Insurance Premium Subsidies:	Current recipients of the \$55 per month for non-Medicare and \$21 per month for Medicare health insurance premium subsidy were identified in the data provided by PABF staff. The subsidies for current recipients are assumed to continue during the recipient's lifetime. The valuation assumes 65 percent of future retirees eligible for the subsidy will receive it in the future and 20 percent of eligible retirees not currently receiving the subsidy will receive it in the future.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement Nos. 67 and 68 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses, and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (“SDR”) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.75%; the municipal bond rate is 2.75%; and the resulting Single Discount Rate is 6.43%.

The sponsor finances benefits using a funding policy defined in state statutes. Sponsor contributions are equal to a fixed payment schedule for payment years 2016 through 2020 and a level percentage of pay contribution determined so that the Fund attains a 90% funded ratio by the end of 2055 on an open group basis for payment years on and after 2021. The statutory contribution does not explicitly separate projected employer contributions between current plan members and future plan members.

For purposes of developing the Single Discount Rate, we have projected actuarial liabilities on an Entry Age Normal basis, and compared against projected market value of assets. We have assumed the actuarial liability for future members will be fully financed, to the extent that assets are available, and any remaining asset will be assigned to current plan members. Based on this assignment of assets and employer contributions, plan assets assigned to current members are projected to be depleted by 2075.

The tables in this section provide background for the development of the Single Discount Rate.

The following tables show the assignment of assets and employer contributions and the projection of assets for current members as of the actuarial valuation date. Our projections assume the sponsor will make the required statutory contributions. The projections are based on the statutory funding projections performed during the December 31, 2019, actuarial valuation.

Total administrative expenses are assumed to increase at the assumed rate of inflation, or 2.25%. Total administrative expenses are allocated between current and future hires by total payroll.

