County Employees' and Officers' Annuity and Benefit Fund of Cook County

A Component Unit of Cook County, Illinois

COMPREHENSIVE ANNUAL FINANCIAL REPORT

For the Fiscal Years Ended December 31, 2018 and 2017

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Prepared by the staff of the
County Employees' and Officers' Annuity and Benefit Fund of Cook County

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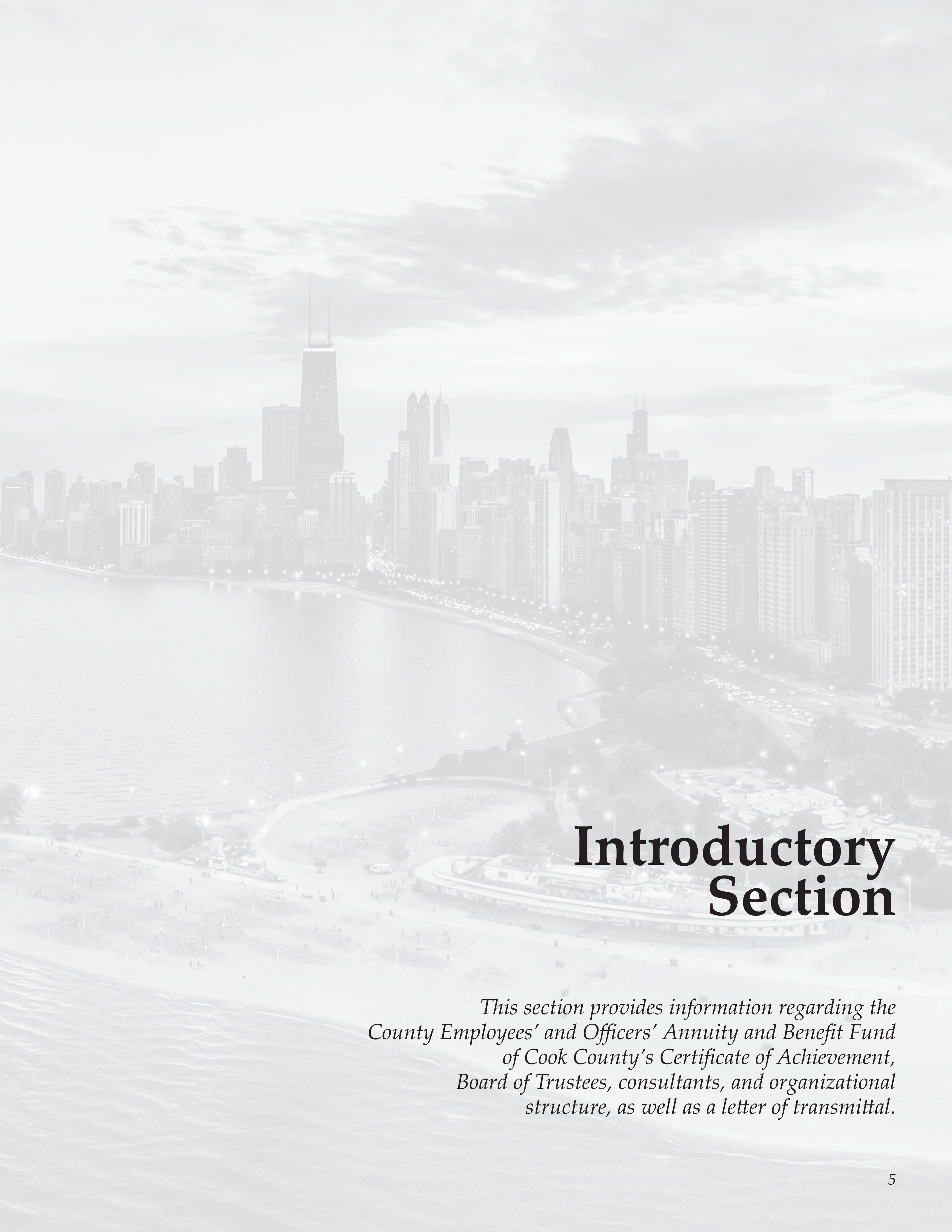

Introductory Section

This section provides information regarding the County Employees' and Officers' Annuity and Benefit Fund of Cook County's Certificate of Achievement, Board of Trustees, consultants, and organizational structure, as well as a letter of transmittal.

Certificate of Achievement

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

County Employees' and Officers'

Annuity and Benefit Fund

of Cook County, Illinois

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

December 31, 2017

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Executive Director/CEO

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Ex Officio Cook County Comptroller

Dennis White
Vice-President
Elected Forest Preserve District Employee

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Secretary
Elected Cook County Employee

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Elected Cook County Employee

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Elected Forest Preserve District Annuitant

Kevin Ochalla
Elected Cook County Employee

John E. Fitzgerald
Elected Cook County Annuitant

Bill Kouruklis
Ex Officio Cook County Treasurer (Designee)

Patrick J. McFadden
Elected Cook County Annuitant

Professional Consultants

Legal Counsel
Burke Burns & Pinelli, Ltd.

Auditor
Legacy Professionals, LLP

Investment Consultant
Callan Associates, Inc.

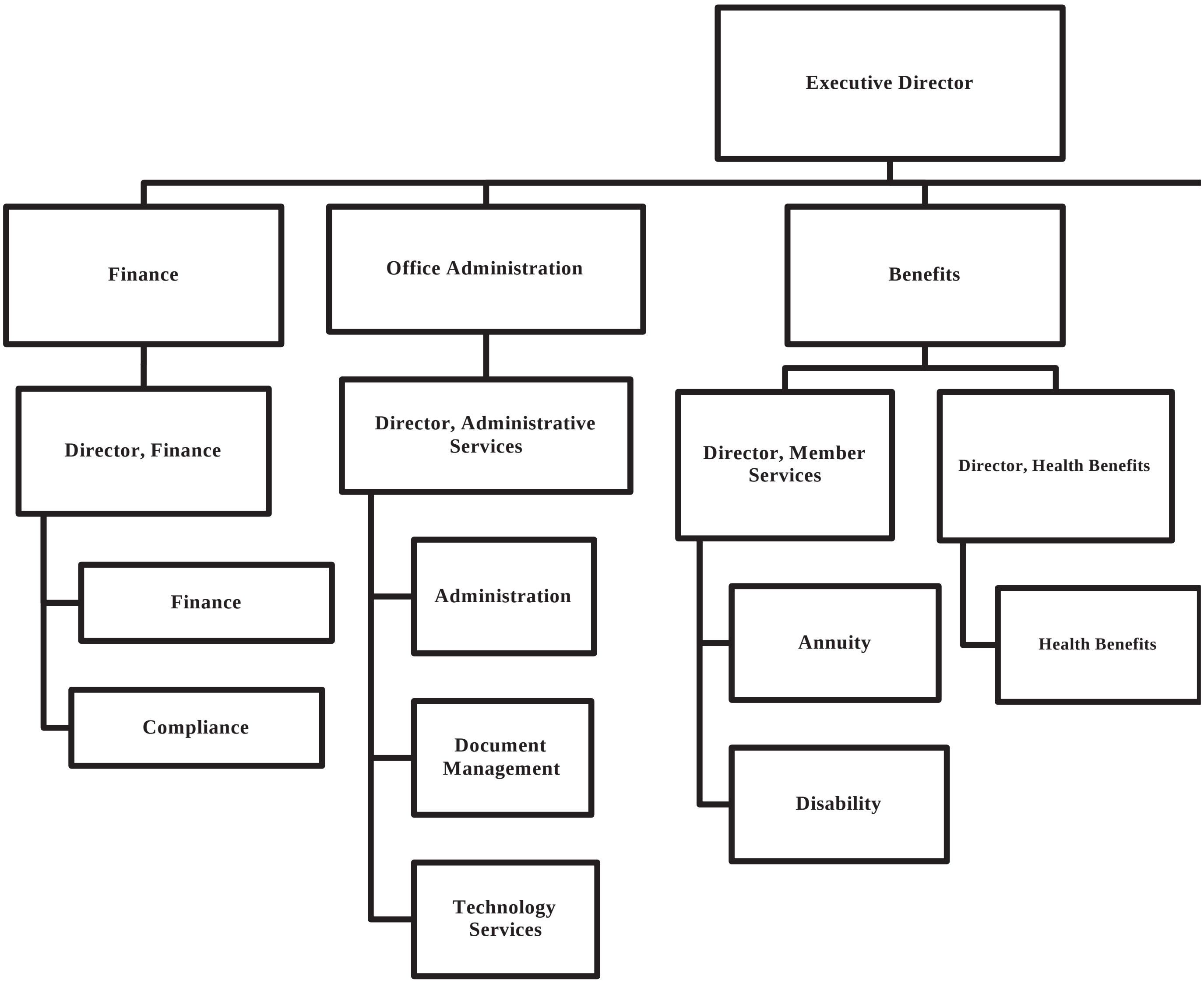
Consulting Actuary
Cavanaugh Macdonald Consulting, LLC

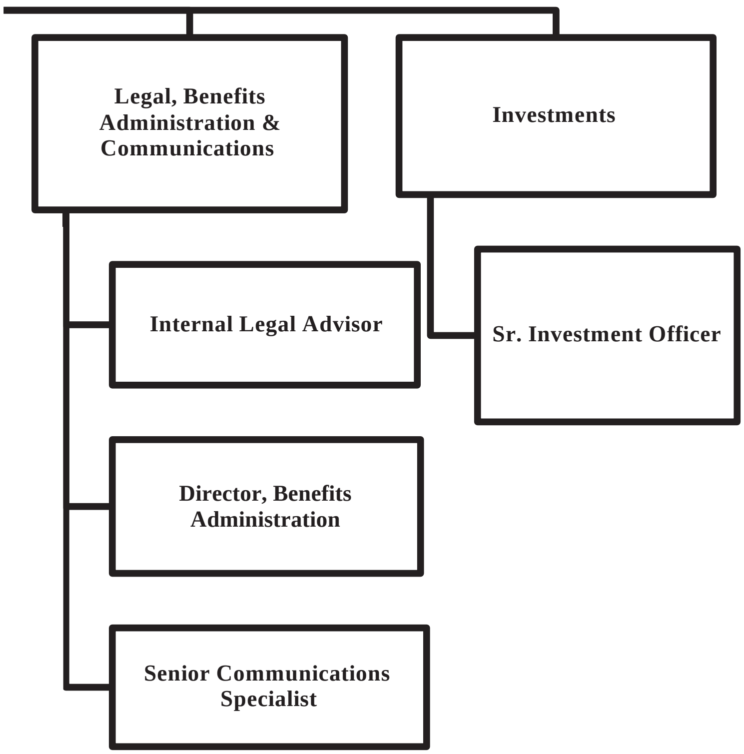
Master Custodian
BNY Mellon

Custodian
Cook County Treasurer

Investment Managers are listed on pages 86-87.
Brokers used by Investment Managers are listed on pages 88-89.

Organizational Chart




Legal, Benefits Administration & Communications
Investments
Internal Legal Advisor
Sr. Investment Officer
Director, Benefits Administration
Senior Communications Specialist

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Letter of Transmittal

June 18, 2019

Retirement Board
County Employees and Officers' Annuity and Benefit Fund of Cook County
and *ex officio* for the Forest Preserve District Employees' Annuity and Benefit Fund of Cook County
70 W Madison St, Suite 1925
Chicago, IL 60602

To the Retirement Board and Our Members:

We are pleased to submit to you the Comprehensive Annual Financial Report ("CAFR") of the County Employees' and Officers' Annuity and Benefit Fund of Cook County ("the Fund") for the calendar year ended December 31, 2018. The financial statements and their content are the responsibility of the Fund's management.

To the best of our knowledge and belief, the information contained in this report is complete and accurate in all material respects. This report is provided to allow the reader to gain an understanding of the Fund's financial position and operational activities. Readers should review this report in conjunction with the Management's Discussion and Analysis (MD&A) found in the Financial Section of this report.

