Segal Consulting

Municipal Employees' Annuity and Benefit Fund of Chicago

Actuarial Valuation and Review as of December 31, 2018

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May 21, 2019

The Retirement Board of the
Municipal Employees' Annuity and Benefit Fund of Chicago
321 North Clark Street, Suite 700
Chicago, Illinois 60654-4767

Dear Board Members:

We are pleased to submit this annual Actuarial Valuation and Review as of December 31, 2018. It summarizes the actuarial data used in the valuation; establishes the net pension liability under Governmental Accounting Standards Board (GASB) Statement No. 67 as of December 31, 2018, the pension expense for the fiscal year ending December 31, 2018, under GASB Statement No. 68, and the actuarially determined contribution for the year ending December 31, 2019; and analyzes the preceding year's experience.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Municipal Employees' Annuity and Benefit Fund of Chicago (MEABF or Fund or Plan).

Asset and Membership Data

The census information and financial information on which our calculations were based was prepared by the Fund staff. That assistance is gratefully acknowledged. We have not subjected the census data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data.

Actuarial Assumptions and Methods

The actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the Fund's actuary. The assumptions and methods used for the December 31, 2018, actuarial valuation were based on an experience analysis covering the five-year period ending December 31, 2016, and were adopted by the Board, effective December 31, 2017. These actuarial assumptions and methods comply with the parameters set by the Actuarial Standards of Practice and the parameters for disclosure of GASB 67 and 68. Further, in our opinion, the assumptions as approved by the Board appear to be reasonably related to the experience of the Fund. The investment return assumption is based on the Fund being invested according to the target asset allocation in the Investment Policy Statement. **To the extent that the liquidation of assets to pay benefit payments and expenses requires a shift in investment allocation to more liquid, lower return asset classes, a lower discount rate will likely be required in the future.**

Funding Adequacy

MEABF is funded by employer and member contributions in accordance with the funding policy specified under the Illinois Pension Code (40 ILCS 5/8), which was revised on July 6, 2017 by Public Act 100-0023. For 2019 through 2022, employer contributions are specified amounts: $344 million in 2019, $421 million in 2020, $499 million in 2021, and $576 million in 2022. Starting in 2023, employer contributions are calculated as the sum of the employer normal cost for that fiscal year plus an amount determined as a level percent of payroll sufficient to bring the total assets of the Fund up to 90% of the actuarial accrued liability by the end of 2058. **The risk of insolvency for MEABF has increased due to the 2018 investment return performance combined with fixed-dollar contributions through 2022, which do not change when the Fund experiences unfavorable investment performance. We strongly recommend an actuarial funding method that targets 100% funding where payments at least cover interest on the unfunded actuarial liability and a portion of the principal balance. If the Fund becomes insolvent, the employer will be required to make contributions on a "pay as you go" basis, which means the employer would have to pay all benefits as they become due.**

Financial Results and Membership Data

This report includes the following schedules for the Actuarial and Financial sections of the Comprehensive Annual Financial Report:

- Actuarial
  - Active Member Valuation Data
  - Retirees and Beneficiaries Added to and Removed from Rolls
  - Solvency Test
  - Analysis of Financial Experience
- Financial
  - Schedule of Funding Progress
  - Schedule of Employer Contributions

Limitation of Actuarial Measurements

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

Qualifications

The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Matthew A. Strom, FSA, MAAA, EA
Vice President and Actuary

Jake Libauskas, FSA, MAAA, EA
Consulting Actuary

SECTION 1

VALUATION SUMMARY

SECTION 2

VALUATION RESULTS

SECTION 3

SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

SECTION 4

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SECTION 4 (Continued)

REPORTING INFORMATION

SECTION 5

GASB INFORMATION

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Municipal Employees' Annuity and Benefit Fund of Chicago (MEABF or Fund or Plan) as of December 31, 2018. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of the Fund, as outlined in 40 ILCS 5/8 and administered by the Retirement Board;
- The characteristics of covered active members, inactive vested members, and retirees and beneficiaries as of December 31, 2018, provided by MEABF staff;
- The assets of the Plan as of December 31, 2018, provided by MEABF staff;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

Valuation Highlights

The following key findings were the result of this actuarial valuation:

1. **The risk of insolvency for MEABF has increased due to the 2018 investment return performance combined with fixed-dollar contributions through 2022, which do not change when the Fund experiences unfavorable investment performance.**
2. For the year ended December 31, 2018, Segal has estimated the asset return on a market basis to be -4.9%. After gradual recognition of investment gains and losses under the actuarial smoothing method, the actuarial rate of return was 4.3%. This represents an experience loss when compared to the assumed rate of 7.0%. As of December 31, 2018, the actuarial value of assets ($4.20 billion) represents 107% of the market value ($3.91 billion).
3. The market value of assets as of December 31, 2018 is $3.91 billion, which includes $3.56 billion of investments and $344 million of employer contributions receivable. As the employer contributions increase in the future, the receivable employer contributions become a larger percentage of the reported market value of assets.

4. The funded ratio based on the actuarial value of assets over the actuarial accrued liability as of December 31, 2018, is 25.0%, compared to 27.4% as of December 31, 2017. Using the market value of assets, the funded ratio as of December 31, 2018, is 23.3%, compared to 28.0% as of December 31, 2017.
5. As shown in Chart 13, for the fiscal year beginning January 1, 2019, the actuarially determined contribution (ADC) for pension benefits is $1,117,387,759. The expected employer contribution for 2019 (payable in 2020) is $421,000,000. **Compared to the actuarially determined contribution of $1,117,387,759, the contribution deficiency is $696,387,759. Each year there is a contribution deficiency leads to an increased deficiency in all future years.**
6. The total employer contributions for 2018 (payable in 2019) were expected to be $344,000,000. Actual employer contributions for 2018 totaled $349,574,257.
7. When measuring pension liability for GASB purposes, the Entry Age actuarial cost method is used, which is the same method that is used for funding purposes. In addition, because of the statutorily-required employer contributions under Public Act 100-0023, which are expected to increase substantially over time, the GASB blended discount rate calculation results in the same discount rate (7.00%) that is used for funding purposes as of December 31, 2018. This means that the total pension liability (TPL) measure for financial reporting shown in this report will match the actuarial accrued liability (AAL) measure for funding.
8. The net pension liability (NPL) is equal to the difference between the TPL and the Plan’s fiduciary net position. The Plan’s fiduciary net position is equal to the market value of assets. The NPL increased from $11,728,377,908 as of December 31, 2017, to $12,894,433,840 as of December 31, 2018. The increase in the NPL is primarily due to the lower than expected market value investment return.
9. As indicated in Section 2, Subsection B of this report, the total unrecognized investment loss as of December 31, 2018, is $281,463,696. This investment loss will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent it is not offset by recognition of investment gains derived from future experience. This implies that earning the assumed rate of investment return of 7.0% per year (net of expenses) on a market value basis will result in investment losses on the actuarial value of assets in the next few years.
10. The current method used to determine the actuarial value of assets yields an amount that is 107.2% of the market value of assets as of December 31, 2018. Guidelines in Actuarial Standards of Practice No. 44 (Selection and Use of Asset Valuation Methods for Pension Valuations) recommend that asset values fall within a reasonable range around the corresponding market value. We believe the actuarial asset method currently complies with these guidelines.
11. This actuarial valuation report as of December 31, 2018, is based on financial data as of that date. Changes in the value of assets subsequent to that date are not reflected.

Summary of Key Valuation Results

		2018	2017
Funding ratios as of December 31:			
Actuarial accrued liability		$16,808,614,316	$16,282,396,195
Market value of assets		3,914,180,476	4,554,018,287
Unfunded actuarial accrued liability on a market value basis		12,894,433,840	11,728,377,908
Funded ratio on a market value basis		23.29%	27.97%
Actuarial value of assets		$4,195,644,172	$4,456,771,744
Unfunded actuarial accrued liability on an actuarial value basis		12,612,970,144	11,825,624,451
Funded ratio on an actuarial value basis		24.96%	27.37%
Book value of assets		$3,588,228,555	$3,765,555,325
Unfunded actuarial accrued liability on a book value basis		13,220,385,761	12,516,840,870
Funded ratio on a book value basis		21.35%	23.13%
Demographic data as of December 31:			
Number of retirees and beneficiaries		25,577	25,383
Number of inactive members		17,575	17,549
Number of active members		31,285	30,922
Total pensionable salary supplied by the Fund		$1,734,595,691	$1,686,532,720
Average pensionable salary		$55,445	$54,542
Contribution requirement for Fiscal Year:	**2020**	**2019**	**2018**
Statutory City contribution*	$499,000,000	$421,000,000	$344,000,000
Actuarially determined contribution requirment	N/A	1,117,387,759	1,049,915,647

**As established by Public Act 100-0023. City contributions are shown in the year that they will be booked. The contributions will be paid in the following year.*

Summary of Key Valuation Results

	2019	2018
Contributions for plan year beginning January 1:		
Actuarially determined contribution requirement	$1,117,387,759	$1,049,915,647
Expected employer contributions	421,000,000	344,000,000
Actual employer contributions*	--	349,574,257
Funding elements for plan year beginning January 1:		
Employer normal cost, including administrative expenses, adjusted for timing	$100,953,857	$96,931,103
Market value of assets	3,914,180,476	4,554,018,287
Actuarial value of assets	4,195,644,172	4,456,771,744
Actuarial accrued liability	16,808,614,316	16,282,396,195
Unfunded actuarial accrued liability on an actuarial value basis	12,612,970,144	11,825,624,451
Funded ratio on an actuarial value basis	24.96%	27.37%
GASB information as of December 31 of the prior year:		
Long-term expected rate of return	7.00%	7.00%
Municipal bond index	4.10%	3.44%
Single equivalent discount rate	7.00%	7.00%
Total pension liability	$16,808,614,316	$16,282,396,195
Plan fiduciary net position	3,914,180,476	4,554,018,287
Net pension liability	12,894,433,840	11,728,377,908
Plan fiduciary net position as a percentage of total pension liability	23.29%	27.97%

**Receivable amount to be paid the following year*

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected benefit obligations. It is an estimated forecast – the actual long-term cost of MEABF will be determined by the actual benefits and expenses paid and the actual investment experience of the Fund.

In order to prepare a valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for the Fund is based on data provided to the actuary by Fund staff. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** The valuation is based on the market value of assets as of the valuation date, as provided by Fund staff, and uses an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan members for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each member for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the Fund's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the Fund's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of MEABF will be determined by the actual benefits and expenses paid and the actual investment experience of the Fund.
- If the Board is aware of any event or trend that was not considered in the valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of MEABF's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.
- The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

As Segal has no discretionary authority with respect to the management or assets of the Fund, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Fund.

A. MEMBER DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive members, retirees and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A - D.

A historical perspective of how the member population has changed over the past ten valuations can be seen in this chart.

CHART 1

Member Population: 2009 – 2018

Year Ended December 31	Active Members	Inactive Members	Retirees and Beneficiaries	Ratio of Non-Actives to Actives
2009	31,586	12,919	22,782	1.13
2010	30,726	13,866	22,960	1.20
2011	31,976	12,762	23,382	1.13
2012	31,326	13,465	24,120	1.20
2013	30,647	14,254	24,602	1.27
2014	30,160	15,495	24,855	1.34
2015	30,683	16,268	24,964	1.34
2016	30,296	16,876	25,236	1.39
2017	30,922	17,549	25,383	1.39
2018	31,285	17,575	25,577	1.38

Active Members
Plan costs are affected by the age, years of service and salary of active members. In this year's valuation, there were 31,285 active members with an average age of 46.2 average years of service of 11.2 and average salary of $55,445. The 30,922 active members in the prior valuation had an average age of 46.4, average years of service of 11.4 and average salary of $54,542.

The active members included 158 members receiving ordinary disability benefits and 164 members receiving duty disability benefits. This compares to 162 and 211 members receiving ordinary and duty disability benefits, respectively, in the prior valuation.

Inactive Members
In this year's valuation, there were 2,014 members with a vested right to a deferred or immediate vested benefit. In addition, there were 15,561 members entitled to a return of their account balance.

These graphs show a distribution of active members by age and by years of service.

CHART 2

Distribution of Active Members by Age as of December 31, 2018

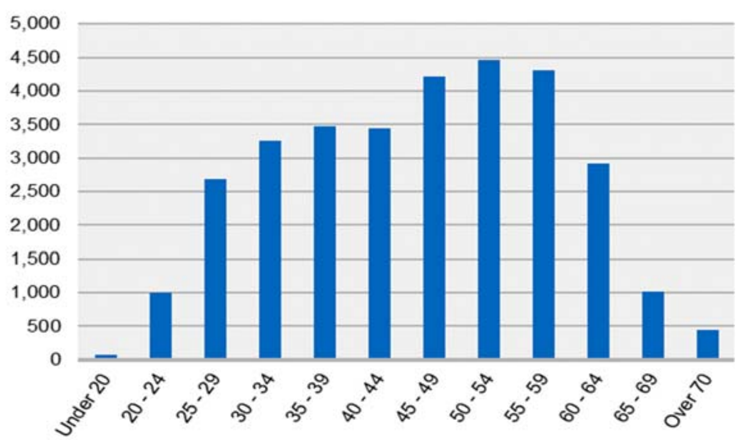
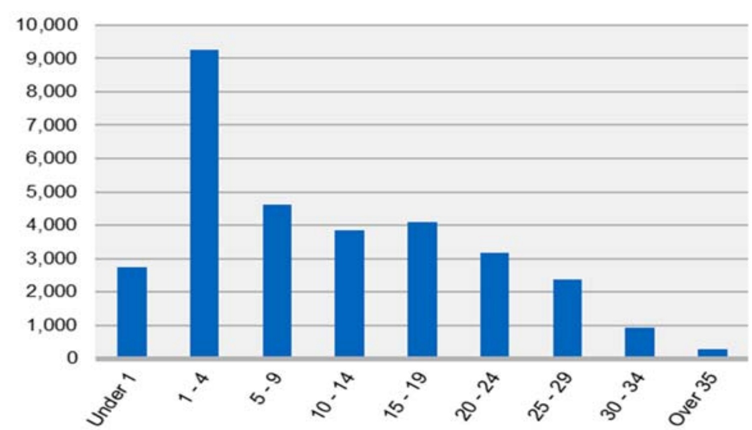


CHART 3

Distribution of Active Members by Years of Service as of December 31, 2018



Retirees and Beneficiaries
As of December 31, 2018, 21,393 retirees and 4,184 beneficiaries were receiving total monthly benefits of $75,687,743. For comparison, in the previous valuation, there were 21,137 retirees and 4,245 beneficiaries receiving monthly benefits of $72,631,055 (excluding 1 deferred retiree).

These graphs show a distribution of the current retirees and beneficiaries based on their monthly amount and age, by type of pension.

CHART 4

Distribution of Retirees and Beneficiaries by Type and by Monthly Amount as of December 31, 2018

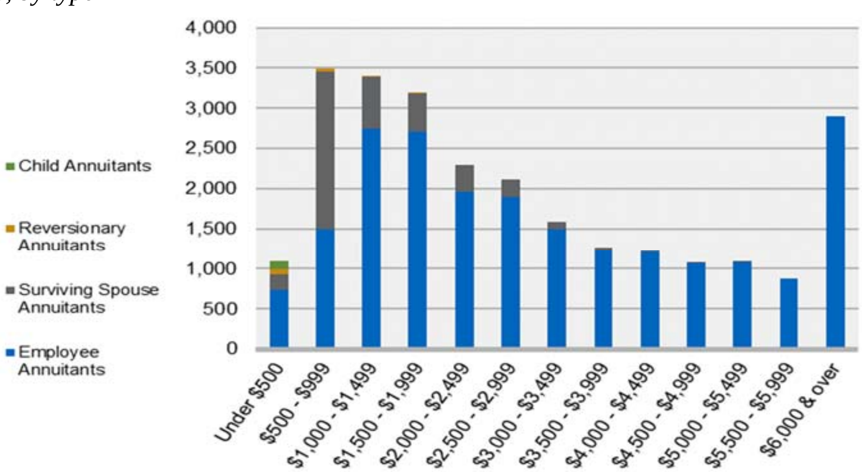
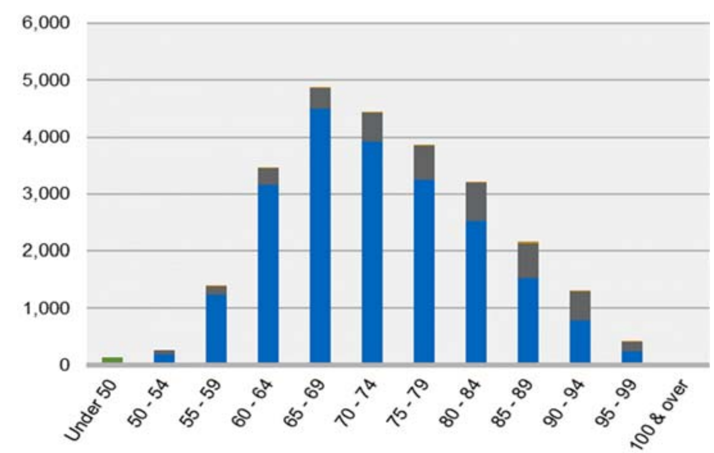


CHART 5

Distribution of Retirees and Beneficiaries by Type and by Age as of December 31, 2018



B. FINANCIAL INFORMATION

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

The chart shows the determination of the actuarial value of assets as of the valuation date.

CHART 6

Determination of Actuarial Value of Assets for Years Ended December 31, 2018 and December 31, 2017

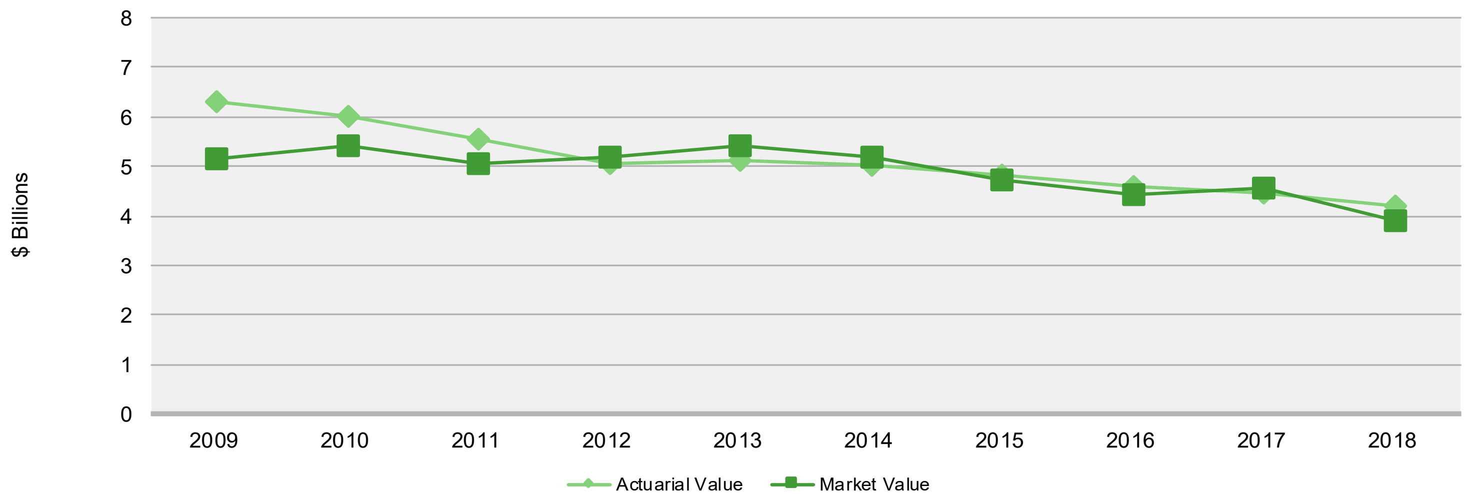
			2018		2017	
1.	Market value of assets as of prior December 31			$4,554,018,287		$4,436,227,596
2.	Employer and employee contributions and other income			487,973,984		401,922,136
3.	Benefits and expenses			922,837,093		894,646,541
4.	Expected investment income			291,325,972		304,423,768
5.	Total investment income, including income for securities lending			-204,974,702		610,515,096
6.	Investment gain/(loss) for the year ended December 31: (5) – (4)			-496,300,674		306,091,328
7.	Market value of assets as of December 31			3,914,180,476		4,554,018,287
8.	Calculation of unrecognized return	Original Amount	% Not Recognized		% Not Recognized	
	(a) Year ended December 31, 2018	-$496,300,674	80%	-$397,040,539		--
	(b) Year ended December 31, 2017	306,091,328	60%	183,654,798	80%	$244,873,062
	(c) Year ended December 31, 2016	-46,285,553	40%	-18,514,222	60%	-27,771,333
	(d) Year ended December 31, 2015	-247,818,663	20%	-49,563,733	40%	-99,127,466
	(e) Year ended December 31, 2014	-103,638,600		0	20%	-20,727,720
	(f) Total unrecognized return			-281,463,696		97,246,543
9.	Total actuarial value of assets as of December 31: (7) – (8f)			$4,195,644,172		$4,456,771,744

Both the actuarial value and market value of assets are representations of the Fund's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Fund's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in the actuarial value of assets versus the market value over the past ten years.