Projection of Funded Status and Assignment of Assets

PYE	Open Group Actuarial	Closed Group	Future Member		Future Member	Closed Group Assigned	Funded Ratio	Funded Ratio
12/31	Liability	Actuarial Liability	Actuarial Liability	Open Group Assets	Assigned Assets	Assets	Current Members	Future Members
	(a)	(b)	(c)=(a)-(b)	(d)	(e)=min[(c),(d)]	(f)=(d)-(e)	(g)=(f)/(b)	(h)=(e)/(c)
2019	\$14,269,769,913	\$14,269,769,913	\$ -	\$3,162,428,863	\$ -	\$3,162,428,863	22.16%	0.00%
2020	14,656,871,964	14,656,871,964	-	3,358,917,491	-	3,358,917,491	22.92%	0.00%
2021	15,046,116,251	15,038,804,981	7,311,269	3,595,531,780	7,311,269	3,588,220,510	23.86%	100.00%
2022	15,435,647,521	15,412,831,630	22,815,891	3,849,019,277	22,815,891	3,826,203,385	24.82%	100.00%
2023	15,821,737,797	15,773,854,405	47,883,392	4,111,230,538	47,883,392	4,063,347,146	25.76%	100.00%
2024	16,201,877,604	16,118,114,594	83,763,010	4,378,714,058	83,763,010	4,294,951,048	26.65%	100.00%
2025	16,573,911,783	16,442,031,968	131,879,815	4,651,089,816	131,879,815	4,519,210,001	27.49%	100.00%
2026	16,936,363,739	16,742,744,815	193,618,923	4,928,187,275	193,618,923	4,734,568,352	28.28%	100.00%
2027	17,288,249,431	17,017,966,145	270,283,285	5,211,213,141	270,283,285	4,940,929,856	29.03%	100.00%
2028	17,629,834,527	17,266,582,311	363,252,216	5,503,049,206	363,252,216	5,139,796,990	29.77%	100.00%
2029	17,960,223,921	17,486,400,753	473,823,169	5,801,271,437	473,823,169	5,327,448,269	30.47%	100.00%
2030	18,280,269,320	17,676,240,986	604,028,334	6,108,495,996	604,028,334	5,504,467,662	31.14%	100.00%
2031	18,590,503,692	17,835,109,414	755,394,278	6,426,241,346	755,394,278	5,670,847,068	31.80%	100.00%
2032	18,890,821,275	17,961,382,068	929,439,207	6,755,625,974	929,439,207	5,826,186,767	32.44%	100.00%
2033	19,181,078,880	18,052,998,227	1,128,080,653	7,098,290,604	1,128,080,653	5,970,209,951	33.07%	100.00%
2034	19,462,388,597	18,109,101,224	1,353,287,373	7,457,790,591	1,353,287,373	6,104,503,218	33.71%	100.00%
2035	19,737,670,298	18,130,570,173	1,607,100,126	7,840,323,156	1,607,100,126	6,233,223,030	34.38%	100.00%
2036	20,007,287,879	18,117,791,317	1,889,496,562	8,243,454,705	1,889,496,562	6,353,958,143	35.07%	100.00%
2037	20,272,664,751	18,071,539,114	2,201,125,637	8,667,897,309	2,201,125,637	6,466,771,672	35.78%	100.00%
2038	20,534,192,048	17,991,681,114	2,542,510,934	9,112,783,042	2,542,510,934	6,570,272,107	36.52%	100.00%
2039	20,793,057,033	17,878,251,812	2,914,805,221	9,580,436,246	2,914,805,221	6,665,631,025	37.28%	100.00%
2040	21,050,018,710	17,731,201,979	3,318,816,731	10,072,780,108	3,318,816,731	6,753,963,376	38.09%	100.00%
2041	21,306,783,608	17,551,151,593	3,755,632,015	10,593,986,068	3,755,632,015	6,838,354,054	38.96%	100.00%
2042	21,564,362,490	17,338,338,738	4,226,023,752	11,147,070,161	4,226,023,752	6,921,046,409	39.92%	100.00%
2043	21,823,529,033	17,092,860,460	4,730,668,573	11,735,318,526	4,730,668,573	7,004,649,953	40.98%	100.00%
2044	22,084,627,526	16,814,811,855	5,269,815,671	12,361,068,789	5,269,815,671	7,091,253,118	42.17%	100.00%
2045	22,347,663,250	16,504,204,178	5,843,459,072	13,026,609,193	5,843,459,072	7,183,150,121	43.52%	100.00%
2046	22,612,767,993	16,161,592,099	6,451,175,895	13,734,784,335	6,451,175,895	7,283,608,440	45.07%	100.00%
2047	22,880,289,553	15,788,089,743	7,092,199,810	14,489,034,217	7,092,199,810	7,396,834,407	46.85%	100.00%
2048	23,150,093,661	15,384,985,143	7,765,108,518	15,292,431,590	7,765,108,518	7,527,323,072	48.93%	100.00%
