

# Park Employees' Annuity and Benefit Fund of Chicago

**Actuarial Valuation and Review as of  
December 31, 2020**



*This report has been prepared at the request of the Board of Trustees to assist in administering the Fund. The measurements shown in this actuarial valuation may not be applicable for other purposes.*



101 North Wacker Drive,  
Suite 500  
Chicago, IL 60606-1724  
segalco.com

May 20, 2021

Board of Trustees  
Park Employees' Annuity and Benefit Fund of Chicago  
55 East Monroe Street, Suite 2720  
Chicago, Illinois 60603

Dear Board Members:

We are pleased to submit this annual Actuarial Valuation and Review as of December 31, 2020. It summarizes the actuarial data used in the valuation, establishes the net pension liability under Governmental Accounting Standards Board (GASB) Statement No. 67 and the funding requirements for the fiscal year ending December 31, 2021, 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 Park Employees' Annuity and Benefit Fund of Chicago.

### **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.

### **Plan Changes**

The plan provisions are unchanged since the last actuarial valuation.

### **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, 2020 actuarial valuation were based on an experience analysis covering the five-year period ending December 31, 2017 and were adopted by the Board, effective for the December 31, 2018 valuation. These actuarial assumptions and methods comply with the parameters set by the Actuarial Standards of Practice and the parameters for disclosure in GASB Statement No. 67. 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 may be required in the future.

## Funding Adequacy

The funding policy of the Fund, adopted by the Board, is to have contributions sufficient to amortize the unfunded liability over the 30-year period ending December 31, 2042. However, the actual amount of employer contributions each year is set by statute. For Fiscal 2021, actual employer contributions come from a property tax levied by the Chicago Park District equal to the total amount of contributions made by employees in the calendar year two years prior to the year of the levy, multiplied by 1.1. The 1.1 factor is known as the tax multiple.

**The employer contributions mandated by the Illinois Pension Code are insufficient to avoid insolvency, and without a change, the Fund is in imminent danger of insolvency and the assets are projected to be depleted in the next eight years (during 2028). Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and 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, which were prepared by Segal:

- Actuarial
  - Active Member Valuation Data
  - Retirees and Beneficiaries Added to and Removed from Rolls
  - Solvency Test
  - Analysis of Financial Experience
- Financial
  - Schedule of Changes in Employer’s Net Pension Liability
  - Schedule of Employer’s Net Pension Liability
  - 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; 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,



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



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Kim M. Nicholl, FSA, FCA, MAAA, EA  
Senior Vice President and Actuary



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# Section 1: Actuarial Valuation Summary

## Purpose

This report has been prepared by Segal to present a valuation of the Park Employees' Annuity and Benefit Fund of Chicago (the Fund) as of December 31, 2020. 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:

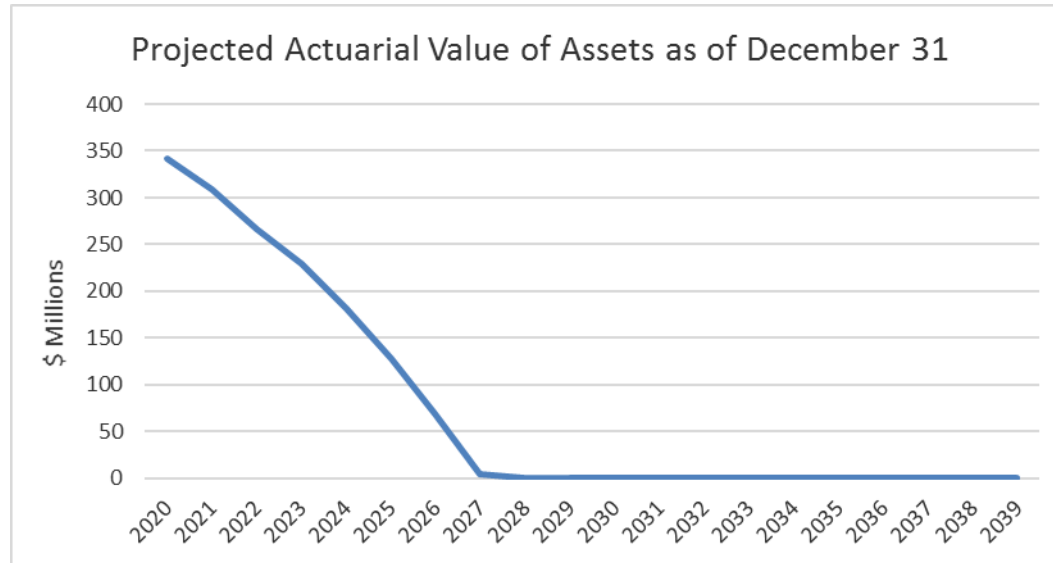
- The benefit provisions of the Fund, as outlined in 40 ILCS 5/12 and administered by the Board;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of December 31, 2020, provided by Fund staff;
- The assets of the Fund as of December 31, 2020, provided by Fund 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 Fund is now projected to become insolvent during 2028. The graph below shows a 20-year projection of the actuarial value of assets. A 40-year projection of the Fund’s financial status is shown in Exhibit V.**



2. **The funding approach mandated by the Illinois Pension Code is inadequate. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance.**
3. The funded ratio based on the actuarial value of assets over the actuarial accrued liability as of December 31, 2020, is 28.7%, compared to 29.9% as of December 31, 2019. This ratio is a measure of funding status, its history is a measure of funding progress. Using the fair value of assets, the funded ratio as of December 31, 2020, is 29.3%, compared to 30.3% as of December 31, 2019. These measurements are not necessarily appropriate for assessing the sufficiency of Fund assets to cover the estimated cost of settling the Fund’s benefit obligation or the need for or the amount of future contributions.

4. Employer contributions to the Fund come from a tax levied upon all taxable property in the City of Chicago. The amount of tax that is levied is 1.1 times the amount of employee contributions made two years prior. The 1.1 factor is known as the tax multiple. For the fiscal year beginning January 1, 2021, the actuarially determined contribution amount (ADC) based on the Board's funding policy is \$70,492,027. Based on the 1.1 tax multiple, and using the Fund's assumption of 3% loss on collections (the Park District has been absorbing this loss, however, the Park District is not guaranteed to do so in the future), we have estimated the employer contribution for the fiscal year beginning January 1, 2021, to be \$13,159,834. **Compared to the ADC of \$70,492,027, the contribution deficiency is \$57,332,193 as of January 1, 2021. In the prior fiscal year, actual contributions were \$33,380,379 less than the ADC. Each year of a contribution deficiency leads to an increased deficiency in all future years.**
5. In 2020, in addition to the contributions required by 40 ILCS 5/12-149, the employer made additional contributions of about \$20.6 million to the Fund. For 2021, including the contributions required by 40 ILCS 5/12-149, the employer has budgeted for a total contribution of \$43.2 million to the Fund.
6. For the year ended December 31, 2020, Segal has determined that the asset return on a fair value basis was 8.3%. After gradual recognition of investment gains and losses under the actuarial smoothing method, the actuarial rate of return was 8.0%. This represents an experience gain when compared to the assumed rate of 7.25%. As of December 31, 2020, the actuarial value of assets (\$342.1 million) represents 98.2% of the fair value (\$348.3 million).
7. The portion of deferred investment gains and losses recognized in the calculation of the December 31, 2020, actuarial value of assets resulted in a gain of \$2,439,429. Additionally, the demographic and liability experience resulted in a \$1,922,686 net gain.
8. The total unrecognized investment gain as of December 31, 2020, is \$6,161,650. This investment gain 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 losses derived from future experience. This implies that earning the assumed rate of investment return of 7.25% per year (net of investment expenses) on a **fair value** basis will result in investment gains on the actuarial value of assets in the next few years. Therefore, if the actual fair value return is equal to the assumed 7.25% rate and all other actuarial assumptions are met, the contribution requirements would decrease over the next few years.
9. As mentioned above, the current method used to determine the actuarial value of assets yields an amount that is 98.2% of the fair value of assets as of December 31, 2020. Guidelines in Actuarial Standard 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 fair value. We believe the actuarial asset method currently complies with these guidelines.
10. When measuring pension liability for GASB purposes, the same actuarial cost method (Entry Age method) that is used for funding purposes is used to determine the total pension liability. However, as of December 31, 2020, the GASB blended discount rate calculation results in a lower discount rate (2.22%) than is used for funding purposes (7.25%). This means that the total pension liability (TPL) measure for financial reporting shown in this report will differ from the actuarial accrued liability (AAL) measure for funding. We note that the same is true for the normal cost component of the annual plan cost for funding and financial reporting.

11. The net pension liability (NPL) is equal to the difference between the total pension liability (TPL) and the Plan's fiduciary net position. The Plan's fiduciary net position is equal to the fair value of assets. The NPL as of December 31, 2020, is \$1,929,145,620.
12. This actuarial report as of December 31, 2020, is based on financial data as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the cost of the plan, while increases in asset values (in excess of expected) will decrease the cost of the plan.

## Summary of Key Valuation Results

	2021	2020
<b>Contributions for fiscal year beginning:</b>		
Actuarially determined contribution requirement	\$70,492,027	\$67,297,212
Expected employer contributions	13,159,843	12,757,896
Actual employer contributions	--	33,939,927
<b>Funding elements for fiscal year beginning:</b>		
Employer normal cost, including administrative expenses	\$5,772,874	\$6,457,619
Fair value of assets	348,294,515	354,556,288
Actuarial value of assets	342,131,743	349,960,428
Actuarial accrued liability	1,190,365,644	1,170,602,980
Unfunded actuarial accrued liability	848,233,901	820,642,552
Funded ratio	28.74%	29.90%
<b>GASB information:</b>		
Long-term expected rate of return	7.25%	7.25%
Municipal bond index	2.12%	2.74%
Single equivalent discount rate	2.22%	2.84%
Total pension liability	\$2,277,440,135	\$2,046,085,330
Plan fiduciary net position	348,294,515	354,556,288
Net pension liability	1,929,145,620	1,691,529,042
Plan fiduciary net position as a percentage of total pension liability	15.29%	17.33%
<b>Demographic data for plan year beginning:</b>		
Number of retired participants and beneficiaries	2,775	2,843
Number of vested former participants	158	147
Number of active participants	2,890	3,132
Total salary supplied by the Fund	\$135,162,943	\$136,105,381
Average salary	46,769	43,456

## Important Information About Actuarial Valuations

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

In order to prepare a valuation, Segal (“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 a plan is based on data provided to the actuary by the 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 fair value of assets as of the valuation date, as provided by the Fund staff. The Fund staff uses an “actuarial value of assets” that differs from fair value to gradually reflect year-to-year changes in the fair 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 participants 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 participant 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 plan’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 plan'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 the plan 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 Fund'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.