CHART 7

Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2009 – 2018



C. ACTUARIAL EXPERIENCE

To calculate the actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. Overall favorable experience relative to the assumptions (an actuarial gain) causes a decrease in the contribution requirement. On the other hand, overall less favorable experince relative to the assumptions (an actuarial loss) causes an increase in the contribution requirement.

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss is $206,416,949; $110,783,177 from investment losses and $95,633,772 in losses from all other sources. The net experience variation from individual sources other than investments was approximately 0.6% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

This chart provides a summary of the actuarial experience during the past year.

CHART 8

Actuarial Experience for Year Ended December 31, 2018

1.	Net gain/(loss) from investments*	-$110,783,177
2.	Net gain/(loss) from administrative expenses	-165,602
3.	Net gain/(loss) from other experience**	-95,468,170
4.	Net experience gain/(loss): (1) + (2) + (3)	-$206,416,949

* *Details in Chart 9*

** *Details in Chart 12*

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the MEABF's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets for the 2018 Plan Year was 7.0%. The actual rate of return on an actuarial basis for the 2018 plan year was 4.27%.

Since the actual return for the year was less than the assumed return, the Fund experienced an actuarial loss during the year ended December 31, 2018 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 9

Actuarial Value Investment Experience for Year Ended December 31, 2018

1.	Actual return	$173,735,537
2.	Average value of assets	4,064,553,061
3.	Actual rate of return: (1) ÷ (2)	4.27%
4.	Assumed rate of return	7.00%
5.	Expected return: (2) x (4)	$284,518,714
6.	Actuarial gain/(loss): (1) – (5)	-$110,783,177

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

CHART 10

Investment Return

Year Ended December 31	Actuarial Value*	Market Value**
2009	(0.3%)	19.6%
2010	1.3%	14.2%
2011	(0.6%)	0.1%
2012	(0.4%)	12.8%
2013	11.1%	16.1%
2014	9.3%	5.1%
2015	6.9%	2.1%
2016	8.0%	6.6%
2017	8.3%	15.2%
2018	4.3%	(5.7%)
Average Returns		
Last 5 years	7.3%	4.4%
Last 10 years	4.7%	8.3%

* *As determined by Segal*
** *As determined by Investment Consultant, which may reflect updates from time to time*

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs. Chart 11 illustrates that the asset returns on a market basis tend to be more volatile than asset returns on an actuarial basis.

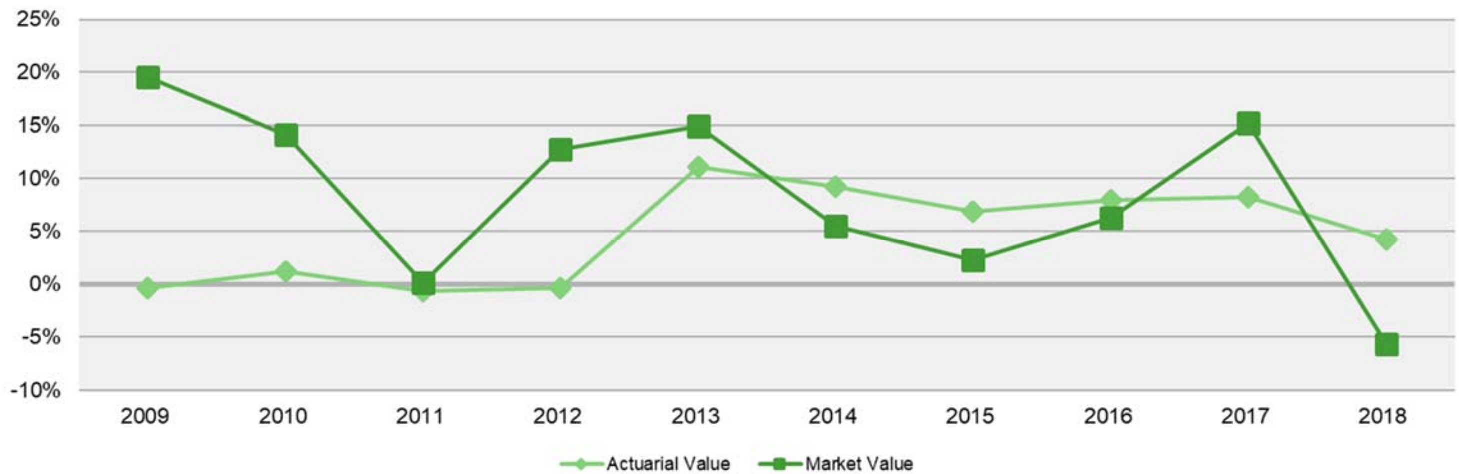
Administrative Expenses

Administrative expenses for the year ended December 31, 2018 totaled $6,638,608 compared to the assumption of $6,473,006. This resulted in a loss of $165,602 for the year.

This chart illustrates how this leveling effect has actually worked over the years 2009 - 2018.

CHART 11

Market and Actuarial Rates of Return for Years Ended December 31, 2009 - 2018



Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed.

The net loss from this other experience for the year ended December 31, 2018, amounted to $95,468,170, which is approximately 0.6% of the actuarial accrued liability.

A brief summary of the demographic gain/(loss) experience of the Fund for the year ended December 31, 2018, is shown in the chart below.

The chart shows elements of the experience gain/(loss) for the most recent year.

CHART 12

Experience Due to Changes in Demographics for Year Ended December 31, 2018

1.	More turnover than expected	$16,106,165
2.	More or earlier retirement than expected	-68,267,826
3.	More deaths than expected among retirees and beneficiaries	21,431,866
4.	Greater salary/service increases than expected for continuing actives	-66,250,601
5.	New entrants	-13,545,423
6.	Miscellaneous	15,057,649
7.	Total	-$95,468,170

D. DEVELOPMENT OF EMPLOYER COSTS

The amount of actuarially determined contribution is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability. This total amount is then divided by the projected payroll for active members to determine the actuarially determined contribution of 62.57% of payroll.

The actuarially determined contribution is based on a 30-year, level dollar amortization of the unfunded actuarial accrued liability. A 30-year “rolling” amortization will never fully fund the unfunded actuarial accrued liability.

The chart shows the calculation of the actuarially determined contribution for the upcoming year.

CHART 13

Actuarially Determined Contribution

	Year Beginning January 1, 2019	
	Amount	**% of Payroll**
1. Total normal cost*	$236,326,396	13.23%
2. Administrative expenses	6,638,608	0.37%
3. Expected employee contributions**	-145,369,227	-8.14%
4. Employer normal cost: (1) + (2) + (3)	97,595,777	5.46%
5. Employer normal cost, adjusted for timing***	100,953,857	5.65%
6. Actuarial accrued liability	16,808,614,316	
7. Actuarial value of assets	4,195,644,172	
8. Unfunded/(overfunded) actuarial accrued liability: (6) - (7)	12,612,970,144	
9. Payment on unfunded actuarial accrued liability, adjusted for timing***	1,016,433,901	56.92%
10. Actuarially determined contribution: (5) + (9)	$1,117,387,759	62.57%
11. Projected payroll	$1,785,862,736	

** Reflects timing adjustment to the middle of the year*

*** Based on payroll, adjusted to the middle of the year*

**** Employer contributions are assumed to be paid at the end of the year*

The contribution requirements as of December 31, 2018, are based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

Reconciliation of Actuarially Determined Contribution
The chart below details the changes in the actuarially determined contribution from the prior valuation to the current year's valuation.

The chart reconciles the contribution from the prior valuation to the amount determined in this valuation.

CHART 14

Reconciliation of Actuarially Determined Contribution from December 31, 2017 to December 31, 2018

Actuarially Determined Contribution as of December 31, 2017	$1,049,915,647
Effect of plan amendment	$0
Effect of change in asset method	0
Effect of expected change in amortization payment due to payroll growth	0
Effect of rolling amortization period	-10,875,512
Effect of change in administrative expense assumption	171,300
Effect of change in other actuarial assumptions	0
Effect of contributions (more)/less than actuarially determined contribution	58,201,538
Effect of investment (gain)/loss	9,023,140
Effect of other (gains)/losses on accrued liability	7,789,242
Effect of net other changes: (gain)/loss*	3,162,404
Total change	$67,472,112
Actuarially Determined Contribution as of December 31, 2018	$1,117,387,759

**Primarily due to larger normal cost caused by larger salaries than expected*

E. RISK

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Plan. Earlier this year, stress-testing projections were provided to show the impact of varying future investment returns.

We also strongly recommend that a stochastic analysis be prepared for MEABF in the context of a full risk assessment. A stochastic analysis would involve the projection of thousands of investment return trials over the full projection period. The stochastic projections would show the most likely range of outcomes as well as the best and worst case scenarios for MEABF. The stochastic analysis would also provide the range of employer contributions and the probability of employer contributions exceeding certain thresholds.

Investment Risk

If the actual return on the market value of assets for the next Plan Year were 1% different from the assumed (either higher or lower), the projected unfunded actuarial liability would change by 0.1%, or about $7 million.

Since the Plan's assets are much larger than contributions, investment performance may create significant volatility in contribution requirements. For example, for each 1% difference in return from the assumed return, the projected employer contributions for the 2022 Fiscal Year (first year after the fixed dollar amounts) would change by approximately $2.4 million.

The market value rate of return over the last 10 years has ranged from a low of -5.7% to a high of 19.6%, with an average of 8.3%.

Longevity Risk

The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the MEABF funding policy and statutorily required contribution amounts.

Contribution Risk

The MEABF funding policy contribution requires payment of the normal cost and an amortization payment according to a schedule sufficient to become 90% funded by 2058. The statutorily-required amount systematically underfunds MEABF. Among other things, it: a) is based on a funding target of 90% of the actuarial accrued liability (as opposed to 100%); b) is based on a level percent of payroll, which back loads the contributions; and c) involves a period of fixed dollar amounts that are not able to be adjusted to account for potential adverse experience.

If contributions beginning 2022 fall short of the statutory schedule included in Public Act 100-0023, the risk of insolvency increases substantially. If contributions fall significantly short of that schedule, insolvency is almost inevitable.

Even if contributions follow this schedule and future experience matches the current assumptions, we project the unfunded actuarial accrued liability will not be paid off.

Demographic Risk

Examples of this risk include:

- Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
- More or less active participant turnover than assumed.
- Individual salary increases higher or lower than assumed.

Actual Experience Over the Last 5 years and Implications for the Future

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past five years:

- The investment gain/(loss) for a year has ranged from a gain of $86.7 million to a loss of $110.8 million.
- The non-investment gain/(loss) for a year has ranged from a gain of $117.6 million to a loss of $95.6 million.
- The funded percentage on the actuarial value of assets has ranged from a low of 24.96% to a high of 56.95% since 2009.

Maturity Measures

As pension plans mature, the cash need to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

Currently the Plan has a non-active to active ratio of 1.38. For the prior year, contributions received were $434.9 million less than benefits paid & administrative expenses. As the Plan continues to mature, more cash will be needed from the investment portfolio to meet benefit payments.

EXHIBIT A

Table of Plan Coverage

Category	Year Ended December 31 2018	Year Ended December 31 2017	Change From Prior Year
Active members in valuation:			
Number*	31,285	30,922	1.2%
Average age	46.2	46.4	N/A
Average years of service	11.2	11.4	N/A
Total pensionable salary supplied by the Fund	$1,734,595,691	$1,686,532,720	2.8%
Average pensionable salary	$55,445	$54,542	1.7%
Total active vested members	14,678	15,320	-4.2%
Male members	12,424	12,518	-0.8%
Female members	18,861	18,404	2.5%
Tier 1 members	18,372	19,586	-6.2%
Tier 2 members	8,248	9,349	-11.8%
Tier 3 members	4,665	1,987	134.8%
Inactive members	17,575	17,549	0.1%
Deferred retirees	0	1	-100.0%
Retirees:			
Number in pay status	21,393	21,137	1.2%
Average age	73.0	72.9	N/A
Average monthly benefit	$3,297	$3,198	3.1%
Surviving spouses:			
Number in pay status	3,963	4,007	-1.1%
Average age	78.5	78.4	N/A
Average monthly benefit	$1,284	$1,238	3.7%
Reversionary annuitants:			
Number in pay status	119	124	-4.0%
Average age	78.9	78.5	N/A
Average monthly benefit	$445	$437	1.8%
Children	102	114	-10.5%
Total number of members	74,437	73,854	0.8%

**Includes 373 and 322 members receiving disability benefits for 2017 and 2018, respectively.*

EXHIBIT B.1

All Members in Active Service as of December 31, 2018
By Age, Years of Service, and Total Salary

		Years of Service								
Age	**Total**	**Under 1**	**1 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 & Over**
Under 20	66	50	16	-	-	-	-	-	-	-
	$1,652,256	$1,260,136	$392,120	-	-	-	-	-	-	-
20 – 24	1,006	421	572	13	-	-	-	-	-	-
	$30,579,630	$12,675,617	$17,494,777	$409,236	-	-	-	-	-	-
25 – 29	2,692	542	1,788	357	5	-	-	-	-	-
	$105,641,949	$19,477,297	$71,768,462	$14,233,986	$162,204	-	-	-	-	-
30 – 34	3,257	461	1,690	851	222	33	-	-	-	-
	$154,213,968	$19,048,297	$80,879,859	$42,591,389	$9,966,195	$1,728,228	-	-	-	-
35 – 39	3,466	352	1,472	791	547	244	60	-	-	-
	$184,184,739	$14,338,184	$73,253,263	$46,460,087	$31,613,721	$14,082,142	$4,437,342	-	-	-
40 – 44	3,436	276	1,095	638	588	552	249	38	-	-
	$199,111,937	$10,843,217	$54,149,764	$37,941,915	$37,553,000	$37,142,391	$18,568,480	$2,913,170	-	-
45 – 49	4,211	254	960	647	636	753	653	290	18	-
	$255,597,830	$9,778,641	$47,875,180	$37,688,410	$38,593,388	$48,833,373	$49,501,239	$22,241,838	$1,085,760	-
50 – 54	4,470	173	753	509	649	803	725	678	175	5
	$277,920,854	$7,011,986	$35,877,165	$28,318,071	$36,270,157	$47,859,704	$53,802,548	$54,138,287	$14,209,686	$433,250
55 – 59	4,306	120	554	414	610	866	743	617	321	61
	$261,250,855	$4,754,207	$27,281,423	$22,186,857	$32,075,488	$47,861,077	$49,475,276	$46,159,858	$26,066,070	$5,390,599
60 – 64	2,921	61	281	267	386	559	490	493	268	116
	$177,597,657	$2,252,263	$13,605,924	$14,723,529	$18,917,955	$29,930,367	$32,641,653	$35,754,001	$19,852,684	$9,919,282
65 – 69	1,012	13	47	93	152	199	188	162	101	57
	$61,975,420	$631,128	$2,055,476	$4,484,104	$8,175,937	$10,844,820	$12,558,451	$11,302,257	$7,614,456	$4,308,790
70 & Over	442	7	33	36	55	69	61	81	47	53
	$24,868,596	$132,600	$1,041,380	$1,136,810	$2,419,660	$3,705,363	$3,684,734	$5,668,355	$3,525,573	$3,554,121
Total	31,285	2,730	9,261	4,616	3,850	4,078	3,169	2,359	930	292
	$1,734,595,691	$102,203,574	$425,674,793	$250,174,393	$215,747,705	$241,987,465	$224,669,724	$178,177,766	$72,354,230	$23,606,042

EXHIBIT B.2

Male Members in Active Service as of December 31, 2018
By Age, Years of Service, and Total Salary

		Years of Service								
Age	**Total**	**Under 1**	**1 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 & Over**
Under 20	24	19	5	-	-	-	-	-	-	-
	$603,596	$470,065	$133,531	-	-	-	-	-	-	-
20 – 24	341	128	206	7	-	-	-	-	-	-
	$10,805,873	$4,011,418	$6,574,965	$219,490	-	-	-	-	-	-
25 – 29	997	191	656	148	2	-	-	-	-	-
	$44,148,732	$7,693,680	$29,916,189	$6,469,950	$68,913	-	-	-	-	-
30 – 34	1,275	158	647	363	98	9	-	-	-	-
	$68,499,839	$6,822,333	$35,771,821	$20,406,407	$5,017,490	$481,788	-	-	-	-
35 – 39	1,365	107	541	365	235	92	25	-	-	-
	$86,521,433	$5,294,605	$33,142,118	$24,574,745	$15,189,395	$6,320,085	$2,000,486	-	-	-
40 – 44	1,387	87	385	316	239	221	124	15	-	-
	$96,754,109	$4,237,675	$24,059,258	$22,399,560	$17,800,429	$16,643,356	$10,361,914	$1,251,917	-	-
45 – 49	1,699	77	338	306	283	287	299	106	3	-
	$126,320,164	$3,592,389	$22,199,677	$20,928,682	$22,095,231	$22,670,386	$25,302,693	$9,287,627	$243,479	-
50 – 54	1,833	65	263	219	265	294	298	350	75	4
	$142,262,620	$3,107,869	$16,815,659	$15,584,483	$19,336,265	$22,726,174	$26,043,827	$31,830,708	$6,455,880	$361,754
55 – 59	1,722	50	215	181	252	282	285	264	159	34
	$132,059,964	$2,090,793	$13,853,965	$12,291,798	$17,070,950	$21,528,184	$23,989,253	$23,866,598	$14,088,409	$3,280,014
60 – 64	1,166	15	123	112	144	173	186	218	126	69
	$91,713,059	$718,162	$7,654,323	$7,797,404	$9,419,744	$13,062,496	$15,934,610	$19,913,365	$10,713,245	$6,499,711
65 – 69	445	7	26	45	71	74	70	66	54	32
	$34,152,539	$454,216	$1,454,959	$2,588,460	$4,850,065	$5,757,904	$5,949,092	$5,590,561	$4,777,617	$2,729,665
70 & Over	170	3	11	16	23	30	17	30	24	16
	$12,230,223	$41,777	$436,685	$729,565	$1,441,052	$2,027,220	$1,383,027	$2,635,279	$2,140,032	$1,395,586
Total	12,424	907	3,416	2,078	1,612	1,462	1,304	1,049	441	155
	$846,072,149	$38,534,981	$192,013,150	$133,990,544	$112,289,535	$111,217,593	$110,964,901	$94,376,054	$38,418,662	$14,266,729

EXHIBIT B.3

Female Members in Active Service as of December 31, 2018
By Age, Years of Service, and Total Salary

		Years of Service								
Age	Total	Under 1	1 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 & Over
Under 20	42	31	11	-	-	-	-	-	-	-
	$1,048,660	$790,071	$258,589	-	-	-	-	-	-	-
20 – 24	665	293	366	6	-	-	-	-	-	-
	$19,773,757	$8,664,199	$10,919,812	$189,746	-	-	-	-	-	-
25 – 29	1,695	351	1,132	209	3	-	-	-	-	-
	$61,493,217	$11,783,617	$41,852,273	$7,764,036	$93,291	-	-	-	-	-
30 – 34	1,982	303	1,043	488	124	24	-	-	-	-
	$85,714,129	$12,225,964	$45,108,038	$22,184,982	$4,948,705	$1,246,440	-	-	-	-
35 – 39	2,101	245	931	426	312	152	35	-	-	-
	$97,663,306	$9,043,579	$40,111,145	$21,885,342	$16,424,325	$7,762,057	$2,436,857	-	-	-
40 – 44	2,049	189	710	322	349	331	125	23	-	-
	$102,357,829	$6,605,543	$30,090,507	$15,542,355	$19,752,571	$20,499,035	$8,206,566	$1,661,253	-	-
45 – 49	2,512	177	622	341	353	466	354	184	15	-
	$129,277,666	$6,186,252	$25,675,503	$16,759,728	$16,498,156	$26,162,987	$24,198,546	$12,954,212	$842,281	-
50 – 54	2,637	108	490	290	384	509	427	328	100	1
	$135,658,234	$3,904,117	$19,061,505	$12,733,587	$16,933,893	$25,133,530	$27,758,722	$22,307,578	$7,753,806	$71,496
55 – 59	2,584	70	339	233	358	584	458	353	162	27
	$129,190,892	$2,663,414	$13,427,458	$9,895,059	$15,004,539	$26,332,893	$25,486,023	$22,293,260	$11,977,661	$2,110,585
60 – 64	1,755	46	158	155	242	386	304	275	142	47
	$85,884,598	$1,534,101	$5,951,602	$6,926,125	$9,498,211	$16,867,871	$16,707,043	$15,840,636	$9,139,438	$3,419,571
65 – 69	567	6	21	48	81	125	118	96	47	25
	$27,822,881	$176,913	$600,517	$1,895,644	$3,325,872	$5,086,916	$6,609,359	$5,711,696	$2,836,840	$1,579,125
70 & Over	272	4	22	20	32	39	44	51	23	37
	$12,638,374	$90,823	$604,695	$407,245	$978,608	$1,678,143	$2,301,707	$3,033,076	$1,385,541	$2,158,535
Total	18,861	1,823	5,845	2,538	2,238	2,616	1,865	1,310	489	137
	$888,523,542	$63,668,593	$233,661,644	$116,183,849	$103,458,170	$130,769,872	$113,704,823	$83,801,711	$33,935,568	$9,339,312