Fund Profile

Established in 1926 by an act of the Illinois General Assembly, the Fund is a defined benefit public pension fund that is governed by Illinois Pension Code 40 ILCS 5/1-101 et. seq. The Fund administers annuity, disability, death, and health benefits to employees and their beneficiaries of Cook County, Illinois. It is considered a component unit of Cook County and is included in the County's financial statements as a pension trust fund. As of December 31, 2018, the Fund consisted of 19,671 active employees, 15,820 retiree annuitants, 2,782 survivor annuitants, and 14,898 inactive members.

The Fund is governed by a nine-member Retirement Board ("Board") that also administers the Forest Preserve District Fund. The nine Trustees are elected as follows: three are elected by the employees of Cook County; one is elected by employees of the Forest Preserve District, two are elected by the annuitants of Cook County; one is elected by the annuitants of the Forest Preserve District, and two are *ex officio* seats appointed by the Comptroller and Treasurer of Cook County. Elected Trustees serve staggered three-year terms resulting in no more than three positions being subject to election each year. The Fund has common trustees to administer the annuity and benefits of Cook County and Forest Preserve District employees in accordance with Illinois Compiled Statutes (ILCS) Chapter 40, Articles 1,9,10, and 20.

Summary of Financial Experience

The following table illustrates the changes in the Fund's net position between December 31, 2018 andDecember 31, 2017 (numbers in millions):

Change in Net Position	2018	2017	$ Change	% Change
Total additions	$ 324.6	$ 2,121.0	$ (1,796.4)	-84.7%
Total deductions	$ 870.5	$ 828.8	$ 41.7	5.0%
Change in net position from prior year	$ (545.9)	$ 1 ,292.2	$ (1,838.1)	-142.2%

A more detailed analysis of the Fund's financial experience can be found in the Financial Section of this report.

Funding

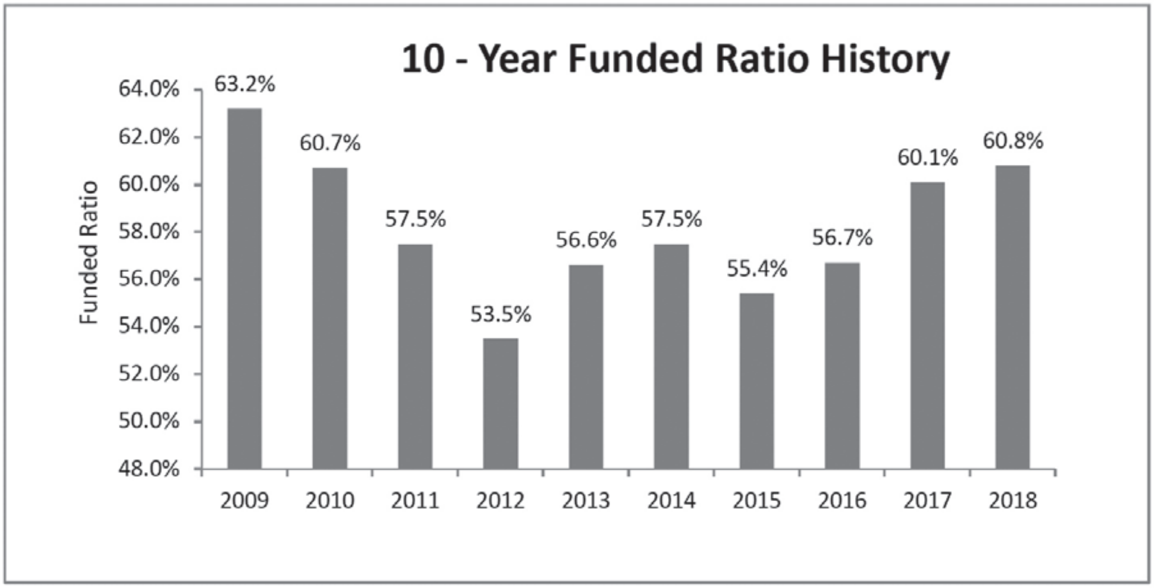
The Fund engages an independent actuary, Cavanaugh Macdonald Consulting, LLC, to perform an actuarial valuation on an annual basis pursuant to the provisions of the Illinois Pension Code. As of December 31, 2018, the Fund's combined actuarial accrued liability for pension and retiree benefits was $17.3 billion, and the actuarial value of assets was $10.5 billion, resulting in an unfunded actuarial accrued liability of $6.8 billion. The Funded ratio (ratio of assets to liabilities) for pension benefits and retiree health benefits combined was 60.75%, a slight increase from prior year's funded ratio of 60.09%.

The Fund's actuarial accrued liability for pension benefits only was $16.3 billion and the actuarial value of assets was $10.5 billion, resulting in an unfunded liability of $5.8 billion and a funded ratio of 64.44%. The Fund's actuarial accrued liability for retiree health benefits was $1.5 billion. As there are no dedicated assets, the actuarial value of assets was $0 for retiree health benefits, resulting in an unfunded liability of $1.5 billion.

The Cook County Administration (Employer) addresses the downward funding trend by identifying an additional contribution source to the Fund pursuant to a one-year Intergovernmental Agreement (IGA). The supplemental contribution source is derived from the Home Rule Sales Tax, which amounted to an additional contribution of $353.8 million (172% above the statutory contribution) in 2017 and $378.4 million* (181% above the statutory contribution) in 2018. For 2019, the Employer is expected to make supplemental payments of $320.3 million, of which $25,000,000 was received in December 2018. On a near-term basis, the supplemental contributions serve to bridge the funding shortfall to annual benefit pay-outs. As of the date of this letter, the Employer has made additional contributions (pursuant to IGA) to the Cook County Fund totaling $150,000,000. The Employer is expected to make additional payments in the amounts of: $25,000,000 on June 28, 2019; $25,000,000 on July 31, 2019; $25,000,000 on August 30, 2019; $25,000,000 on September 30, 2019; $25,000,000 on October 31, 2019; and $45,296,720 on or before November 30, 2019 for a total of $320,296,720. This will significantly alleviate the cash flow burden resulting in the need to liquidate investments in order to pay monthly benefit payments, especially during volatile markets.

**Includes a $25 million payment which pertains to 2019's IGA.*

The following chart depicts historical funding ratios for the Fund.



A detailed discussion of funding is provided in the Actuarial Section of this report.

On a projected basis, the Fund continues to face a funding shortfall without legislative action to establish an actuarially-based funding policy. Since 1984, the statutory tax multiple used to determine the employer contribution has been 1.54. According to the 2018 valuation, an actuarially-determined tax multiple of 4.73 is needed to restore solvency and avoid projected depletion of the Fund that is estimated by 2040.

Investments

The Board's authority to invest fund assets is governed by 40 ILCS 5/1-101 et seq. and 40 ILCS 5/9-101 et seq. The Fund's Investment Policy, which provides additional strategies and safeguards for the Fund's investment objectives, can be found at CookCountyPension.com.

At year-end, the total invested assets of the Fund were valued at $9.6 billion compared with $10.2 billion at the end of 2017, a decrease of approximately $0.6 billion. Although investment returns were positive for much of 2018, volatile market conditions at the end of 2018, resulted in unfavorable investment results for many public retirement systems, including the Fund. The Fund's investment rate of return (loss) for 2018 was approximately (3.8%), which was more favorable than many other broad market indices. While the domestic and international equity and fixed income portfolios delivered negative returns in 2018, the Fund's consistent dedication to alternative investments was very beneficial as the Fund's investment in private equity, private real estate, and hedge funds posted positive rates of return in 2018. The Board continues to work to maintain a diversified asset allocation within acceptable risk parameters.

Additional information regarding performance and investment professionals who provide services to the Fund can be found in the Investment Section of this report.

2018 Initiatives

The Fund continues to implement strategic initiatives across member services, organizational flexibility, systems and performance measurement, and liability and risk management. As the annuitant membership grows, the Fund's staff continually reviews its strategic and operating imperatives to maintain and improve quality member service.

Benefits

The Fund maintains its commitment to delivering high-touch customer service with an increasing volume of benefit requests that included the processing of over 910 retirement applications in the past year. The Employer implemented a new payroll module in 2018, and the Fund worked in coordination with the employer to ensure a smooth transition and seamless service to members retiring and requesting other related benefit services.

Member engagement remains a primary focus and the Fund continues to seek new ways to enhance communication with members, including frequent website updates, and three issues of a health benefits digest newsletter in 2018. The Fund has been drafting and will soon be issuing a communications survey to members in an upcoming pension newsletter to active and retired members.

Beginning January 1, 2017, Medicare eligible members began receiving a comparable prescription drug benefit at a lower cost through the Center for Medicare & Medicaid Services' (CMS) Medicare Part D Employer Group Waiver Plan ("EGWP"), which allows the Fund to take advantage of the Federal Government's competitive drug prices. With the EGWP program fully implemented in 2018, additional reimbursements were received. The EGWP program resulted in a continued cost reduction for the health benefit plan when compared to the prior two years.

Effective January 1, 2019, the Fund implemented a mandated Medicare enrollment for all Health Plan members eligible for Medicare at age 65 or at retirement if older than age 65. Health Plan members ineligible for premium free Medicare Part A are required to buy Medicare Part A and Part B in order to maintain coverage in the Fund's Health Plan. These members receive a reduced premium rate to offset the cost of Medicare Part A premiums. The Fund and members benefit from this change as Medicare becomes the primary payor on all claims.

To assist retired members with Medicare enrollment and the related transition, the Fund held two Medicare education programs in 2018 which received maximum participation. These two programs were designed to educate members on critical information regarding Medicare eligibility, enrollment considerations including timing, coordination with the Fund's Health Plan, and other helpful information.

In 2018, the Fund initiated an Out-of-State member information verification project. In April 2018, the Fund sent verification letters to all of the out-of-state annuitant members (totaling 2,676). The verification letters were sent to these annuitant members in order to verify various information necessary for benefit continuation, including current address, signatures, and status of legal guardian or agent under a Power of Attorney. For annuitants residing in Illinois, the Fund utilizes and works with the Illinois Department of Public Health's data to verify members' accurate status.

Investment

In October 2018, the Fund implemented a rebalancing strategy with a total notional value of approximately $1.1 billion. The objective of the rebalancing was to reduce the overweight to domestic small cap equity and increase the allocations to passive fixed income, core plus fixed income, international equity and emerging markets allocation in order to improve total risk and return metrics.

The rebalancing plan was the culmination of two years of extensive research, planning, and discussions conducted between the Fund's investment consultant, Fund staff, and the Investment Committee. The Board then reviewed and approved individual components of the plan during 2017 and 2018. The rebalancing involved 26 managers across three asset classes and was coordinated with all parties to occur simultaneously during the first part of the fourth quarter 2018. After a competitive bid process, Russell Investments Implementation Services, LLC. was selected from the Fund's transition manager pool to conduct the transition.

As a result of the rebalancing, three investment managers and their related mandates were removed from the portfolio. These assets were then redistributed according to the target asset allocation plan. Garcia Hamilton & Associates, PGIM Inc., and Strategic Global Advisors, LLC were added to the portfolio as part of the rebalancing.

Legislation

The following Public Acts were enacted in calendar year 2018:

Public Act 100-0794 Provisions

- Amended 5-9/228 to allow payments to be directed to a member's certified and licensed nursing home under limited conditions when they are legally disabled.
- The act requires the nursing home to notify the Fund in the event of the disabled member's death or any other relevant change in their status.

Public Act 100-0902 Provisions

- Amended 5-1/109.1(5) requiring all Illinois pension funds to make best efforts to ensure the racial and ethnic makeup of its senior staff represents the racial and ethnic makeup of its membership.

Accounting System & Internal Control

This report and the financial statements included within were prepared to conform to the principles of governmental accounting and reporting pronounced by the Governmental Accounting Standards Board and the American Institute of Certified Public Accountants.

The financial statements were prepared using the accrual basis of accounting. Under the accrual basis, revenues are recognized in the accounting period in which they are earned, without regard to the date of collection, and expenses are recognized when the corresponding liabilities are incurred, regardless of when payment is made.

The Fund maintains a system of internal controls to adequately safeguard its assets and assure the reliability of its financial records. The controls are designed to provide reasonable, but not absolute, assurance that these objectives are met. The concept of reasonable assurance recognizes that first, the cost of the control should not exceed the benefits likely to be derived, and second that the valuation of the cost and benefits requires estimates and judgments by management. Management and the external auditor continually review the controls for adequacy.