# Section 2: Actuarial Valuation Results

## A. Membership 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, B, and C.

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

### Member Population: 2012 – 2020

Census Date	Active Members	Vested Terminated Members*	Retired and Beneficiaries**	Ratio of Actives to Retirees and Beneficiaries
June 30, 2012	2,977	153	2,921	1.02
December 31, 2012	3,053	152	2,906	1.05
December 31, 2013	3,076	148	2,904	1.06
December 31, 2014	2,973	147	2,891	1.03
December 31, 2015	3,063	145	2,876	1.07
December 31, 2016	3,114	149	2,870	1.09
December 31, 2017	3,543	150	2,876	1.23
December 31, 2018	3,187	145	2,854	1.12
December 31, 2019	3,132	147	2,843	1.05
December 31, 2020	2,890	158	2,775	1.04

\* Excludes terminated members due a refund of employee contributions.

\*\* Excludes QILDROs

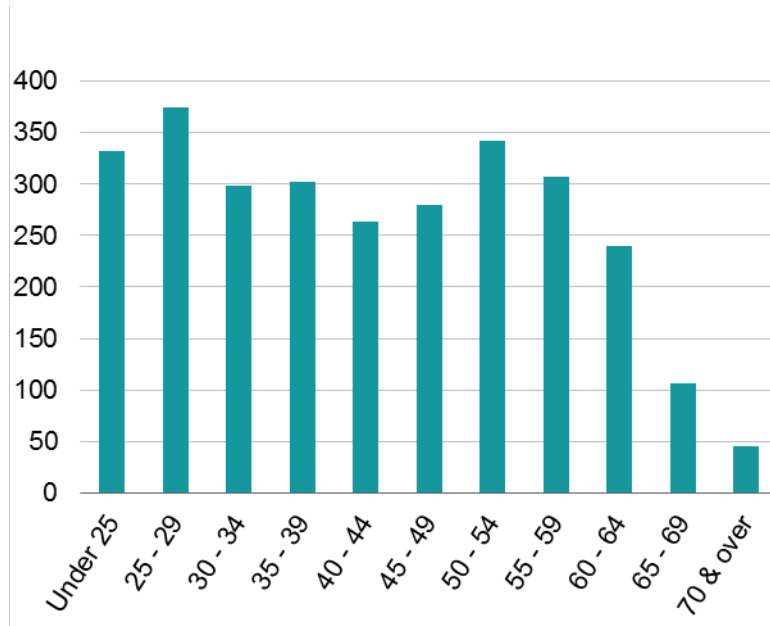
## Active Members

Plan costs are affected by the age, years of service and payroll of active members. In this year's valuation, there were 2,890 active members with an average age of 42.9, average years of service of 10.9 years and average salary of \$46,769. The 3,132 active participants in the prior valuation had an average age of 41.8, average years of service of 10.0 years and average salary of \$43,456.

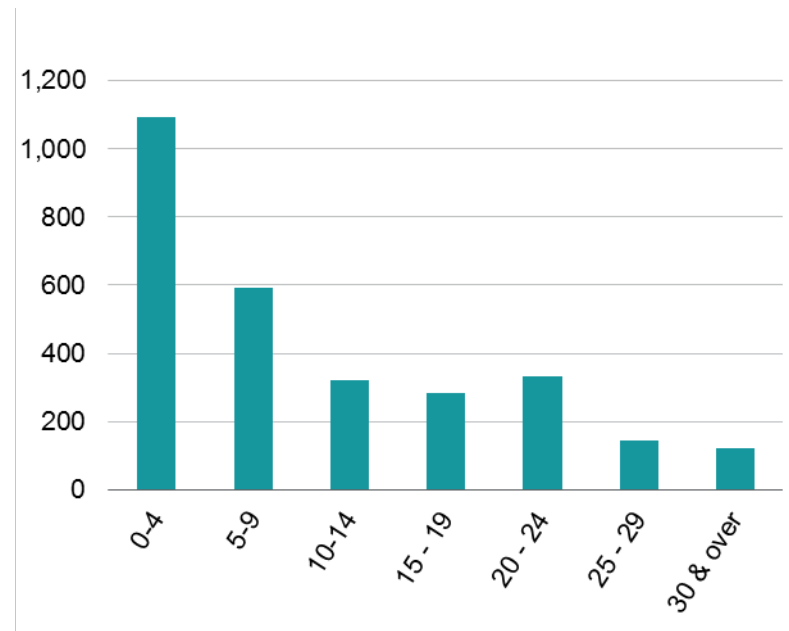
These graphs show a distribution of active members by age and by years of service.

### Distribution of Active Members as of December 31, 2020

Actives by Age



Actives by Years of Service



## Inactive Members

In this year's valuation, there were 158 members with a vested right to a deferred or immediate vested benefit.

In addition, there were 4,906 members entitled to a return of their employee contributions.



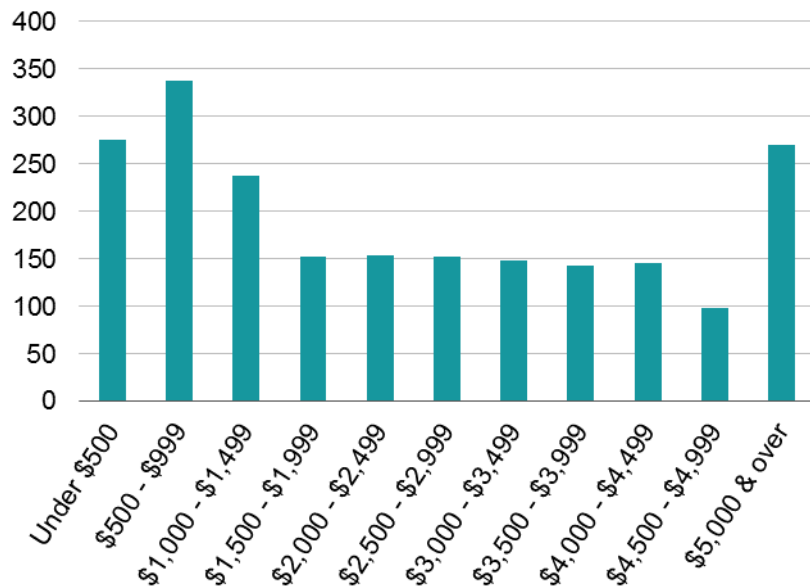
## Retirees and Beneficiaries

As of December 31, 2020, 2,116 retirees, 648 beneficiaries, and 11 dependent children were receiving total monthly benefits of \$6,383,953. For comparison, in the previous valuation, there were 2,144 retirees, 686 beneficiaries, and 13 dependent children receiving monthly benefits of \$6,329,549.

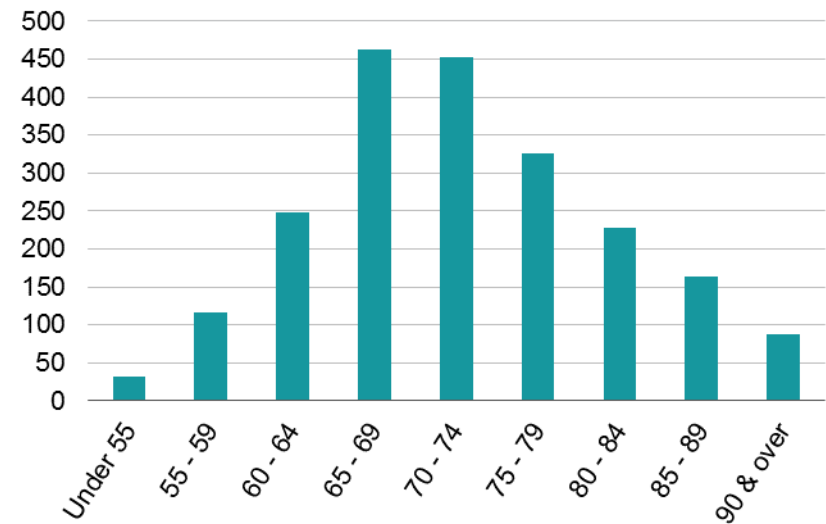
These graphs show a distribution of the current retirees and beneficiaries based on their monthly amount and age.

### Distribution of Retirees as of December 31, 2020

#### Retirees by Monthly Amount



#### Retirees by Age



## 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 fair 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 fair 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.