EXHIBIT B.4

Board of Education Plan Members in Active Service as of December 31, 2018
By Age, Years of Service, and Total Salary

		Years of Service								
Age	**Total**	**Under 1**	**1 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 & Over**
Under 20	57	47	10	-	-	-	-	-	-	-
	$1,488,762	$1,217,506	$271,256	-	-	-	-	-	-	-
20 – 24	809	363	438	8	-	-	-	-	-	-
	$25,047,740	$11,276,363	$13,508,545	$262,832	-	-	-	-	-	-
25 – 29	1,998	421	1,288	285	4	-	-	-	-	-
	$72,334,225	$14,405,332	$46,918,078	$10,875,244	$135,570	-	-	-	-	-
30 – 34	2,157	300	1,068	636	151	2	-	-	-	-
	$87,956,028	$11,163,800	$42,710,176	$27,715,753	$6,270,467	$95,832	-	-	-	-
35 – 39	2,143	251	903	498	338	142	11	-	-	-
	$90,961,773	$9,234,776	$35,050,595	$22,979,616	$15,579,382	$7,152,364	$965,040	-	-	-
40 – 44	1,811	187	668	383	278	240	50	5	-	-
	$76,843,594	$6,712,152	$25,443,526	$17,312,653	$12,577,584	$11,839,587	$2,702,518	$255,574	-	-
45 – 49	2,141	166	581	401	335	355	204	93	6	-
	$91,899,636	$5,660,999	$21,985,514	$17,511,706	$14,863,264	$15,985,165	$10,722,144	$4,907,938	$262,906	-
50 – 54	2,151	114	454	306	361	425	236	206	49	-
	$90,150,837	$4,195,511	$16,024,442	$12,754,687	$14,434,199	$16,984,119	$11,840,502	$11,165,493	$2,751,883	-
55 – 59	2,074	77	309	257	346	479	297	224	75	10
	$82,922,882	$2,534,748	$10,820,306	$10,166,861	$13,028,774	$17,760,596	$13,053,790	$11,149,198	$3,890,209	$518,400
60 – 64	1,291	44	148	147	210	298	182	180	72	10
	$50,948,535	$1,777,789	$5,159,748	$5,561,422	$7,276,873	$10,571,778	$7,999,492	$8,640,314	$3,372,197	$588,921
65 – 69	400	9	25	54	73	94	66	44	27	8
	$15,979,600	$512,810	$838,359	$2,023,529	$2,484,409	$3,235,827	$3,177,622	$1,997,036	$1,291,414	$418,594
70 & Over	114	2	13	16	25	21	9	12	7	9
	$3,956,619	$62,400	$467,603	$374,470	$636,836	$858,294	$312,708	$490,758	$370,068	$383,482
Total	17,146	1,981	5,905	2,991	2,121	2,056	1,055	764	236	37
	$690,490,231	$68,754,185	$219,198,149	$127,538,774	$87,287,359	$84,483,563	$50,773,816	$38,606,311	$11,938,676	$1,909,397

EXHIBIT B.5

City Plan Members in Active Service as of December 31, 2018
By Age, Years of Service, and Total Salary

		Years of Service								
Age	Total	Under 1	1 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 & Over
Under 20	8	3	5	-	-	-	-	-	-	-
	$158,309	$42,630	$115,679	-	-	-	-	-	-	-
20 – 24	193	58	130	5	-	-	-	-	-	-
	$5,413,778	$1,399,254	$3,868,120	$146,404	-	-	-	-	-	-
25 – 29	690	121	497	71	1	-	-	-	-	-
	$33,140,281	$5,071,965	$24,709,749	$3,331,933	$26,634	-	-	-	-	-
30 – 34	1,095	161	621	212	70	31	-	-	-	-
	$65,935,265	$7,884,497	$38,096,338	$14,678,417	$3,643,616	$1,632,396	-	-	-	-
35 – 39	1,310	101	568	287	206	99	49	-	-	-
	$91,961,368	$5,103,408	$38,102,667	$23,091,954	$15,738,409	$6,452,626	$3,472,302	-	-	-
40 – 44	1,617	89	426	254	310	309	196	33	-	-
	$121,364,881	$4,131,066	$28,601,239	$20,456,261	$24,975,416	$24,885,830	$15,657,474	$2,657,596	-	-
45 – 49	2,062	88	377	245	301	398	444	197	12	-
	$163,041,720	$4,117,642	$25,779,666	$20,084,704	$23,730,124	$32,848,208	$38,324,621	$17,333,900	$822,854	-
50 – 54	2,304	59	298	202	284	375	487	469	125	5
	$186,232,278	$2,816,475	$19,730,429	$15,458,384	$21,467,075	$30,596,762	$41,708,151	$42,628,857	$11,392,896	433249.64
55 – 59	2,221	43	245	157	262	384	443	391	245	51
	$177,068,464	$2,219,459	$16,461,117	$12,019,996	$18,921,334	$29,759,983	$35,951,486	$34,765,660	$22,097,229	$4,872,199
60 – 64	1,624	17	132	120	175	259	307	312	196	106
	$126,025,775	$474,474	$8,361,785	$9,162,107	$11,516,082	$19,209,809	$24,556,985	$26,933,687	$16,480,487	$9,330,361
65 – 69	607	4	22	38	78	104	122	117	74	48
	$45,692,818	$118,318	$1,217,117	$2,415,575	$5,645,602	$7,560,787	$9,380,829	$9,225,686	$6,323,042	$3,805,860
70 & Over	327	5	20	20	30	48	52	68	40	44
	$20,836,029	$70,200	$573,777	$762,339	$1,782,824	$2,847,070	$3,372,026	$5,101,649	$3,155,505	$3,170,639
Total	14,058	749	3,341	1,611	1,717	2,007	2,100	1,587	692	254
	$1,036,870,966	$33,449,388	$205,617,683	$121,608,075	$127,447,116	$155,793,472	$172,423,874	$138,647,035	$60,272,013	$21,612,308

EXHIBIT C

Inactive Members as of December 31, 2018
By Age and Years of Service

		Years of Service								
Age	**Total**	**Under 1**	**1 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 & Over**
Under 20	3	3	--	--	--	--	--	--	--	--
20 – 24	233	120	113	--	--	--	--	--	--	--
25 – 29	1,275	435	809	31	--	--	--	--	--	--
30 – 34	2,245	577	1486	162	19	1	--	--	--	--
35 – 39	2,508	508	1645	261	77	17	--	--	--	--
40 – 44	2,189	335	1349	342	131	25	7	--	--	--
45 – 49	2,274	349	1236	358	205	82	36	8	--	--
50 – 54	2,054	292	1036	308	188	121	73	35	1	--
55 – 59	1,923	245	861	315	291	158	42	11	--	--
60 – 64	1,266	154	628	245	120	65	38	11	4	1
65 – 69	727	101	409	112	54	26	17	5	2	1
70 & Over	878	133	429	174	62	30	21	18	7	4
Total	17,575	3,252	10,001	2,308	1,147	525	234	88	14	6
Average Age	46.93									
Average Service	3.89									

EXHIBIT D.1

Employee Annuitants as of December 31, 2018
By Age and Annual Benefit

	Male		Female	
Age	Number	Annual Payments	Number	Annual Payments
Under 55	95	$6,068,424	99	$5,214,751
55 – 59	625	36,239,863	621	25,182,244
60 – 64	1,389	76,701,597	1,765	59,221,224
65 – 69	1,827	96,850,923	2,681	86,617,605
70 – 74	1,440	73,078,284	2,476	78,995,709
75 – 79	1,165	57,530,072	2,079	64,180,123
80 – 84	835	39,875,418	1,695	50,536,909
85 – 89	534	26,246,657	990	28,793,129
90 – 94	272	12,880,887	525	13,783,002
95 – 99	65	2,749,977	187	4,795,983
100 & over	5	215,285	23	522,137
Totals	8,252	$428,437,386	13,141	$417,842,815

EXHIBIT D.2

Surviving Spouse Annuitants as of December 31, 2018
By Age and Annual Benefit

	Male		Female	
Age	**Number**	**Annual Payments**	**Number**	**Annual Payments**
Under 40	1	$9,600	1	$9,600
40 – 44	2	19,200	9	91,683
45 – 49	1	9,600	20	248,712
50 – 54	13	123,075	55	808,995
55 – 59	26	344,001	110	1,865,325
60 – 64	72	889,679	220	4,061,620
65 – 69	62	737,585	296	5,051,989
70 – 74	131	1,705,748	384	6,499,950
75 – 79	125	1,615,339	488	8,154,242
80 – 84	136	1,642,139	527	8,869,223
85 – 89	102	1,238,766	510	8,096,530
90 – 94	86	990,978	413	5,996,227
95 – 99	24	279,600	127	1,468,101
100 & over	2	20,039	20	211,821
Totals	783	$9,625,348	3,180	$51,434,017

EXHIBIT D.3

Reversionary Annuitants as of December 31, 2018
By Age and Annual Benefit

	Male		Female	
Age	Number	Annual Payments	Number	Annual Payments
Under 30	- -	- -	1	$2,616
30 – 34	- -	- -	- -	- -
35 – 39	- -	- -	1	1,092
40 – 44	- -	- -	1	2,790
45 – 49	- -	- -	3	4,902
50 – 54	- -	- -	- -	- -
55 – 59	1	$750	2	7,380
60 – 64	1	18,864	11	91,412
65 – 69	- -	- -	10	51,166
70 – 74	2	4,590	3	6,492
75 – 79	1	4,440	12	80,115
80 – 84	- -	- -	19	115,041
85 – 89	- -	- -	23	122,533
90 – 94	- -	- -	21	85,129
95 – 99	- -	- -	7	35,537
100 & over	- -	- -	- -	- -
Totals	5	$28,644	114	$606,206

EXHIBIT D.4

Retirees and Beneficiaries as of December 31, 2018
By Monthly Benefit Amount and Type

Amount of Monthly Benefit	Number of Employee Annuitants	Number of Spouse Annuitants	Number of Reversionary Annuitants	Number of Child Annuitants	Total Number of Annuitants
Under $500	741	185	73	102	1,101
$500 - $999	1,491	1,958	40	0	3,489
$1,000 - $1,499	2,742	652	3	0	3,397
$1,500 - $1,999	2,703	479	3	0	3,185
$2,000 - $2,499	1,965	324	0	0	2,289
$2,500 - $2,999	1,890	222	0	0	2,112
$3,000 - $3,499	1,499	92	0	0	1,591
$3,500 - $3,999	1,225	41	0	0	1,266
$4,000 - $4,499	1,209	7	0	0	1,216
$4,500 - $4,999	1,073	1	0	0	1,074
$5,000 - $5,499	1,085	2	0	0	1,087
$5,500 - $5,999	872	0	0	0	872
$6,000 - $6,499	817	0	0	0	817
$6,500 - $6,999	679	0	0	0	679
$7,000 & over	1,402	0	0	0	1,402
Totals	21,393	3,963	119	102	25,577

EXHIBIT E

Reconciliation of Member Data

	Active Members*	Inactive Members	Deferred Retirees	Retirees	Beneficiaries	Total
Number as of December 31, 2017	30,922	17,549	1	21,137	4,245	73,854
New members	3,537	N/A	N/A	N/A	N/A	3,537
Terminations	-1,809	1,809	0	0	0	0
Retirements	-894	-181	-1	1,076	N/A	0
Died with beneficiary	-19	-4	0	-213	236	0
Died without beneficiary	-27	-11	0	-610	-304	-952
Refunds	-676	-1,433	0	0	0	-2,109
Rehire	252	-247	0	-5	N/A	0
Net transfers	0	92	0	0	0	92
Temporary annuity expired	N/A	N/A	NA	-2	-23	-25
Data adjustment	-1	1	0	10	30	40
Number as of December 31, 2018	31,285	17,575	0	21,393	4,184	74,437

** Includes members receiving disability benefits*

EXHIBIT F.1

Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended December 31, 2018		Year Ended December 31, 2017	
Net assets at market value at the beginning of the year		$4,554,018,287		$4,436,227,596
Contribution income:				
Employer contributions	$349,574,257		$261,763,635	
Employee contributions	138,399,727		134,764,920	
Administrative expenses	-6,638,608		-6,473,006	
Net contribution income		481,335,376		390,055,549
Investment income:				
Interest, dividends and other income	$103,222,011		$107,770,984	
Asset appreciation	-290,889,323		522,085,114	
Less investment fees	-17,307,390		-19,341,002	
Net investment income		-204,974,702		610,515,096
Other income:		0		5,393,581*
Total income available for benefits		$276,360,674		$1,005,964,226
Less benefit payments:				
Annuity payments	-$878,738,782		-$842,632,392	
Refund of contributions	-27,043,978		-33,830,051	
Disability payments	-10,415,725		-11,711,092	
Net benefit payments		-$916,198,485		-$888,173,535
Change in reserve for future benefits		-$639,837,811		$117,790,691
Net assets at market value at the end of the year		$3,914,180,476		$4,554,018,287

**OPEB income due to eliminating retiree health insurance subsidy for Fund staff members*

EXHIBIT F.2

Summary Statement of Income and Expenses on a Book Value Basis

	Year Ended December 31, 2018		Year Ended December 31, 2017	
Net assets at book value at the beginning of the year		$3,765,555,325		$3,816,295,757
Contribution income:				
Employer contributions	$349,574,257		$261,763,635	
Employee contributions	138,399,727		134,764,920	
Administrative expenses	-6,638,608		-6,473,006	
Net contribution income		481,335,376		390,055,549
Investment income:				
Interest, dividends and other income	$103,222,011		$107,770,984	
Realized investment gain/(loss)	171,621,718		353,553,991	
Less investment fees	-17,307,390		-19,341,002	
Net investment income		257,536,339		441,983,973
Other income:		0		5,393,581*
Total income available for benefits		$738,871,715		$837,433,103
Less benefit payments:				
Annuity payments	-$878,738,782		-$842,632,392	
Refund of contributions	-27,043,978		-33,830,051	
Disability payments	-10,415,725		-11,711,092	
Net benefit payments		-$916,198,485		-$888,173,535
Change in reserve for future benefits		-$177,326,770		-$50,740,432
Net assets at book value at the end of the year		$3,588,228,555		$3,765,555,325

**OPEB income due to eliminating retiree health insurance subsidy for Fund staff members*

EXHIBIT G
Summary Statement of Plan Assets

	Year Ended December 31, 2018		Year Ended December 31, 2017	
Cash equivalents		$499,871		$492,001
Accounts receivable:				
Employer contributions	$348,621,245		$260,306,200	
Member contributions	8,743,313		10,973,768	
Interest and dividends	12,702,046		12,121,538	
Investments sold	8,968,833		18,482,922	
Miscellaneous	737,379		819,751	
Total accounts receivable		379,772,816		302,704,179
Investments, at fair value:				
Equities	$1,957,384,313		$2,508,445,189	
Fixed income	899,456,519		986,491,904	
Real estate	408,489,873		431,421,604	
Short-term investments	128,644,859		169,027,392	
Private equity	165,224,281		200,760,945	
Total investments at market value		3,559,199,845		4,296,147,034
Invested securities lending collateral		121,892,297		243,632,186
Capital assets		150,143		30,500
Total assets		4,061,514,972		4,843,005,900
Less accounts payable:				
Securities lending collateral	-$121,892,297		-$243,632,186	
Investments purchased	-19,296,299		-38,450,544	
Accounts payable	-6,145,900		-6,904,883	
Total accounts payable		-$147,334,496		-$288,987,613
Net assets at market value		$3,914,180,476		$4,554,018,287
Net assets at actuarial value		$4,195,644,172		$4,456,771,744

EXHIBIT H

Development of the Fund Through December 31, 2018

Year Ended December 31	Employer Contributions*	Employee Contributions	Net Investment Return**	Administrative Expenses	Benefit Payments	Actuarial Value of Assets at End of Year
2009	$157,697,608	$130,980,605	($21,761,698)	$7,765,918	$632,864,176	$6,295,788,191
2010	164,302,005	133,299,542	76,825,912	6,744,947	660,081,098	6,003,389,605
2011	156,525,374	132,596,417	(37,170,409)	7,375,338	695,674,232	5,552,291,417
2012	158,380,709	130,266,293	(19,193,464)	6,841,486	741,583,194	5,073,320,275
2013	157,704,971	131,532,173	537,153,324	6,498,913	779,004,027	5,114,207,803
2014	158,797,631	129,971,981	450,561,553	6,567,842	807,673,694	5,039,297,432
2015	157,716,475	131,428,103	327,913,441	6,701,000	834,527,607	4,815,126,844
2016	157,444,029	130,390,848	361,858,504	7,056,784	867,397,200	4,590,366,241
2017	267,157,216***	134,764,920	359,129,908	6,473,006	888,173,535	4,456,771,744
2018	349,574,257	138,399,727	173,735,537	6,638,608	916,198,485	4,195,644,172

**Receivable amount to be paid the following year*

*** Actuarial investment return, net of investment fees*

****Includes other OPEB income of $5,393,581*

EXHIBIT I

Development of Unfunded Actuarial Accrued Liability

	Year Ending December 31				
	2018	2017	2016	2015	2014
1. Unfunded actuarial accrued liability at beginning of year*	$11,825,624,451	$10,464,982,455	$9,840,134,873	$7,285,291,571	$8,742,285,563
2. Normal cost at beginning of year*	229,786,056	246,761,737	255,682,691	233,177,207	253,748,078
3. Total contributions	-487,973,984	-396,528,555	-287,834,877	-289,144,578	-288,769,612
4. Interest					
(a) Unfunded actuarial accrued liability and normal cost	$843,878,736	$803,380,814	$757,186,317	$563,885,158	$674,702,523
(b) Total contributions	-4,762,064	-4,962,323	-4,801,261	-4,839,455	-10,633,094
(c) Total interest: (4a) + (4b)	839,116,672	798,418,491	752,385,056	559,045,703	664,069,429
5. Expected unfunded actuarial accrued liability: (1) + (2) + (3) + (4c)	$12,406,553,195	$11,113,634,128	$10,560,367,743	$7,788,369,903	$9,371,333,458
6. Changes due to (gain)/loss from:					
(a) Investments	$110,783,177	-$33,329,605	-$22,722,207	$29,330,715	-$86,701,165
(b) Demographics and other	95,633,772	-116,622,006	-72,663,081	-117,575,084	-8,634,360
(c) Total changes due to (gain)/loss: (6a) + (6b)	206,416,949	-149,951,611	-95,385,288	-88,244,369	-95,335,525
7. Change due to plan provisions	0	0	0	2,140,009,339	-1,990,706,362
8. Change in actuarial assumptions	0	861,941,934	0	0	0
9. Unfunded actuarial accrued liability at end of year*: (5) + (6c) + (7) + (8)	$12,612,970,144	$11,825,624,451	$10,464,982,455	$9,840,134,873	$7,285,291,571

** Includes pension and OPEB liabilities for years ended December 31, 2016 and earlier*

EXHIBIT J
Definitions of Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability For Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability For Pensioners:	The single-sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the Actuarially Determined Contribution.
Actuarial Gain or Actuarial Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., MEABF's assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:

a. Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)
b. Multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).