2049	23,421,219,857	14,953,276,288	8,467,943,569	16,147,260,539	8,467,943,569	7,679,316,970	51.36%	100.00%
2050	23,692,849,387	14,494,633,781	9,198,215,605	17,056,190,576	9,198,215,605	7,857,974,970	54.21%	100.00%
2051	23,964,750,202	14,012,086,955	9,952,663,248	18,022,756,937	9,952,663,248	8,070,093,690	57.59%	100.00%
2052	24,237,420,179	13,509,892,062	10,727,528,117	19,051,461,514	10,727,528,117	8,323,933,397	61.61%	100.00%
2053	24,511,885,779	12,993,144,283	11,518,741,495	20,147,571,910	11,518,741,495	8,628,830,415	66.41%	100.00%
2054	24,788,803,082	12,466,524,257	12,322,278,826	21,316,247,032	12,322,278,826	8,993,968,206	72.14%	100.00%
2055	25,068,791,930	11,934,062,903	13,134,729,027	22,562,916,866	13,134,729,027	9,428,187,839	79.00%	100.00%
2056	25,352,329,334	11,399,074,823	13,953,254,512	22,817,096,401	13,953,254,512	8,863,841,890	77.76%	100.00%
2057	25,639,908,254	10,864,311,211	14,775,597,043	23,075,917,428	14,775,597,043	8,300,320,385	76.40%	100.00%
2058	25,932,674,449	10,332,755,772	15,599,918,678	23,339,407,005	15,599,918,678	7,739,488,327	74.90%	100.00%
2059	26,231,654,431	9,807,031,625	16,424,622,807	23,608,488,988	16,424,622,807	7,183,866,182	73.25%	100.00%
2060	26,538,109,424	9,289,562,781	17,248,546,642	23,884,298,482	17,248,546,642	6,635,751,839	71.43%	100.00%
2061	26,853,089,898	8,782,269,208	18,070,820,690	24,167,780,909	18,070,820,690	6,096,960,219	69.42%	100.00%
2062	27,177,611,624	8,286,602,479	18,891,009,145	24,459,850,461	18,891,009,145	5,568,841,316	67.20%	100.00%
2063	27,512,451,804	7,803,556,801	19,708,895,003	24,761,206,624	19,708,895,003	5,052,311,621	64.74%	100.00%
2064	27,858,360,124	7,333,907,550	20,524,452,574	25,072,524,111	20,524,452,574	4,548,071,538	62.01%	100.00%
2065	28,215,900,388	6,878,257,558	21,337,642,830	25,394,310,350	21,337,642,830	4,056,667,520	58.98%	100.00%
2066	28,585,448,054	6,437,069,815	22,148,378,238	25,726,903,248	22,148,378,238	3,578,525,010	55.59%	100.00%
2067	28,967,252,007	6,010,712,631	22,956,539,376	26,070,526,806	22,956,539,376	3,113,987,430	51.81%	100.00%
2068	29,361,407,010	5,599,479,898	23,761,927,113	26,425,266,310	23,761,927,113	2,663,339,197	47.56%	100.00%
2069	29,767,836,923	5,203,601,319	24,564,235,603	26,791,053,230	24,564,235,603	2,226,817,627	42.79%	100.00%
2070	30,186,279,180	4,823,220,919	25,363,058,261	27,167,651,262	25,363,058,261	1,804,593,002	37.41%	100.00%
2071	30,616,276,464	4,458,466,503	26,157,809,961	27,554,648,818	26,157,809,961	1,396,838,856	31.33%	100.00%
2072	31,057,238,574	4,109,399,280	26,947,839,295	27,951,514,717	26,947,839,295	1,003,675,422	24.42%	100.00%
2073	31,508,355,569	3,776,046,227	27,732,309,342	28,357,520,012	27,732,309,342	625,210,670	16.56%	100.00%
2074	31,968,688,701	3,458,391,170	28,510,297,531	28,771,819,831	28,510,297,531	261,522,300	7.56%	100.00%
2075	32,437,192,859	3,156,404,314	29,280,788,545	29,193,473,573	29,193,473,573	-	0.00%	99.70%
2076	32,912,730,374	2,870,038,713	30,042,691,661	29,621,457,336	29,621,457,336	-	0.00%	98.60%
2077	33,394,093,620	2,599,229,601	30,794,864,019	30,054,684,258	30,054,684,258	-	0.00%	97.60%
2078	33,880,081,014	2,343,916,495	31,536,164,519	30,492,072,913	30,492,072,913	-	0.00%	96.69%
2079	34,369,517,129	2,104,017,167	32,265,499,962	30,932,565,416	30,932,565,416	-	0.00%	95.87%
2080	34,861,314,379	1,879,444,533	32,981,869,845	31,375,182,940	31,375,182,940	-	0.00%	95.13%