### Determination of Actuarial Value of Assets for Fiscal Years Ended December 31

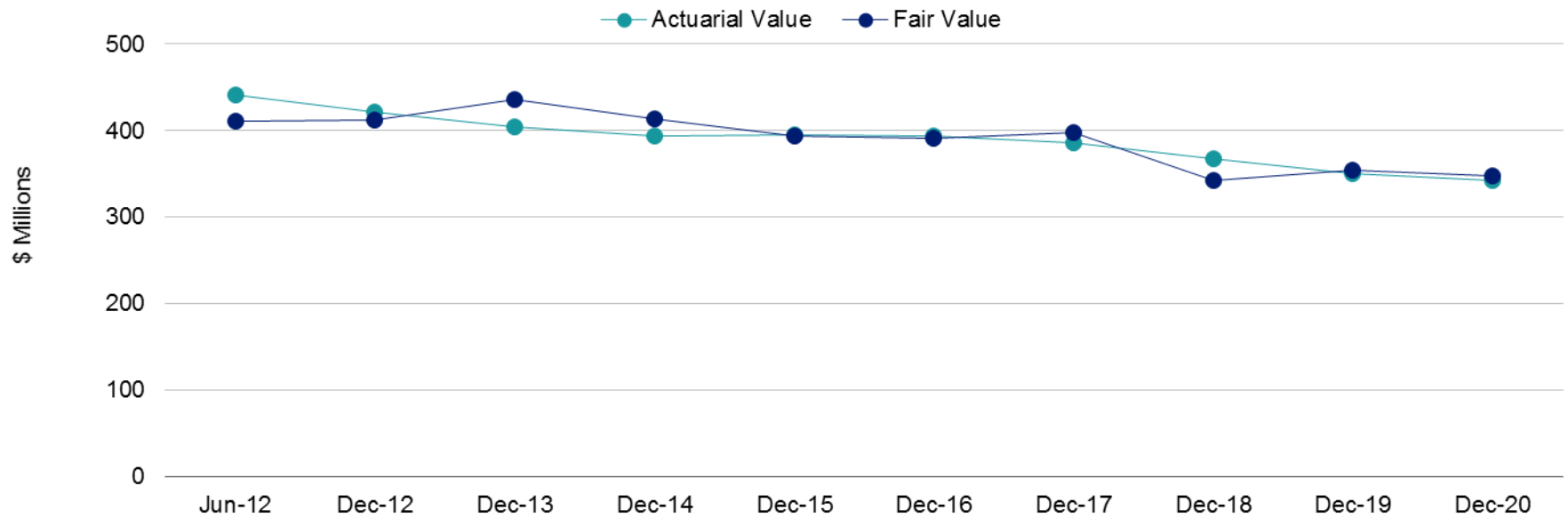
		2020	2019
1	Actuarial value of assets as of prior valuation date	\$349,960,428	\$366,806,612
2	Employer and employee contributions and other income	46,574,827	40,346,944
3	Benefits and expenses	80,968,378	80,079,310
4	Expected investment income	24,125,367	25,153,186
5	Total investment income, including income for securities lending	28,131,708	52,032,656
6	Investment gain/(loss): (5) – (4)	4,006,341	26,879,470
7	Expected actuarial value of assets: (1) + (2) – (3) + (4)	339,692,314	352,227,557
8	Calculation of unrecognized return		
		<u>Original Amount*</u>	<u>Percent Recognized</u>
			<u>Percent Recognized</u>
(a)	Year ended December 31, 2020	\$4,006,341	20% 801,268 -- --
(b)	Year ended December 31, 2019	26,879,470	20% 5,375,894 20% 5,375,894
(c)	Year ended December 31, 2018	-44,600,621	20% -8,920,124 20% -8,920,124
(d)	Year ended December 31, 2017	23,345,719	20% 4,669,144 20% 4,669,144
(e)	Year ended December 31, 2016	2,566,234	20% 513,247 20% 513,247
(f)	Year ended December 31, 2015	-19,526,450	0% 0 20% -3,905,290
(g)	Total unrecognized return	2,439,429	-2,267,129
9	Actuarial value of assets as of current valuation date: (7) + (8g)	\$342,131,743	\$349,960,428

\* Total return minus expected return on actuarial value

Both the actuarial value and fair 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 fair 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.

The chart shows the change in the actuarial value of assets versus the fair value over the past ten valuation dates.

Actuarial Value of Assets vs. Fair Value of Assets as of June 30, 2012 – December 31, 2020



## C. Actuarial Experience

To calculate the actuarially determined contribution requirement, 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. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

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.

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

The total gain is \$4,350,329; \$2,439,429 from investment gains and \$1,910,900 in gains from all other sources. The net experience variation from individual sources other than investments was 0.2% 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.

### Actuarial Experience for Year Ended December 31, 2020

<b>1</b>	Net gain from investments*	\$2,439,429
<b>2</b>	Net loss from administrative expenses	(11,786)
<b>3</b>	Net gain from other experience**	<u>1,922,686</u>
<b>4</b>	Net experience gain: <b>(1) + (2) + (3)</b>	\$4,350,329

\* Details on the next page

# Investment Experience

## 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 Fund's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets for the year ended December 31, 2020 was 7.25%. The actual rate of return on an actuarial basis for the year ended December 31, 2020, was 7.98%.

Since the actual return for the year was more than the assumed return, the Fund experienced an actuarial gain during the fiscal year ended December 31, 2020, with regard to its investments.

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

### Investment Experience

<b>1</b>	Actual return	\$26,564,796
<b>2</b>	Average value of assets	332,763,688
<b>3</b>	Actual rate of return: <b>(1) ÷ (2)</b>	7.98%
<b>4</b>	Assumed rate of return	7.25%
<b>5</b>	Expected return: <b>(2) x (4)</b>	24,125,367
<b>6</b>	Actuarial gain: <b>(1) – (5)</b>	<u>\$2,439,429</u>

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 fair value investment return for the last ten valuation years, including five-year and ten-year averages.

### Investment Return

Fiscal Year Ended	Fair Value	Actuarial Value
June 30, 2012	0.9%*	-0.6%*
December 31, 2012	6.3%*	1.0%*
December 31, 2013	16.9%**	6.5%*
December 31, 2014	6.9%**	10.4%*
December 31, 2015	1.9%**	8.2%*
December 31, 2016	8.4%**	8.0%*
December 31, 2017	14.2%**	10.0%*
December 31, 2018	-5.1%**	5.4%*
December 31, 2019	17.0%**	6.6%*
December 31, 2020	9.3%**	8.0%*
Average Returns		
Last 5 years	8.5%	7.6%
Last 10 years	7.9%	6.6%

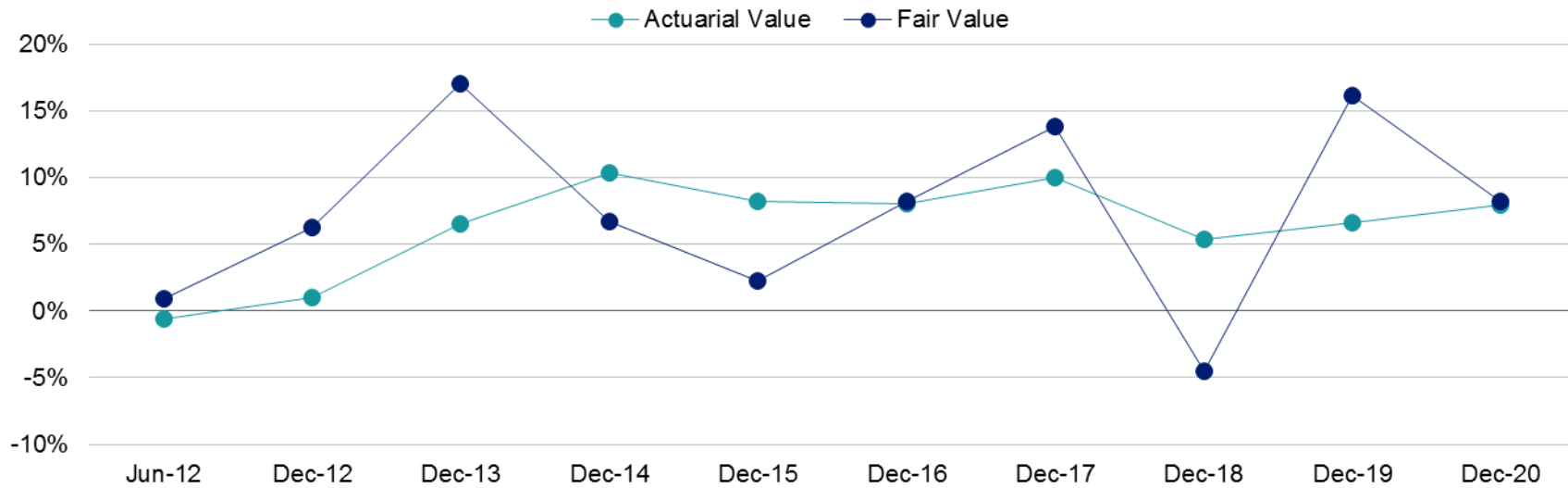
\* As determined by Segal

\*\* As determined by Investment Consultant

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the fair value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling the actuarially required contribution.

This chart illustrates how this leveling effect has actually worked over the years 2012 - 2020.

Fair Value and Actuarial Rates of Return for Years Ended June 30, 2012 - December 31, 2020



### Administrative Expenses

Administrative expenses for the year ended December 31, 2020 totaled \$1,598,370 compared to the assumption of \$1,532,725. This resulted in a loss of \$11,786 for the year when adjusted for timing.

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

The net gain from this other experience for the year ended December 31, 2020, amounted to \$1,922,686, which is 0.2% of the actuarial accrued liability.

A brief summary of the demographic gain/(loss) experience of the Fund for the year ended December 31, 2020, is shown in the chart below.

### Experience Due to Changes in Demographics for Year Ended December 31, 2020

<b>1</b>	Turnover	-\$2,245,258
<b>2</b>	Retirement	-1,209,835
<b>3</b>	Experience among retired members and beneficiaries related to mortality	6,113,208
<b>4</b>	Salary/service increase for continuing actives	879,676
<b>5</b>	Other	<u>-1,501,237</u>
<b>6</b>	Net Gain	\$1,922,686



## D. Development of Employer Costs

At the discretion of the Board, the actuarial valuation includes the calculation of a funding policy benchmark contribution amount referred to as the actuarially determined contribution. 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 50.18% of payroll.

The actuarially determined contribution is calculated on a level percentage of pay basis and is based on a closed 30-year period, which ends on December 31, 2042. As of January 1, 2021, there are 22 years remaining on the amortization period.

The chart compares this valuation's actuarially determined contribution with the prior valuation.

### Actuarially Determined Contribution

		Year Beginning January 1			
		2021		2020	
		Amount	% of Payroll	Amount	% of Payroll
<b>1</b>	Total normal cost*	\$16,948,567	12.06%	\$17,626,255	12.41%
<b>2</b>	Administrative expenses	1,593,091	1.13%	1,532,725	1.08%
<b>3</b>	Expected employee contributions*	<u>-12,768,784</u>	<u>-9.09%</u>	<u>-12,922,180</u>	<u>-9.10%</u>
<b>4</b>	Employer normal cost: <b>(1) + (2) + (3)</b>	5,772,874	4.11%	6,236,800	4.39%
<b>5</b>	Employer normal cost, adjusted for timing*	5,977,267	4.25%	6,457,619	4.55%
<b>6</b>	Actuarial accrued liability	1,190,365,644		1,170,602,980	
<b>7</b>	Actuarial value of assets	<u>342,131,743</u>		<u>349,960,428</u>	
<b>8</b>	Unfunded/(overfunded) actuarial accrued liability: <b>(6) - (7)</b>	<u>848,233,901</u>		<u>820,642,552</u>	
<b>9</b>	Payment on unfunded actuarial accrued liability	<u>64,514,760</u>	45.92%	<u>60,839,593</u>	42.82%
<b>10</b>	Actuarially determined contribution, adjusted for timing*: <b>(5) + (9)</b>	<u>70,492,027</u>	<u>50.18%</u>	<u>67,297,212</u>	<u>47.37%</u>
<b>11</b>	Projected payroll	\$140,488,179		\$142,076,419	

\* Recommended contributions are assumed to be paid at the middle of every month.