Actuarial Value of Assets: The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

Actuarially Determined: Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Actuarially Determined Contribution (ADC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Assumptions or Actuarial Assumptions: The estimates on which the cost of the Plan is calculated including:

(a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;

(b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;

(c) Retirement rates — the rate or probability of retirement at a given age;

(d) Withdrawal rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Closed Amortization Period: A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, as another measure of the Plan's health.
GASB:	Governmental Accounting Standards Board.
GASB 67 and GASB 68:	Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves. Governmental Accounting Standards Board Statements No. 67 and No. 68 are the successor statements to GASB Statements No. 25 and No. 27.
Investment Return:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.

Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount, or in relation to covered payroll, if the actuarial assumptions are realized.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	The actuarially accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
Unfunded Actuarial Accrued Liability:	The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1.	Pensioners as of the valuation date (including 4,184 beneficiaries)		25,577
2.	Members inactive during year ended December 31, 2018 with vested rights		2,014
3.	Members active during the year ended December 31, 2018		31,285
	Fully vested	14,678	
	Not vested	16,607	
4.	Other non-vested inactive members as of the valuation date		15,561

Determination of Actuarial Accrued Liability:

		Actuarial Present Value of Projected Benefits	Actuarial Present Value of Future Normal Costs	Actuarial Accrued Liability
1.	Active members			
	a. Retirement benefits	$6,885,364,929	$1,186,292,392	$5,669,072,537
	b. Death benefits	113,863,923	32,247,282	81,616,641
	c. Withdrawal benefits	689,327,907	485,929,959	203,397,948
	d. Total	$7,658,556,759	$1,704,469,633	$5,954,087,126
2.	Inactive vested members	$405,173,297	--	$405,173,297
3.	Inactive non-vested members	140,649,770	--	140,649,770
4.	Retirees and beneficiaries	10,308,704,123	--	10,308,704,123
5.	Total	$18,513,083,949	$1,704,469,633	$16,808,614,316

Determination of Unfunded Actuarial Accrued Liability:

1.	Actuarial accrued liability	$16,808,614,316
2.	Actuarial value of assets ($3,914,180,476 at market value)	4,195,644,172
3.	Unfunded actuarial accrued liability	$12,612,970,144

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

Components of normal cost:	Tier 1		Tier 2		Tier 3		Total	
	% of Payroll	Amount	% of Payroll	Amount	% of Payroll	Amount	% of Payroll	Amount
1. Retirement	9.89%	$116,510,045	5.52%	$22,772,998	6.39%	$12,429,542	8.50%	$151,712,585
2. Turnover	3.51%	41,354,008	2.73%	11,265,867	3.35%	6,527,559	3.31%	$59,147,434
3. Mortality	0.23%	2,727,383	0.25%	1,030,906	0.23%	453,071	0.24%	$4,211,360
4. Disability	0.75%	8,839,358	0.75%	3,095,296	0.75%	1,459,317	0.75%	13,393,971
5. Total normal cost: (1) + (2) + (3) + (4)	14.38%	$169,430,794	9.25%	$38,165,067	10.73%	$20,869,489	12.79%	$228,465,350
6. Total normal cost, adjusted for timing*	14.87%	175,260,576	9.57%	39,478,252	11.09%	21,587,568	13.23%	236,326,396
7. Administrative expenses	0.37%	4,381,153	0.37%	1,534,157	0.37%	723,298	0.37%	6,638,608
8. Total normal cost, including administrative expenses: (6) + (7)	15.24%	$179,641,729	9.94%	$41,012,409	11.47%	$22,310,866	13.60%	$242,965,004
9. Expected employee contributions**							-8.14%	-145,369,227
10. Employer normal cost: (8) + (9)							5.46%	$97,595,777
11. Employer normal cost, adjusted for timing***							5.65%	100,953,857

** Reflects timing adjustment to the middle of the year*

*** Based on payroll, adjusted to the middle of the year*

**** Reflects timing adjustment to the end of the year*

EXHIBIT II

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)
12/31/2009	$6,295,788,191	$10,830,119,369	$4,534,331,178	58.13%	$1,551,973,348	292.17%
12/31/2010	6,003,389,605	11,828,665,658	5,825,276,053	50.75%	1,541,388,065	377.92%
12/31/2011	5,552,291,417	12,292,930,124	6,740,638,707	45.17%	1,605,993,339	419.72%
12/31/2012	5,073,320,275	13,475,376,963	8,402,056,688	37.65%	1,590,793,702	528.17%
12/31/2013	5,114,207,803	13,828,920,032	8,714,712,229	36.98%	1,580,288,709	551.46%
12/31/2014	5,039,297,432	12,307,094,062	7,267,796,630	40.94%	1,602,977,593	453.39%
12/31/2015	4,815,126,844	14,647,114,971	9,831,988,127	32.87%	1,643,480,973	598.24%
12/31/2016	4,590,366,241	15,055,348,696	10,464,982,455	30.49%	1,646,939,238	635.42%
12/31/2017	4,456,771,744	16,282,396,195	11,825,624,451	27.37%	1,686,532,720	701.18%
12/31/2018	4,195,644,172	16,808,614,316	12,612,970,144	24.96%	1,734,595,691	727.25%

EXHIBIT III

Solvency Test

Actuarial Valuation Date	(1) Active and Inactive Member Contribution	(2) Retirees and Beneficiaries	(3) Active and Inactive Members (ER Financed Portion)	Actuarial Value of Assets	Portion (%) of Present Value Covered By Assets		
					(1)	(2)	(3)
12/31/2009	$1,610,503,053	$5,874,606,230	$3,569,183,317	$6,295,788,191	100.00%	79.75%	0.00%
12/31/2010	1,682,418,161	6,438,552,003	3,931,259,712	6,003,389,605	100.00%	67.11%	0.00%
12/31/2011	1,724,683,910	6,803,140,300	3,928,347,812	5,552,291,417	100.00%	56.26%	0.00%
12/31/2012	1,724,021,890	7,633,045,219	4,280,392,937	5,073,320,275	100.00%	43.88%	0.00%
12/31/2013	1,763,193,047	7,938,850,949	4,154,449,370	5,114,207,803	100.00%	42.21%	0.00%
12/31/2014	1,816,477,893	7,029,523,772	3,478,587,338	5,039,297,432	100.00%	45.85%	0.00%
12/31/2015	1,874,982,804	8,427,968,220	4,352,310,693	4,815,126,844	100.00%	34.89%	0.00%
12/31/2016	1,918,150,355	8,725,032,932	4,412,165,409	4,590,366,241	100.00%	30.63%	0.00%
12/31/2017	1,952,652,300	9,905,000,389	4,424,743,506	4,456,771,744	100.00%	25.28%	0.00%
12/31/2018	1,992,398,627	10,308,704,123	4,507,511,566	4,195,644,172	100.00%	21.37%	0.00%

EXHIBIT IV
Funded Ratio

A critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the Plan as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

The chart below depicts a history of the funded ratios for this plan using the actuarial value of assets, the market value of assets and the book value of assets.

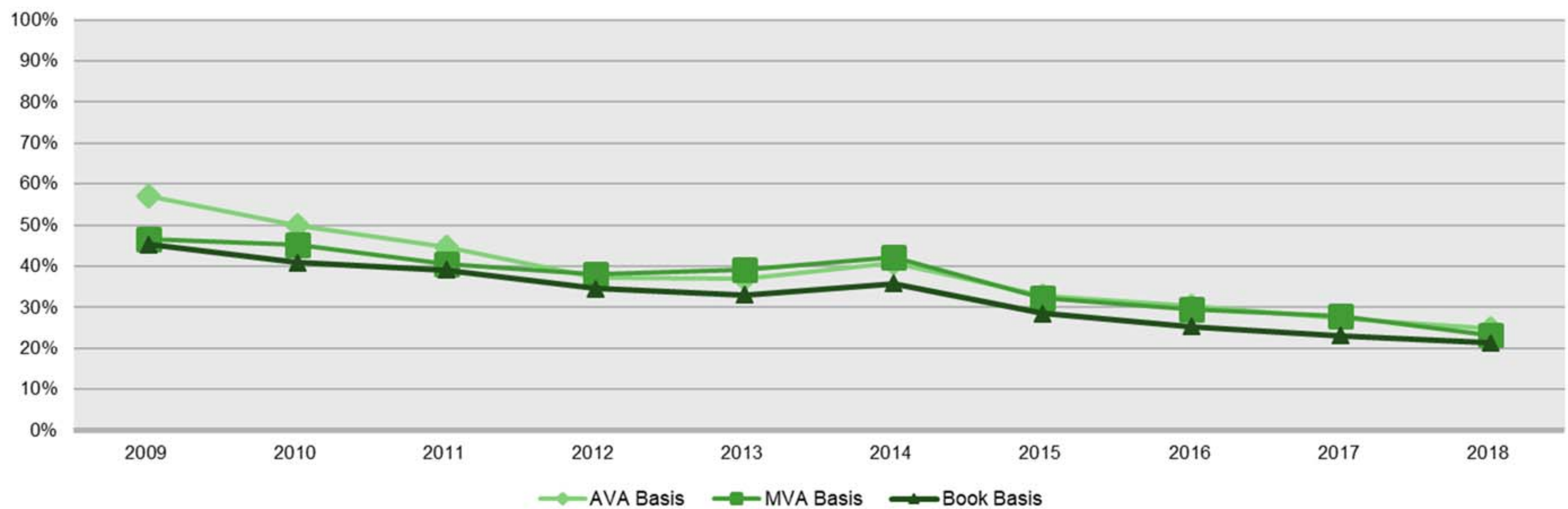


EXHIBIT V

Statutory Reserves as of December 31, 2018

The table below shows the statutory reserves as of December 31, 2018 as required by State statutes. The "New in 2018" columns on the left show the Reserves for members who started receiving a pension benefit during the year and the middle columns "Continuing from 2017" show the Reserves for members who were included in this exhibit last year that continued to receive a pension benefit during 2018.

	New in 2018			Continuing from 2017			Total		
	Annuity Payment Fund	Prior Service Fund	Total	Annuity Payment Fund	Prior Service Fund	Total	Annuity Payment Fund	Prior Service Fund	Total
Statutory Reserve*									
Retirees	$188,248,736	$412,452,585	$600,701,321	$1,621,136,221	$5,941,886,793	$7,563,023,014	$1,809,384,957	$6,354,339,378	$8,163,724,335
Future Surviving Spouses	37,061,557	19,803,140	56,864,697	377,406,523	463,558,583	840,965,106	414,468,080	483,361,723	897,829,803
Spouses**	21,190,566	16,906,518	38,097,084	182,140,336	160,818,921	342,959,257	203,330,902	177,725,439	381,056,341
Annual Benefits									
Retirees	$17,297,931	$24,389,717	$41,687,648	$201,756,621	$602,835,932	$804,592,553	$219,054,552	$627,225,649	$846,280,201
Future Surviving Spouses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spouses**	2,796,258	2,736,887	5,533,145	28,528,606	27,632,463	56,161,069	31,324,864	30,369,350	61,694,214

* *As required by State statutes, Statutory Reserves are calculated using the Combined Annuity Mortality Table with interest at 3.00 percent per annum, except for employees and spouses of employees who were participants on or before January 1, 1952, for whom the American Experience Table of Mortality with interest at 4.00 percent per annum is used.*

** *Surviving spouses also include reversionary annuitants.*

EXHIBIT VI

State Reporting Disclosure (40 ILCS 5/1A-110 (b)(5)(iv))

	2018	2017
Projected Unit Credit Accrued Liability (PUCAL)		
Payable to Retirees and Beneficiaries	$10,308,704,123	$9,905,000,389
Current Active and Inactive Employees:		
Accumulated Active and Inactive Employee Contributions	1,992,398,627	1,952,652,300
Payable to Vested and Non-Vested Employees	2,919,328,687	2,878,566,198
Total PUCAL	$15,220,431,437	$14,736,218,887
Net Assets Available for Benefits, Actuarial Value	$4,195,644,172	$4,456,771,744
Unfunded PUCAL (PUCAL in excess of assets)	$11,024,787,265	$10,279,447,143
Percent Funded	27.57%	30.24%
Unfunded PUCAL as Percent of Payroll	635.58%	609.50%
Payroll	$1,734,595,691	$1,686,532,720

EXHIBIT VII

Actuarial Reserve Liabilities as of December 31, 2018

	2018	2017
Accrued Liability for Active and Inactive Participants*	$6,499,910,194	$6,377,395,806
Reserves for:		
Service Retirement Pension	$9,178,317,200	$8,811,148,340
Future Spouses of Current Retirees	676,671,756	649,791,536
Surviving Spouse Pension	452,740,154	443,026,241
Child Annuitants	975,012	1,034,272
Total Accrued Liability	16,808,614,316	16,282,396,195
Actuarial Net Assets	4,195,644,172	4,456,771,744
Unfunded Actuarial Liabilities	$12,612,970,144	$11,825,624,451

* *Accrued liability for active participants includes retirement liability for members in ordinary or duty disability status. Liability for disability benefits is recognized as a one-year term cost of 0.75 percent of pay added to the normal cost.*

EXHIBIT VIII

50-Year Projection of Contributions, Liabilities, and Assets

Based on the results of the December 31, 2018, actuarial valuation, we have projected valuation results for a 50-year period.

For purposes of the projections, all assets, contributions, and benefit payments have been included. Our projections of contributions, liabilities, and assets are based on the actuarial assumptions, membership data and benefit provisions that were used for the regular actuarial valuation.

In order to determine projected contributions, liabilities, and assets, certain calculations need to be made that are not normally required in a regular actuarial valuation. Benefit payout requirements, actuarial liabilities, and payroll were estimated over the 50-year period from 2019 through 2067 by projecting the membership of the Fund over the 50-year period, taking into account the impact of new entrants into the Fund over the 50-year period.

To make the required projections, assumptions needed to be made regarding the age and salary distribution of new entrants as well as the size of the active membership of the Fund. The assumptions regarding the profile of new entrants to the Fund were based on the recent experience of the Fund with regard to new entrants. The size of the active membership of the Fund was assumed to remain constant over the 50-year projection period. The results of our projections are shown on the following pages.

EXHIBIT VIII (continued)

50-Year Projection of Contributions, Liabilities, and Assets

Based on the December 31, 2018 actuarial valuation.
(All dollar amounts are in thousands. Employer Contributions are shown on a cash basis in the fiscal year they are actually paid, not receivable.
Actuarial Liability and asset figures as of end of year.)

Fiscal Year	Employee Contributions	Employer Contributions (Cash Basis)	Pensionable Payroll	Normal Cost	Benefit Payouts	Estimated Expenses	Total Actuarial Liability	Market Value of Assets	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
2018	$138,400	$261,764	$1,735,904	$223,528	$916,198	$6,639	$16,808,614	$3,914,180	$4,195,644	$12,612,970	25.0%
2019	145,369	344,000	1,785,863	228,465	981,909	6,805	17,212,931	3,736,312	3,920,913	13,292,018	22.8%
2020	146,352	421,000	1,795,309	229,716	1,019,391	6,975	17,608,091	3,586,039	3,723,341	13,884,750	21.1%
2021	150,507	499,000	1,806,696	229,951	1,061,587	7,149	17,987,487	3,462,694	3,561,954	14,425,533	19.8%
2022	154,576	576,000	1,819,513	230,292	1,105,008	7,328	18,348,864	3,658,360	3,658,360	14,690,503	19.9%
2023	160,131	944,559	1,856,760	233,803	1,147,564	7,511	18,695,237	3,844,846	3,844,846	14,850,391	20.6%
2024	165,540	960,168	1,893,631	237,294	1,190,563	7,699	19,025,079	4,020,853	4,020,853	15,004,225	21.1%
2025	170,949	975,735	1,930,218	240,734	1,234,722	7,891	19,335,975	4,184,260	4,184,260	15,151,715	21.6%
2026	176,426	991,120	1,967,261	244,201	1,279,083	8,088	19,626,421	4,334,218	4,334,218	15,292,203	22.1%
2027	181,994	1,006,682	2,005,078	247,737	1,323,858	8,291	19,894,630	4,469,792	4,469,792	15,424,838	22.5%
2028	187,669	1,022,589	2,043,718	251,357	1,366,763	8,498	20,141,070	4,592,386	4,592,386	15,548,684	22.8%
2029	193,420	1,038,866	2,083,583	255,092	1,410,625	8,710	20,363,350	4,700,796	4,700,796	15,662,554	23.1%
2030	199,295	1,055,766	2,124,823	258,997	1,453,982	8,928	20,560,482	4,795,377	4,795,377	15,765,105	23.3%
2031	205,192	1,073,367	2,166,421	262,888	1,496,722	9,151	20,731,330	4,875,951	4,875,951	15,855,379	23.5%
2032	211,197	1,091,103	2,209,509	266,955	1,537,588	9,380	20,876,181	4,944,362	4,944,362	15,931,818	23.7%
2033	217,402	1,109,618	2,255,423	271,375	1,575,673	9,615	20,996,471	5,004,337	5,004,337	15,992,134	23.8%
2034	223,795	1,129,631	2,303,993	276,155	1,611,686	9,855	21,093,011	5,059,057	5,059,057	16,033,954	24.0%
2035	230,335	1,151,083	2,354,352	281,228	1,646,456	10,101	21,165,735	5,110,588	5,110,588	16,055,147	24.1%
2036	236,962	1,173,537	2,405,967	286,397	1,678,166	10,354	21,216,248	5,162,566	5,162,566	16,053,683	24.3%
2037	243,771	1,196,599	2,460,015	291,891	1,707,796	10,613	21,245,495	5,218,659	5,218,659	16,026,836	24.6%
2038	250,780	1,220,963	2,516,499	297,690	1,721,025	10,878	21,269,287	5,297,596	5,297,596	15,971,691	24.9%
2039	258,030	1,246,593	2,575,866	303,936	1,743,127	11,150	21,278,536	5,393,619	5,393,619	15,884,917	25.3%
2040	265,516	1,273,807	2,638,131	310,631	1,764,194	11,429	21,273,775	5,510,829	5,510,829	15,762,946	25.9%
2041	273,091	1,302,617	2,701,669	317,479	1,782,196	11,715	21,257,359	5,654,640	5,654,640	15,602,719	26.6%
2042	280,896	1,332,102	2,768,114	324,748	1,796,973	12,007	21,232,261	5,832,063	5,832,063	15,400,198	27.5%

EXHIBIT VIII (continued)

50-Year Projection of Contributions, Liabilities, and Assets

Based on the December 31, 2018 actuarial valuation.
(All dollar amounts are in thousands. Employer Contributions are shown on a cash basis in the fiscal year they are actually paid, not receivable.
Actuarial Liability and asset figures as of end of year.)