The projections in this report are strictly for the purpose of determining the GASB Single Discount Rate and are different from a funding projection for the ongoing plan.



Current Member Projection of Assets and Assignment of Employer Contributions

PYE 12/31	Assets (boy)	Member Contributions	Administrative Expenses	Benefit Payments	Assigned Sponsor Contribution	Income on Assets and Cash Flow	Assets (eoy)
2020	\$ 3,162,428,863	\$ 111,009,408	\$ 4,840,993	\$ 826,437,428	\$ 737,527,285	\$ 179,230,356	\$ 3,358,917,491
2021	3,358,917,491	114,812,442	4,833,422	853,193,841	783,217,104	189,300,736	3,588,220,510
2022	3,588,220,510	115,025,816	4,782,700	883,220,361	807,959,514	203,000,606	3,826,203,385
2023	3,826,203,385	113,745,971	4,727,762	915,024,313	825,609,748	217,540,117	4,063,347,146
2024	4,063,347,146	111,736,834	4,650,733	948,275,094	840,718,789	232,074,105	4,294,951,048
2025	4,294,951,048	109,431,888	4,557,343	983,278,298	856,452,071	246,210,635	4,519,210,001
2026	4,519,210,001	106,677,977	4,445,734	1,018,709,711	872,023,747	259,812,071	4,734,568,352
2027	4,734,568,352	103,792,459	4,323,378	1,054,485,796	888,578,164	272,800,055	4,940,929,856
2028	4,940,929,856	100,871,184	4,194,131	1,089,614,961	906,620,764	285,184,278	5,139,796,990
2029	5,139,796,990	97,236,428	4,061,517	1,123,885,821	921,320,369	297,041,820	5,327,448,269
2030	5,327,448,269	93,378,913	3,917,804	1,157,172,125	936,504,655	308,225,754	5,504,467,662
2031	5,504,467,662	89,251,951	3,761,276	1,189,005,333	951,170,688	318,723,376	5,670,847,068
2032	5,670,847,068	84,960,783	3,598,559	1,220,110,359	965,557,146	328,530,688	5,826,186,767
2033	5,826,186,767	80,373,140	3,425,588	1,250,473,825	979,936,685	337,612,771	5,970,209,951
2034	5,970,209,951	75,615,391	3,242,127	1,279,097,891	995,034,339	345,983,556	6,104,503,218
2035	6,104,503,218	70,915,492	3,052,179	1,304,828,227	1,011,901,366	353,783,360	6,233,223,030
2036	6,233,223,030	66,261,805	2,861,357	1,328,161,318	1,024,238,471	361,257,511	6,353,958,143
2037	6,353,958,143	61,644,051	2,683,756	1,348,691,212	1,034,179,608	368,364,837	6,466,771,672
2038	6,466,771,672	57,042,928	2,515,536	1,367,333,067	1,041,264,305	375,041,806	6,570,272,107
2039	6,570,272,107	52,474,469	2,348,672	1,383,991,291	1,048,017,989	381,206,423	6,665,631,025
2040	6,665,631,025	48,051,134	2,184,067	1,399,028,701	1,054,608,221	386,885,764	6,753,963,376
2041	6,753,963,376	43,786,771	2,020,243	1,411,844,527	1,062,296,032	392,172,644	6,838,354,054
2042	6,838,354,054	39,687,532	1,861,274	1,422,885,949	1,070,513,335	397,238,712	6,921,046,409
2043	6,921,046,409	35,723,404	1,700,881	1,432,230,866	1,079,570,044	402,241,843	7,004,649,953
2044	7,004,649,953	31,899,763	1,544,001	1,439,906,016	1,088,801,469	407,351,948	7,091,253,118