The actuarially determined contribution as of January 1, 2021, is 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.

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

### Reconciliation of Actuarially Determined Contribution from January 1, 2020 to January 1, 2021

<b>Actuarially Determined Contribution as of January 1, 2020</b>	\$67,297,212
Effect of expected change in amortization payment due to payroll growth	1,520,989
Effect of change in administrative expense assumption	62,503
Effect of change in other actuarial assumptions	0
Effect of contributions less than recommended contribution	2,577,873
Effect of investment gains	-177,320
Effect of other gains and losses on accrued liability	-138,902
Effect of net other changes	<u>-650,328</u>
<b>Total change</b>	<u>\$3,194,815</u>
<b>Actuarially Determined Contribution as of January 1, 2021</b>	\$70,492,027

## 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 Fund. Upon request, a more detailed assessment of the risks can be provided to enable a better understanding of the risks specific to this Fund.

### **Investment Risk** (the risk that returns will be different than expected)

Since the Plan's assets are much larger than contributions, investment performance may create significant volatility in contribution requirements. For example, if the actual return on the fair 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 \$0.8 million and the actuarially determined contribution requirements would increase or decrease by approximately \$0.06 million.

The fair value rate of return over the last 10 years has ranged from a low of -5.1% to a high of 17.0%, with an average of 7.9%.

A fair value rate of return of 6.3% during 2021 would move the projected year of insolvency a year sooner; from 2028 into 2027.

### **Longevity Risk** (the risk that mortality experience will be different than expected)

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 Plan's funding policy and actuarially determined contribution requirement.

### **Contribution Risk**

The Plan's funding policy contribution requires payment of the Employer's normal cost and an amortization payment according to a schedule sufficient to pay down unfunded actuarial liability over time. If the Plan's funding policy contribution were adhered to, contribution risk would be negligible.

However, Plan contributions are set by statute. The statutorily-required amount systematically underfunds the Plan. For Fiscal 2021, actual employer contributions come from a property tax levied by the Chicago Park District equal to the total amount of contributions made by employees in the calendar year two years prior to the year of the levy, multiplied by 1.1, the tax multiple.

If contributions remain at current level and future experience matches the current assumptions, we project the unfunded actuarial accrued liability will not be paid off and the Fund will become insolvent.

**Demographic Risk** (the risk that participant experience will be different than assumed)

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 10 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 ten years:

- The investment gain/(loss) for a year has ranged from a gain of \$37 million to a loss of \$45 million.
- The non-investment gain/(loss) for a year has ranged from a gain of \$5 million to a loss of \$9 million.
- The funded percentage on the actuarial value of assets has ranged from a low of 28.74% to a high of 50.87%.

# Section 3: Supplemental Information

## Exhibit A - Table of Fund Coverage

Category	Year Ended December 31		Change From Prior Year
	2020	2019	
<b>Active members in valuation:</b>			
Number	2,890	3,132	-7.7%
Average age	42.9	41.8	+1.1
Average years of service	10.9	10.0	+0.9
Total salary supplied by the Fund	\$135,162,943	\$136,105,381	-0.7%
Average salary	\$46,769	\$43,456	+7.6%
Total active vested members with at least 10 years of service	1,235	1,264	-2.3%
<b>Vested terminated members</b>	158	147	+7.5%
<b>Non-vested terminated members eligible for a return of contributions</b>	4,906	4,756	+3.2%
<b>Service retirees:</b>			
Number in pay status*	2,116	2,144	-1.3%
Average age	72.5	72.3	+0.2
Average monthly benefit	\$2,561	\$2,484	+3.1%
<b>Beneficiaries</b>			
Number in pay status	659	699	-5.7%
Average age	79.3	78.1	+1.2
Average monthly benefit	\$1,464	\$1,403	+4.3%
<b>Total number of members</b>	10,729	10,878	-1.4%

\* Excluding QILDROS

## Exhibit B - Participants in Active Service as of December 31, 2020 By Age, Years of Service, and Average Payroll provided by the Fund

Age	Total	Years of Service								
		0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 - 39	40 & over
Under 25	332	324	8							
	\$22,669	\$22,550	\$27,489							
25 – 29	374	233	134	7						
	31,317	28,846	35,289	\$37,540						
30 – 34	298	116	113	63	6					
	44,145	38,616	50,357	43,266	\$43,291					
35 – 39	302	98	70	59	65	10				
	50,624	42,352	55,654	51,225	56,474	\$54,900				
40 – 44	264	78	54	38	39	52	3			
	56,132	40,396	67,840	56,395	63,015	62,141	\$57,559			
45 – 49	280	61	69	36	35	55	23	1		
	58,867	33,635	63,230	63,634	70,726	66,731	68,180	\$63,639		
50 – 54	342	69	39	42	60	64	43	25		
	53,426	32,785	58,162	44,923	61,692	58,994	66,119	61,368		
55 – 59	307	60	49	33	30	70	32	24	9	
	55,124	36,088	49,880	45,411	53,697	63,639	75,871	69,156	\$73,526	
60 – 64	240	39	36	22	27	52	25	16	14	9
	54,214	40,085	46,203	41,714	53,043	58,778	56,333	80,114	83,027	\$58,432
65 – 69	106	14	12	15	18	21	14	7	2	3
	54,733	25,298	48,540	47,176	56,141	62,855	67,593	70,730	86,595	70,772
70 & Over	45	2	7	5	2	10	6	5	7	1
	48,244	53,311	25,594	47,693	36,818	57,184	51,400	54,890	53,267	45,548
Total	2,890	1,094	591	320	282	334	146	78	32	13
	\$46,769	\$31,363	\$50,251	\$49,043	\$59,193	\$61,764	\$66,266	\$68,064	\$74,068	\$60,288

## Exhibit C - History of Active Member Valuation Data

Actuarial Valuation Date	Active Members	Percent Increase	Annual Salaries	Percent Increase	Average Salary	Percent Increase
06/30/2012	2,977	6.51%	\$109,798,508	1.96%	\$36,882	(4.27%)
12/31/2012	3,053	2.55%	113,934,756*	3.77%	37,319	1.18%
12/31/2013	3,076	0.75%	115,617,428	1.48%	37,587	0.72%
12/31/2014	2,973	(3.35%)	120,376,477	4.12%	40,490	7.72%
12/31/2015	3,063	3.03%	126,294,812	4.92%	41,232	1.83%
12/31/2016	3,114	1.67%	124,502,908	(1.42%)	39,982	(3.03%)
12/31/2017	3,543	13.78%	134,258,328	7.84%	37,894	(5.22%)
12/31/2018	3,187	(10.05%)	129,923,175	(3.23%)	40,767	7.58%
12/31/2019	3,132	(1.73%)	136,105,381	4.76%	43,456	6.60%
12/31/2020	2,890	(7.73%)	135,162,943	(0.69%)	46,769	7.62%
<b>Average Increase/(Decrease)</b>						
Last 5 years		(0.81%)		1.45%		2.71%
Last 10 years		0.54%		2.35%		2.07%

\* Annualized for short plan year.

## Exhibit D - Reconciliation of Member Data

	Active Members	Inactive Members	Retirees	Beneficiaries	Total
Number as of December 31, 2019	3,132	4,903	2,144	699	10,878
New participants	90	N/A	N/A	N/A	90
Terminations	(205)	205	-	-	-
Retirements	(54)	(21)	75	N/A	-
New disabilities	-	-	N/A	N/A	-
Died with beneficiary	(3)	(1)	(23)	27	-
Died without beneficiary	(3)	-	(80)	(67)	(150)
Refunds	(71)	(33)	-	-	(104)
Rehires	4	(4)	-	-	-
Data adjustments	<u>-</u>	<u>15</u>	<u>-</u>	<u>-</u>	<u>15</u>
Number as of December 31, 2020	2,890	5,064	2,116	659	10,729



## Exhibit E - Schedule of Pensioners and Beneficiaries Added to and Removed from Rolls

Fiscal Year	<u>Added to Rolls</u>		<u>Removed from Rolls</u>		<u>Rolls – End of Year</u>		% Increase in Avg. Annual Allowances	Average Annual Allowances
	<u>Number</u>	<u>Annual Allowances</u>	<u>Number</u>	<u>Annual Allowances</u>	<u>Number*</u>	<u>Annual Allowances</u>		
06/2012	167	\$4,681,195	158	\$2,797,326	2,908	\$63,980,341	2.7	\$22,001
12/2012	71	2,470,960	91**	1,290,060	2,888	65,161,241	2.6	22,563
12/2013	147	4,594,883	147	2,788,285	2,888	66,967,839	2.8	23,188
12/2014	126	4,085,581	138	2,781,597	2,876	68,271,823	2.4	23,738
12/2015	94	1,823,238	106	2,271,591	2,864	67,823,470	-0.7	23,681
12/2016	126	5,283,834	133	2,711,190	2,857	70,396,114	4.0	24,640
12/2017	107	3,628,199	104	1,952,677	2,860	72,071,636	2.3	25,200
12/2018	135	5,446,939	153	2,967,901	2,842	74,550,674	4.1	26,232
12/2019	128	4,578,087	140	3,174,168	2,830	75,954,593	2.3	26,839
12/2020	80	3,824,254	146	3,171,408	2,764	76,607,439	3.3	27,716

\* Does not include child beneficiaries receiving a pension.

\*\* Includes removal of 21 QILDROs for participant count purposes.