Fiscal Year	Employee Contributions	Employer Contributions (Cash Basis)	Pensionable Payroll	Normal Cost	Benefit Payouts	Estimated Expenses	Total Actuarial Liability	Market Value of Assets	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
2043	$288,955	$1,363,165	$2,837,534	$332,467	$1,808,165	$12,308	$21,202,063	$6,051,033	$6,051,033	$15,151,030	28.5%
2044	297,255	1,395,847	2,909,969	340,633	1,816,031	12,615	21,170,329	6,319,789	6,319,789	14,850,540	29.9%
2045	305,791	1,430,174	2,985,122	349,275	1,824,057	12,931	21,137,294	6,643,431	6,643,431	14,493,864	31.4%
2046	314,339	1,466,045	3,060,815	358,002	1,831,060	13,254	21,104,016	7,027,200	7,027,200	14,076,816	33.3%
2047	322,967	1,502,253	3,138,156	367,032	1,836,179	13,585	21,072,752	7,478,351	7,478,351	13,594,401	35.5%
2048	331,302	1,539,483	3,217,732	376,421	1,840,045	13,925	21,045,324	8,004,327	8,004,327	13,040,997	38.0%
2049	339,803	1,578,452	3,299,566	386,183	1,842,258	14,273	21,024,109	8,613,531	8,613,531	12,410,579	41.0%
2050	348,560	1,618,714	3,384,002	396,456	1,847,820	14,630	21,006,623	9,310,085	9,310,085	11,696,538	44.3%
2051	357,206	1,660,483	3,468,162	406,831	1,853,241	14,996	20,993,380	10,100,230	10,100,230	10,893,150	48.1%
2052	365,902	1,702,356	3,553,616	417,482	1,857,458	15,371	20,986,220	10,992,663	10,992,663	9,993,557	52.4%
2053	374,726	1,745,086	3,641,290	428,496	1,861,641	15,755	20,985,992	11,996,007	11,996,007	8,989,985	57.2%
2054	383,657	1,789,120	3,730,889	439,836	1,865,076	16,149	20,994,303	13,120,047	13,120,047	7,874,256	62.5%
2055	392,788	1,834,302	3,822,821	451,586	1,873,831	16,552	21,006,683	14,369,255	14,369,255	6,637,428	68.4%
2056	401,884	1,880,817	3,914,954	463,506	1,881,143	16,966	21,025,090	15,754,162	15,754,162	5,270,928	74.9%
2057	411,067	1,927,653	4,008,985	475,691	1,888,572	17,390	21,050,112	17,285,317	17,285,317	3,764,795	82.1%
2058	420,371	1,975,581	4,105,279	488,177	1,896,581	17,825	21,081,930	18,973,737	18,973,737	2,108,193	90.0%
2059	287,102	2,024,773	4,203,674	500,961	1,905,312	18,271	21,120,592	19,008,533	19,008,533	2,112,059	90.0%
2060	293,903	400,391	4,304,045	514,055	1,916,590	18,727	21,164,272	19,047,845	19,047,845	2,116,427	90.0%
2061	300,822	407,579	4,406,006	527,467	1,928,766	19,196	21,212,731	19,091,458	19,091,458	2,121,273	90.0%
2062	307,868	415,053	4,509,695	541,178	1,942,594	19,676	21,264,913	19,138,422	19,138,422	2,126,491	90.0%
2063	315,041	422,868	4,615,155	555,224	1,958,021	20,167	21,319,783	19,187,805	19,187,805	2,131,978	90.0%
2064	322,343	431,052	4,722,425	569,615	1,975,013	20,672	21,376,277	19,238,650	19,238,650	2,137,628	90.0%
2065	329,776	439,607	4,831,528	584,365	1,993,929	21,188	21,432,902	19,289,612	19,289,612	2,143,290	90.0%
2066	337,322	448,586	4,942,230	599,481	2,015,026	21,718	21,487,801	19,339,021	19,339,021	2,148,780	90.0%
2067	345,074	458,038	5,055,468	614,989	2,036,351	22,261	21,541,035	19,386,932	19,386,932	2,154,104	90.0%

EXHIBIT IX

Development of City Contribution Requirements

	Fiscal Year 2019	Projected Fiscal Year 2020	Projected Fiscal Year 2021	Projected Fiscal Year 2022	Projected Fiscal Year 2023	Projected Fiscal Year 2024
Preliminary Determination of City Contribution						
Projected Payroll	$1,785,862,736	$1,795,308,542	$1,806,695,552	$1,819,512,511	$1,856,759,793	$1,893,631,062
Statutory Contribution Rate	N/A	N/A	N/A	51.91%	51.71%	51.53%
Statutory City Contribution*	$421,000,000	$499,000,000	$576,000,000	$944,559,336	$960,167,618	$975,734,904
Actuarially Determined Contribution	$1,117,387,759	$1,172,603,405	$1,216,498,527	$1,256,415,644	$1,275,963,340	$1,287,177,622
Actuarial Accrued Liability at the Beginning of the Year	$16,808,614,316	$17,212,930,604	$17,608,090,746	$17,987,487,270	$18,348,863,633	$18,695,236,920
Actuarial Value of Assets at the Beginning of the Year	$4,195,644,172	$3,920,912,660	$3,723,340,820	$3,561,954,125	$3,658,360,261	$3,844,845,668
Funded Ratio	24.96%	22.78%	21.15%	19.80%	19.94%	20.57%

** Per Public Act 100-0023, city contributions are a specified amount for payment years 2018 through 2022, and the sum of employer normal cost and an amount determined as a level percent of payroll sufficient to bring the total assets of the Fund up to 90% of the actuarial accrued liability by the end of 2058 for all years thereafter. The city contributions are shown in the year that they will be booked. The contributions will be paid to the Fund in the following year.*

EXHIBIT X.1

Comparison of Employer Contribution to Actuarially Determined Contribution

Plan Year Ended December 31	Actuarially Determined Contributions (ADC)*	Actual Contributions**	Percentage Contributed
2009	$436,475,587	$157,697,608	36.1%
2010	506,902,840	164,302,004	32.4%
2011	634,559,144	156,525,374	24.7%
2012	705,454,416	158,380,709	22.5%
2013	834,398,482	157,704,971	18.9%
2014	848,864,496	158,797,631	18.7%
2015	686,373,727	157,716,475	23.0%
2016	970,112,414	157,444,029	16.2%
2017	1,005,456,621	261,763,635	26.0%
2018	1,049,915,647	349,574,257	33.3%
2019	1,117,387,759	--	--

** Prior to 2015, this amount was the Annual Required Contribution (ARC). Includes pension and OPEB.*
***Receivable amount to be paid the following year.*

EXHIBIT X.2

History of Active Member Valuation Data

Actuarial Valuation Date	Active Members	Percent Increase	Annual Salaries	Percent Increase	Average Salary	Percent Increase	CPI Chicago*
12/31/2009	31,586	(3.00)%	$1,551,973,348	0.52%	$49,135	3.63%	2.54%
12/31/2010	30,726	(2.72)%	1,541,388,065	(0.68)%	50,166	2.10%	1.23%
12/31/2011	31,976	4.07%	1,605,993,339	4.19%	50,225	0.12%	2.06%
12/31/2012	31,326	(2.03)%	1,590,793,702	(0.95)%	50,782	1.11%	1.68%
12/31/2013	30,647	(2.17)%	1,580,288,709	(0.66)%	51,564	1.54%	0.51%
12/31/2014	30,160	(1.59)%	1,602,977,593	1.44%	53,149	3.07%	1.48%
12/31/2015	30,683	1.73%	1,643,480,973	2.53%	53,563	0.78%	0.00%
12/31/2016	30,296	(1.26)%	1,646,939,238	0.21%	54,362	1.49%	1.86%
12/31/2017	30,922	2.07%	1,686,532,720	2.40%	54,542	0.33%	1.66%
12/31/2018	31,285	1.17%	1,734,595,691	2.85%	55,445	1.66%	1.07%
Average Increase/ (Decrease) Last 5 years		0.41%		1.88%		1.46%	1.21%

** CPI-Chicago as of the valuation date*

EXHIBIT X.3
History of Average Pension Benefit Payments to New Retirees[1]

Retirement Effective Date		Years of Service 10 - 14	15 – 19	20 – 24	25 – 29	30 & Over	Total
	Average Monthly Benefit at Retirement	$1,407	$1,790	$2,275	$3,255	$4,082	$2,969
2009	Average Final Average Salary	$4,664	$4,148	$4,406	$5,005	$5,209	$4,794
	Number of Active Recipients	57	75	153	92	231	608
	Average Monthly Benefit at Retirement	$1,334	$1,835	$2,215	$3,208	$4,354	$3,129
2010	Average Final Average Salary	$4,418	$4,311	$4,278	$4,945	$5,590	$4,933
	Number of Active Recipients	60	77	169	132	287	725
	Average Monthly Benefit at Retirement	$1,350	$1,981	$2,432	$3,459	$4,696	$3,361
2011	Average Final Average Salary	$4,261	$4,506	$4,661	$5,265	$6,046	$5,257
	Number of Active Recipients	66	88	193	185	311	843
	Average Monthly Benefit at Retirement	$1,295	$2,014	$2,391	$3,362	$4,506	$3,230
2012	Average Final Average Salary	$4,400	$4,893	$4,533	$5,094	$5,737	$5,125
	Number of Active Recipients	93	132	274	254	418	1,171
	Average Monthly Benefit at Retirement	$1,304	$1,998	$2,348	$3,259	$4,446	$3,065
2013	Average Final Average Salary	$4,456	$4,890	$4,314	$4,953	$5,668	$5,030
	Number of Active Recipients	104	106	204	216	290	920
	Average Monthly Benefit at Retirement	$1,169	$1,760	$2,290	$3,137	$4,350	$2,891
2014	Average Final Average Salary	$4,161	$4,528	$4,597	$4,877	$5,644	$4,921
	Number of Active Recipients	93	92	185	203	223	796
	Average Monthly Benefit at Retirement	$1,275	$1,959	$2,279	$3,405	$4,446	$3,048
2015	Average Final Average Salary	$4,439	$4,685	$4,387	$5,174	$5,724	$5,031
	Number of Active Recipients	68	119	171	180	227	765
	Average Monthly Benefit at Retirement	$1,347	$1,909	$2,350	$3,383	$4,795	$3,126
2016	Average Final Average Salary	$5,096	$4,836	$4,604	$5,199	$6,276	$5,306
	Number of Active Recipients	83	113	208	199	237	840
	Average Monthly Benefit at Retirement	$1,306	$1,938	$2,480	$3,687	$4,889	$3,273
2017	Average Final Average Salary	$4,734	$4,860	$4,841	$5,526	$6,293	$5,434
	Number of Active Recipients	91	122	197	247	245	902
	Average Monthly Benefit at Retirement	$1,551	$2,030	$2,741	$3,973	$5,285	$3,628
2018	Average Final Average Salary	5,590	$4,998	$5,247	$6,017	$6,854	$5,961
	Number of Active Recipients	82	126	167	201	272	848

[1] *This schedule excludes reciprocal annuities, money purchase annuities and minimum annuities.*

EXHIBIT X.4

History of Retirees and Beneficiaries by Type of Benefit

	Annuitants				Disability		Compensation	Reciprocal	
Valuation Date	Employee	Spouse	Child	Reversionary*	Ordinary	Duty	Annuitants**	Employee	Spouse
12/31/2009	15,838	4,008	167		306	220	2	2,407	356
12/31/2010	15,961	3,982	173		304	246	2	2,477	364
12/31/2011	16,230	3,910	164	129	346	264	2	2,583	364
12/31/2012	16,874	3,864	149	129	280	250	2	2,740	361
12/31/2013	17,320	3,844	141	138	227	213	2	2,793	363
12/31/2014	17,553	3,798	141	139	195	225	2	2,858	363
12/31/2015	17,697	3,757	118	134	187	213	2	2,887	369
12/31/2016	17,954	3,706	102	128	178	216	2	2,965	379
12/31/2017	18,113	3,633	114	124	162	211	2	3,024	374
12/31/2018	18,304	3,597	102	119	158	164	2	3,089	366

* *Prior to December 31, 2011, reversionary annuitants were included with spouse annuitants.*

** *Compensation annuitants also included with spouse annuitants.*

EXHIBIT X.5

History of Average Employee Retirement Benefits Payable

Valuation Date	Average Annual Benefit	Average Current Age of Retirees	Average Benefit at Retirement Current Year	Average Age at Retirement Current Year	Average Service Years at Retirement Current Year
12/31/2009	$29,960	72.8	$29,843	62.9	23.90
12/31/2010	31,046	72.8	31,290	62.2	24.25
12/31/2011	32,269	72.7	34,513	62.1	24.86
12/31/2012	33,423	72.6	33,508	62.7	24.81
12/31/2013	34,357	72.6	31,177	63.0	23.55
12/31/2014	34,532	72.7	29,775	62.5	23.35
12/31/2015	36,277	72.8	31,686	62.6	23.48
12/31/2016	37,243	72.9	32,000	62.0	23.50
12/31/2017	38,372	72.9	34,413	62.0	24.16
12/31/2018	39,559	73.0	37,678	62.2	24.45

EXHIBIT X.6

History of Annuities 2009 – 2018

Employee Annuitants (Male and Female)			
Valuation Date	**Number of Annuitants**	**Total Annuities**	**Average Annuities**
12/31/2009	18,245	$546,628,095	$29,960
12/31/2010	18,438	572,425,992	31,046
12/31/2011	18,813	607,077,636	32,269
12/31/2012	19,614	655,556,736	33,423
12/31/2013	20,113	691,021,680	34,357
12/31/2014	20,411	704,832,876	34,532
12/31/2015	20,584	746,717,052	36,277
12/31/2016	20,919	779,089,612	37,243
12/31/2017	21,137	811,061,417	38,372
12/31/2018	21,393	846,280,201	39,559

Surviving Spouse and Reversionary Annuities			
Valuation Date	**Number of Annuitants**	**Total Annuities**	**Average Annuities**
12/31/2009	4,364	$52,884,192	$12,118
12/31/2010	4,346	53,920,752	12,407
12/31/2011	4,403	54,594,060	12,399
12/31/2012	4,354	55,544,340	12,757
12/31/2013	4,345	57,041,916	13,128
12/31/2014	4,300	57,976,668	13,483
12/31/2015	4,260	58,481,052	13,728
12/31/2016	4,213	59,799,086	14,194
12/31/2017	4,131	60,199,042	14,573
12/31/2018	4,082	61,694,214	15,114

EXHIBIT X.7

History of Retirees and Beneficiaries Added to Payrolls 2009 – 2018

	Added to Payroll		Removed from Payroll		Payroll End of Year			
Valuation Date	Number	Annual Benefits*	Number	Annual Benefits	Number	Annual Benefits	Average Annual Benefit	Increase in Average Benefit
Employee Annuitants (Male and Female)								
12/31/2009	840	$39,821,463	768	$18,900,720	18,245	$546,628,095	$29,960	3.57%
12/31/2010	1,008	46,836,109	815	21,038,211	18,438	572,425,992	31,406	3.62%
12/31/2011	1,149	55,405,692	774	20,754,048	18,813	607,077,636	32,269	3.94%
12/31/2012	1,559	68,828,940	758	20,349,840	19,614	655,556,736	33,423	3.58%
12/31/2013	1,242	57,147,576	743	21,682,632	20,113	691,021,680	34,357	2.79%
12/31/2014	1,054	37,110,852	756	23,299,656	20,411	704,832,876	34,532	0.51%
12/31/2015	990	65,756,124	817	23,871,948	20,584	746,717,052	36,277	5.05%
12/31/2016	1,107	58,094,440	772	25,721,880	20,919	779,089,612	37,243	2.66%
12/31/2017	1,148	62,453,527	930	30,481,722	21,137	811,061,417	38,372	3.03%
12/31/2018	1,086	64,883,087	830	29,664,303	21,393	846,280,201	39,559	3.09%
Surviving Spouse and Reversionary Annuitants								
12/31/2009	266	$3,869,064	280	$2,939,460	4,364	$52,884,192	$12,118	2.12%
12/31/2010	269	4,329,156	287	3,292,596	4,346	53,920,752	12,407	2.38%
12/31/2011**	362	4,152,804	241	3,479,496	4,403	54,594,060	12,399	(0.06)%
12/31/2012	237	4,168,092	286	3,217,812	4,354	55,544,340	12,757	2.89%
12/31/2013	270	4,593,708	279	3,096,132	4,345	57,041,916	13,128	2.91%
12/31/2014	265	4,648,596	310	3,713,844	4,300	57,976,668	13,483	2.70%
12/31/2015	251	4,185,900	291	3,681,516	4,260	58,481,052	13,728	1.82%
12/31/2016	235	4,862,474	282	3,544,440	4,213	59,799,086	14,194	3.39%
12/31/2017	261	5,053,290	343	4,653,334	4,131	60,199,042	14,573	2.67%
12/31/2018	255	5,539,163	304	4,043,991	4,082	61,694,214	15,114	3.71%

* *Annual benefits added to payroll include post-retirement increase amounts.*

** *Number added in 2011 includes 121 reversionary annuitants that are also surviving spouses.*

EXHIBIT XI

Actuarial Assumptions and Actuarial Cost Method

Rationale for Assumptions:	The information and analysis used in supporting each assumption that has a significant effect on this actuarial valuation is shown in the Experience Review dated September 21, 2017, with a follow-up report dated March 12, 2018. Current data is reviewed in conjunction with each annual valuation.
Mortality Rates:	
Post-retirement:	The RP-2014 Healthy Annuitant Mortality Table, set forward two years for males and one year for females, projected generationally using scale MP-2016 (effective December 31, 2017).
Pre-retirement:	120% of the RP-2014 Employee Mortality Tables, projected generationally using scale MP-2016 (effective December 31, 2017). The mortality tables specified above were determined to reasonably reflect the mortality experience of the Plan as of the valuation date. The mortality table was then adjusted to future years using generational projection under scale MP-2016 to reflect future mortality improvements.

Termination Rates: These service-based rates are based on recent experience of the Fund (effective December 31, 2017).

Service	Rate (%)	Service	Rate (%)
0 - 0.99	17.00	12 - 12.99	4.25
1 - 1.99	16.00	13 - 13.99	4.00
2 - 2.99	14.00	14 - 14.99	3.75
3 - 3.99	12.00	15 - 15.99	3.50
4 - 4.99	10.00	16 - 16.99	3.25
5 - 5.99	8.00	17 - 17.99	3.00
6 - 6.99	7.00	18 - 18.99	2.75
7 - 7.99	6.50	19 - 19.99	2.50
8 - 8.99	6.00	20 - 20.99	2.25
9 - 10.99	5.00	21+	2.00
11 - 11.99	4.50		

Retirement Rates:

For employees first hired prior to January 1, 2011, rates of retirement are based on the recent experience of the Fund (effective December 31, 2017).

Tier 1:

	Age and Service-Based Retirement Rates							
Service	**50 - 54**	**55 - 59**	**60 - 64**	**65**	**66 - 67**	**68 - 69**	**70 - 79**	**80+**
10 - 11		0%	8%	40%	30%	30%	35%	100%
12 - 19		0%	8%	30%	15%	20%	22.5%	100%
20 - 24		8%	10%	30%	15%	20%	22.5%	100%
25 - 29		8%	10%	35%	22.5%	20%	22.5%	100%
30	20%	8%	15%	35%	22.5%	20%	22.5%	100%
31 - 32	20%	8%	15%	40%	22.5%	20%	30%	100%
33 - 34	25%	13%	15%	40%	22.5%	20%	30%	100%
35 - 39	25%	13%	15%	45%	22.5%	20%	30%	100%
40+	50%	50%	50%	50%	50%	50%	50%	100%

Tier 2:

For employees first hired on or after January 1, 2011 and before July 6, 2017, rates of retirement for each age from 62 to 80 were used (effective December 31, 2011).

Age	**Rate**
62	40%
63 - 69	20%
70 - 79	45%
80 +	100%

Tier 3: For employees first hired on or after July 6, 2017, rates of retirement for each age from 62 to 80 were used (effective December 31, 2017).

Age	Rate
60	40%
61 – 69	20%
70 – 79	45%
80 +	100%

Disability Benefit Valuation: Disability benefits are valued in normal cost as 0.75% of projected payroll (effective December 31, 2005).

Valuation of Inactive Participants: Inactive members with less than 10 years of service are assumed to take an immediate refund of his or her account balance. For inactive members with 10 or more years of service, the money purchase benefit is estimated by projecting the account balance (including employer contributions, when applicable) to the earliest retirement age. This estimated money purchase benefit is increased by 15% to account for the possibility that the minimum annuity formula is more valuable. For inactive members with 10 or more service and salary information available, the minimum annuity benefit is valued, if it is more valuable than the money purchase benefit.

Unknown Data for Participants: Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Spouse: 85% of members are assumed to be married, female spouses are assumed to be four years younger than male spouses, and 100% of spouses are assumed to be opposite gender (effective December 31, 1999).

Member Contributions: Based on payroll, adjusted to the middle of the year.

Net Investment Return: 7.00% per year, net of investment expense (effective December 31, 2017)

Inflation: 2.50% per year (effective December 31, 2017)

Salary Increases:

These service-based rates are based on the recent experience of the Fund (effective December 31, 2017).

Service	Rate for Years 2019 - 2022 (%)	Rate for 2023 and After (%)
0 - 0.99	6.50	7.75
1 – 1.99	5.50	7.25
2 – 2.99	4.50	6.75
3 – 3.99	3.50	6.25
4 – 4.99	3.25	5.75
5 – 5.99	3.00	5.25
6 – 6.99	2.75	4.75
7 – 7.99	2.50	4.50
8 – 8.99	2.25	4.25
9 – 9.99	2.25	4.00
10 – 25.99	2.25	3.75
26+	1.50	3.50

Administrative Expenses:

Equal to actual expenses for the prior year. For purposes of the 50-year projection, future administrative expenses are assumed to increase by 2.5% each year

Actuarial Value of Assets:

Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five - year period (effective December 31, 1999).

Actuarial Cost Method:

Entry Age Normal. Under this method, a normal cost is calculated for each employee that is the level annual contribution as a percent of pay required to be made from the employee's date of hire for as long as he/she remains active so that sufficient assets will be accumulated to provide his/her benefit. The accrued liability is the difference between the present value of all future benefits and the present value of all future normal costs.