2045	7,091,253,118	28,200,646	1,387,719	1,445,932,057	1,098,295,764	412,720,369	7,183,150,121
2046	7,183,150,121	24,650,198	1,234,654	1,449,843,354	1,108,369,515	418,516,614	7,283,608,440
2047	7,283,608,440	21,267,283	1,084,324	1,451,161,533	1,119,232,252	424,972,289	7,396,834,407
2048	7,396,834,407	18,057,416	938,962	1,449,769,163	1,130,767,668	432,371,706	7,527,323,072
2049	7,527,323,072	14,969,612	797,481	1,445,921,857	1,142,733,476	441,010,149	7,679,316,970
2050	7,679,316,970	12,021,043	656,889	1,438,996,767	1,155,091,088	451,199,525	7,857,974,970
2051	7,857,974,970	9,323,055	522,815	1,427,910,033	1,167,900,295	463,328,218	8,070,093,690
2052	8,070,093,690	6,986,562	401,202	1,411,795,084	1,181,163,211	477,886,220	8,323,933,397
2053	8,323,933,397	5,090,242	298,075	1,390,186,975	1,194,842,916	495,448,911	8,628,830,415
2054	8,628,830,415	3,615,234	216,452	1,363,763,805	1,208,878,922	516,623,892	8,993,968,206
2055	8,993,968,206	2,492,264	152,553	1,333,341,441	1,223,218,531	542,002,831	9,428,187,839
2056	9,428,187,839	1,646,364	104,314	1,299,762,580	1,61,721,564	572,153,017	8,863,841,890
2057	8,863,841,890	997,870	66,944	1,263,662,933	145,618,768	553,591,735	8,300,320,385
2058	8,300,320,385	534,257	37,727	1,224,972,143	146,541,022	517,102,531	7,739,488,327
2059	7,739,488,327	240,222	18,793	1,184,200,633	147,782,201	480,574,858	7,183,866,182
2060	7,183,866,182	78,001	6,787	1,141,647,856	149,005,679	444,456,621	6,635,751,839
2061	6,635,751,839	14,678	1,574	1,097,909,361	150,216,747	408,887,890	6,096,960,219
2062	6,096,960,219	-	-	1,053,495,009	151,403,518	373,972,589	5,568,841,316
2063	5,568,841,316	-	-	1,008,897,056	152,582,714	339,784,647	5,052,311,621
2064	5,052,311,621	-	-	964,373,191	153,756,459	306,376,648	4,548,071,538
2065	4,548,071,538	-	-	920,141,066	154,948,442	273,788,606	4,056,667,520
2066	4,056,667,520	-	-	876,375,414	156,181,708	242,051,197	3,578,525,010
2067	3,578,525,010	-	-	833,198,122	157,471,849	211,188,693	3,113,987,430
2068	3,113,987,430	-	-	790,705,277	158,836,229	181,220,815	2,663,339,197
2069	2,663,339,197	-	-	748,978,207	152,484,196	154,910,131	2,226,817,627
2070	2,226,817,627	-	-	708,114,845	153,976,812	126,801,545	1,804,593,002
2071	1,804,593,002	-	-	668,140,295	155,592,164	99,628,494	1,396,838,856
2072	1,396,838,856	-	-	629,127,365	157,340,133	73,400,276	1,003,675,422
2073	1,003,675,422	-	-	591,113,187	159,238,128	48,123,774	625,210,669
2074	625,210,669	-	-	554,141,288	161,293,324	23,804,830	261,522,299
2075	261,522,299	-	-	518,223,791	248,019,235	448,287	-
2076	-	-	-	483,375,356	483,375,356	(16,047,538)	-
2077	-	-	-	449,610,155	449,610,155	(14,926,570)	-
2078	-	-	-	416,919,818	416,919,818	(13,841,286)	-
2079	-	-	-	385,321,438	385,321,438	(12,792,254)	-
2080	-	-	-	354,814,341	354,814,341	(11,779,451)	-