## Exhibit F - Summary Statement of Income and Expenses on a Fair Value Basis at Fiscal Year Ended December 31

	Year Ended December 31, 2020	Year Ended December 31, 2019
<b>Net position at value at the beginning of the year</b>	\$354,556,288	\$342,255,873
<b>Contribution income:</b>		
Employer contributions	\$33,939,927	\$27,682,089
Employee contributions	12,634,900	12,664,855
Less administrative expenses	<u>-1,598,370</u>	<u>-1,528,861</u>
Net contribution income	44,976,457	38,818,083
<b>Securities leading income</b>	60,381	50,111
<b>Other income</b>	70	125
<b>Investment income:</b>		
Interest, dividends and other income	\$5,930,941	\$6,785,122
Asset appreciation	23,730,507	46,929,814
Less investment and administrative fees	<u>-1,590,121</u>	<u>-1,732,391</u>
Net investment income	<u>28,071,327</u>	<u>51,982,545</u>
<b>Total income available for benefits</b>	\$73,108,235	\$90,850,864
<b>Less benefit payments:</b>		
Annuity payments	-\$77,073,553	-\$75,850,465
Disability & death	-688,695	-615,546
Refund of contributions	<u>-1,607,760</u>	<u>-2,084,438</u>
Net benefit payments	-\$79,370,008	-\$78,550,449
<b>Change in reserve for future benefits</b>	-\$6,261,773	\$12,300,415
<b>Net position at fair value at the end of the year</b>	\$348,294,515	\$354,556,288

## Exhibit G - Summary Statement of Fund Assets at Fiscal Year Ended December 31

	Year Ended December 31, 2020	Year Ended December 31, 2019
<b>Accounts receivable</b>	\$14,930,087	\$15,987,449
<b>Investments, at fair value:</b>		
Collective investment funds	\$107,283,908	\$81,295,724
Bonds	27,974,249	59,247,177
Common and preferred stocks	46,568,393	43,787,794
Real estate	31,443,567	37,047,140
Private equity partnerships	20,885,335	18,031,007
Hedged equity	25,951,241	24,807,129
Infrastructure	24,460,163	24,353,479
Mutual funds	18,355,546	19,208,421
International equity	21,343,216	21,776,682
Short-term investments	<u>4,964,290</u>	<u>4,784,370</u>
Total investments at fair value	329,229,908	334,338,923
<b>Invested securities lending collateral</b>	16,670,194	19,769,592
<b>Prepaid annuity benefits</b>	5,349,711	5,252,036
<b>Furniture and fixtures, net</b>	131,686	145,461
<b>Prepaid expenses</b>	<u>31,715</u>	<u>53,866</u>
<b>Total assets</b>	\$366,343,301	\$375,547,327
<b>Less accounts payable:</b>		
Accounts payable	-\$534,101	-\$348,273
Accrued benefits and member contributions payable	-805,298	-568,215
Securities lending collateral	-16,670,194	-19,769,592
Due to broker	0	-257,794
Deferred rent	<u>-39,193</u>	<u>-47,165</u>
Total accounts payable	-\$18,048,786	-\$20,991,039
<b>Net position at fair value</b>	\$348,294,515	\$354,556,288
<b>Net position at actuarial value</b>	\$342,131,743	\$349,960,428

## Exhibit H - Development of the Fund Through December 31, 2020

Fiscal Year Ended	Employer Contributions*	Employee Contributions	Net Investment Return*	Administrative Expenses	Benefit Payments	Actuarial Value of Assets at End of Year
June 30, 2012	\$10,868,361	\$10,404,827	-\$2,804,426	\$1,644,603	\$65,502,658	\$440,692,006
December 31, 2012	5,268,363	5,371,084	4,121,362	723,802	33,281,012	421,448,001
December 31, 2013	15,707,814	10,732,730	26,107,300	1,367,443	68,335,967	404,292,435
December 31, 2014	11,225,438	10,831,434	39,408,258	1,458,831	70,536,042	393,762,692
December 31, 2015	30,588,976	12,368,636	31,067,518	1,533,700	70,602,016	395,652,106
December 31, 2016	30,890,241	12,246,115	30,432,110	1,537,699	74,077,876	393,604,997
December 31, 2017	20,920,614	13,675,292	37,038,766	1,682,136	78,138,027	385,419,506
December 31, 2018	27,638,402	12,125,457	19,651,105	1,501,039	76,526,820	366,806,612
December 31, 2019	27,682,089	12,664,855	22,886,182	1,528,861	78,550,449	349,960,428
December 31, 2020	33,939,927	12,634,900	28,131,778	1,598,370	79,370,008	342,131,743

\* On an actuarial basis, net of investment, and includes other income.

## Exhibit I - Development of Unfunded Actuarial Accrued Liability

			Plan Year Ended December 31	
			2020	2019
<b>1</b>	Unfunded actuarial accrued liability at beginning of year		\$820,642,552	\$775,491,353
<b>2</b>	Normal cost at beginning of year		19,158,980	17,952,526
<b>3</b>	Total contributions		46,574,827	40,346,944
<b>4</b>	Interest			
	<b>(a)</b> Unfunded actuarial accrued liability and normal cost	\$60,885,611		\$57,524,681
	<b>(b)</b> Total contributions	<u>1,528,086</u>		<u>1,323,754</u>
	<b>(c)</b> Total interest: <b>(4a) – (4b)</b>		<u>59,357,525</u>	<u>56,200,927</u>
<b>5</b>	Expected unfunded actuarial accrued liability: <b>(1) + (2) – (3) + (4c)</b>		\$852,584,230	\$809,297,862
<b>6</b>	Changes due to (gain)/loss from:			
	<b>(a)</b> Investments	(\$2,439,429)		\$2,267,129
	<b>(b)</b> Demographics and other	<u>(1,910,900)</u>		<u>9,077,561</u>
	<b>(c)</b> Total changes due to (gain)/loss: <b>(6a) + (6b)</b>		(\$4,350,329)	\$11,344,690
<b>7</b>	Assumption changes		<u>0</u>	<u>0</u>
<b>8</b>	Unfunded actuarial accrued liability at end of year: <b>(5) + (6c) + (7)</b>		<u>\$848,233,901</u>	<u>\$820,642,552</u>

## Exhibit J - Definition of Pension Terms

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

<b>Actuarial Accrued Liability for Actives:</b>	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
<b>Actuarial Accrued Liability for Pensioners:</b>	The single-sum value of lifetime benefits to existing pensioners. This sum takes into account 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.
<b>Actuarial Cost Method:</b>	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.
<b>Actuarial Gain or Loss:</b>	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., the Fund'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.
<b>Actuarially Equivalent:</b>	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
<b>Actuarial Present Value (APV):</b>	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: <ol style="list-style-type: none"><li>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</li><li>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</li><li>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</li></ol>

<b>Actuarial Present Value of Future Plan Benefits:</b>	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.
<b>Actuarial Valuation:</b>	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).
<b>Actuarial Value of Assets (AVA):</b>	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.
<b>Actuarially Determined:</b>	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.
<b>Actuarially Determined Contribution (ADC):</b>	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Fund's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
<b>Amortization Method:</b>	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.
<b>Amortization Payment:</b>	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

<b>Assumptions or Actuarial Assumptions:</b>	The estimates upon which the cost of the Fund is calculated, including: <ul style="list-style-type: none"> <li>a. <u>Investment return - the rate of investment yield that the Fund will earn over the long-term future;</u></li> <li>b. <u>Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates;</u></li> <li>c. <u>Retirement rates - the rate or probability of retirement at a given age;</u></li> <li>d. <u>Turnover rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;</u></li> <li>e. <u>Salary increase rates - the rates of salary increase due to inflation and productivity growth.</u></li> </ul>
<b>Closed Amortization Period:</b>	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.
<b>Decrements:</b>	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.
<b>Defined Benefit Plan:</b>	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
<b>Defined Contribution Plan:</b>	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.
<b>Employer Normal Cost:</b>	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
<b>Experience Study:</b>	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.
<b>Funded Ratio:</b>	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes calculate a market funded ratio, using the fair value of assets (MVA), rather than the AVA.
<b>GASB:</b>	Governmental Accounting Standards Board.
<b>GASB 67 and GASB 68:</b>	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.



<b>Investment Return:</b>	The rate of earnings of the Fund 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.
<b>Net Pension Liability (NPL):</b>	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
<b>Normal Cost:</b>	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.
<b>Open Amortization Period:</b>	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 with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
<b>Plan Fiduciary Net Position:</b>	Fair value of assets.
<b>Total Pension Liability (TPL):</b>	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.
<b>Unfunded Actuarial Accrued Liability:</b>	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
<b>Valuation Date or Actuarial Valuation Date:</b>	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.

# Section 4: Reporting Information

## Exhibit I – Summary of Actuarial Valuation Results

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

<b>1</b>	Pensioners as of the valuation date (including 648 beneficiaries and 11 dependent children)	2,775
<b>2</b>	Members inactive as of the valuation date with vested rights	158
<b>3</b>	Members active as of the valuation date	2,890
	Fully vested	1,235
	Not vested	1,655
<b>4</b>	Other non-vested inactive members as of the valuation date	4,906

The actuarial factors as of the valuation date are as follows:

<b>1</b>	Employer normal cost, including administrative expenses	\$5,772,874
<b>2</b>	Actuarial accrued liability	1,190,365,644
	Retirees and beneficiaries	\$795,731,449
	Inactive members with vested rights	25,054,751
	Active members	369,579,444
<b>3</b>	Actuarial value of assets (\$348,294,515 at fair value)	342,131,743
<b>4</b>	Unfunded actuarial accrued liability: <b>(2) – (3)</b>	\$848,233,901
<b>5</b>	Funded ratio: <b>(3) ÷ (2)</b>	28.7%

## Exhibit I – Summary of Actuarial Valuation Results *(continued)*

### Actuarially Determined Contribution Split by Tier

	Total		Tier I		Tier II	
	Amount	% of Payroll	Amount	% of Payroll	Amount	% of Payroll
<b>1</b> Total normal cost	\$16,948,567	12.06%	\$12,358,924	14.57%	\$4,589,643	8.25%
<b>2</b> Administrative expenses*	1,593,091	1.13%	1,564,097	1.84%	28,994	0.03%
<b>3</b> Expected employee contributions	<u>-12,768,784</u>	<u>-9.09%</u>	<u>-7,700,072</u>	<u>-9.08%</u>	<u>-5,068,712</u>	<u>-9.11%</u>
<b>4</b> Employer normal cost: <b>(1) + (2) + (3)</b>	5,772,874	4.11%	6,222,949	7.33%	-450,075	-0.81%
<b>5</b> Employer normal cost, adjusted for timing**	5,977,268	4.25%	6,443,278	7.59%	-466,010	-0.84%
<b>6</b> Actuarial accrued liability	1,190,365,644		1,168,701,352		21,664,292	
<b>7</b> Actuarial value of assets	<u>342,131,743</u>					
<b>8</b> Unfunded actuarial accrued liability: <b>(6) – (7)</b>	848,233,901					
<b>9</b> Payment on unfunded actuarial accrued liability	64,514,760	45.92%				
<b>10</b> Actuarially determined contribution, adjusted for timing**: <b>(5) + (9)</b>	<u>\$70,492,027</u>	<u>50.18%</u>				
<b>11</b> Estimated employer contributions provided by the Fund, reflecting 3% loss on collections***	\$13,159,834					
<b>12</b> Projected payroll	140,488,179		84,847,879		55,640,300	

\* Administrative expenses are split by % of accrued liability.