The financial statements included in this report were audited by Legacy Professionals, LLP, who have issued an unqualified opinion for calendar year ended December 31, 2018. A copy of their report is contained in the Financial Section of this report.

Administration

In December of 2018, I began my responsibilities as the Executive Director of the Fund. I am truly pleased and honored to serve in this very important position and am fortunate to follow a long history of dedicated and talented prior Executive Directors. I am thankful for this very special opportunity and welcome the privilege to serve such a diverse, hard-working, and diligent group of members who provide vital services to Cook County.

Awards

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the Fund for its CAFR for the fiscal year ended December 31, 2017. This was the ninth year that the Fund has earned this prestigious award. In order to be awarded a Certificate of Achievement, the Fund must publish an easily readable and efficiently organized comprehensive annual financial report. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that this current CAFR continues to meet the Certificate of Achievement Program's requirements, and we are submitting it to the GFOA to determine its eligibility for another certificate.

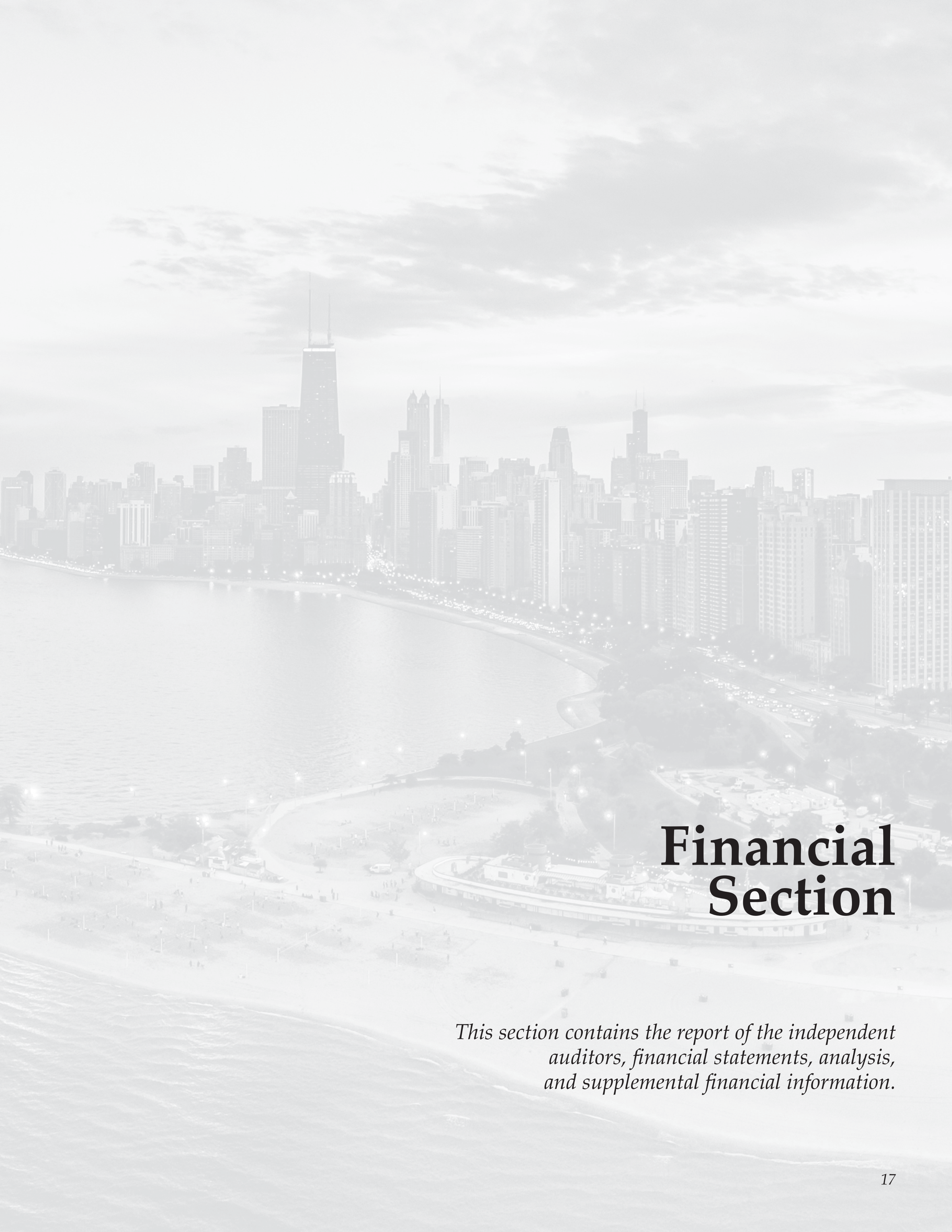
Acknowledgments

This report was prepared through the combined efforts of the Fund's staff under the direction of the Board. On behalf of the Board, I would like to thank the staff and professional consultants for their efforts in compiling this report.

Respectfully submitted,

Regina Tuczak

Regina Tuczak, Executive Director



Financial Section

This section contains the report of the independent auditors, financial statements, analysis, and supplemental financial information.

Report of Independent Auditors

LEGACY
PROFESSIONALS LLP
CERTIFIED PUBLIC ACCOUNTANTS

REPORT OF INDEPENDENT AUDITORS

To the Board of Trustees of
County Employees' and Officers' Annuity
and Benefit Fund of Cook County

Report on the Financial Statements

We have audited the accompanying financial statements of County Employees' and Officers' Annuity and Benefit Fund of Cook County (the Plan), a fiduciary fund of Cook County, Illinois, which comprise the combining statements of pension plan fiduciary net position and postemployment healthcare plan net position as of December 31, 2018 and 2017, and the related combining statements of changes in pension plan fiduciary net position and postemployment healthcare plan net position for the years then ended, and the related notes to the financial statements, which collectively comprise the Plan's basic financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Plan's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control.

Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to in the first paragraph present fairly, in all material respects, the plan net position of County Employees' and Officers' Annuity and Benefit Fund of Cook County as of December 31, 2018 and 2017, and the changes in plan net position for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis and the required supplementary information, consisting of the schedule of changes in the employer's net pension liability and related ratios, schedule of employer contributions and related notes, schedule of investment returns, schedule of changes in the employer's net postemployment healthcare liability and related ratios, and schedule of employer contributions and related notes, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquires of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the Plan's basic financial statements as a whole. The accompanying supplementary information, consisting of the schedules of net administrative expenses and professional and consulting fees, schedules of investment expenses, additions by source, deductions by type, and schedule of employer contributions receivable, is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the basic financial statements as a whole.

Previously Audited Information

We also have previously audited the basic financial statements for the years ended December 31, 2016, 2015, 2014, and 2013 (which are not presented herein), and we expressed unmodified opinions on those financial statements. In our opinion, the previously audited information presented on the additions by source and deductions by type is fairly stated in all material respects in relation to the basic financial statements from which it has been derived.

Legacy Professionals LLP

Westchester,
Illinois June 17, 2019

Management's Discussion and Analysis (Unaudited)

This section presents Management's Discussion and Analysis of the financial position and performance of the County Employees' and Officers' Annuity and Benefit Fund of Cook County (the Plan) for the years ended December 31, 2018 and 2017. This discussion is presented as an overview of the financial activities of the Plan and should be read in conjunction with the Plan's financial statements.

Overview of the Basic Financial Statements

The following discussion and analysis is intended to serve as an introduction to the Plan's basic financial statements. The financial statements are prepared on an economic sources focus and accrual basis of accounting in accordance with Governmental Accounting Standards Board (GASB) pronouncements. The basic components of the financial package are described below:

Combining Statements of Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position provides a snapshot of account balances and net position held in trust for future benefit payments and any liabilities as of the Plan's year end. Over time increases and decreases in net position may serve as a useful indicator of whether the financial position of the Plan is improving or deteriorating.

Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position shows the revenues (additions) and expenses (deductions) during the year, where additions less deductions equal net increase (decrease) in net position. The net increase (decrease) in net position reports the change in net position as reported in the combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position of the prior year and the current year.

Notes to the Financial Statements provides additional information that is essential to achieving a better understanding of the data provided in the basic financial statements.

Required Supplementary Information provides schedules and related notes concerning actuarial information, funding progress, employer contributions and investment returns.

Supplementary Information includes schedules of net administrative expenses, professional and consulting fees, investment expenses, additions by source, and deductions by type and employer contributions receivable.

Financial Highlights

Net position decreased by $545,859,661 or -5.2% from $10,407,883,443 at December 31, 2017 to $9,862,023,782 at December 31, 2018. Comparatively, net position increased by $1,292,225,573 or 14.2% from $9,115,657,870 at December 31, 2016 to 10,407,883,443 at December 31, 2017. The decrease in net position for 2018 was primarily due to the decrease in the fair value of investments. The increase in net position for 2017 was primarily due to the increase in the fair value of investments.

Rate of return of the Plan's investment portfolio was -3.79% for 2018, 15.35% for 2017 and 7.67% for 2016.

Net Position

The condensed Combining Statements of Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position reflects the resources available to pay benefits to members. A summary of the Combining Statements of Pension Plan Fiduciary Net Position and Postemployment Plan Net Position is as follows:

	Plan Net Position as of December 31,			Current Year Increase in	
	2018	2017	2016	Dollars	Percent
Total assets	$ 10,886,244,214	$ 11,765,897,724	$ 10,407,279,006	$ (879,653,510)	-7.5%
Total liabilities	1,024,220,432	1,358,014,281	1,291,621,136	(333,793,849)	-24.6%
Net position	$ 9,862,023,782	$ 10,407,883,443	$ 9,115,657,870	$ (545,859,661)	-5.2%

Changes in Plan Net Position

The condensed Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position reflects the changes in the resources available to pay benefits to members. A summary of the Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position is as follows:

	Changes in Plan Net Position For the Years Ended December 31,			Current Year Increase/ (Decrease) in	
	2018	2017	2016	Dollars	Percent
Additions:					
Employer contributions	$ 587,748,221	$ 559,205,626	$ 464,268,404	$ 28,542,595	5.1%
Employee contributions	134,159,171	138,826,184	139,355,592	(4,667,013)	-3.4%
Net investment income (loss)(includes security lending activities)	(424,787,945)	1,399,625,874	629,442,470	(1,824,413,819)	-130.4%
Other	27,479,205	23,321,813	14,019,340	4,157,392	17.8%
Total additions	324,598,652	2,120,979,497	1,247,085,806	(1,796,380,845)	-84.7%
Deductions:					
Benefits	831,661,745	790,352,526	742,396,434	41,309,219	5.2%
Refunds	33,662,521	32,995,364	26,702,222	667,157	2.0%
Administrative expenses	5,134,047	5,406,034	5,373,555	(271,987)	-5.0%
Total deductions	870,458,313	828,753,924	774,472,211	41,704,389	5.0%
Net increase (decrease)	(545,859,661)	1,292,225,573	472,613,595	(1,838,085,234)	142.2%
Net position					
Beginning of year	10,407,883,443	9,115,657,870	8,643,044,275	1,292,225,573	14.2%
End of year	$ 9,862,023,782	$ 10,407,883,443	$ 9,115,657,870	$ (545,859,661)	-5.2%

Additions to Plan Net Position

Total additions were $324,598,652 in 2018, $2,120,979,497 in 2017 and $1,247,085,806 in 2016.

Employer contributions increased to $587,748,221 in 2018 from $559,205,626 in 2017 and increased from $464,268,404 in 2016. Employer contributions are statutorily set at 1.54 times employee contributions collected two years prior. The County made supplemental contributions of $378,436,000 in 2018, $353,800,000 in 2017, and $270,526,000 in 2016.

Employee contributions, including permissive service credit purchases, decreased to $134,159,171 in 2018 from $138,826,184 in 2017 and decreased from $139,355,592 in 2016 when compared to 2017 employee contributions. The majority of members contribute 8.5% of covered wages.

Net investment (loss) totaled ($424,787,945) for 2018 compared to income of $1,399,625,874 and $629,442,470 for 2017 and 2016, respectively. Investment earnings fluctuate primarily from the overall performance of the financial markets from year to year.