EXHIBIT XII
Summary of Plan Provisions

This exhibit summarizes the major provisions of the Fund included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Membership:	Any employee of the City of Chicago or the Board of Education employed under the provisions of the municipal personnel ordinance or any person employed by the Municipal Employees' Annuity and Benefit Fund of Chicago who is not participating in any other pension fund or retirement system is covered by the Fund. Current and former employees of the Chicago Housing Authority and the Public Building Commission who have service in this Plan or who reinstate service in this Plan, may elect to participate in this Plan with respect to their employment with the Chicago Housing Authority or the Public Building Commission under certain circumstances.
Tiers:	Tier 1: First hired before January 1, 2011 Tier 2: First hired from non-reciprocal Fund on or after January 1, 2011 and before July 6, 2017 Tier 3: First hired on or after July 6, 2017 or former Tier 2 members that elected to make a one-time irrevocable election to switch to Tier 3 ("elective" Tier 3)
Employee Contributions:	Tier 1 and Tier 2 members of the Fund are required to contribute 8.5% of pensionable salary to the Fund as follows: 6.5% for the employee's retirement annuity, 1.5% for the spouse's annuity, and 0.5% for the automatic increases in the retirement annuity. Tier 3 members of the Fund are required to contribute 11.5% of pensionable pay. However, member contribution rate will be the normal cost rate, if less than 11.5%, but not lower than 8.5%. Once the Fund reaches 90% funded, the member contribution rate will be lowered to 7.5% and remain at 7.5% unless the funded ratio drops below 75%.

Final Average Salary:

For Tier 1 members, the final average salary is the average salary of the highest four consecutive years within the last 10 years of service prior to retirement.

For Tier 2 and Tier 3 members, the final average salary is the average pensionable salary of the highest eight 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% or ½ of the change in CPI-U, not less than zero. For 2018, the salary limit was $113,645.

Employee Retirement Annuity:

Money Purchase Formula

Eligibility

Tier 1, the earlier of:

- Age 60 and in active employment
- Age 55 and 10 years of service

Tier 2: Age 62 and 10 years of service

Tier 3: Age 60 and 10 years of service

Amount

The annuity is based on all employee and City contributions. However, for Tier 1 members who retire before age 60 with less than 20 years of service, the annuity is based on employee contributions plus 1/10th of the City contributions for each year of service over 10.

Maximum is 60% of highest salary.

Minimum Annuity Formula

Eligibility

Tier 1, the earlier of:

- Age 60 and 10 years of service
- Age 55 and 20 years of service
- Age 50 and 30 years of service

Tier 2: Age 62 and 10 years of service

Tier 3: Age 60 and 10 years of service

Amount	The annuity is equal to 2.4% for each year of service times final average salary. For Tier 1 members under age 60 with less than 25 years of service, the annuity is reduced by 0.25% for each month that the member is under age 60. For Tier 2 members under age 67, the annuity is reduced by 0.50% for each month that the member is under age 67. For Tier 3 members under age 65, the annuity is reduced by 0.50% for each month that the member is under age 65. Maximum is 80% of final average salary.
Post-Retirement Increase:	Tier 1: An employee annuitant is eligible to receive an annual increase of 3% of the current payable annuity (compound). This increase begins in January of the year of the first payment date following the earlier of: 1) the later of the third anniversary of retirement or age 53, or 2) the later of the first anniversary of retirement or age 60 Tier 2 and Tier 3: An employee annuitant or surviving spouse who is eligible to receive an increase in annuity benefit, shall receive an annual increase equal to the lesser of 3% or ½ of the annual unadjusted percentage increase in the Consumer Price Index-U. The increase is based on the amount of the originally granted benefit (simple). This increase begins in January of the year of the first payment date following the later of: 1) the attainment of age 67 for Tier 2 members or age 65 for Tier 3 members, or 2) the first anniversary of the annuity start date

Reversionary Annuity:	An employee may elect to reduce his or her annuity by an amount less than or equal to $400 to provide a reversionary annuity for a spouse, parent, child, brother, or sister, to begin upon the employee's death. The election must be made before retirement and have been in effect one year prior to death. The one-year requirement is waived if the beneficiary is the employee's spouse. The death of the employee before retirement voids this election. The reversionary annuity for a spouse when added to the spouse's annuity cannot exceed 100% of the employee's reduced annuity. The amount of the monthly reversionary annuity is determined by multiplying the amount of the monthly reduction in the employee's annuity by a factor based on the age of the employee and the difference between the ages of the employee and the reversionary annuitant at the start date of the employee's annuity.
Elected City Officer's Optional Plan:	An alternative plan for elected officials of 3% of final salary for the first eight years, 4% for the next four years, and 5% thereafter, subject to an 80% maximum, is available. The elected official must contribute an additional 3% of salary to receive these benefits. This plan also includes alternative widow and disability benefit formulas. This plan became effective upon approval from the IRS on September 17, 1991. Public Act 100-0023 closed this Plan to officers elected after July 6, 2017.
Spouse Annuity:	The surviving spouse annuity is the greater of the annuity under the money purchase formula or the minimum annuity formula. Surviving spouses who remarry on or after September 4, 2000, will not have their annuities terminated.
Money Purchase Formula	When an employee retires, the spouse's annuity is fixed, based on employee and City contributions for the spouse's annuity and a joint life age factor. If the employee dies in service, the spouse's annuity is based on all contributions. For 3% annuities fixed on or after August 1, 1983, the "Combined Annuity Mortality Table" shall continue to be used; however, surviving spouse's single life annuities and reversionary annuities shall be computed using the best factor (the factor producing the highest annuity), without regard to gender.

Minimum Annuity Formula	If the employee retires or dies in service and is at least age 55 with 20 or more years of service, or is at least age 50 with 30 or more years of service, the spouse's annuity is equal to half the amount of the annuity the employee was entitled to receive at the time of retirement or death in service. This annuity must be reduced by 0.25% for each month the spouse is under age 55 (or age 50 if the employee had at least 25 years of service) at the time the employee retires or dies in service. If the employee dies while receiving a retirement annuity, the spouse is eligible for an annuity of one half of the employee's annuity at death. This annuity is reduced by 0.25% for each month the spouse is under age 55 (or age 50 if the employee had at least 25 years of service) at the time of the employee's death. If the employee dies in service with at least 10 years of service, the spouse is entitled to an annuity of half of the minimum formula annuity earned and accrued to the credit of the employee at the date of death. This annuity is not reduced due to the age of the employee or spouse. The spouse is eligible for this annuity only if the marriage was in effect for at least 10 years. The spouse will receive a minimum annuity of $800 per month if the employee retires with at least 10 years of service or dies in service with at least five years of service. For Tier 2 and Tier 3 members, the annuity payable to the surviving spouse is equal to 66 2/3% of the participant's accrued retirement annuity without a reduction due to age.
Child Annuity:	A child's annuity is provided for an unmarried child of a deceased employee who is under the age of 18, if the child was born before the withdrawal from service. The annuity is $220 per month while the spouse of the deceased employee is alive and $250 per month if the spouse is deceased.

Ordinary Disability Benefit:	This benefit is granted for disabilities incurred other than in performance of an act of duty and is 50% of salary as of the last day worked. The first payment shall be made one month after the disablement occurs provided the employee is not then in receipt of salary. Length of time on disability is limited to a maximum of 25% of the employee's total service or five years, whichever occurs first. The Fund contributes salary deductions for annuity purposes for the ordinary disability benefit. Such amounts contributed by the Fund after December 31, 2000, while the employee is receiving ordinary disability benefits, are not refundable to the employee and will be used for annuity purposes only.
Duty Disability Benefit:	Any employee who becomes disabled as the result of an injury incurred in the performance of any act of duty has a right to receive a duty disability benefit in the amount of 75% of salary at date of injury, plus $10 a month for each unmarried child less than age 18. Child's duty disability benefit is limited to 15% of the employee's salary as of the date of injury. Duty disability benefits begin one day after the later of the last day worked or the last day paid. If the disability has resulted from any mental disorder, physical defect or disease which existed at the time such injury was sustained, the duty disability benefit shall be 50% of salary at date of injury. Disablement because of heart attacks, strokes, or any disablement due to heart disease shall not be considered the result of an accident suffered in the performance of duty. However, the employee will receive service credit and the City will contribute salary deductions for annuity purposes if the employee is receiving Workers' Compensation. A duty disability benefit is payable to age 65 if the disability benefits begin before age 60. For an employee who begins disability on or after age 60, disability benefits will continue for five years. A duty disability benefit which continues for more than five years and which starts before the employee's age 60, will be increased by 10% on January 1st of the sixth year. The City contributes salary deductions for annuity purposes for the duty disability benefit. Such amounts contributed by the City after December 31, 1981, while the employee is receiving duty disability benefits, are not refundable to the employee and will be used for annuity purposes only.

Refunds:	Tier 1: An employee who resigns before age 55, or before age 60 with less than 10 years of service, is entitled to all salary deductions accumulated with interest to date of resignation, plus the 0.50% deducted for annuity increase purposes without interest. Tier 2 and Tier 3: An employee who resigns before age 62 (or age 60 for Tier 3) without regard to length of service, or who resigns with less than 10 years of service regardless of age, is entitled to all salary deductions accumulated with interest to date of resignation, plus the 0.50% deducted for annuity increase purposes without interest. All Tiers: Amounts contributed by the employee, excluding the 0.50% deductions for annuity increase, that have not been paid out as annuity are refundable to the employee's estate with interest to the date of retirement or death, if the employee died in service. If the annuity of an employee or spouse is less than $800 a month, the employee or spouse may elect to receive a refund in lieu of an annuity. If unmarried at the time of retirement, the employee is entitled to a refund, with interest, of contributions made for the spouse's annuity.
Plan Year:	January 1 through December 31

EXHIBIT XIII

Legislative Changes in Plan Provisions

1979 Session

SB 964

- Disability benefit for chronic alcoholism, pregnancy, or childbirth.

HB 1023

- Reciprocal Act: changes proportionate pension credits under the "alternative formula."

HB 2012

- Under IRS Code Section 414(h), employer may pick up the employee contributions for all compensation earned after December 31, 1980, by a reduction in the cash salary or an offset to a future salary increase or by a combination of both.

1980 Session

HB 3635

- Reversed all changes made by HB 2012 and put the pick-up section as a new paragraph; they are treated as employee contributions for all purposes, including refunds and determination of the tax levy.

Spring 1981 Session

SB 21

- Actuarial Reporting Standards.

SB 851

- Authorizes investments in conventional mortgage pass-through securities.

SB 879

- Financial statement required by Department of Insurance within 6 months and actuarial statement within 9 months; $100 penalty per day if late.

HB 212

- Eliminates refund of City contributions made while an employee is receiving duty disability benefits.

HB 213

- $200 refund in lieu of annuity.

HB 215

- Authorizes securities lending.

Spring 1982 Session

SB 1147

- Minimum reporting and actuarial information for 1984.

SB 1180

- Board of Education may incur an obligation to "pick up" employee contributions. These contributions may be paid by a special Pension Contribution Liability Tax. If levied, no payment is required until actual collection of the tax.

SB 1452

- Provides that an active member of the General Assembly who was employed by the City of Chicago by temporary appointment or in an exempt position, and could have elected to participate in the Fund but did not so elect, may establish credit for such service by making the required contribution.

SB 1579

- Expanded fiduciary standards, prohibited transactions, civil action may be brought by Attorney General or by a participant; list of permitted investments moved to general section of the statute.

HB 740

- Pension credit may be established for services rendered for a transportation system operated by a public utility prior to the establishment of the CTA.

HB 2286

- Allows persons who withdrew from service or became eligible for survivors' benefits in 1981 and who receive a monthly annuity between $100 and $200 to elect a refund in lieu of annuity.

Spring 1983 Session

SB22

- Delegation of investment authority restrictions.

HB 380

- Maximum survivor annuity from $400 to $500; 10% increase in duty disability benefit January 1 of the sixth year.

HB 514

- 10% prudent person investment category.

HB 637

- Allows an active member of the General Assembly to establish credit in this fund for time for which he or she could have elected to participate with interest at 6% and to transfer credits to the Park Fund.

HB 1144

- Revises provision allowing a person who withdrew from service or began receiving a widow's annuity in 1981 to elect to receive a refund in lieu of annuity by extending the deadline for election by one year to March 1, 1984, and by raising the amount subject to refund to $250 per month.
- 3% post-retirement annuity increase for those who qualify.
- Mandatory coverage for all employees in temporary positions.
- Reversionary annuity revisions - table of factors.
- Credit for Executive Director of Chicago Land Clearance Commission or Chicago Dwellings Association or for service as administrator of Illinois--Indiana Bi-State Commission--if certain contributions are made before April 1, 1984.

Federal Law and Regulation or Supreme Court Decision

- For an employee under the age of 70 who commences disability on or after attainment of age 60 in service, the ordinary disability benefit payments shall not exceed in the aggregate throughout the employee's service a period equal to 1/4 of the total service rendered prior to the date of the disability but no more than five years or age 70, whichever is earlier. The duty disability payments shall be payable for a period of five years or age 70, whichever occurs first.
- For 3% annuities fixed on or after August 1, 1983, the "Combined Annuity Mortality Table" shall continue to be used; however, widows' single life annuities and reversionary annuities shall be computed using the best factor (the factor producing the highest annuity, not depending upon sex).

1984 Session

- Illinois Public Employees' Pension Laws Commission abolished.

1985 Session

HB 561

- 1.80, 2.00, 2.20, 2.40% benefit accrual rate for those born before January 1, 1936, and retiring after July 18, 1985.
- Reduction in age discount factor (employee and widow) from 0.5% to 0.25% for employees born before January 1, 1936, and retiring after July 18, 1985.
- Health insurance supplement up to $25 per month if the employee is age 65 or older with at least 15 years of service (for each employee annuitant in receipt of annuity and for each employee who retires on annuity in the future).
- Disability provisions extended to age 70 in certain cases.

- Unisex money purchase factors for widows/widowers.
- Membership provisions extended to age 70.
- Board of Education employee contribution "pick up" included in the definition of salary for contribution and benefit purposes (retroactive).

1986 Session

HB 2630

- Beginning for retirement or death in service on or after January 23, 1987, the spouse dollar cap is eliminated.
- Beginning for retirement on or after January 1, 1987, the first annuity increase will begin on the first annuity payment date following the first anniversary of retirement or age 60 if later.

1987 Session

HB 2715

- 1.80, 2.00, 2.20, 2.40% benefit accrual rates for those born on or after January 1, 1936, and retiring on or after January 1, 1988.
- Reduction in an age discount factor (employee and widow) from .5% to .25% for employees born on or after January 1, 1936, and retiring or dying in service on or after January 1, 1988. No discount for employee age less than 60 if employee has at least 35 years of service.
- Minimum employee annuity of $250 and minimum spouse of $200 under certain conditions.
- Elimination of cap on maximum widow's annuity for spouses of certain retired employees with repayment of any "excess spouse" refund.
- Change amount of children's benefits to $120 or $150, effective January 1, 1988.
- Provides for certain "Good Government" initiatives.

1988 Session

- No legislative changes.

1989 Session

SB 95

- Signed August 23, 1989. Changed the amount of fund paid health insurance "supplement" from January 1, 1988 until December 31, 1992 to $65 per month for each annuitant not qualified to receive Medicare benefits (and $35 if qualified) and from January 1, 1993 until December 31, 1997 the amounts are $75 and $45, respectively. Widows will now be supplemented and employee annuitants will no longer be required to meet the age 65 and 15 years of service requirements. The City will be required to pay 50% of the aggregated cost of health care claims for the retired group under all health care plans offered by the City. A procedure was established for the City to determine, with the help of an independent actuary, the aggregate cost of claims and premiums for each calendar year from 1989 through 1997 for the retired group.

HB 332

- Signed August 23, 1989. Eliminated age-related discriminatory provisions as required by Federal law or regulation. Provided for Age Discrimination changes effective January 1, 1988 to eliminate age 65 requirements for marriage in service and children's benefits, provided contributions after age 65 for spouse benefits, provided employee accumulation annuities be computed after age 70, provided employee and spouse accumulation annuities not be "fixed" at age 65, provided no age 70 restriction on disability benefits, provided for active members over age 65 that their accounts be "unfixed" and accumulate interest until the date of withdrawal, and provided that there be no age 70 membership limitation and removed the permitted "no spouse" refund at age 65.
- Allow for local labor officials on a leave of absence from the Fund to contribute for their service as a local labor official.

1990 Session

SB 136

- Amends Chapter 120, Paragraph 671 of the Revenue Act to provide for a separate listing on the tax bill of the dollar amount of tax due from the person assessed which is allocable to a tax levied under the Illinois Pension Code, or any other tax levied by a municipality or township for public pension or retirement purposes. Effective January 1, 1990.

SB 1951

- Signed January 14, 1991. Beginning for withdrawals on or after January 1, 1991, annuity payments will be made as of the first day of the calendar month during the annuity payment period.
- 2.2% benefit accrual rate for employees retiring on or after July 1, 1990.
- No discount for employee age less than 60 if employee has at least 30 years of service and retires on or after July 1, 1990.
- Minimum employee annuity of $350 and minimum spouse of $300 under certain conditions.

- Spouses and widows of employees retiring or dying in service on or after July 1, 1990 with 20 or more years of service at age 55 or over will be eligible for half of the employee's annuity discounted .25% for each month the spouse or widow is less than 55.
- Retroactive eligibility for 35 years no discount and spouse and widow annuities computed as half of employee annuity.
- Refund in lieu of $300 annuity.
- Disability benefit retroactive one year from application; duty disability deductions in lieu for heart attack or stroke.
- An alternative plan for elected officials of 3% of salary for the first 8 years, 4% for the next 4 years and 5% thereafter, subject to a maximum of 80%, is available. The elected official must contribute an additional 3% of salary to receive these benefits. This plan also includes alternative widow and disability benefit formulas. This plan will become effective upon approval from the IRS.
- Collateral for securities lending expanded.
- Fractional payment for refund repayment and temporary service authorized. Credit established by fractional payment shall be earliest service for which credit may be established.

1991 Session

HB 971

- Signed November 19, 1991. Eligibility for the alternative plan for elected officials was extended to persons who hold office as a City officer on April 30, 1991 until 30 days after the date the plan takes effect, notwithstanding the ending of his term of office prior to that effective date.

1992 Session

SB 1650

- Signed January 25, 1993.
- Transfer provisions for County elected officers and judges.
- Early Retirement Incentive was created for withdrawals from December 31, 1992 to June 30, 1993.
  - Requires a total of 20 years of service (with at least 10 in this fund, 5 in a Reciprocal fund and up to 5 purchased under ERI).
  - Requires age 55 or older.
  - Requires an election form to be filed before June 1, 1993.
  - Retired under this Article.
  - Provides for elimination of the age discount for employees 55-60.
  - Provides for 80% maximum final average salary compared to the present 75%.

- Provides for an optional purchase of up to five years of service credit for 4.25% of the November 1, 1992 salary.
- Provides for a 24-month option to pay for ERI service.
- Provides for a tax levy derived from ERI contributions.

1993 Session

- No legislative changes.

1994 Session

- No legislative changes.

1995 Session

SB 114

- Approved July 14, 1995.
- The amount of earnings that may be taken into account by any retirement system is limited to the maximum dollar limitation specified in Section 401(a)(17) of the Internal Revenue Code, except for persons who became Members before 1996.
- The Plan is authorized to make certain involuntary distributions required by Section 401(a)(9) of the Internal Revenue Code.

SB 424

- Approved July 7, 1995.
- The Pension Laws Commission was created as a legislative support services agency.

1996 Session

SBJPA

- On August 20, 1996, the Small Business Job Protection Act was signed by President Clinton.
- Treatment of governmental plans under Code Section 415:
  - Rule limiting annual benefit to 100 percent of the average of the highest three-year compensation no longer applies.
  - Excess benefit plans are permitted to provide Members with benefits in excess of the Code Section 415 limits.
  - Early retirement reduction does not apply to certain survivor and disability benefits.
  - The definition of compensation now includes elective deferrals.
  - Taxation of distributions:
    - $5,000 death benefit exclusion was repealed for deaths after August 20, 1996.

- Five-year averaging for lump sum distributions was repealed effective January 1, 2000.
- Annuity payments will be taxed according to a simplified general rule, which uses investment and age as of annuity starting date for annuities, which start on or after November 19, 1996.

1997 Session

HB 15

- Approved June 27, 1997.
- For withdrawals from service occurring on or after July 1, 1990, an alternate method of calculating salary using the annual equivalent of average salary instead of the salary rate applicable for the greatest part of the year is allowed.
- Annuities effective on or after January 1, 1998, will be payable on the first day of the calendar month.
- The prudent person rule for investing is allowed.
- An eligible employee is allowed to contribute for all periods of temporary service while still in City service, for up to 90 days after withdrawal from City service, or while in reciprocal service.
- The Board is allowed to adopt rules prescribing the manner of repaying refunds and purchasing any optional credit including accepting rollovers for payments.
- The City is allowed to use deposits from any legal source (including borrowing) in lieu of all or part of the tax levy on or after June 27, 1997.