\*\* Recommended contributions are assumed to be paid at the middle of every month.

\*\*\* The Park District has been absorbing the 3% loss on collections, however, the Park District is not guaranteed to do so in the future.

## Exhibit II – Comparison of Employer Contribution to Actuarially Determined Contribution

Fiscal Year Ended	Actuarially Determined Contribution (ADC)*	Actual Contributions	Percentage Contributed
June 30, 2012	\$28,051,528	\$10,868,361	38.7%
December 31, 2012	16,786,671	5,268,636	31.4%
December 31, 2013	41,834,857	15,707,814	37.5%
December 31, 2014	35,307,186	11,225,438	31.8%
December 31, 2015	36,273,994	30,588,976	84.3%
December 31, 2016	37,130,268	30,890,241	83.2%
December 31, 2017	45,253,238	20,920,614	46.2%
December 31, 2018	50,929,734	27,638,402	54.3%
December 31, 2019	61,887,790	27,682,089	44.7%
December 31, 2020	67,297,212	33,939,927	50.4%
December 31, 2021	70,492,027	--	--

\* Prior to 2015, this amount was referred to as the Annual Required Contribution (ARC)

## Exhibit III – 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)
06/30/2012	\$440,692,006	\$866,370,565	\$425,678,559	50.87%	\$114,223,909	372.67%
12/31/2012	421,448,001	971,807,222	550,359,221	43.37%	58,231,511	472.56%**
12/31/2013	404,292,435	888,023,364	483,730,929	45.53%	117,781,596	410.70%
12/31/2014	393,762,692	900,840,617	507,077,925	43.71%	118,987,507	426.16%
12/31/2015	395,652,106	910,260,360	514,608,254	43.47%	122,382,584	420.49%
12/31/2016	393,604,997	1,005,493,093	611,888,096	39.15%	121,126,918	505.16%
12/31/2017	385,419,506	1,039,279,444	653,859,938	37.09%	135,315,008	483.21%
12/31/2018	366,806,612	1,142,297,965	775,491,353	32.11%	133,112,100	582.59%
12/31/2019	349,960,428	1,170,602,980	820,642,552	29.90%	139,204,051	589.52%
12/31/2020	342,131,743	1,190,365,644	848,233,901	28.74%	138,942,498	610.50%

\* Not less than zero

\*\* Adjusted for annualized covered payroll

## Exhibit IV – Solvency Test at December 31

	12/31/2020	12/31/2019	12/31/2018	12/31/2017	12/31/2016
<b>1 Actuarial accrued liability (AAL)</b>					
a. Active member contributions	\$174,600,431	\$173,843,745	\$164,316,381	\$173,903,043	\$172,808,623
b. Retirees and beneficiaries	795,731,449	789,231,586	778,565,525	706,084,520	694,881,116
c. Active and inactive members (employer financed)	220,033,764	207,527,649	199,416,059	159,291,881	137,803,354
d. Total	\$1,190,365,644	\$1,170,602,980	\$1,142,297,965	\$1,039,279,444	\$1,005,493,093
<b>2 Actuarial value of assets</b>	342,131,743	349,960,428	366,806,612	385,419,506	393,604,997
<b>3 Cumulative portion of AAL covered</b>					
a. Active member contribution	100.0%	100.0%	100.0%	100.0%	100.0%
b. Retirees and beneficiaries	21.1%	22.3%	26.0%	30.0%	31.8%
c. Active and inactive members (employer financed)	0.0%	0.0%	0.0%	0.0%	0.0%

	12/31/2015	12/31/2014	12/31/2013	12/31/2012	06/30/2012
<b>1 Actuarial accrued liability (AAL)</b>					
a. Active member contributions	\$173,241,768	\$169,952,178	\$171,065,449	\$166,554,660	\$158,144,793
b. Retirees and beneficiaries	625,396,307	625,641,580	621,827,982	662,153,615	599,353,146
c. Active and inactive members (employer financed)	111,622,285	105,246,859	95,129,933	143,098,947	108,872,626
d. Total	\$910,260,360	\$900,840,617	\$888,023,364	\$971,807,222	\$866,370,565
<b>2 Actuarial value of assets</b>	395,652,106	393,762,692	404,292,435	421,448,001	440,692,006
<b>3 Cumulative portion of AAL covered</b>					
a. Active member contribution	100.0%	100.0%	100.0%	100.0%	100.0%
b. Retirees and beneficiaries	35.6%	35.8%	37.5%	38.5%	47.1%
c. Active and inactive members (employer financed)	0.0%	0.0%	0.0%	0.0%	0.0%

## Exhibit V – Projection of Contributions, Liabilities, and Assets

Based on the results of the December 31, 2020, actuarial valuation, we have projected valuation results for a 40-year period commencing with Fiscal Year 2021.

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 needed to be made that are not normally required in a regular actuarial valuation. Benefit payout requirements, actuarial liabilities, and payroll were estimated over the 40-year period from 2021 through 2059 by projecting the membership of the Fund over the 40-year period, taking into account the impact of new entrants into the Fund over the 40-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 40-year projection period. The results of our projections are shown on the following pages.

For purposes of this projection, we have assumed that all available assets, including accumulated contributions made by existing active members, will be used to pay benefits until insolvency; at that point, request for refund of contributions from terminating active members will be treated as benefit payments that must be funded by employer contributions. However, the legality of this situation is undetermined at this time, and if it is determined that the reserve for accumulated active member contributions cannot be paid to existing annuitants, the Fund would become insolvent earlier than 2028.

The fair value of assets is assumed to earn the assumption of 7.25% each year of the projection until the projected date of insolvency. In reality, as the insolvency date approaches, invested assets will likely be rebalanced into more liquid, lower return assets in order to pay the benefits that are due. To the extent that actual returns are less than the 7.25% assumption as a result of this rebalancing, the Fund would become insolvent earlier than 2028.

For purposes of this projection, budgeted supplemental contributions for future years are not included. The projection only reflects statutorily-required contributions expected to be made by the employer.

## Exhibit V – Projection of Contributions, Liabilities, and Assets *(continued)*

Fiscal Year	Employee Contributions	Employer Contributions	Payroll	Normal Cost	Benefit Payouts	Estimated Expenses	Total Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
2020							\$1,190,365.6	\$342,131.7	\$848,233.9	28.7%
2021	\$12,768.8	\$13,159.8	\$140,488.2	\$16,948.6	\$82,583.2	\$1,654.3	1,209,267.7	308,528.5	900,739.2	25.5%
2022	12,540.9	13,481.4	137,955.9	16,674.7	83,785.1	1,712.2	1,228,000.9	266,678.8	961,322.1	21.7%
2023	12,415.8	13,624.3	136,566.2	16,497.3	85,127.9	1,772.1	1,246,510.5	229,389.0	1,017,121.6	18.4%
2024	12,323.3	13,381.1	135,538.0	16,296.3	86,584.8	1,834.2	1,264,636.8	182,121.3	1,082,515.5	14.4%
2025	12,255.8	13,247.7	134,788.4	16,109.5	88,086.6	1,898.4	1,282,320.6	128,803.9	1,153,516.7	10.0%
2026	12,200.9	13,148.9	134,178.2	15,919.4	89,660.8	1,964.8	1,299,451.4	69,678.1	1,229,773.3	5.4%
2027	12,147.5	13,076.9	133,585.0	15,704.9	91,355.6	2,033.6	1,315,837.9	4,244.6	1,311,593.3	0.3%
2028	12,103.0	78,987.2	133,090.9	15,500.4	93,230.0	2,104.7	1,331,250.7	0.0	1,331,250.7	0.0%
2029	12,054.0	85,304.2	132,545.9	15,256.8	95,179.8	2,178.4	1,345,499.3	0.0	1,345,499.3	0.0%
2030	12,017.4	87,322.4	132,139.9	15,046.8	97,085.1	2,254.7	1,358,581.3	0.0	1,358,581.3	0.0%
2031	11,984.3	89,533.5	131,772.2	14,833.0	99,184.3	2,333.6	1,370,207.0	0.0	1,370,207.0	0.0%
2032	11,958.0	91,559.7	131,479.3	14,616.3	101,102.4	2,415.2	1,380,455.6	0.0	1,380,455.6	0.0%
2033	11,943.6	93,491.9	131,320.0	14,404.6	102,935.8	2,499.8	1,389,320.4	0.0	1,389,320.4	0.0%
2034	11,946.4	95,441.9	131,351.1	14,204.1	104,801.0	2,587.3	1,396,680.0	0.0	1,396,680.0	0.0%
2035	11,944.5	97,056.4	131,329.6	13,987.2	106,323.1	2,677.8	1,402,763.2	0.0	1,402,763.2	0.0%
2036	11,971.8	98,829.5	131,632.3	13,798.8	108,029.7	2,771.6	1,407,317.0	0.0	1,407,317.0	0.0%
2037	11,981.9	97,921.2	131,744.9	13,597.8	107,034.6	2,868.6	1,413,016.6	0.0	1,413,016.6	0.0%
2038	12,010.8	99,271.2	132,065.6	13,407.0	108,313.0	2,969.0	1,417,599.9	0.0	1,417,599.9	0.0%
2039	12,046.5	100,239.4	132,462.7	13,218.9	109,213.0	3,072.9	1,421,381.2	0.0	1,421,381.2	0.0%
2040	12,109.4	100,951.8	133,161.1	13,065.0	109,880.8	3,180.4	1,424,579.6	0.0	1,424,579.6	0.0%
2041	12,186.2	101,435.8	134,015.3	12,929.9	110,330.3	3,291.7	1,427,399.2	0.0	1,427,399.2	0.0%
2042	12,281.3	101,544.2	135,071.4	12,840.2	110,418.5	3,406.9	1,430,235.6	0.0	1,430,235.6	0.0%
2043	12,401.1	101,245.5	136,403.3	12,782.2	110,120.5	3,526.2	1,433,524.2	0.0	1,433,524.2	0.0%
2044	12,545.8	100,728.5	138,010.4	12,754.5	109,624.6	3,649.6	1,437,535.3	0.0	1,437,535.3	0.0%
2045	12,706.8	99,788.1	139,799.6	12,753.9	108,717.6	3,777.3	1,442,776.6	0.0	1,442,776.6	0.0%
2046	12,897.7	98,735.9	141,920.3	12,796.4	107,724.0	3,909.5	1,449,473.0	0.0	1,449,473.0	0.0%
2047	13,096.2	97,649.2	144,125.6	12,871.9	106,699.0	4,046.4	1,457,798.1	0.0	1,457,798.1	0.0%
2048	13,302.0	96,505.4	146,413.3	12,962.2	105,619.5	4,188.0	1,467,942.3	0.0	1,467,942.3	0.0%