Deductions to Plan Net Position

Total deductions were $870,458,313 in 2018, $828,753,924 in 2017 and were $774,472,211 in 2016.

Benefits increased to $831,661,745 in 2018 from $790,352,526 in 2017 and $742,396,434 in 2016 due primarily to the 3% annual cost of living increases for annuitants and an increase in the number of retirees.

Refunds increased to $33,662,521 in 2018 from $32,995,364 in 2017 and increased from $26,702,222 in 2016. These changes are due to fluctuations in refund applications.

The cost to administer the Plan decreased by 5.0% to $5,134,047 in 2018 from $5,406,034 in 2017. Comparatively, the cost to administer the Plan increased by 0.6% to $5,406,034 in 2017 from $5,373,555 in 2016.

Actuarial Information

Pension Benefits

Under GASB Statement No. 67, *Financial Reporting for Pension Plans*, the Plan's funding for pension benefits is as follows:

	Funding for Pension Benefits For the Years Ended December 31,		
	2018	**2017**	**2016**
Total pension liability	$ 21,723,236,738	$ 22,940,794,624	$ 23,240,192,010
Plan fiduciary net position	9,862,023,782	10,407,883,443	9,115,657,870
Employer's net pension liability	$ 11,861,212,956	$ 12,532,911,181	$ 14,124,534,140
Plan fiduciary net position as a percentage of the total pension liability	45.40%	45.37%	39.22%

Postemployment Healthcare Benefits

Under GASB Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*, the Plan's funding for postemployment healthcare benefits is as follows:

	Funding for Healthcare Benefits For the Years Ended December 31,		
	2018	**2017**	**2016**
Total other postemployment benefits liability	$ 1,534,053,569	$ 2,148,249,441	$ 2,229,886,669
Plan fiduciary net position	—	—	—
Employer's net other postemployement benefits liability	$ 1,534,053,569	$ 2,148,249,441	$ 2,229,886,669

Contributions for postemployment healthcare benefits are made on a "pay-as-you-go" basis, resulting in a 0.00% funded ratio.

Actuarial Information (continued)

Combined

The Plan actuary has performed a combined valuation of the pension and postemployment healthcare benefits provided by the Plan to measure the overall funded status and contribution requirements of the Plan. Such a valuation is required under Chapter 40, Article 5/9-199 of the Illinois Pension Code which provides that the Plan shall submit a report each year containing a detailed statement of the affairs of the Plan, its income and expenditures, and assets and liabilities. The combined valuation reflects the actuarial assumptions adopted by the Board based on the results of an actuarial experience study. These assumptions conform to the actuarial standards recommended by the Plan's actuary and were used by the Plan's actuary to present the combined funding status in accordance with *Section 9-199*. The Plan's funding under the combined actuarial valuation is as follows:

	Funding for Combined Pension and Postemployment Healthcare Benefits For the Years Ended December 31,		
	2018	**2017**	**2016**
Unfunded actuarial accrued liability	$ 6,791,017,319	$ 6,741,295,828	$ 7,238,233,759
Funded ratio	60.75%	60.09%	56.73%

Contact Information

This financial report is designed to provide the employer, plan participants and others with a general overview of the Plan's finances and show accountability for money it receives. Questions concerning any data provided in the report or requests for additional information should be addressed to:

County Employees' and Officers' Annuity and Benefit Fund of Cook County
Attention: Executive Director
70 West Madison Street Suite 1925
Chicago, Illinois 60602

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Combining Statements of Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position

December 31, 2018			
ASSETS	**Total**	**Pension**	**Postemployment Healthcare**
Receivables			
Employer contributions less allowance of $8,185,337 in 2018	$ 222,543,029	$ 222,543,029	$ -
Employee contributions	14,314,210	14,314,210	-
Accrued investment income	29,686,644	29,686,644	-
Receivable for securities sold	34,415,136	34,415,136	-
Due from Forest Preserve District Employees' Annuity and Benefit Fund of Cook County	381,010	381,010	-
EGWP/Medicare Part D subsidy	5,479,027	-	5,479,027
Prescription rebates	949,412	-	949,412
Imprest balance receivable	1,441,000	-	1,441,000
Other	11,349	11,349	-
Total receivables	309,220,817	301,351,378	7,869,439
Investments			
U.S. and international equities	4,958,851,665	4,958,851,665	-
U.S. Government and government agency obligations	1,170,334,505	1,170,334,505	-
Corporate and foreign government obligations	1,049,336,411	1,049,336,411	-
Collective international equity fund	70,371,275	70,371,275	-
Commingled fixed income fund	28,081,553	28,081,553	-
Private global fixed fund limited partnership	255,881,343	255,881,343	-
Exchange traded funds	55,162,948	55,162,948	-
Private equities	513,790,532	513,790,532	-
Hedge funds	666,385,423	666,385,423	-
Real estate funds	647,961,102	647,961,102	-
Short-term investment	218,141,023	218,141,023	-
Total investments	9,634,297,780	9,634,297,780	-
Collateral held for securities on loan	942,725,617	942,725,617	-
Total assets	10,886,244,214	10,878,374,775	7,869,439
LIABILITIES			
Accounts payable	12,634,128	12,634,128	-
Healthcare & other benefits payable	7,869,439	-	7,869,439
Payable for securities purchased	60,991,248	60,991,248	-
Securities lending collateral	942,725,617	942,725,617	-
Total liabilities	1,024,220,432	1,016,350,993	7,869,439
Net position			
Net position restricted for pensions	9,862,023,782	9,862,023,782	-
Net position held in trust for postemployment healthcare benefits	-	-	-
Total	$ $9,862,023,782	$ $9,862,023,782	$ -

Combining Statements of Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position (continued)

December 31, 2017			
ASSETS	**Total**	**Pension**	**Postemployment Healthcare**
Receivables			
Employer contributions less allowance of $6,501,930 in 2017	$ 221,777,241	$ 221,777,241	$ -
Employee contributions	6,313,252	6,313,252	-
Accrued investment income	22,764,522	22,764,522	-
Receivable for securities sold	42,988,417	42,988,417	-
Due from Forest Preserve District Employees' Annuity and Benefit Fund of Cook County	359,334	359,334	-
EGWP/Medicare Part D subsidy	3,416,852	-	3,416,852
Prescription rebates	2,066,366	-	2,066,366
Imprest balance receivable	1,200,000	-	1,200,000
Other	46,069	46,069	-
Total receivables	300,932,053	294,248,835	6,683,218
Investments			
U.S. and international equities	5,840,815,927	5,840,815,927	-
U.S. Government and government agency obligations	1,042,879,014	1,042,879,014	-
Corporate and foreign government obligations	892,437,094	892,437,094	-
Collective international equity fund	77,439,593	77,439,593	-
Commingled fixed income fund	28,067,670	28,067,670	-
Private global fixed fund limited partnership	214,787,328	214,787,328	-
Exchange traded funds	172,932,810	172,932,810	-
Private equities	393,324,331	393,324,331	-
Hedge funds	661,759,083	661,759,083	-
Real estate funds	625,399,268	625,399,268	-
Short-term investment	296,147,796	296,147,796	-
Total investments	10,245,989,914	10,245,989,914	-
Collateral held for securities on loan	1,218,975,757	1,218,975,757	-
Total assets	11,765,897,724	11,759,214,506	6,683,218
LIABILITIES			
Accounts payable	7,103,244	7,103,244	-
Healthcare & other benefits payable	9,373,422	2,690,204	6,683,218
Payable for securities purchased	122,561,858	122,561,858	-
Securities lending collateral	1,218,975,757	1,218,975,757	-
Total liabilities	1,358,014,281	1,351,331,063	6,683,218
Net position			
Net position restricted for pensions	10,407,883,443	10,407,883,443	-
Net position held in trust for postemployment healthcare benefits	-	-	-
Total	$ 10,407,883,443	$ 10,407,883,443	$ -

Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position

December 31, 2018

	Total	Pension	Postemployment Healthcare
Additions			
Employer contributions			
Statutory	$ 209,312,221	$ 209,312,221	$ -
Supplemental	378,436,000	378,436,000	-
Allocation to postemployment healthcare	-	(38,310,969)	38,310,969
Total employer contributions	587,748,221	549,437,252	38,310,969
Employee contributions			
Salary deductions	129,003,778	129,003,778	-
Refund repayments	2,249,491	2,249,491	-
Former and miscellaneous service payments	660,852	660,852	-
Optional payments and deductions	164,362	164,362	-
Deductions in lieu of disability	2,080,688	2,080,688	-
Total employee contributions	134,159,171	134,159,171	-
Investment income			
Net appreciation (depriciation) in fair value of investments	(595,032,962)	(595,032,962)	-
Dividends	128,038,585	128,038,585	-
Interest	73,805,330	73,805,330	-
	(393,189,047)	(393,189,047)	-
Less investment expenses	(36,754,398)	(36,754,398)	-
Net investment income	(429,943,445)	(429,943,445)	-
Securities lending			
Income	6,160,217	6,160,217	-
Expenses	(1,004,717)	(1,004,717)	-
Net securities lending income	5,155,500	5,155,500	-
Other			
Employer federal subsidized programs	5,678,102	5,678,102	-
EGWP/Medicare Part D subsidy	18,324,171	-	18,324,171
Prescription plan rebates	3,294,421	-	3,294,421
Employee transfers from Forest Preserve District			
Employees' Annuity and Benefit Fund of Cook County	182,511	182,511	-
Miscellaneous	-	-	-
Total other additions	27,479,205	5,860,613	21,618,592
Total additions	324,598,652	264,669,091	59,929,561

Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position (continued)

December 31, 2017			
	Total	**Pension**	**Postemployment Healthcare**
Additions			
Employer contributions			
Statutory	$ 205,405,626	$ 205,405,626	$ -
Supplemental	353,800,000	353,800,000	-
Allocation to postemployment healthcare	-	(47,454,641)	47,454,641
Total employer contributions	559,205,626	511,750,985	47,454,641
Employee contributions			
Salary deductions	133,373,644	133,373,644	-
Refund repayments	2,688,177	2,688,177	-
Former and miscellaneous service payments	701,554	701,554	-
Optional payments and deductions	36,687	36,687	-
Deductions in lieu of disability	2,026,122	2,026,122	-
Total employee contributions	138,826,184	138,826,184	-
Investment income			
Net appreciation (depriciation) in fair value of investments	1,248,856,354	1,248,856,354	-
Dividends	114,586,784	114,586,784	-
Interest	66,512,771	66,512,771	-
	1,429,955,909	1,429,955,909	-
Less investment expenses	(35,232,027)	(35,232,027)	-
Net investment income	1,394,723,882	1,394,723,882	-
Securities lending			
Income	5,817,943	5,817,943	-
Expenses	(915,951)	(915,951)	-
Net securities lending income	4,901,992	4,901,992	-
Other			
Employer federal subsidized programs	4,296,563	4,296,563	-
EGWP/Medicare Part D subsidy	10,398,481	-	10,398,481
Prescription plan rebates	7,563,914	-	7,563,914
Employee transfers from Forest Preserve District			
Employees' Annuity and Benefit Fund of Cook County	54,257	54,257	-
Miscellaneous	1,008,598	1,008,598	-
Total other additions	23,321,813	5,359,418	17,962,395
Total additions	2,120,979,497	2,055,562,461	65,417,036

Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position (continued)

December 31, 2018	Total	Pension	Postemployment Healthcare
Deductions			
Benefits			
Annuity			
Employee	$ 704,246,643	$ 704,246,643	$ -
Spouse and children	55,983,104	55,983,104	-
Disability			
Ordinary	10,851,548	10,851,548	-
Duty	650,889	650,889	-
Healthcare less annuitant contributions of $50,903,709 in 2018	59,929,561	-	59,929,561
Total benefits	831,661,745	771,732,184	59,929,561
Refunds	33,662,521	33,662,521	-
Net administrative expenses	5,134,047	5,134,047	-
Total deductions	870,458,313	810,528,752	59,929,561
Net increase (decrease)	(545,859,661)	(545,859,661)	-
Net position			
Beginning of year	10,407,883,443	10,407,883,443	-
End of year	$ 9,862,023,782	$ 9,862,023,782	$ -

Combining Statements of Changes in Pension Plan Fiduciary Net Position and Postemployment Healthcare Plan Net Position (continued)

December 31, 2017	Total	Pension	Postemployment Healthcare
Deductions			
Benefits			
Annuity			
Employee	$ 661,594,080	$ 661,594,080	$ -
Spouse and children	51,874,102	51,874,102	-
Disability			
Ordinary	10,875,990	10,875,990	-
Duty	591,318	591,318	-
Healthcare less annuitant contributions of $46,679,437 in 2017	65,417,036	-	65,417,036
Total benefits	790,352,526	724,935,490	65,417,036
Refunds	32,995,364	32,995,364	-
Net administrative expenses	5,406,034	5,406,034	-
Total deductions	828,753,924	763,336,888	65,417,036
Net increase (decrease)	1,292,225,573	1,292,225,573	-
Net position			
Beginning of year	9,115,657,870	9,115,657,870	-
End of year	$ 10,407,883,443	$ 10,407,883,443	$ -

Notes to Financial Statements

Note 1: Summary of Significant Accounting Policies

The County Employees' and Officers' Annuity and Benefit Fund of Cook County (the Plan) is administered in accordance with Chapter 40, Article 5/9 of the Illinois Compiled Statutes (the Statutes).