HB 313

- Approved June 27, 1997. For withdrawals from service occurring on or after June 27, 1997, an employee (or surviving spouse) age 50 or over with at least 30 years of service is eligible to receive an annuity based on the minimum annuity formula.
- For withdrawals from service occurring on or after June 27, 1997, an employee under age 60, with at least 25 years of service, is not subject to an age discount.
- The surviving spouse of a retiree dying on or after June 27, 1997, while receiving an annuity is eligible for one-half of the employee's annuity at death, discounted for spouse's age under 55 at the time of employee's death.
- Beginning June 27, 1997, employees already receiving annuity will receive a minimum annuity of $550 for life (reciprocal annuitants must have at least five years of Municipal service). Any future employee annuitant withdrawing from service after attainment of age 60 with 10 or more years of service would qualify for this minimum.
- Beginning June 27, 1997, widow(er)s already receiving annuity will receive a minimum annuity of $500 for life (reciprocal annuitants must have at least five years of Municipal service). For future spouses of retirees, 10 years of service is required. For spouses of employees dying in service in the future, five years of service is required.

- Beginning June 27, 1997, the child's annuity will be increased to $220 per month if the spouse of the deceased employee parent survives or $250 per month if no such spouse survives.
- Coverage in the City group health insurance is extended through June 30, 2002, with some modification in the plans offered. Pension plan supplement remains $45 and $75 for Medicare eligible and non-Medicare eligible annuitants respectively.
- Spouses of employees dying in service after age 50 on or after June 27, 1997, will be eligible to receive 50 percent of the annuity that the employee would have received. This annuity will be reduced by 0.25 percent per month for each month that the spouse is below the age of 55.
- Spouses of employees dying after retirement on or after June 27, 1997, will be eligible to receive 50 percent of the employee's annuity at death. This annuity will be reduced by 0.25 percent per month for each month that the spouse is below the age of 55.

HB 1641

- Approved August 22, 1997.
- Beginning August 22, 1997, for surviving spouses of employees who retired or died in service before January 23, 1987, the previous $300, $400, or $500 maximum spouse annuity limitation is removed. If an excess spouse refund was paid, it must be repaid with interest.
- Service paid under Section 8-230 can be counted for ordinary disability purposes for periods of disability on or after August 22, 1997.
- Early Retirement Incentive was created for withdrawals from December 31, 1997, to June 30, 1998.
  - Requires an election form to be filed before June 1, 1998.
  - Requires a member to be a current contributor on November 1, 1997, and have not previously retired under this Article.
  - Provides for elimination of the age discount for employees age 55 to 60.
  - Provides for 80 percent maximum final average salary compared to the present 75 percent.
  - Provides for an optional purchase of up to five years of service credit for 4.25 percent of the November 1, 1997, salary.
  - Provides for a 24-month option to pay for ERI service.
  - Provides for a tax levy derived from ERI contributions.

1998 Session

HB 3515

- Approved August 14, 1998.

- Beginning January 1, 1999, the automatic increase for employee annuitants changed to 3.00 percent compounded for all past, current, and future annuitants regardless of the effective date of the annuity. Term annuities are not eligible for the increase.
- Employees withdrawing after January 1, 1999, will be eligible for the minimum formula upon attainment of age 60 if they have at least 10 years of service.
- Beginning January 1, 1999, employees already receiving an annuity as of August 14, 1998, will receive a minimum annuity of $850 for life (reciprocal annuitants must have at least five years of Municipal service). Any future employee annuitant withdrawing from service after August 14, 1998, after attainment of age 60 with 10 or more years of service would qualify for this minimum.
- Beginning January 1, 1999, widow(er)s already receiving annuity as of August 14, 1998, will receive a minimum of $800 for life (reciprocal annuitants must have at least five years of Municipal service). For future spouses of retirees dying after August 14, 1998, 10 years of service is required. For spouses of employees dying in service after August 14, 1998, five years of service is required.
- The conditions of the reversionary option were changed as follows:
  - The nullification of reversionary payment due to employee dying was reduced to 365 days after written designation was filed with the board and now applies only to parents, children, and siblings (not spouses).
  - Employees may reduce their monthly annuity by as much as $400.
  - The increased annuity for spouse may now be as much as 100 percent of the reduced employee annuity.
- Spouses and widows that are eligible for the "50 percent employee amount" will no longer have this amount reduced for under age 55 if the employee dies on or after January 1, 1998, and withdrew from service on or after June 27, 1997, and the employee retired after age 55 with at least 25 years of service or after age 50 with at least 30 years of service. The age discount will only apply if the spouse is under age 50.
- The child of an annuitant who withdraws after January 1, 1998, having attained age 50 with at least 30 years of service is eligible for a child annuity upon the death of the annuitant.
- The required employer multiple has been set at 1.25 for 1999 and beyond.
- Money deposited under 5/8-173(f) may be used by the plan for any of the purposes for which the proceeds of the tax levied by the city under this section may be used.
- An employee or former employee may pay and receive credit for all periods of full-time employment by the Public Building Commission as long as they are not receiving credit for the same service from another retirement system. Employee must pay employee and employer contributions based on the salary received from the Public Building Commission for employment. Repayment must be made before annuity begins.

- Annuitants may authorize a portion of their annuity to be withheld for payment of dues to the labor organization by which they were represented. A minimum of 25 annuitants must choose an organization for it to be included in this plan.

HB 1612

- Effective July 1, 1999, Qualified Illinois Domestic Relations Orders were recognized.

1999 Session

- No Changes.

2000 Session

HB 1583

- Approved July 6, 2000.
- An employee or widow whose annuity would amount to less than $800 per month may elect to receive a refund in lieu of annuity. Formerly, only employees and widows whose annuity would be less than $300 per month could choose a refund.
- The reversionary annuity tables have been extended down to age 50 from age 55 to comply with the change in the law allowing retirement at age 50 with 30 years of service.
- The Board is allowed to pay an annuity (if the person qualifies) directly to a Medicare approved, State certified nursing home or to a publicly owned and operated nursing home, hospital, or mental institution. Each person must qualify under the provisions of this amendment.
- Annuities of widows who remarry on or after the date 60 days after the effective date of this amendment would not be terminated upon remarriage.
- For annuities effective before January 1, 1998, all annuity payments will be made on the first day of the calendar month, for the entire month without proration.

2001 Session

EGTRRA

- On June 7, 2001, the Economic Growth and Tax Relief Reconciliation Act of 2001 was signed by President Bush.
- Beginning January 1, 2002, payments for eligible optional service credits may be made with funds rolled over from a 457 deferred compensation plan or a 403(b) tax deferred annuity plan (if allowed by the 457 or 403(b) plan).

2002 Session

SB 314

- Effective July 1, 2002.

- The accrual rate for the minimum formula annuity is changed from 2.20 percent to 2.40 percent of final average salary and the maximum annuity is changed from 75 percent to 80 percent of final average salary for employees withdrawing from service on or after January 1, 2002.
- The 3.00 percent post-retirement automatic increase will now begin no later than three years after retirement for an eligible retiree (An eligible retiree is an employee annuitant, not a widow or widower annuitant, originally granted a lifetime annuity). For eligible retirees less than age 60 on the first anniversary of retirement, the 3.00 percent increase will begin at the earlier of age 60, and the latest of the following dates:
  - The third anniversary of retirement
  - The attainment of age 53; or
  - January 1, 2002

  For eligible retirees age 60 or older on the first anniversary of retirement, the 3.00 percent increase will begin on the first anniversary of retirement.

HB 5168

- Effective June 28, 2002.
- For the eligible spouse of an employee who dies in service on or after August 28, 2002, with at least 10 years of service, the annuity is no less than 50 percent of the minimum formula annuity the employee would have been entitled to based on service and salary to the date of death without regard to age eligibility requirements. This is equal to 2.40 percent of final average salary for each year of service. The employee and the spouse must have been married for ten years.
- For children of employees who die in service on or after June 28, 2002, there is no service requirement for eligibility for children’s annuity.
- The definition of “child” now includes any child adopted before employee withdraws from service and at least one year prior to the date any benefit for the child accrues. Previously the adoption also had to take place before the employee attained age 55.
- For ordinary disability benefits paid on or after January 1, 2001, the ordinary disability benefit is 50 percent of the employee’s salary at the date of disability with the amounts ordinarily contributed by the employee for annuity purposes contributed by the Plan. These contributions are not refundable.
- The pension plan subsidy for retiree health insurance was extended through June 30, 2003. For annuitants (older than child annuitants) taking the employer-provided plan, the subsidy is $75 per month if the annuitant is not eligible for Medicare, and $45 per month if the annuitant is eligible for Medicare.
- Current and former Chicago Housing Authority employees who have service in this Plan or who reinstate service in this Plan may elect to participate in this Plan with respect to their employment with the Chicago Housing Authority under certain conditions. Contributions can be made for past service as well as current service.

- Current and former Public Building Commission employees who have service in this Plan or who reinstate service in this Plan may elect to participate in this Plan with respect to their employment with the Public Building Commission under certain conditions. Contributions can be made for past service as well as current service.
- An employee with 10 years of service in this Plan may establish service credit for up to seven years of full-time employment by the Illinois Housing Development Authority.
- The City Clerk and City Treasurer may elect to establish alternative credits in the Aldermanic Plan.
- Chicago aldermen may receive an annuity at age 55 with 10 years of service or age 60 with eight years of service.
- An alderman in service on June 1, 1995, can make payments for prior service up to 30 days after the effective date, even though he might be out of service or retired.
- A member of the Plan who has service in Police Fund may apply to Police to transfer his credits and service to Municipal under certain conditions. This must be done within 90 days of the effective date. Employee and employer contributions will be transferred.

2003 Session

SB 1701

- Effective July 1, 2003.
- The healthcare benefits were extended and increased to $85 per month for non-Medicare eligible participants and $55 per month for Medicare eligible participants for the period from July 1, 2003, through June 30, 2008. Thereafter, the benefits are extended and increased from $85 to $95 and $55 to $65 for the period July 1, 2008, to June 30, 2013.
- The healthcare benefits referred to above are not and shall not be construed to be pension or retirement benefits for the purposes of Section 5 of Article XIII of the Illinois Constitution of 1970.

2004 Session

HB 600

- Effective January 16, 2004.
- Early Retirement Incentive was created for withdrawals from January 31, 2004, to February 29, 2004 (or to May 31, 2004, for those deemed critical employees).
  - Requires an election form to be filed before January 31, 2004.
  - Requires a member to be a current contributor who has not previously retired under this Article and satisfy one of the following:
    - Active as of October 15, 2003
    - Returned to active from approved leave of absence prior to December 15, 2003
    - Receiving ordinary or duty disability benefits as of October 15, 2003

    - Restored to service by January 31, 2004, after having been involuntarily laid off
  - Requires that employees that re-enter service forfeit their right to receive benefits and will have their benefits recalculated at the time of retirement excluding the benefits provided under the ERI.
  - Requires that the participant is age 50 with ten years of creditable service in this Fund and have 70 combined years of age and service, with service in one or more systems under the Reciprocal Act (excluding service purchased under the ERI).
  - Provides for elimination of the age discount for employees younger than age 60.
  - Provides for an optional purchase of up to five years of service credit for 4.25 percent of the monthly salary rate in effect October 15, 2003.
  - Provides for a 24-month option to pay for ERI service.
  - Provides for the exclusion of ERI contributions from the base from which the tax levy is derived.
  - Allows Board members to continue until the end of their terms without forfeiting the benefits provided by the early retirement incentive.
  - Provides for a lump sum benefit option of 100 percent of salary at retirement and an actuarially reduced monthly annuity for those employees who were eligible for the maximum benefit (excluding purchased service under the ERI).
- Automatic increases in annuities will now take effect in the January of each year in which they are to be provided.
- An employee who previously withdrew contributions from the Fund, may have his rights under the Fund restored after repaying the withdrawn contributions with interest after completing the required amount of service after the date of refund. The required service is:
  - 90 days of service under this Fund or
  - Two years of service under any participating Fund under the Reciprocal Act.
- Municipality credits earned in this Fund shall be transferred to the Firemen's Annuity and Benefit Fund of Chicago with 11.00 percent interest compounded annually to the date of the transfer for former paramedics who are now covered under the Firemen's Annuity and Benefit Fund.
- Employees may elect to have their optional contributions "picked-up" by the employer, to be treated as employer contributions for tax purposes. The employee election is irrevocable.
- For the eligible spouse of an employee who died in service on or after January 1, 2002, and before August 28, 2002, with at least 10 years of service, the annuity is no less than 50 percent of the minimum formula annuity the employee would have been entitled to based on service and salary to date of death without regard to age eligibility requirements. This minimum formula annuity is equal to 2.40 percent of final average salary for each year of service. The employee and spouse must have been married for ten years.

2005 Session

SB 23

- Approved June 27, 2005.
- Prohibits the investment or deposit from the retirement system or pension fund to certain entities doing business in or with the government of the Republic of the Sudan. Fund managing companies must certify that under Section 1-110.5 of the pension code that they have not loaned to, invested in, or otherwise transferred any of the pension fund assets to a forbidden entity.

SB 253

- Approved August 4, 2005.
- Provides, that to qualify as an "emerging investment manager", the maximum value of an investment portfolio that a manager manages is $2,000,000,000 (was $400,000,000).

SB 1446

- Approved August 22, 2005.
- Provides for various changes in provisions and procedures concerning Qualified Illinois Domestic Relations Orders. Allows for alternate payee's benefit to be based on a percentage of employee's benefit. Effective July 1, 2006.

HB 227

- Approved August 22, 2005.
- Provides a benefit to a spouse married to the employee after retirement under certain conditions.

2006 Session

- No Changes.

2007 Session

HB 49

- Approved August 17, 2007.
- Provides that, beginning on the effective date, legally adopted children shall be entitled to the same benefits as other children, and no child's or survivor's benefit shall be disallowed because the child is an adopted child.

SB 1169

- Approved August 28, 2007.
- Provides that, in order for an Illinois finance entity to be eligible for investment or deposit of retirement system or pension fund assets, the Illinois finance entity must annually certify that it complies with the requirements of the High Risk Home Loan Act and the rules adopted pursuant to that Act that are applicable to that Illinois finance entity.

Requires the retirement system or pension fund to divest its assets with the Illinois finance entity if the certification is not made. Provides that these certification requirements are severable. Makes changes in the severability provisions applicable to the amendatory Act.

SB 1380

- Approved August 28, 2007.
- Amends the Illinois Municipal Retirement Fund (IMRF) and Chicago Municipal Articles of the Illinois Pension Code. Allows a sheriff's law enforcement employee under the IMRF Article to transfer service credit under the Chicago Municipal Article to the IMRF.

2008 Session

- No Changes.

2009 Session

SB 2520

- Approved February 17, 2009.
- Provides that, before any action is taken by the Board on an application for a duty disability benefit or a widow's compensation or supplemental benefit, the employee or widow shall file a claim with the employer to establish that the disability or death occurred while the employee was acting within the scope of and in the course of his or her duties. Provides an offset of disability benefits for any amounts provided to the employee or surviving spouse as temporary total disability payments, permanent disability payments, a lump sum settlement award, or other payment under the Workers' Compensation Act or the Workers' Occupational Diseases Act. Makes other changes concerning disability benefits.

HB 2557

- Approved August 25, 2009.
- Provides that it is the public policy of the State to encourage pension funds to promote the economy of Illinois through the use of economic opportunity investments within the bounds of financial and fiduciary prudence. Provides that the pension funds submit a report to the Governor and General Assembly by September 1 of each year identifying the economic opportunity investments made by the Fund, the primary location of the business or project, the percentage of the Fund's assets in economic opportunity investments, and the actions the Fund has taken to increase the use of economic opportunity investments.
- Requires the Fund to instruct the investment advisors to utilize investment strategies designed to ensure that all securities transactions are executed in such a manner that the total explicit and implicit costs and the total proceeds in every transaction are the most favorable under the circumstances.

SB 364

- Approved April 3, 2009.
- Requires Board members to file a verified written statement of economic interest annually with the office of the Clerk of Cook County.
- Requires the Board to adopt a policy that sets quantifiable utilization goals for the management of assets in specific asset classes for emerging investment managers. Goals shall be separated by minority ownership, female ownership, and person with a disability ownership.
- Requires that if at least one emerging firm(s) meet criteria of search process, at least one shall be invited to present to the Board for final consideration.
- Requires the Board to adopt a policy that sets forth goals for increasing the racial, ethnic and gender diversity of its fiduciaries, including its consultants and senior staff.
- Requires the Board to adopt a policy that sets forth goals for utilization of WMDBE firms for all contracts and services, based on the percentage of total dollar amount of all contracts let.
- Requires the Board to adopt a policy that sets forth goals for increasing the utilization of minority broker-dealers.
- Requires an annual report to the Governor and General Assembly on the utilization of "emerging firms" as defined by Article 1 of the Pension Code.
- Requires the Board to award all contracts for investment services using a competitive process that is substantially similar to the process required for the procurement of professional services under Article 35 of the Illinois Procurement Code. Requires the Board to adopt a procurement policy which will be posted on the Fund's website and filed with the Illinois Procurement Policy Board.
- Provides that a person may not act as a consultant or investment adviser unless that person is registered as an investment adviser or bank under the federal Investment Advisers Act of 1940.
- Requires investment contracts between the Retirement Board and investment service providers to include certain required information.
- Provides consultant contracts cannot exceed five years in duration; however, incumbent consultant may compete for new contract.
- Requires investment consultants and advisers to disclose all direct and indirect fees, commissions, penalties, and other compensation paid by or on behalf of the investment consultant or adviser in connection with the services provided.
- Requires that a description of every contract let for investment services be posted on the website, including name of entity awarded the contract, amount of contract, total fees paid, and disclosure describing the factors that contributed to the selection.

- Requires the Fund to maintain a website that shall include standard investment reporting, a copy of relevant Board policies, a listing of investment consultants and managers, a notification of any requests for investment services, and the names and e-mail addresses of Board members, Fund directors, and senior staff.
- Requires Board members to attend at least eight hours of ethics training per year and requires each Board to annually certify its member's compliance and submit an annual certification to the Division of Insurance of the Department of Financial and Professional Regulation.
- Prohibits any Fund trustee or employee or their spouses or immediate family living with them to intentionally solicit or accept any gift from any prohibited source as prescribed in Article 10 of the State Officials and Employees Ethics Act, including educational materials and missions and travel expenses for discussing Fund business.
- Provides that any person who knowingly makes any false statement or falsifies or permits falsifying any record of the pension fund in an attempt to defraud is guilty of a Class 3 felony.
- Provides that no person or entity shall retain a person or entity to influence the outcome of an investment decision or the procurement of investment advice to a pension fund for compensation, contingent upon the decision of the Board.
- Requires approval for travel or education mission expense of a Trustee by a majority of the Board prior to mission.

SB 1440

- Approved August 18, 2009.
- Provides that the Fund may, and to the extent required by federal law shall, allow an employee to roll over a refund, lump-sum benefit, or other non-periodic distribution (including the non-taxable portion) directly to any entity that is designated in writing by the person, is qualified under federal law to accept the distribution, and has agreed to accept the distribution.

SB 1705

- Approved August 25, 2009.
- Provides the Municipal fund will send city contributions to the Fire fund for a fireman who was employed by the Chicago Fire Department and participated in the Municipal fund, terminated that service, and received a refund, if the employee establishes the service under the Fire fund.

2010 Session

Public Act 96-0889 (SB 1946)

- Approved April 14, 2010.
- Establishes a new tier of benefits for participants that first become members on or after the effective date of January 1, 2011.