## Exhibit V – Projection of Contributions, Liabilities, and Assets *(continued)*

Fiscal Year	Employee Contributions	Employer Contributions	Payroll	Normal Cost	Benefit Payouts	Estimated Expenses	Total Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
2049	\$13,521.3	\$95,297.2	\$148,849.1	\$13,058.9	\$104,483.9	\$4,334.6	\$1,480,102.3	\$0.0	\$1,480,102.3	0.0%
2050	13,747.4	93,730.0	151,361.8	13,188.7	102,991.1	4,486.3	1,494,830.0	0.0	1,494,830.0	0.0%
2051	14,003.2	92,267.3	154,203.4	13,355.6	101,627.2	4,643.3	1,512,217.9	0.0	1,512,217.9	0.0%
2052	14,265.1	91,088.1	157,113.9	13,545.6	100,547.4	4,805.8	1,532,189.1	0.0	1,532,189.1	0.0%
2053	14,523.1	89,764.7	159,981.0	13,734.4	99,313.8	4,974.0	1,555,089.0	0.0	1,555,089.0	0.0%
2054	14,802.8	88,486.7	163,088.5	13,940.9	98,141.4	5,148.1	1,581,085.5	0.0	1,581,085.5	0.0%
2055	15,095.3	87,094.3	166,338.4	14,166.8	96,861.3	5,328.3	1,610,535.6	0.0	1,610,535.6	0.0%
2056	15,408.7	85,753.7	169,820.9	14,428.0	95,647.6	5,514.8	1,643,658.6	0.0	1,643,658.6	0.0%
2057	15,735.6	84,429.2	173,452.9	14,706.4	94,457.0	5,707.8	1,680,715.4	0.0	1,680,715.4	0.0%
2058	16,079.9	83,312.8	177,278.6	15,016.0	93,485.1	5,907.6	1,721,798.0	0.0	1,721,798.0	0.0%
2059	16,437.5	81,934.4	181,251.2	15,341.5	92,257.5	6,114.4	1,767,480.2	0.0	1,767,480.2	0.0%

## Exhibit VI – 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 October 25, 2018. Current data is reviewed in conjunction with each annual valuation.

### Mortality Rates:

#### *Healthy Post-retirement Mortality*

110% of PubG-2010 Healthy Annuitant Table, with mortality improvements projected generationally using scale MP-2017.

#### *Pre-retirement*

10% of PubG-2010 Healthy Employee Table, with mortality improvements projected generationally using scale MP-2017

The mortality tables specified above were determined to contain provisions appropriate to reasonably reflect future mortality improvement, based on a review of mortality experience as of the most recent experience study date.

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**Termination Rates:**

Select and ultimate termination rates are based on recent experience of the Fund. Ultimate rates applicable for members with eight or more years of service are shown for sample ages in the table on the next page. Select rates are as follows:

<u>Years of Service</u>	<u>Rate (%)</u>
0 - 0.99	17.5
1 - 1.99	13.0
2 - 2.99	13.0
3 - 3.99	12.5
4 - 4.99	12.5
5 - 5.99	10.0
6 - 6.99	10.0
7 - 7.99	10.0

Ultimate rates:

<u>Age</u>	<u>Rate (%)</u>
20	7.0
25	7.0
30	6.0
35	4.0
40	4.0
45	4.0
50	3.0
55	3.0

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**Retirement Rates:**

For employees first hired prior to January 1, 2011, rates of retirement for each age from 50 to 75 based on the recent experience of the Fund were used. Sample rates are shown below.

<u>Age</u>	<u>Rate (%)</u>	
	<u>&lt;30 Years of Service</u>	<u>30+ Years of Service</u>
50	2.5	30.0
55	2.0	20.0
60	5.0	5.0
65	15.0	15.0
70	20.0	20.0
75	100.0	100.0

For employees first hired on or after January 1, 2011, rates of retirement for each age from 62 to 75 were used. Sample rates are shown below.

<u>Age</u>	<u>Rate (%)</u>
62	50.0
65	20.0
67	50.0
70	20.0
75	100.0

**Salary Increases:**

Assumed salary increases are based on the recent experience of the Fund were used. Rates are shown below.

<u>Years of Service</u>	<u>Rate (%)</u>
0 – 0.99	20.00
1 – 1.99	7.50
2 – 2.99	5.00
3 – 3.99	3.50
4 - 4.99	3.50
5+	2.75

**Valuation of Inactive Vested Participants:**

The liability for an inactive member is equal to his or her existing account balance, or, if the participant has at least 10 years of service, twice the existing account balance.

**Unknown Data for Participants:**

Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.

**Spouse:**

75% of members are assumed to be married and female spouses are assumed to be two years younger than males.

**Disability Benefit Valuation:**

Disability benefits are valued in normal cost by annualizing the actual monthly disability payment amounts for the month prior to the valuation date.

**Investment Return:**

7.25% per year, net of investment expenses

**Inflation:**

2.50% per year

**Payroll Growth:**

2.50% per year

**Administrative Expenses:**

Equal to actual expenses for the prior year, increased by 3.5% each year.

**Actuarial Value of Assets:**

The actuarial value of assets was determined by smoothing unexpected gains and losses over a period of 5 years. The gain or loss for a year is calculated as the total investment income on the fair value of assets, minus expected investment return on the prior actuarial value of assets. The final actuarial value is equal to the expected actuarial value plus (or minus) 20% of the calculated gain (or loss) in the prior 5 years.

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**Salary Increases:**

Assumed salary increases are based on the recent experience of the Fund were used. Rates are shown below.

<u>Years of Service</u>	<u>Rate (%)</u>
0 – 0.99	20.00
1 – 1.99	7.50
2 – 2.99	5.00
3 – 3.99	3.50
4 - 4.99	3.50
5+	2.75

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**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.

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## Exhibit VII – Summary of Plan Provisions

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

<b>Membership:</b>	Any person employed by the Chicago Park District in a position requiring service for 6 months or more in a calendar year is required to become a member of the Fund as a condition of employment.
<b>Employee Contributions:</b>	All members of the Fund are required to contribute 9% of salary to the Fund as follows: 7% for the retirement pension, 1% for the spouse's pension, and 1% for the automatic increases in the retirement pension. In addition, employees are required to contribute \$3.60 per month toward the cost of the single sum death benefit.
<b>Tiers:</b>	Tier 1: First hired before January 1, 2011. Tier 2: First hired on or after January 1, 2011.

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**Retirement Pension:**

a. Eligibility – An employee may retire at age 50 with at least 10 years of service or at age 60 with 4 years of service. If retirement occurs before age 60, the retirement pension is reduced  $\frac{1}{4}$  of 1% of each month that the age of the member is below 60. However, there is no reduction if the employee has at least 30 years of service.

b. Amount – The retirement pension is based on the average of the 4 highest consecutive years of salary within the last 10 years. For an employee who withdraws from service on or after December 31, 2003, the amount of the retirement pension is 2.4% of highest average salary for each year of service.

The maximum pension payable is 80% of the highest annual salary.

An employee who was a participant before July 1, 1971 is entitled to the pension provided under the money purchase formula if it provides a greater pension than that provided under the above fixed benefit formula.

An employee who first becomes a participant on or after January 1, 2011 is subject to the following provisions:

1. The highest salary for annuity purposes is equal to the average monthly salary obtained by dividing the participant's total salary during the 96 consecutive months of service within the last 120 months of service in which the total compensation was the highest by the number of months in that period.

2. For 2021, the annual salary is limited to \$116,740.42. Limitations for future years shall automatically be increased by the lesser of 3% or one-half the percentage change in the Consumer Price Index-U during the preceding calendar year.

3. A participant is eligible to retire with unreduced benefits after attainment of age 67 with at least 10 years of service credit. However, a participant may elect to retire at age 62 with at least 10 years of service credit and receive a retirement annuity reduced by  $\frac{1}{2}$  of 1% for each month that the age of the member is below 67.

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**Post-Retirement Increase:**

Section 1 An employee retiring at age 60 or over, or an employee with 30 or more years of service, is entitled to automatic annual increases of 3% of the originally granted pension following one year's receipt of pension payments. In the case of an employee with less than 30 years of service who retires before age 60, the increases begin following the later of attainment of age 60 and receipt of one year's pension payments.

Automatic annual increases (AAI) in the retirement annuity for employees who first became a participant on or after January 1, 2011 are equal to the lesser of 3% or one-half the annual change in the Consumer Price Index-U, whichever is less, based on the originally granted retirement annuity.