Financial Reporting Entity - Accounting principles generally accepted in the United States of America define a financial reporting entity as consisting of the primary government and its component units for which the primary government is financially accountable. Financial accountability includes appointing a voting majority of a component unit's governing board, the ability of a primary government to impose its will on the component unit, or a potential for a component unit to provide specific financial benefits to or impose specific financial burdens on the primary government. The Plan has determined that no other outside entity meets the above criteria and, therefore, no other entity has been included as a component unit in the Plan's financial statements.

Based on the above criteria, the Plan is considered to be a fiduciary fund of Cook County, Illinois (the County) and is included in the County's financial statements.

Method of Accounting - The financial statements are prepared using the accrual basis of accounting. Employer contributions are recognized as income pursuant to legal requirements as specified by the Illinois Compiled Statutes. Employee contributions are recognized in the period in which the contributions are due. Benefits and refunds are recognized when paid and payable in accordance with the terms of the Plan.

Investments - Investments are reported at fair value, which generally represents reported market value as of the last business day of the year. Where less than an entire investment holding is sold, average value is used to determine realized gain or loss.

Allocated Expenses - Administrative expenses are initially paid by the Plan. These expenses are allocated between the Plan and the Forest Preserve District Employees' Annuity and Benefit Fund of Cook County (the Forest Fund) on a pro rata basis, as applicable.

Capital Assets - The Plan has set a capitalization threshold of $100,000 for all capital asset types. As of December 31, 2018 and 2017, the Plan does not have any capital assets.

Estimates - The preparation of the financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect certain reported amounts and disclosures in the financial statements. Actual results could differ from those estimates.

Reclassifications - Certain prior year amounts have been reclassified to conform to the current year presentation.

Subsequent Events - Subsequent events have been evaluated through June 17, 2019, which is the date the financial statements were available to be issued.

Note 2: Plan Description

The Plan was established on January 1, 1926, and is governed by legislation contained in the Illinois Compiled Statutes (the Statutes), particularly Chapter 40, Article 5/9 (the Article). Effective with the signing of Public Act 96-0889 into law on April 14, 2010, participants that first became contributors on or after January 1, 2011 are Tier 2 participants. All other participants that were contributing prior to January 1, 2011 are Tier 1 participants. The Plan can be amended only by the Illinois Legislature. The Plan is a single employer defined benefit pension plan with a defined contribution minimum. The Plan was established for the purpose of providing retirement, death and disability benefits for full-time employees of the County and the dependents of such employees. The Plan is considered to be a fiduciary fund of Cook County, Illinois and is included in the County's financial statements.

The Statutes authorize a Board of Trustees (the Board) of nine members to carry out the provisions of the Article. According to the Article, two members of the Board are ex officio, four are elected by the employee members of the Plan and three are elected by the annuitants of the Plan. The two ex officio members are the Comptroller of Cook County, or someone chosen by the Comptroller, and the Treasurer of Cook County, or someone chosen by the Treasurer. All members of the Board are fiduciaries with respect to the Plan and are statutorily mandated to discharge their duties, as such, solely in the interest of the Plan's participants and beneficiaries.

The Board has the powers and duties required in the Article to collect all contributions due to the Plan, to invest the Plan's reserves, to have an annual audit, to appoint employees, to authorize or suspend payment of any benefit and to have exclusive original jurisdiction in all matters relating to or affecting the Plan. The Board approves its own budget which is prepared by the administrative staff of the Plan. The Board is required annually to submit to the County Board of Cook County a detailed report of the financial affairs and status of the Plan. Provisions in other articles of Chapter 40 require the Board to submit its annual audit and actuarial valuation reports to the State of Illinois Department of Insurance, as well as another detailed annual report, the form and content of which is specified by the Department of Insurance.

Covered employees are required to contribute 8.5% (9% for sheriffs) of their salary to the Plan, subject to the salary limitations for Tier 2 participants in Article 5/1-160. If an employee leaves covered employment without qualifying for an annuity, accumulated contributions are refunded with interest (3% or 4% depending on when the employee became a participant). The County's total contribution is the amount of contributions made by the employees to the Plan in the calendar year two years prior to the year for which annual applicable tax is levied, multiplied by 1.54. The source of funds for the County's contributions has been designated by State Statute as the County's annual property tax levy. The County's payroll for employees covered by the Plan for the years ended December 31, 2018 and 2017 was $1,533,721,507 and $1,567,480,401 respectively.

The Plan provides retirement as well as death and disability benefits. Tier 1 employees age 50 or older and Tier 2 employees age 62 or older are entitled to receive a minimum formula annuity of 2.4% for each year of credited service if they have at least 10 years of service. The maximum benefit is 80% of the final average monthly salary. For Tier 1 employees under age 60 and Tier 2 employees under age 67, the monthly retirement benefit is reduced by ½% for each month the participant is below that age. The reduction is waived for Tier 1 participants having 30 or more years of credited service.

Note 2: Plan Description (continued)

Participants should refer to the applicable State Statutes for more complete information. At December 31, 2018 and 2017, participants consisted of the following:

	2018	2017
Active members	19,671	20,349
Retired members	15,820	15,488
Beneficiaries	2,782	2,729
Inactive members	14,898	14,624
Total	53,171	53,190

Note 3: Employer's Pension Liability

Net Pension Liability

The components of the employer's net pension liability of the Plan for the years ended December 31, 2018 and 2017 are as follows:

	2018	2017
Total pension liability	$ 21,723,236,738	$ 22,940,794,624
Plan fiduciary net position	9,862,023,782	10,407,883,443
Employer's net pension liability	$ 11,861,212,956	$ 12,532,911,181
Plan fiduciary net position as a percentage of the total pension liability	45.40%	45.37%

See the schedule of changes in the employer's net pension liability and related ratios in the required supplementary information for additional information related to the funded status of the Plan.

Note 3: Employer's Pension Liability (continued)

The net pension liability was determined by actuarial valuations performed as of December 31, 2018 and 2017 using the following actuarial methods and assumptions:

Actuarial valuation date	**December 31, 2018**	**December 31, 2017**
Actuarial cost method	Entry Age Normal	Entry Age Normal
Amortization method	Level Dollar - Open	Level Dollar - Open
Remaining amortization period	30 years	30 years
Asset valuation method	Five Year Smoothed Average Market	Five Year Smoothed Average Market
Actuarial assumptions		
Inflation	2.75% per year, compounded annually;	2.75% per year, compounded annually
Salary increases	3.50% to 8.0%, based on age;	3.50% to 8.0%, based on age;
Investment rate of return	7.25% per year, compounded annually;	7.25% per year, compounded annually
Retirement age	Rates of retirement for each age from 50 to 80 based on recent experience of the Plan where all employees are assumed to retire by age 80	Rates of retirement for each age from 50 to 80 based on recent experience of the Plan where all employees are assumed to retire by age 80
Mortality	RP-2014 Blue Collar Mortality Table, base year 2006. Buck Modified MP-2017 projection scale.	RP-2014 Blue Collar Mortality Table, base year 2006. Buck Modified MP-2017 projection scale.
Postretirement annuity increase		
	Tier 1 participants - 3.0% compounded annually	Tier 1 participants - 3.0% compounded annually
	Tier 2 participants - the lesser of 3.0% or one half of the increase in the Consumer Price Index	Tier 2 participants - the lesser of 3.0% or one half of the increase in the Consumer Price Index

The actuarial assumptions used in the December 31, 2018 and 2017 valuations were based on the results of an actuarial experience study conducted by Buck (formerly Conduent, Inc.) dated February 2018. The Plan engaged Cavanaugh Macdonald Consulting to prepare the December 31, 2018 valuation.

Discount Rate

The discount rate used to measure the total pension liability at December 31, 2018 and 2017 were 4.98% and 4.47%, respectively. The projection of cash flows used to determine the discount rate assumed that contributions will continue to follow the current funding policy. Based on this assumption, the Plan's fiduciary net position was projected to be insufficient to make all projected future benefit payments of current plan members. A municipal bond rate of 4.13% and 3.16% at December 31, 2018 and 2017 were used in the development of the blended GASB discount rate after that point. The 4.13% and 3.16% rates are based on the S&P Municipal Bond 20 Year High Grade Rate Index. Based on the long-term rate of return of 7.25% and the municipal bond rate of 4.13% at December 31, 2018 and 3.16% at December 31, 2017, the blended GASB discount rates would be 4.98% and 4.47% at December 31, 2018 and 2017, respectively.

Note 3: Employer's Pension Liability (continued)

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following is an analysis of the net pension liability's sensitivity to changes in the discount rate at December 31, 2018 and 2017. The following table presents the net pension liability of the employer using the blended discount rate as well as the employer's net pension liability calculated using a discount rate 1 percent lower and 1 percent higher than the current discount rate:

	1% Decrease	Current Discount Rate	1% Increase
	3.98%	4.98%	5.98%
Net Pension Liability - December 31, 2018	$ 15,172,534,698	$ 11,861,212,956	$ 9,169,383,954

	1% Decrease	Current Discount Rate	1% Increase
	3.47%	4.47%	5.47%
Net Pension Liability - December 31, 2017	$ 16,366,617,953	$ 12,532,911,181	$ 9,471,482,980

Note 4: Summary of Employer Funding Policies

Statutory Funding

Employer contributions are funded primarily through a tax levied by Cook County, Illinois. The employer contributions to be remitted to the Plan are equal to the total contributions made by the employees to the Plan in the calendar year two years prior, multiplied by 1.54.

Supplemental Funding

Per the 2018 IGA (Intergovernmental Agreement), the County is required to make supplemental payments totaling $353,436,000 to promote the long-term fiscal sustainability of the Plan. During the year ended December 31, 2018, the County made supplemental contributions to the Plan totaling $378,436,000. The additional $25,000,000 received on December 31, 2018 pertains to 2019's IGA. For the year ended December 31, 2017, the County made supplemental contributions to the plan totaling $353,800,000.

Note 5: Investments

Investment Policy

The Board of Trustees is responsible for establishing reasonable and consistent investment objectives, policies, and guidelines governing the investment of Plan assets in accordance with the Illinois Compiled Statutes. The Plan is authorized to invest in bonds, notes, certificates of indebtedness, mortgage notes, real estate, stocks, shares, debentures, or other obligations or securities as set forth in the "prudent person" provisions of the state statutes. All of the Plan's financial instruments are consistent with the permissible investments outlined in the state statutes and any index-linked financial instruments are limited to those indices that replicate the permissible investments outlined in the State Statutes. During the year ended December 31, 2018 and 2017, there were no significant changes to the investment policy.