The projections in this report are strictly for the purpose of determining the GASB Single Discount Rate and are different from a funding projection for the ongoing plan.



Development of Single Discount Rate

PYE 12/31	Benefit Payments	Discount Rate	Discounted Benefit Payment	Single Discount Rate	Discounted Benefit Payment
2020	\$ 826,437,428	6.75%	\$ 799,882,206	6.43%	\$ 801,065,852
2021	853,193,841	6.75%	773,563,351	6.43%	777,002,535
2022	883,220,361	6.75%	750,152,159	6.43%	755,718,892
2023	915,024,313	6.75%	728,022,901	6.43%	735,597,633
2024	948,275,094	6.75%	706,771,238	6.43%	716,239,908
2025	983,278,298	6.75%	686,519,842	6.43%	697,777,735
2026	1,018,709,711	6.75%	666,283,720	6.43%	679,215,491
2027	1,054,485,796	6.75%	646,073,022	6.43%	660,563,166
2028	1,089,614,961	6.75%	625,382,964	6.43%	641,302,834
2029	1,123,885,821	6.75%	604,264,801	6.43%	621,482,317
2030	1,157,172,125	6.75%	582,820,990	6.43%	601,202,849
2031	1,189,005,333	6.75%	560,987,443	6.43%	580,394,585
2032	1,220,110,359	6.75%	539,262,931	6.43%	559,570,932
2033	1,250,473,825	6.75%	517,735,775	6.43%	538,824,233
2034	1,279,097,891	6.75%	496,100,277	6.43%	517,836,644
2035	1,304,828,227	6.75%	474,079,467	6.43%	496,316,625
2036	1,328,161,318	6.75%	452,044,039	6.43%	474,649,239
2037	1,348,691,212	6.75%	430,006,047	6.43%	452,846,455
2038	1,367,333,067	6.75%	408,383,765	6.43%	431,349,445
2039	1,383,991,291	6.75%	387,221,645	6.43%	410,208,605
2040	1,399,028,701	6.75%	366,678,130	6.43%	389,596,024
2041	1,411,844,527	6.75%	346,638,962	6.43%	369,395,201
2042	1,422,885,949	6.75%	327,259,835	6.43%	349,776,758
2043	1,432,230,866	6.75%	308,579,991	6.43%	330,788,474
2044	1,439,906,016	6.75%	290,616,987	6.43%	312,455,352
2045	1,445,932,057	6.75%	273,380,071	6.43%	294,793,695
2046	1,449,843,354	6.75%	256,786,486	6.43%	277,720,456
2047	1,451,161,533	6.75%	240,768,106	6.43%	261,167,437
2048	1,449,769,163	6.75%	225,327,487	6.43%	245,142,500
2049	1,445,921,857	6.75%	210,519,463	6.43%	229,710,611
2050	1,438,996,767	6.75%	196,263,421	6.43%	214,789,247
2051	1,427,910,033	6.75%	182,436,826	6.43%	200,248,857
2052	1,411,795,084	6.75%	168,972,273	6.43%	186,019,018
2053	1,390,186,975	6.75%	155,865,182	6.43%	172,097,824
2054	1,363,763,805	6.75%	143,234,347	6.43%	158,619,950
2055	1,333,341,441	6.75%	131,184,192	6.43%	145,705,689
2056	1,299,762,580	6.75%	119,794,333	6.43%	133,449,098
2057	1,263,662,933	6.75%	109,102,728	6.43%	121,898,775
2058	1,224,972,143	6.75%	99,074,683	6.43%	111,022,446
2059	1,184,200,633	6.75%	89,720,954	6.43%	100,838,494
2060	1,141,647,856	6.75%	81,027,581	6.43%	91,337,624
2061	1,097,909,361	6.75%	72,996,042	6.43%	82,527,847
2062	1,053,495,009	6.75%	65,614,138	6.43%	74,401,723
2063	1,008,897,056	6.75%	58,863,206	6.43%	66,944,337
2064	964,373,191	6.75%	52,707,729	6.43%	60,121,333
2065	920,141,066	6.75%	47,110,282	6.43%	53,895,731
2066	876,375,414	6.75%	42,032,342	6.43%	48,228,819
2067	833,198,122	6.75%	37,434,653	6.43%	43,080,546
2068	790,705,277	6.75%	33,279,154	6.43%	38,411,745
2069	748,978,207	6.75%	29,529,693	6.43%	34,184,959
2070	708,114,845	6.75%	26,153,244	6.43%	30,365,894
2071	668,140,295	6.75%	23,116,477	6.43%	26,919,471
2072	629,127,365	6.75%	20,390,350	6.43%	23,815,182
2073	591,113,187	6.75%	17,946,876	6.43%	21,023,376
2074	554,141,288	6.75%	15,760,531	6.43%	18,516,922
2075	518,223,791	6.75%	13,807,015	6.43%	16,269,797
2076	483,375,356	2.75%	104,378,507	6.43%	14,258,235
2077	449,610,155	2.75%	94,488,913	6.43%	12,460,454
2078	416,919,818	2.75%	85,273,768	6.43%	10,855,923
2079	385,321,438	2.75%	76,701,570	6.43%	9,426,574
2080	354,814,341	2.75%	68,738,558	6.43%	8,155,458
2081	325,422,913	2.75%	61,357,202	6.43%	7,027,677
2082	297,178,855	2.75%	54,532,260	6.43%	6,029,733
2083	270,116,905	2.75%	48,239,803	6.43%	5,149,303
2091	101,003,079	2.75%	14,518,900	6.43%	1,169,131
2101	11,383,264	2.75%	1,247,520	6.43%	70,625
2111	157,594	2.75%	13,167	6.43%	524
2118	1,093	2.75%	76	6.43%	2
Total Present Value			\$ 17,582,076,169		\$ 17,582,076,169