- Final average compensation is based on the average of the highest consecutive eight years within the last ten years of service.
- Establishes a cap on final average salary of $106,800, as automatically increased by the lesser of 3 percent or one-half of the annual increase in the Consumer Price Index-U during the preceding 12-months.
- Increases eligibility for a retirement annuity:
  - Age 67 with 10 years of service for an unreduced benefit.
  - Age 62 with 10 years of service for a reduced benefit. Reduction is one-half percent for each full month that retirement precedes age 67.
- Changes provisions for automatic increases in annuity:
  - Increases begin in the year following the later of the first anniversary of the annuity start date and attainment of age 67.
  - Increases are equal to the lesser of 3 percent or one-half of the annual increase in the Consumer Price Index-U during the preceding 12-months.
  - Increases are based on the amount of the originally granted benefit (not compounded).
- Changes benefits provided to surviving spouses:
  - Surviving spouse annuity is equal to 66 2/3 percent of the participant's earned retirement annuity at the date of death.
  - Provides an automatic increase in annuity:
    - Increases begin on January 1 in the year following the commencement of the survivor's annuity if the deceased member died while receiving a retirement annuity and January 1 following the first anniversary of commencement otherwise.
    - Increases are equal to the lesser of 3 percent or one-half of the annual increase in the Consumer Price Index-U during the preceding 12-months.
    - Increases are based on the amount of the originally granted benefit (not compounded)
- Establishes that members that are receiving a retirement annuity and accept a full-time position under the same Article or another Article established under the Illinois Compiled Statutes would have their benefits suspended during employment. Their benefits would be recalculated, if applicable, upon termination of employment.

Public Act 96-1490 (SB 550)

- Approved December 30, 2010.
- Amends certain provisions established in SB1946 that apply to participants that first become members on or after January 1, 2011:

- Establishes the period for calculating the annual unadjusted percentage increase in the Consumer Price Index-U as the 12-month period ending with September for purposes of capping salary and calculating the automatic increase in annuity percentage.
- Establishes that the salary cap of $106,800 applies for all purposes under the Code, including the calculation of benefits and employee contributions.
- Establishes that the survivor’s annuity is calculated with no reduction due to age.
- Establishes that members who withdraw before age 62, or with less than 10 years of service, regardless of age, are entitled to all salary deductions for retirement annuity and spouse annuity accumulated with interest to date of resignation, plus the 0.50 percent deducted for annuity increase purposes without interest.
- Establishes that increases in annuity for employee annuitants commence on January 1.

2011 Session

Public Act 97-0530 (SB 1672)

- Approved August 23, 2011.
- Requires all pension funds and retirement systems subject to the Code to comply with the federal Heroes Earnings Assistance and Relief Tax Act of 2008.

Public Act 97-0609 (SB 1831)

- Approved August 26, 2011.
- Applies to those members hired on or after January 1, 2012.
  - Provides that if a new hire is receiving a retirement annuity or pension and accepts a contractual position to provide services to a governmental entity from which he or she has retired, then that person's annuity or pension will be suspended during that contractual service.
  - Makes it a Class A misdemeanor for a pensioner who is seeking contractual employment to fail to notify certain persons about his or her retirement status before accepting an employment contract.

Public Act 97-0504 (HB 1670)

- Approved August 23, 2011.
- Amends the Open Meetings Act.
  - Requires each elected or appointed member of a public body subject to this Act who is such a member on the effective date of the amendatory Act to successfully complete the electronic training curriculum developed and administered by the Public Access Counselor.
  - Requires those members to complete the training not later than one year after the effective date of the amendatory Act.

- Requires each elected or appointed member of a public body subject to the Act who becomes such a member after the effective date of the amendatory Act to successfully complete the electronic training curriculum developed and administered by the Public Access Counselor.
- Requires those members to complete the training not later than the 90th day after the date the member either (i) takes the oath of office, if the member is required to take an oath of office to assume the person's duties as a member of the public body or (ii) otherwise assumes responsibilities as a member of the public body, if the member is not required to take an oath of office to assume the person's duties as a member of the governmental body.
- Requires each member who successfully completes the curriculum to file a copy of the certificate of completion with the public body.
- Provides that the failure of one or more members of a public body to complete the training required by this Section does not affect the validity of an action taken by the public body.
- Provides that an elected or appointed member of a public body subject to this Act who has successfully completed the required training and filed a copy of the certificate of completion with the public body is not required to subsequently complete that training.

2012 Session

Public Act 97-0651 (HB 3813)

- Approved and effective January 5, 2012.
- Requires any reasonable suspicion of fraud against the Fund to be reported to the State's Attorney for investigation.
- Changes provisions for Union Leaves of Absence as follows:
  - Service credit can be accrued only for union leaves that begin before the effective date of this amendatory Act.
  - "Any pension plan established by the local labor organization" is defined as any pension plan in which the member can receive credit as a result of his membership in the local labor organization. This is a declaration of existing law.
  - Salary used for calculation of final average salary must be a salary paid by an employer, not by the union. This is a declaration of existing law.
  - Minimum annuity section 11-134 is changed to add to the final average salary the product of (1) final average salary, (2) the average percentage increase in the CPI during the leave of absence, and (3) the number of years of leave of absence. This does not seem to deal with a situation where the employee may have been on leave within the last 10 years but is last with Municipal. It also only amends paragraph (f-1) which applies to those members who go on annuity on or after the attainment of age 60.
  - Does not change that contributions are based on current salary with the union.

***Public Act 97-0967 (HB 3969*)**

- Approved and effective August 16, 2012.
- Applies if the member retired after the effective date with less than 2 years of service in a participating system under the Reciprocal Act after General Assembly service.
- Requires that if the final average salary in a participating system is used to calculate the annuity, the employer must pay the General Assembly Retirement System for any increased cost of the General Assembly annuity that is attributable to the higher salary under the participating system.

2013 Session

Public Act 98-0043 (HB 1584)

- Approved and effective June 28, 2013
- Changes the duration of health insurance supplement payments to eligible employee annuitants to "Beginning July 1,2008, and until such time as the city no longer provides a health care plan for such annuitants or December 31, 2016, whichever comes first."

Public Act 98-0433 (HB 2620)

- Approved and effective August 16, 2013
- Allows for an additional exception to the RFP process for obtaining investment services for "contracts for follow-on funds with the same fund sponsor through close-end funds"

2014 Session

Public Act 98-0641 (SB 1922) (Ruled unconstitutional by Illinois Supreme Court on March 24, 2016. See next page)

- Approved and effective June 9, 2014
- Implements a funding policy designed to achieve 90% funded ratio by 2055
- Provides for incrementally increased employer contribution multiple, which eventually converts to actuarial-based funding.
- Caps the current pension levy at the full required city contribution amount.
- Creates payment obligation to the fund; provides enforcement.
- Provides for incrementally increased employee contributions.
- Tier 1: Ties annual increase in retirement annuity to inflation, subject to 3% cap, delays initial annual increase by one year, and eliminates annual increases in 2017, 2019 and 2025 for most annuitants.

- Tier 2: Reduces minimum retirement age by 2 years, delays the initial annual increase by one year for some retirees, and eliminates the annual increases in 2025.

Public Act 98-1022 (SB 452)

- Approved and effective August 22, 2014
- Requires investment managers and consultants entering into a contract to disclose information on use of vendors owned by minorities, females, and persons with disabilities.
- Requires minority consideration to be “within the bounds of financial and fiduciary prudence.”
- Defines “minority investment managers” and requires funds to adopt a policy to increase goals for utilization. Requires annual review.
- Declares it is the public policy of the State to encourage use of minority investment managers.

2015 Session

Public Act 99-0462 (SB 1334)

- Approved August 25, 2015
- Sets aspirational goals that, beginning January 1, 2016, at least 20% of the total funds under management be managed by emerging investment managers and that at least 20% of the investment advisors be minorities, females, and persons with disabilities.
- Sets the aspirational goal that, beginning January 1, 2016, at least 20% of contracts for "information technology services", "accounting services", "insurance brokers", "architectural and engineering services", and "legal services" be awarded to businesses owned by minorities, females, and persons with disabilities.

Jones et al. v. Municipal Employees’ Annuity and Benefit Fund of Chicago, et al.
Johnson et al. v. Municipal Employees’ Annuity and Benefit Fund of Chicago, et al.

- Public Act 98-0641 was ruled unconstitutional by the circuit court on July 24, 2015. On March 24, 2016, the Illinois Supreme Court affirmed the circuit court’s decision.
- Restores full automatic annual increase, the date of initial increase and eliminates increase holidays
- For Tier 2, changes retirement age for unreduced benefits back to age 67 and for reduced benefits to age 62
- Eliminates new funding policy

2016 Session

Public Act 99-0683 (HB 6030)

- Approved July 29, 2016
- Requires every pension fund or retirement system under the Code to develop and implement, by no later than June 30, 2017, a process to identify annuitants who are deceased. The process shall require the pension fund or retirement system to check for any deceased annuitants at least once per month and shall include the use of commonly accepted methods to identify persons who are deceased, which include but are not limited to, the use of a third party entity that specializes in the identification of deceased persons, the use of data provided by the Social Security Administration, the use of data provided by the Department of Public Health's Office of Vital Records, or the use of any other method that is commonly used by other states to identify deceased persons.

2017 Session

Public Act 100-0023 (SB 0042)

- Approved July 6, 2017 (effective date)
- Creates a new tier of benefit eligibility and contribution requirements for members (Tier 3) who first become members on or after the effective date of the Act. Benefit structure would be consistent with a Tier 2 member, except as reflected below:
  - Members would contribute 11.5%
  - Beginning January 1, 2018, members would contribute the lesser of 11.5% or the normal cost of the accrued benefit calculated on an annual basis; not less than 8.5%
  - Qualified members would be able to retire at 65 years of age undiscounted and 60 to 64 years of age discounted
- A Tier 2 member would have from October 1 to November 15, 2017 to make an irrevocable election to become a Tier 3 member
- Creates an optional benefits structure for certain Tier 2 members. Must be passed by resolution or ordinance by the governing body of the local government.
- Requires law department employees first hired after the effective date of the Act to be members of the Fund.
- The City of Chicago will increase contributions to the Fund from 2018 to 2022 (ramp period) and then begin paying a required contribution to achieve 90% funding in 40 years (2058).
- The Fund's ability to subrogate a disability injury of a member that was caused by a third party
- Closes the Alternative Annuity for City Officers Plan to officers who first become an elected officer after the effective date of the Act.

- Felony conviction. Any refund to a person who was convicted of a felony that was in relation to their service as a municipal employee, shall be reduced by any benefit received by the person prior to the calculation of the refund. This relates to persons who first became members after the effective date of the Act.

Public Act 100-0334 (HB0350)

- Approved and effective August 25, 2017
- Provides for the forfeiture of benefits for any person who otherwise would receive a survivor benefit who is convicted of any felony relating to or arising out of or in connection with the service of the member from whom the benefit results
- Provides that this legislation will not affect any right to survivor benefits prior to the effective date of this Act.

Public Act 100-0542 (SB1714)

- Approved and effective November 8, 2017
- Amends the General Provisions Article 1 of the Illinois Pension Code
- Requires an investment consultant to annually disclose to the Board (of a retirement system, pension fund, or investment board) the following:
  - Total searches conducted for investment services in the prior year
  - Total searches conducted for investment services in the prior year that include minority owned, female owned, or businesses owned by persons with a disability (MWDBE), number of MWDBE recommendations made, and amounts awarded to the MWDBE
  - Requires a consultant to disclose any compensation or economic opportunity received in the last 24 months from any investment advisors recommended to or retained by the Board (of a retirement system, pension fund, or investment board).
  - Requires consideration of these disclosures before awarding any contract for consulting services.

2018 Session

Public Act 100-1166 (HB0166)

- Approved and effective 1/4/19
- Trailer bill to SB0042 (Public Act 100-0023)
- Clarifies what qualifies a participant as a Tier 3 member
- Clarifies the member contribution rate once the MEABF achieves 90% funding

EXHIBIT 1

Net Pension Liability

The components of the net pension liability at December 31, 2018, were as follows:

Total pension liability	$16,808,614,316
Plan fiduciary net position	3,914,180,476
Net pension liability	12,894,433,840
Plan fiduciary net position as a percentage of the total pension liability	23.29%

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of December 31, 2018, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.50%	
Salary increases	3.50% to 7.75% (1.50% to 6.50% for 2019–2022), varying by years of service	
Investment rate of return	7.00%, net of investment expense	
Municipal bond index	4.10%, based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of December 31, 2018	
Cost of living adjustments	Tier 1:	3% compound
	Tier 2 & 3:	the lesser of 3% or one-half of the change in CPI, simple

Post-retirement mortality rates were based on the RP-2014 Healthy Annuitant Mortality Tables, set forward two years for males and one year for females, and projected generationally using scale MP-2016. Pre-retirement mortality rates were based on 120% of the RP-2014 Employee Mortality Tables projected generationally using scale MP-2016.

The actuarial assumptions used in the December 31, 2018, valuation were based on the results of an experience study for the period January 1, 2012, through December 31, 2016.

Discount rate: The discount rate used to measure the total pension liability was 7.00%. The projection of cash flows used to determine the discount rate assumed member contributions will be made according to the contribution rate applicable for each member's tier and that employer contributions will be made as specified by Public Act 100-0023. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions and contributions from future plan members that are intended to fund the service costs of future plan members and their beneficiaries are not included. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability as of December 31, 2018, calculated using the discount rate of 7.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate:

	1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
Net pension liability as of December 31, 2018	$15,018,711,709	$12,894,433,840	$11,132,767,680

EXHIBIT 2

Schedules of Changes in Net Pension Liability

	2018	2017
Total pension liability		
Service cost	$223,528,365	$572,533,631
Interest	1,123,347,772	915,710,984
Change of benefit terms	0	0
Differences between expected and actual experience	95,540,469	(177,754,999)
Changes of assumptions	0	(7,431,191,282)
Benefit payments, including refunds of employee contributions	(916,198,485)	(888,173,535)
Net change in total pension liability	$526,218,121	($7,008,875,201)
Total pension liability – beginning	16,282,396,195	23,291,271,396
Total pension liability – ending (a)	$16,808,614,316	$16,282,396,195
Plan fiduciary net position		
Contributions – employer*	$349,574,257	$261,763,635
Contributions – employee	138,399,727	134,764,920
Net investment income	(204,974,702)	610,515,096
Benefit payments, including refunds of employee contributions	(916,198,485)	(888,173,535)
Administrative expense	(6,638,608)	(6,473,006)
Other	0	5,393,581
Net change in plan fiduciary net position	($639,837,811)	$117,790,691
Plan fiduciary net position – beginning	4,554,018,287	4,436,227,596
Plan fiduciary net position – ending (b)	$3,914,180,476	$4,554,018,287
Fund's net pension liability – ending (a) – (b)	$12,894,433,840	$11,728,377,908
Plan fiduciary net position as a percentage of the total pension liability	23.29%	27.97%
Covered employee payroll	$1,734,595,691	$1,686,532,720
Fund's net pension liability as percentage of covered employee payroll	743.37%	695.41%

**Receivable amount to be paid the following year*

Changes in the net pension liability from the beginning of the year to the end of the year arise from the net difference between changes in the total pension liability and plan fiduciary net position that occurred during the year. Changes in net pension liability will be recognized immediately as pension expense, or reported as deferred outflows of resources related to pensions or deferred inflows of resources related to pensions, depending on the nature of the change.

Differences between actual and expected investment-related experience are recognized over a closed five-year period. Differences between actual and expected non-investment-related experience and changes of assumptions are recognized over the average of the expected remaining service lives of all members who are provided with pensions through the pension plan (active employees and inactive employees). The amounts below that are not included in pension expense for the current year are included in deferred outflows of resources or deferred inflows of resources related to pensions.

EXHIBIT 3
Reconciliation of Net Pension Liability

	Increase/(Decrease) For Fiscal Year Ending December 31, 2018		
	Total Pension Liability (a)	**Plan Fiduciary Net Position (b)**	**Net Pension Liability (a) – (b)**
Balances at beginning of year	$16,282,396,195	$4,554,018,287	$11,728,377,908
Changes for the year			
Service cost	223,528,365		223,528,365
Interest	1,123,347,772		1,123,347,772
Differences between expected and actual experience	95,540,469		95,540,469
Contributions – employer		349,574,257	(349,574,257)
Contributions – member		138,399,727	(138,399,727)
Other income		0	0
Net investment income		(204,974,702)	204,974,702
Benefit payments, including refunds of employee contributions	(916,198,485)	(916,198,485)	0
Administrative expense		(6,638,608)	6,638,608
Change of assumptions	0	0	0
Changes of benefit terms	0	0	0
Net changes	526,218,121	(639,837,811)	1,166,055,932
Balances at end of year	$16,808,614,316	$3,914,180,476	$12,894,433,840

EXHIBIT 4

Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

	Year Established	Original Balance	Original Amortization Period	Amortization Amount	Outstanding Balance at December 31, 2018
Outflows					
Investment	2015	$248,137,086	5	$49,627,417	$49,627,418
Assumption	2015	8,711,754,654	5	1,742,350,931	1,742,350,930
Investment	2016	46,575,261	5	9,315,052	18,630,105
Investment	2018	496,300,674	5	99,260,134	397,040,540
Demographic	2018	95,540,469	5*	19,108,093	76,432,376
Total outflows				**$1,919,661,627**	**$2,284,081,369**
Inflows					
Demographic	2015	$109,835,037	5	$21,967,007	$21,967,009
Demographic	2016	127,119,398	5	25,423,880	50,847,758
Assumption	2016	578,920,424	5	115,784,085	231,568,169
Demographic	2017	177,754,999	5	35,551,000	106,652,999
Assumption	2017	7,431,191,282	5	1,486,238,256	4,458,714,770
Investment	2017	296,275,191	5	59,255,038	177,765,115
Total inflows				**$1,744,219,266**	**$5,047,515,820**

* The average expected remaining service lives of all members is 5 years, determined as of January 1, 2018. This amount is equal to the total expected remaining service of 338,864 years, divided by total employees that are provided with pensions through the plan of 73,740 (as shown in the table below), rounded to the nearest integer year.

	Expected Remaining Service	Counts	Average of the Expected Remaining Service
Actives Members	338,864	30,922	10.96
Inactive Members		17,549	-
Retirees and Beneficiaries		25,269	-
Total Employees	338,864	73,740	4.60

EXHIBIT 4 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

At December 31, 2018, deferred outflows of resources and deferred inflows of resources related to pensions are:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$76,432,376	$179,467,766
Changes of assumptions	1,742,350,930	4,690,282,939
Net differences between projected and actual earnings on pension plan investments	287,532,948	0
Total	$2,106,316,254	$4,869,750,705

Deferred outflows of resources and deferred inflows of resources related to pensions will be recognized as follows:

Year ended December 31:	
2019	$175,442,361
2020	(1,594,568,974)
2021	(1,462,676,067)
2022	118,368,229
2023	-
Thereafter	-

EXHIBIT 5
Pension Expense

	Fiscal Year Ending December 31, 2018	Fiscal Year Ending December 31, 2017
Components of pension expense		
Service cost	$223,528,365	$572,533,631
Interest on the total pension liability	1,123,347,772	915,710,984
Projected earnings on plan investments	(291,325,972)	(314,239,905)
Contributions – member	(138,399,727)	(134,764,920)
Other income*	0	(5,393,581)
Administrative expense	6,638,608	6,473,006
Current year recognition of:		
Changes of assumptions	140,328,590	140,328,590
Difference between expected and actual experience	(63,833,794)	(82,941,887)
Difference between projected and actual earnings on pension plan investment	98,947,565	(312,569)
Change of benefit terms	0	0
Total pension expense	1,099,231,407	$1,097,393,349

**OPEB income due to eliminating retiree health insurance subsidy for Fund staff members*

EXHIBIT 6

Schedule of Employer Contributions

Year Ended December 31	Actuarially Determined Contributions	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Actual Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2014	$839,038,303	$149,746,748	$689,291,555	$1,602,977,593	9.34%
2015	$677,200,246	$149,225,191	$527,975,055	$1,643,480,973	9.08%
2016	$961,769,955	$149,718,491	$812,051,464	$1,646,939,238	9.09%
2017	$1,005,456,621	$261,763,635	$743,692,986	$1,686,532,720	15.52%
2018	$1,049,915,647	$349,574,257	$700,341,390	$1,734,595,691	20.15%

Notes to EXHIBIT 6

Valuation date	Actuarially determined contribution amount is determined as of December 31, with appropriate interest to the end of the year.
Methods and assumptions used to establish "actuarially determined contribution" rates:	
Actuarial cost method	Entry Age Actuarial cost method
Amortization method	30-year open, level dollar amortization
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.00%, net of investment expense
Projected salary increases	3.50% to 7.75% (1.50% to 6.50% for 2019–2022), varying by years of service
Mortality	Post-retirement mortality rates were based on the RP-2014 Healthy Annuitant Mortality Tables, set forward two years for males and one year for females, and projected generationally using scale MP-2016. Pre-retirement mortality rates were based on 120% of the RP-2014 Employee Mortality Tables projected generationally using scale MP-2016.
Cost of living adjustments	Tier 1: 3% compound
	Tier 2 & 3: The lesser of 3% or one-half of the change in CPI, simple
Other assumptions:	Same as those used in the December 31, 2018, actuarial funding valuations.

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