The Plan's investment policy in accordance with the Statutes establishes the following target allocation across asset classes:

Asset Class	Target Allocation %	Long-term Expected Real Rate of Return
Domestic equities	33.00%	11.24%
International equities	21.00%	9.51%
Fixed income	26.00%	4.77%
Real estate funds	9.00%	9.77%
Private equity	4.00%	11.43%
Hedge Funds	6.00%	7.31%
Short-term investment	1.00%	3.98%
Total investments	100.00%	

Long-Term Expected Rate of Return

The long-term expected rate of return on the Plan's investments was determined based on the results of an experience review. The results of the experience review were presented to the Board at the Board's March 2018 Meeting and adopted at a subsequent meeting. The rate of return assumption was based on the target asset allocation of the Plan. In the experience review, best estimate ranges of expected future real rates of return (net of inflation) for the portfolio were developed, based on the expected returns of each major asset class and their weights in the portfolio. An econometric model that forecasts a variety of economic environments and then calculates asset class returns based on functional relationships between the economic variables and the asset classes was then used. Expected investment expenses were subtracted and expected inflation was added to arrive at the long term expected nominal return. A value for the expected long term expected return was selected for the portfolio such that there was a better than 50% likelihood of the emerging returns exceeding the expected return. Best estimates or arithmetic real rates of return for each major asset class included in the Plan's target asset allocation as of December 31, 2018 are listed in the table above.

Note 5: Investments (continued)

Annual Money-Weighted Rate of Return

The annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was (3.79%) and 15.35% for years ended December 31, 2018 and 2017, respectively. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The Plan's investment policy is an average credit quality for each manager's total fixed income portfolio (Corporate and U.S. Government holdings) of not less than A- by two out of three credit agencies (Moody's Investor Service, Standard & Poor's and/or Fitch). The following table presents a summarization of the Plan's credit quality ratings of investments at December 31, 2018 and 2017 valued by Moody's Investors Service, Standard & Poor's and/or Fitch:

Type of Investment	Rating	2018	2017
U.S. Government and government agency obligations	Aaa/AAA	$ 1,126,661,748	$ -
	Aa/AA	4,446,042	969,866,822
	A/A	1,034,254	-
	Baa/BBB	410,323	-
	Not Rated	37,782,138	73,012,192
		$ 1,170,334,505	$ 1,042,879,014
Corporate and foreign government obligations	Aaa/AAA	$ 140,912,898	$ 49,734,614
	Aa/AA	55,450,980	43,244,820
	A/A	244,845,248	196,619,170
	Baa/BBB	439,977,678	399,219,807
	Ba/BB	47,343,211	91,257,578
	B/B	27,024,658	21,568,391
	Caa/CCC	-	71,256
	D/D	-	33,808
	Not Rated	93,781,738	90,687,650
		$ 1,049,336,411	$ 892,437,094
Commingled fixed income fund	Not Rated	$ 28,081,553	$ 28,067,670
Short-term investment	Not Rated	$ 218,141,023	$ 296,147,796

Note 5: Investments (continued)

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Investments held for longer periods are subject to increased risk of adverse interest rate changes. The Plan's investment policy for duration for each manager's total fixed income portfolio is within plus or minus 30% of the duration for the fixed income performance benchmark (*Bloomberg Barclays US Aggregate Fixed Income*, which was 5.87 years at December 31, 2018 and 5.98 years at December 31, 2017). The following table presents a summarization of the Plan's debt investments at December 31, 2018 and 2017, using the segmented time distribution method:

Type of Investment	Maturity	2018	2017
U.S. Government and government agency obligations	Less than 1 year	$ 167,349,384	$ 92,827,736
	1 - 5 years	355,220,165	271,124,646
	5 - 10 years	186,092,265	221,211,473
	Over 10 years	461,672,691	457,715,159
		$ 1,170,334,505	$ 1,042,879,014
Corporate and foreign government obligations	Less than 1 year	$ 219,808,611	$ 94,336,069
	1 - 5 years	240,685,129	248,124,750
	5 - 10 years	290,893,458	295,709,384
	Over 10 years	297,949,213	254,266,891
		$ 1,049,336,411	$ 892,437,094
Commingled fixed income fund	1 - 5 years	$ 28,081,553	$ 28,067,670
Short-term investment	Less than 1 year	$ 218,141,023	$ 296,147,796

Note 5: Investments (continued)

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or a deposit. The Plan's exposure to foreign currency risk at December 31, 2018 and 2017 is as follows:

Type of Investment	Fair Value (USD) 2018	Fair Value (USD) 2017
U.S. and international equities		
Australian dollar	$ 61,079,609	$ 67,544,094
Brazil real	36,260,689	34,564,982
British pound sterling	233,612,366	287,406,366
Canadian dollar	121,270,059	126,857,132
Chilean peso	2,579,305	2,923,883
Colombian peso	353,726	500,048
Danish krone	23,220,147	25,977,028
Egyptian pound	162,844	198,082
European euro	432,970,169	586,137,751
Hong Kong dollar	159,921,452	152,526,523
Hungarian forint	779,492	1,193,009
Indian rupee	17,563,526	20,584,222
Indonesian rupiah	9,088,212	7,985,768
Israeli shekel	6,620,433	9,049,297
Japanese yen	315,882,453	409,706,421
Malaysian ringgit	5,079,458	6,338,639
Mexican peso	10,215,052	9,944,521
New Taiwan dollar	46,706,841	44,440,360
New Turkish lira	54,295	117,984
New Zealand dollar	12,423,410	12,434,442
Norwegian krone	11,186,482	18,276,725
Phillipenes peso	4,107,072	7,609,358
Polish zloty	5,221,095	5,990,608
Russian ruble	418,882	496,564
Singapore dollar	28,583,794	29,599,310
South African rand	16,043,067	20,504,292
South Korean won	46,400,568	61,647,767
Swedish krona	50,572,540	56,520,490
Swiss franc	90,292,671	106,330,018
Thailand baht	7,826,846	9,006,007
United Arab Emirates dirham	1,304,847	1,457,264
U.S. dollar	3,201,050,263	3,716,946,972
Total U.S. and international equities	$ 4,958,851,665	$ 5,840,815,927

Note 5: Investments (continued)

Foreign Currency Risk (continued)

Type of Investment	Fair Value (USD) 2018	Fair Value (USD) 2017
Corporate and foreign government obligations		
Brazil real	$ 927,578	$ -
British pound sterling	728,888	-
Canadian dollar	732,473	2,764,885
Chinese yuan renminbi	733,031	-
Czech koruna	2,579,712	-
European euro	1,582,488	-
Hungarian forint	1,108,290	-
Indian rupee	14,540	-
Japanese yen	1,021,298	-
Mexican peso	541,343	-
Peruvian sol	532,737	-
Philippines peso	2,466,560	-
Polish zloty	465,682	-
Russian ruble	701,429	-
Singapore dollar	93,330	-
South korean won	279,744	-
Swedish krona	453,178	-
Taiwan dollar	760,528	-
New Turkish lira	989,532	1,003,130
Norwegian krone	695,979	-
U.S. dollar	1,031,928,071	888,669,079
Total corporate and foreign government obligations	$ 1,049,336,411	$ 892,437,094
Private equities		
European euro	$ 30,651,851	$ 21,420,498
U.S. dollar	483,138,681	371,903,833
Total private equities	$ 513,790,532	$ 393,324,331

Note 5: Investments (continued)

Foreign Currency Risk (continued)

For the years ended December 31, 2018 and 2017, net realized gain on investments sold, reflecting the difference between the proceeds received and cost value of securities sold, was $478,576,208 and $545,849,687 respectively. These amounts are included in the net appreciation (depreciation) in fair value of investments as reported on the combining statements of changes in pension plan fiduciary net position and postemployment healthcare plan net position. The calculation of realized gains and losses is independent of the calculation of net appreciation (depreciation) in the fair value of plan investments. Investments purchased in a previous year and sold in the current year result in their realized gains and losses being reported in the current year and their net appreciation (depreciation) in Plan assets being reported in both the current year and the previous years.

Note 6: Derivatives

Derivative transactions involve, to varying degrees, credit risk, interest rate risk and market risk. Credit risk is the possibility that a loss may occur because a party to a transaction fails to perform according to the previously agreed upon terms. Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Market risk is the possibility that a change in interest or currency rates will cause the value of a financial instrument to decrease or become more costly to settle. The following table summarizes the derivatives held within the Fund's investment portfolio as of December 31, 2018 and 2017.

	Notional Amounts		Fair Value	
	2018	2017	2018	2017
Hedging derivative instruments				
Foreign currency contracts purchased	$ -	$ -	$ (119,728,163)	$ (29,474,769)
Foreign currency contracts sold	-	-	119,604,889	29,494,115
Futures				
Equity	2,858,634	-	(173,650)	-
Fixed Income	(42,720,771)	-	(1,329,775)	-
Swaps				
Interest rate swaps	-	-	(775,834)	-
Inflation rate swaps	-	-	(299,536)	-
Return swaps	-	-	27,002	-

Note 6: Derivatives (continued)

Forward Currency Forward Contracts

Forward currency contracts are used to hedge against fluctuations in foreign currency- denominated assets used primarily in portfolio trade settlements. These contracts are a cash contract in which a seller agrees to deliver a specific cash commodity to a buyer sometime in the future. Forward agreements are subject to the creditworthiness of the counterparties, which are principally large financial institutions. Forward currency contracts are reported at fair value within the combining statement of pension plan fiduciary net position and postemployment healthcare plan net position included in investments. The gain or loss on forward currency contracts is recognized and recorded on the combining statement of changes in pension plan fiduciary net position and postemployment healthcare plan net position as part of investment income. The foreign currency contracts are short-term in nature.

The Plan's exposure to foreign currency risk at December 31, 2018 and 2017 is as follows:

Type of Investment	Fair Value (USD) 2018	Fair Value (USD) 2017
Foreign currency exchange sales		
Australian Dollar	$ 5,775,404	$ 4,540,837
Brazil real	1,188,837	-
British pound sterling	4,163,582	924,178
Canadian dollar	5,841,758	1,823,268
Chinese yuan renminbi	2,640,904	473,069
Colombian Peso	488,418	-
Czech koruna	2,813,404	-
Danish Krone	27,273	-
European euro	5,645,797	1,477,105
Hong Kong Dollar	57,624	18,845
Hungarian forint	1,108,290	-
Indian rupee	1,370,140	-
Indonesian rupiah	876,101	-
Israeli shekel	994,922	438,328
Japanese yen	3,935,175	1,958,520
Mexican peso	218,311	-
New Zealand Dollar	2,073,553	1,191,396
Norwegian krone	2,249,579	385,935
Peruvian sol	532,737	-
Philippines peso	2,775,428	-
Polish zloty	740,795	-
Russian ruble	701,429	-
Singapore dollar	1,613,291	476,493
South Korean won	1,386,691	-
South African rand	251,139	-
Swedish krona	2,742,988	1,137,855
Swiss franc	2,003,079	-
Taiwan dollar	2,538,580	-
Thailand baht	1,042,820	-
Turkish lira	1,406,242	-
U.S. dollar	60,400,598	14,648,285
Total	$ 119,604,889	$ 29,494,115

Note 6: Derivatives (continued)

Forward Currency Forward Contracts (continued)

Type of Investment	Fair Value (USD) 2018	Fair Value (USD) 2017
Foreign currency exchange purchases		
Australian Dollar	$ (2,420,985)	$ -
Brazil real	(385,672)	-
British pound sterling	(1,688,995)	(470,661)
Canadian dollar	(3,494,140)	(2,025,665)
Chilean Peso	(1,853,262)	-
Chinese yuan renminbi	(4,581,231)	(4,127,033)
Colombian Peso	(493,295)	-
Czech koruna	(233,691)	-
European euro	(21,869,186)	(9,716,932)
Indian rupee	(1,355,601)	-
Indonesian rupiah	(1,134,166)	-
Israeli shekel	(2,198,794)	-
Japanese yen	(1,501,240)	(471,836)
Mexican peso	(241,996)	-
New Zealand Dollar	(3,378,101)	(6,866,396)
Norwegian krone	(1,171,395)	(3,582)
Philippines peso	(308,868)	-
Polish zloty	(275,114)	-
Singapore dollar	(1,046,909)	-
South Korean won	(1,106,947)	-
South African rand	(1,894,716)	-
Swedish krona	(1,782,559)	-
Swiss franc	(9,456,032)	(770,697)
Taiwan dollar	(1,778,052)	-
Thailand baht	(2,874,171)	-
Turkish lira	(416,709)	-
U.S. dollar	(50,786,335)	(5,021,966)
Total	$ (119,728,163)	$ (29,474,769)

Note 6: Derivatives (continued)

Futures & Swaps

Futures are agreements to purchase or sell a specific amount of an asset at a specified maturity for an agreed-upon price. Futures contracts are reported at fair value in the equity and fixed income investments on the combining statement of pension plan fiduciary net position and postemployment healthcare plan net position. The gain or loss on futures contracts is reported as part of investment income on the combining statement of changes in pension plan fiduciary net position and postemployment healthcare plan net position. These instruments are not rated by the credit rating agencies.