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<p><b>Surviving Spouse's Pension:</b></p>	<p>A surviving spouse is entitled to a pension upon the death of an employee while in service or on retirement. If the surviving spouse is age 60 or over and the employee or retiree had at least 20 years of service, the minimum surviving spouse's pension is 50% of the deceased employee's or retired employee's pension at the date of death. If the age of the surviving spouse is less than 60, the pension is reduced ½ of 1% for each month the surviving spouse is under age 60. If the employee had less than 20 years of service, the surviving spouse is entitled to a pension under the money purchase formula, taking into account employee and employer contributions toward the surviving spouse's pension.</p> <p>Surviving spouse's pensions are subject to annual increases of 3% per year based on the current amount of pension.</p> <p>For employees who first become a participant on or after January 1, 2011, the initial survivor's annuity is equal to 66 2/3% of the participant's earned retirement annuity at the date of death, subject to automatic annual increases of the lesser of 3% or one-half of the increase in the Consumer Price Index-U during the preceding calendar year, based on the originally granted survivor's annuity.</p>
<p><b>Children's Pension:</b></p>	<p>Unmarried children of a deceased employee under the age of 18 are entitled to a children's pension. If either parent is living, the pension is \$100.00 per month. If no parent survives, the pension for each child is \$150.00 per month. The total amount payable to a spouse or children may not exceed 60% of the employee's final salary.</p>
<p><b>Single Sum Death Benefit:</b></p>	<p>A death benefit is payable upon the death of an employee in service in addition to any other benefits payable to the surviving spouse or minor children. The death benefit payable is as follows:</p> <ul style="list-style-type: none"> <li>\$3,000 benefit during the first year of service,</li> <li>\$4,000 benefit during the second year of service,</li> <li>\$5,000 benefit during the third year of service,</li> <li>\$6,000 benefit during the fourth through ninth year of service, and</li> <li>\$10,000 benefit if death occurs after ten or more years of service.</li> </ul> <p>Upon the death of a retired member with ten or more years of service, the \$10,000 maximum benefit is reduced to \$6,000 if death occurs during the first year of retirement. Thereafter, it is reduced by \$1,500 for each year or fraction of a year while on retirement, but shall not be less than \$3,000.</p>
<p><b>Ordinary Disability Benefit:</b></p>	<p>An ordinary disability benefit is payable after eight consecutive days of absence for illness without pay. The amount of the benefit is 45% of salary. The benefit is payable for a period not to exceed ¼ of the length of service or five years, whichever is less.</p>
<p><b>Occupational Death Benefit:</b></p>	<p>Upon disability resulting from an injury incurred while on duty, an employee is entitled to a disability benefit of 75% of salary from the first day of absence without pay. The benefit is payable during the period of disability until the employee attains age 65 if disability is incurred before age 60, or for a period of five years if disability is incurred after age 60.</p>

<b>Refunds:</b>	<p>An employee who terminates employment before qualifying for a pension is entitled to a refund of employee contributions. The refund is payable to any employee who withdraws before age 55, regardless of the length of service. It is also payable to an employee who withdraws between age 55 and 60 with less than 10 years of service, and to an employee who withdraws after age 60 with less than 5 years of service.</p> <p>An employee who is unmarried at date of retirement is entitled to a refund of the full amount contributed for the spouse's pension, without interest.</p>
<b>Plan Year:</b>	January 1 through December 31. Prior to December 31, 2012, the plan year was July 1 through June 30.
<b>Employer Contributions:</b>	The tax multiple is 1.1.

# Section 5: GASB 67 Information

## Exhibit 1 – Net Pension Liability

The components of the net pension liability of the Fund at December 31, 2020, were as follows:	
Total pension liability	\$2,277,440,135
Plan fiduciary net position	348,294,515
Net pension liability	1,929,145,620
Plan fiduciary net position as a percentage of the total pension liability	15.29%

*Actuarial assumptions.* The total pension liability was determined by an actuarial valuation as of December 31, 2020, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.50%
Salary increases	Service-based ranging from 20.00% to 2.75%
Single equivalent discount rate	2.22%, net of pension plan investment expense, including inflation
Cost of living adjustments	3% of original benefit for employees who first became a participant before January 1, 2011; the lesser of 3% and 1/2 of CPI of original benefit for employees and beneficiaries of employees who first became a participant on or after January 1, 2011; 3% compounded for beneficiaries of employees who first became a participant by January 1, 2011.

For healthy annuitants, mortality rates were based on 110% of PubG-2010 Healthy Annuitant Table, with mortality improvements projected generationally using scale MP-2017. For active participants, mortality rates were based on 110% of PubG-2010 Healthy Employee Table, with mortality improvements projected generationally using scale MP-2017.

The actuarial assumptions used in the December 31, 2020, valuation were based on the results of an experience study for the five-year period ending December 31, 2018.

*Discount rate:* The discount rate used to measure the total pension liability was 2.22%. The projection of cash flows used to determine the discount rate assumed member contributions will be made at the 9% contribution rate for 2021 and thereafter.

Employer contributions will be made at the 1.1 multiple of member contributions from two years prior for 2021 and thereafter. 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 not projected to be available to make all projected future benefit payments of current plan members. The projected benefit payments through 2026 were discounted at the expected long-term rate of return (7.25%). Starting in 2027, the projected benefit payments were discounted at the municipal bond index (2.12%, based on the Bond Buyer 20-GO Municipal Bond Index as of December 31, 2020). Therefore, a single equivalent, blended discount rate of 2.22% was calculated using the long-term expected rate of return and the municipal bond index.

*Sensitivity of the net pension liability to changes in the discount rate.* The following presents the net pension liability of the Fund, calculated using the discount rate of 2.22%, as well as what the Fund's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (1.22%) or 1-percentage-point higher (3.22%) than the current rate:

	<b>1% Decrease (1.22%)</b>	<b>Current Discount Rate (2.22%)</b>	<b>1% Increase (3.22%)</b>
Net pension liability as of December 31, 2020	\$2,323,041,621	\$1,929,145,620	\$1,614,340,720

## Exhibit 2 – Schedules of Changes in Net Pension Liability

	2020	2019
<b>Total pension liability</b>		
Service cost	\$51,348,187	\$33,317,058
Interest	58,440,058	69,086,515
Change of benefit terms	0	0
Differences between expected and actual experience	-2,309,221	15,529,818
Changes of assumptions	203,245,789	359,734,367
Benefit payments, including refunds of employee contributions	<u>-79,370,008</u>	<u>-78,550,449</u>
<b>Net change in total pension liability</b>	231,354,805	399,117,309
<b>Total pension liability – beginning</b>	2,046,085,330	1,646,968,021
<b>Total pension liability – ending (a)</b>	2,277,440,135	2,046,085,330
<b>Plan fiduciary net position</b>		
Contributions – employer	33,939,927	27,682,089
Contributions – employee	12,634,900	12,664,855
Net investment income	28,071,327	51,982,545
Benefit payments, including refunds of employee contributions	-79,370,008	-78,550,449
Administrative expense	-1,598,370	-1,528,861
Other	<u>60,451</u>	<u>50,236</u>
<b>Net change in plan fiduciary net position</b>	-6,261,773	12,300,415
<b>Plan fiduciary net position – beginning</b>	354,556,288	342,255,873
<b>Plan fiduciary net position – ending (b)</b>	348,294,515	354,556,288
<b>Fund’s net pension liability – ending (a) – (b)</b>	1,929,145,620	1,691,529,042
<b>Plan fiduciary net position as a percentage of the total pension liability</b>	15.29%	17.33%
<b>Covered employee payroll</b>	\$138,942,498	\$139,204,051
<b>Fund’s net pension liability as percentage of covered employee payroll</b>	1,388.45%	1,215.14%

## Exhibit 3 – Schedule of Employer Contribution – Last Ten Fiscal Years

<b>Fiscal Year Ended</b>	<b>Actuarially Determined Contributions</b>	<b>Contributions in Relation to the Actuarially Determined Contributions</b>	<b>Contribution Deficiency (Excess)</b>	<b>Covered-Employee Payroll</b>	<b>Contributions as a Percentage of Covered Employee Payroll</b>
June 30, 2012	\$28,051,528	\$10,868,361	\$17,183,167	\$114,223,909	9.51%
December 31, 2012	16,786,671	5,268,363	11,518,308	58,231,511	9.05%
December 31, 2013	41,834,857	15,707,814	26,127,043	117,781,596	13.34%
December 31, 2014	35,307,186	11,225,438	24,081,748	118,987,507	9.43%
December 31, 2015	36,273,994	30,588,976	5,685,018	122,382,584	24.99%
December 31, 2016	37,130,268	30,890,241	6,240,027	121,126,918	25.50%
December 31, 2017	45,253,238	20,920,614	24,332,624	135,315,008	15.46%
December 31, 2018	50,929,734	27,638,402	23,291,332	133,112,100	20.76%
December 31, 2019	61,887,790	27,682,089	34,205,701	139,204,051	19.89%
December 31, 2020	67,297,212	33,939,927	33,357,285	138,942,498	24.43%

## Notes to Exhibit 3

<b>Valuation date</b>	Actuarially determined contribution amount is determined as of December 31, with appropriate interest to the middle of the year.
<b>Methods and assumptions used to establish “actuarially determined contribution” for the fiscal year ended December 31, 2020:</b>	
<b>Actuarial cost method</b>	Entry Age Actuarial cost method
<b>Amortization method</b>	22-year closed, level percentage of payroll amortization
<b>Asset valuation method</b>	5-year smoothed fair value
<b>Actuarial assumptions:</b>	
Investment rate of return	7.25%, net of investment expense
Projected salary increases	Service-based ranging from 20.00% to 2.75%
Mortality	For healthy annuitants, mortality rates were based on 110% of PubG-2010 Healthy Annuitant Table, with mortality improvements projected generationally using scale MP-2017. For active participants, mortality rates were based on 110% of PubG-2010 Healthy Employee Table, with mortality improvements projected generationally using scale MP-2017.
Cost of living adjustments	3% of original benefit for employees who first became a participant before January 1, 2011; the lesser of 3% and 1/2 of CPI of original benefit for employees and beneficiaries of employees who first became a participant on or after January 1, 2011; 3% compounded for beneficiaries of employees who first became a participant by January 1, 2011.
<b>Other assumptions:</b>	Same as those used in the December 31, 2020, actuarial funding valuations based on the results of an experience study for the five-year period ending December 31, 2018.

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