The projections in this report are strictly for the purpose of determining the GASB Single Discount Rate and are different from a funding projection for the ongoing plan.



SECTION H

GLOSSARY OF TERMS

Glossary of Terms

<i>Accrued Service</i>	Service credited under the system which was rendered before the date of the actuarial valuation.
<i>Actuarial Accrued Liability ("AAL")</i>	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
<i>Actuarial Assumptions</i>	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income, and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation, and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
<i>Actuarial Cost Method</i>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
<i>Actuarial Equivalent</i>	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
<i>Actuarial Gain (Loss)</i>	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
<i>Actuarial Present Value ("APV")</i>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<i>Actuarial Valuation</i>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
<i>Actuarial Valuation Date</i>	The date as of which an actuarial valuation is performed.
<i>Actuarially Determined Contribution ("ADC") or Annual Required Contribution ("ARC")</i>	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms

<i>Amortization Method</i>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<i>Covered-Employee Payroll</i>	The payroll of employees that are provided with pensions through the pension plan.
<i>Deferred Inflows and Outflows</i>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
<i>Deferred Retirement Option Program (“DROP”)</i>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<i>Discount Rate</i>	<p>For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:</p> <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

<i>Entry Age Actuarial Cost Method (“EAN”)</i>	The EAN is a cost method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
<i>Fiduciary Net Position</i>	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
<i>GASB</i>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<i>Long-Term Expected Rate of Return</i>	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
<i>Money-Weighted Rate of Return</i>	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
<i>Multiple-Employer Defined Benefit Pension Plan</i>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<i>Municipal Bond Rate</i>	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
<i>Net Pension Liability (“NPL”)</i>	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
<i>Non-Employer Contributing Entities</i>	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contributing entities.
<i>Normal Cost</i>	The portion of the actuarial present value allocated to a valuation year is called the normal cost. For purposes of application to the requirements of this Statement, the term normal cost is the equivalent of service cost.

Glossary of Terms

<i>Other Postemployment Benefits (“OPEB”)</i>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
<i>Real Rate of Return</i>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<i>Service Cost</i>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<i>Total Pension Expense</i>	<p>The total pension expense is the sum of the following items that are recognized at the end of the employer’s fiscal year:</p> <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
<i>Total Pension Liability (“TPL”)</i>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<i>Unfunded Actuarial Accrued Liability (“UAAL”)</i>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<i>Valuation Assets</i>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.