Swaps are arrangements to exchange currency or assets. Swaps are reported at fair value in the fixed income investments on the combining statement of pension plan fiduciary net position and postemployment healthcare plan net position. The gain or loss on futures contracts is reported as part of investment income on the combining statement of changes in pension plan fiduciary net position and postemployment healthcare plan net position. These instruments are not rated by the credit rating agencies.

The following table presents a summarization of the Plan's Future and Swaps investments' interest rate risk exposure at December 31, 2018 and 2017, using the segmented time distribution method:

Derivate Type	Maturity	2018	2017
Futures	Less than 1 Year	$ 1,156,125	$ -
			-
Swaps	Less than 1 Year	$ 27,002	$ -
	1 - 5 years	(304,633)	-
	5 - 10 years	(785,776)	-
	Over 10 years	15,039	-
	Total	$ (1,048,368)	$ -

Note 7: When-Issued Transactions

The Plan may purchase securities on a when-issued basis, that is, obligate itself to purchase securities with delivery and payment to occur at a later date. At the time the Plan enters into a commitment to purchase the security, the transaction is recorded at the purchase price which equals fair value. The value at delivery may be more or less than the purchase price. No interest accrues to the Plan until delivery and payment takes place. As of December 31, 2018 and 2017, the Plan contracted to acquire securities on a when-issued basis with a total principal amount of approximately $37,540,000 and $73,800,000 respectively.

Note 8: Fair Value Measurements

GASB Statement No. 72, *Fair Value Measurement and Application*, established a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The three levels of the fair value hierarchy are described below:

Basis of Fair Value Measurement

Level 1 Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities

Level 2 Quoted prices in markets that are not considered to be active or financial instruments for which all significant inputs are observable, either directly or indirectly

Level 3 Prices or valuations that require inputs that are both significant to the fair value measurement and unobservable

The Plan categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The Plan has the following recurring fair value measurements as of December 31, 2018 and 2017:

		Fair Value Measurements at 12/31/2018 Using:		
	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level				
U.S. and international equities	$ 4,958,851,665	$ 4,958,851,665	$ -	$ -
U.S. Government and government agency obligations	1,170,334,505	-	1,170,334,505	-
Corporate and foreign government obligations	1,049,336,411	-	1,049,336,411	-
Exchange traded funds	55,162,948	55,162,948	-	-
Total investments by fair value level	$ 7,233,685,529	$ 5,014,014,613	$ 2,219,670,916	$ -
Investments measured at net asset value	2,400,612,251			
Total investments at fair value	$ 9,634,297,780			

Note 8: Fair Value Measurements (continued)

	Total	Fair Value Measurements at 12/31/2017 Using: Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level				
U.S. and international equities	$ 5,840,815,927	$ 5,840,815,927	$ -	$ -
U.S. Government and government agency obligations	1,042,879,014	-	1,042,879,014	-
Corporate and foreign government obligations	892,437,094	-	892,437,094	-
Exchange traded funds	172,932,810	172,932,810	-	-
Total investments by fair value level	$ 7,949,064,845	$ 6,013,748,737	$ 1,935,316,108	$ -
Investments measured at net asset value	2,296,925,069			
Total investments at fair value	$ 10,245,989,914			

Level 1 Measurements

U.S. and international equities and exchange traded funds are traded in active markets on national and international securities exchanges and are valued at closing prices on the measurement date.

Level 2 Measurements

U.S. Government and government agency obligations and corporate and foreign government obligations are generally valued by benchmarking model-derived prices to quoted market prices and trade data for identical or comparable securities. To the extent that quoted prices are not available, fair value is determined based on a valuation model that include inputs such as interest rate yield curves and credit spreads. Securities traded in markets that are not considered active are valued based on quoted market prices, broker to dealer quotations, or alternative pricing sources with reasonable levels of price transparency. Securities that trade infrequently and therefore have little or no price transparency are valued using the investment manager's best estimates.

Note 8: Fair Value Measurements (continued)

The valuation methods for investments measured at net asset value (NAV) are presented on the following table:

	Fair Value				
	12/31/2018	12/31/2017	Unfunded Commitments	Redemption Frequency (If Eligible)	Redemption Notice Period
Investments measured at net asset value:					
Collective international equity fund (1)					
Lazard/Wilmington Emerging					
Markets Sudan Free Portfolio	$ 70,371,275	$ 77,439,593	-	Daily	N/A
Commingled fixed income fund (2)					
MacKay Shields Defensive Bond					
Arbitrage Fund Ltd.	28,081,553	28,067,670	-	Daily	5 days
Private global fixed fund limited partnership (3)					
Franklin Templeton Global Multisector					
Plus Fund, L.P.	255,881,343	214,787,328	-	Monthly	15 days
Private equities (4)	513,790,532	393,324,331	346,463,426	Closed Ended	N/A
Hedge funds (5)					
Burnham Harbor Fund Ltd.	490,556,721	477,351,993	-	Monthly	95 days
RC Kenwood Fund Ltd.	175,828,702	184,407,090	-	Quarterly	90 days
Real estate funds (6)					
JPMCB Strategic Property Fund	272,741,485	262,575,288	-	Quarterly	45 days
PRISA Separate Account	247,088,693	237,020,184	-	Quarterly	90 days
Others	128,130,925	125,803,796	44,875,571	Quarterly	90 days
Short-term investment (7)					
BNY Mellon EB Temporary					
Investment Fund	218,141,022	296,147,796	-	Daily	N/A
Total investments measured at net asset value	$ 2,400,612,251	$ 2,296,925,069			

Note 8: Fair Value Measurements (continued)

(1) Collective international equity fund - The fund's investment objective is to achieve long- term capital appreciation by investing primarily in equity and equity-related securities of issuers that are located, or do significant business, in emerging market countries. The fair value of the investment in the fund has been determined using the NAV per share of the investment.

(2) Commingled fixed income fund - The fund's investment objective is to track the performance of the Barclays U.S. Aggregate Index. The fair value of the investment in the fund has been determined using the NAV per share of the investment.

(3) Private global fixed income fund limited partnership - The partnership's investment objective is to maximize total investment return by investing in a portfolio of fixed and floating rate debt securities and debt obligations of governments, government-related or corporate issuers worldwide, as well as derivative financial instruments. The fair value of the investment in the partnership fund has been determined using the NAV per share (or its equivalent) of the investment.

(4) Private equities - This investment consists of 79 limited partnership investments in 2018 and 51 in 2017, with an investment objective to achieve long-term capital appreciation and capital preservation through investments in limited partnerships, privately issued securities, private equity funds, and other pooled investments. Closed-end limited partnership interests are generally illiquid and cannot be redeemed. It is expected that liquidation of the limited partnership interests will generally coincide with the terms of the various underlying partnership agreements. These underlying private equity partnerships generally have a fund life per the Limited Partnership Agreements of approximately 10 to 12 years plus 2 to 3 one-year extensions. However, the underlying general partners may extend their funds indefinitely to facilitate an orderly liquidation of the underlying assets. The fair value of the investments in this type has been determined using the NAV per share (or its equivalent) of the investments.

(5) Hedge funds - The investment objective of the hedge funds is to invest in non-traditional portfolio managers, diversified portfolios of hedge funds having a low correlation with major investment markets, and diversified groups of alternative investment funds that invest or trade in a wide variety of financial instruments and strategies. The fair value of the investment in the hedge funds has been determined using the NAV per share (or its equivalent) of the investment.

(6) Real estate funds - These investments include a commingled pension trust fund, an insurance company separate account, and other real estate funds that are designed as funding vehicles for tax-qualified pension plans. Their investments are comprised primarily of real estate investments either directly owned or through partnership interests and mortgage and other loans on income producing real estate. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. Due to the nature of the investments and available cash on hand, significant redemptions in this type of investment may at times be subject to additional restrictions.

(7) Short-term investment - This investment's objective is to invest in short-term investments of high quality and low risk to protect capital while achieving investment returns. The fair value of the investment in the fund has been determined using the NAV per share of the investment.

Note 9: Securities Lending

State Statutes and the investment policy permit the Plan to lend its securities to broker-dealers and other entities with a simultaneous agreement to return collateral for the same securities in the future. The Plan's custodian, acting as the lending agent, lends securities for collateral in the form of cash, U.S. Government obligations and irrevocable letters of credit equal to 102% of the fair value of domestic securities plus accrued interest and 105% of the fair value of foreign securities plus accrued interest.

The Plan does not have the right to sell or pledge securities received as collateral unless the borrower defaults. The average term of securities loaned was 75 days for 2018 and 87 days for 2017; however, any loan may be terminated on demand by either the Plan or the borrower. Cash collateral was invested in a separately managed portfolio, which had an average weighted maturity at December 31, 2018 and 2017 of 77 and 90 days, respectively.

As of December 31, 2018 and 2017, the fair value (carrying amount) of loaned securities was $1,188,389,587 and $1,402,318,531 respectively. As of December 31, 2018 and 2017, the fair value (carrying amount) of cash collateral received by the Plan was $942,725,617 and $1,218,975,757 respectively. The cash collateral is included as an asset and a corresponding liability on the combining statements of pension plan fiduciary net position and postemployment healthcare plan net position. As of December 31, 2018 and 2017, the fair value (carrying amount) of non-cash collateral received by the Plan was $278,065,381 and $219,920,960 respectively.

Although the Plan's securities lending activities are collateralized as described above, they involve both market and credit risk. In this context, market risk refers to the possibility that the borrower of securities will be unable to collateralize the loan upon a sudden material change in the fair value of the loaned securities. Credit risk refers to the possibility that counterparties involved in the securities lending program may fail to perform in accordance with the terms of their contracts.

Indemnification deals with the situation in which a client's securities are not returned due to the insolvency of a borrower. The contract with the lending agent requires indemnification to the Plan if borrowers fail to return the securities or fail to pay the Plan for income distributions by the issuers of securities while the securities are on loan.

Note 9: Securities Lending (continued)

A summary of securities loaned at fair value as of December 31, 2018 and 2017 is as follows:

	2018	2017
Securities loaned - backed by cash collateral		
U.S. and international equities	$ 663,838,236	$ 840,093,373
U.S. Government and government agency obligations	130,459,946	105,971,706
Exchange traded funds	40,377,541	163,399,993
Corporate and foreign government obligations	83,164,383	79,146,994
Total securities loaned -backed by cash collateral	917,840,107	1,188,612,066
Securities loaned - backed by non-cash collateral		
U.S. and international equities	221,564,089	-
U.S. Government and government agency obligations	47,724,114	213,706,465
Corporate and foreign government obligations	1,261,277	-
Total securities loaned - backed by non-cash collateral	270,549,480	213,706,465
Total	$ 1,188,389,587	$ 1,402,318,531

Note 10: Employer's Postemployment Healthcare Liability

Plan Description

The Plan administers a Postemployment Group Healthcare Benefit Plan (PGHBP), a single- employer defined benefit postemployment healthcare plan. The PGHBP is administered in accordance with Chapter 40, Article 5/10 of the Illinois Compiled Statutes, which assigns the authority to establish and amend benefit provisions to the Plan's Board of Trustees. PGHBP provides a healthcare benefit to annuitants of Cook County, Illinois (the employer) who elect to participate in the PGHBP.

At December 31, 2018 and 2017, participants consisted of the following:

	2018	2017
Active members	19,671	20,349
Inactive plan members or beneficiaries currently receiving benefit payments	11,809	11,605
Inactive plan members entitled to but not yet receiving benefit payments	1,592	1,528
Total	33,072	33,482

Note 10: Employer's Postemployment Healthcare Liability (continued)

Plan Description (continued)

Benefits provided - The PGHBP provides healthcare and vision benefits for annuitants and their dependents.

Contributions - The PGHBP is funded on a "pay-as-you-go" basis. The employee and spouse annuitants pay between 51% - 61% and 38% - 48% of the annual medical costs, respectively, depending upon medicare eligibility and coverage type. The remaining costs are funded by an allocation from the Plan.

Method of Accounting - The PGHBP's financial statements have been combined with the Plan's financial statements and are presented using the accrual basis of accounting. Healthcare expenses are recognized when incurred and estimable.

Employer's Net Postemployment Healthcare Liability

The components of the employer's net postemployment healthcare liability at December 31, 2018 and 2017 were as follows:

	2018	2017
Total postemployment healthcare liability	$ 1,534,053,569	$ 2,148,249,441
Plan fiduciary net position	-	-
Employer's net postemployment healthcare liability	1,534,053,569	2,148,249,441
Plan fiduciary net position as a percentage of the total postemployment healthcare liability	0.00%	0.00%

Contributions for postemployment healthcare benefits are made on a "pay-as-you-go" basis. There are no dedicated assets for healthcare benefits resulting in a 0.00% funded ratio.

See the schedule of changes in the employer's net postemployment healthcare liability and related ratios in the required supplementary information for additional information related to the funded status of the PGHBP.

Note 10: Employer's Postemployment Healthcare Liability (continued)

The net postemployment healthcare liability was determined by actuarial valuation performed as of December 31, 2018 and 2017 using the following actuarial methods and assumptions:

Actuarial valuation date	December 31, 2018	December 31, 2017
Actuarial cost method	Entry Age Normal	Entry Age Normal
Actuarial assumptions:		
Inflation	2.75% per year	2.75% per year
Salary increases	3.50% to 8.00%, based on age	3.50% to 8.00%, based on age
Health care cost trend rates	7.25% in the first year, decreasing by .25% per year until an ultimate rate of 4.75% is reached for pre-medicare 5.75% in the first year, decreasing by .25% per year until an ultimate rate of 4.75% is reached for post-medicare	7.25% in the first year, decreasing by .25% per year until an ultimate rate of 4.75% is reached for pre-medicare 5.75% in the first year, decreasing by .25% per year until an ultimate rate of 4.75% is reached for post-medicare
Mortality	2017 - RP-2014 Blue Collar Mortality Table, base year 2006, Buck Modified MP-2017 projection scale	2017 - RP-2014 Blue Collar Mortality Table, base year 2006, Buck Modified MP-2017 projection scale

The actuarial assumptions used in the December 31, 2018 and 2017 valuation were based on the results of an actuarial experience study conducted by Buck (Formerly Conduent, Inc.) over the period 2013 through 2016.

Discount Rate

The blended discount rate used to measure the total postemployment healthcare liability at December 31, 2018 and 2017 were 4.13% and 3.16%, respectively. The projection of cash flows used to determine the discount rate assumed that the employer's contributions will continue to follow the current funding policy. Based on this assumption, the Plan's fiduciary net position was projected to be insufficient to make all projected future benefit payments of current plan members. Municipal bond rates of 4.13% and 3.16% at December 31, 2018 and 2017, respectively, and the long-term investment rate of return of 0% was used in the development of the blended discount rates. The municipal bond rates are based on the S&P Municipal Bond 20 Year High Grade Rate Index.

Note 10: Employer's Postemployment Healthcare Liability (continued)

Sensitivity of the Net Postemployment Healthcare Liability to Changes in the Discount Rate

The following is an analysis of the net postemployment healthcare liability's sensitivity to changes in the discount rate at December 31, 2018 and 2017. The following table presents the net postemployment healthcare liability of the employer using the blended discount rate as well as the employer's net postemployment healthcare liability calculated using a discount rate 1 percent lower and 1 percent higher than the current discount rate:

	1% Decrease	Current Discount Rate	1% Increase
	3.13%	4.13%	5.13%
Net postemployment healthcare liability as of December 31, 2018	$ 1,803,057,515	$ 1,534,053,569	$ 1,319,144,094

	1% Decrease	Current Discount Rate	1% Increase
	2.16%	3.16%	4.16%
Net postemployment healthcare liability as of December 31, 2017	$ 2,532,858,758	$ 2,148,249,441	$ 1,842,064,933

Sensitivity of the Net Postemployment Healthcare Liability to Changes in the Health Care Cost Trend Rate

The following is an analysis of the net postemployment healthcare liability's sensitivity to changes in the health care cost trend rate at December 31, 2018 and 2017. The following table presents the net postemployment healthcare liability of the employer using the health care cost trend rate as well as the employer's net postemployment healthcare liability calculated using a health care cost trend rate 1 percent lower and 1 percent higher than the current health care cost trend rate:

	1% Decrease	Health Care Cost Trend Rate	1% Increase
Net postemployment healthcare liability as of December 31, 2018	$ 1,289,159,107	$ 1,534,053,569	$ 1,850,456,464

	1% Decrease	Health Care Cost Trend Rate	1% Increase
Net postemployment healthcare liability as of December 31, 2017	$ 1,805,019,432	$ 2,148,249,441	$ 2,593,628,968

Note 11: Related Party Transactions

The Plan has common Trustees and shares office space with the Forest Preserve District Employees' Annuity and Benefit Fund of Cook County (Forest Fund) who reimburses the Plan for shared administrative services provided by the Plan. During the years ended December 31, 2018 and 2017, the Plan allocated administrative expenditures of $99,627 and $109,430 respectively to the Forest Fund.

As of December 31, 2018 and 2017, the Forest Fund owes the Plan $381,010 and $359,334 respectively. These amounts include plan transfers of Plan members transferring from one plan to another.

Note 12: Pronouncements Issued Not Yet Effective

In November 2016, GASB issued Statement No. 83, *Certain Asset Retirement Obligations.* Statement No. 83 addresses accounting and financial reporting for certain asset retirement obligations and establishes criteria for determining the timing and pattern of recognition of a liability and a corresponding deferred outflow of resources for asset retirement obligations. Statement No. 83 is effective for the Plan's fiscal year ending December 31, 2019.

In January 2017, GASB issued Statement No. 84, *Fiduciary Activities.* Statement No. 84 improves guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how those activities should be reported. Statement No. 84 is effective for the Plan's fiscal year ending December 31, 2019.

In June 2017, GASB issued Statement No. 87, *Leases.* Statement No. 87 was issued to improve accounting and financial reporting for leases by governments. This Statement increases the usefulness of governmental financial statements by requiring recognition of certain lease assets and liabilities for leases that were previously classified as operating leases. Statement No. 87 establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Statement No. 87 is effective for the Plan's fiscal year ending December 31, 2020.

In June 2017, GASB issued Statement No. 88, *Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements.* Statement No. 88 was issued to improve the information that is disclosed in notes to government financial statements related to debt. This Statement also clarifies which liabilities governments should include when disclosing information related to debt. Statement No. 88 is effective for the Plan's fiscal year ending December 31, 2019.

In June 2018, GASB issued Statement No. 89, *Accounting for Interest Cost Incurred Before the End of a Construction Period.* Statement No. 89 was issued to enhance the relevance and comparability of information about capital assets and the cost of borrowing for a reporting and simplify accounting for interest cost incurred before the end of the construction period. Statement No. 89 is effective for the Plan's fiscal year ending December, 31, 2020.

In August 2018, GASB issued Statement No. 90, *Major Equity Interests – An Amendment of GASB Statements no. 14 and No. 61.* Statement No. 90 was issued to improve the consistency and comparability of reporting a government's majority equity interest in a legally separate organization and to improve the relevance of financial statement information for certain component units. Statement No. 90 is effective for the Plan's fiscal year ending December 31, 2019.

Note 12: Pronouncements Issued Not Yet Effective (continued)

In May 2019, GASB issued Statement No. 91, *Conduit Debt Obligations.* Statement No. 91 was issued to provide a single method of reporting conduit debt obligations by issuers and eliminate diversity in practice associated with commitments extended by issues, arrangements associated with conduit debt obligations, and related note disclosures. Statement No. 91 is effective for the Plan's fiscal year ending December 31, 2021.

The Plan is currently evaluating the impact of adopting the aforementioned GASB Statements.

Note 13. Subsequent Event

The Fund has been named as a defendant in a class action litigation, entitled *Lori G. Levin, et. al., v. The Retirement Board of the County Employees' and Officers' Annuity and Benefit Fund of Cook County*, in which the plaintiff seeks, on behalf of herself and similarly situated annuitants, the ability to purchase health insurance administered by the Fund, despite her ineligibility under the Board's policy. On June 7, 2019, the Appellate Court reversed the order of the Circuit Court of Cook County affirming the Board's decision denying Ms. Levin's participation in the health insurance program administered by the Fund. The Fund has not yet determined what, if any, further legal action it intends to take and no reasonable estimate of the financial impact arising out of the decision can be made at this time.

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Required Supplementary Information - Pension

Schedule of Changes in the Employer's Net Pension Liability and Related Ratios

		2018
Total pension liability		
Service cost	$	440,682,868
Interest		1,027,348,255
Difference between expected and actual experience		(278,982,116)
Changes of assumptions		(1,601,212,188)
Expected benefit payments, including refunds of employee contributions		(805,394,705)
Net change in total pension liability		(1,217,557,886)
Total pension liability		
Beginning of year		22,940,794,624
End of year	$	21,723,236,738
Plan fiduciary net position		
Contributions - employer	$	549,437,252
Contributions - employee		134,159,171
Net investment income		(424,787,945)
Expected benefit payments, including refunds of employee contributions		(805,394,705)
Administrative expenses		(5,134,047)
Other		5,860,613
Net change in plan fiduciary net position		(545,859,661)
Plan fiduciary net position		
Beginning of year		10,407,883,443
End of year	$	9,862,023,782
Employer's net pension liability	$	11,861,212,956
Plan fiduciary net position as a percentage of the total pension liability		45.40%
Covered payroll	$	1,533,721,507
Employer's net pension liability as a percentage of covered payroll		773.36%

Note:

This schedule is intended to show information for ten years.
The additional years' information will be displayed as it becomes available.

Schedule of Changes in the Employer's Net Pension Liability and Related Ratios (continued)

	2017
Total pension liability	
Service cost	$ 478,904,097
Interest	1,082,982,064
Difference between expected and actual experience	(152,859,373)
Changes of assumptions	(950,493,320)
Expected benefit payments, including refunds of employee contributions	(757,930,854)
Net change in total pension liability	(299,397,386)
Total pension liability	
Beginning of year	23,240,192,010
End of year	$ 22,940,794,624
Plan fiduciary net position	
Contributions - employer	$ 511,750,985
Contributions - employee	138,826,184
Net investment income	1,399,625,874
Expected benefit payments, including refunds of employee contributions	(757,930,854)
Administrative expenses	(5,406,034)
Other	5,359,418
Net change in plan fiduciary net position	1,292,225,573
Plan fiduciary net position	
Beginning of year	9,115,657,870
End of year	$ 10,407,883,443
Employer's net pension liability	$ 12,532,911,181
Plan fiduciary net position as a percentage of the total pension liability	45.37%
Covered payroll	$ 1,567,480,401
Employer's net pension liability as a percentage of covered payroll	799.56%

Note:

This schedule is intended to show information for ten years.
The additional years' information will be displayed as it becomes available.

Schedule of Changes in the Employer's Net Pension Liability and Related Ratios (continued)

	2016
Total pension liability	
Service cost	$ 559,176,234
Interest	1,002,950,495
Difference between expected and actual experience	318,014,746
Changes of assumptions	(1,893,474,930)
Expected benefit payments, including refunds of employee contributions	(709,560,225)
Net change in total pension liability	(722,893,680)
Total pension liability	
Beginning of year	23,963,085,690
End of year	$ 23,240,192,010
Plan fiduciary net position	
Contributions - employer	$ 414,703,155
Contributions - employee	139,355,592
Net investment income	629,442,470
Expected benefit payments, including refunds of employee contributions	(709,560,225)
Administrative expenses	(5,373,555)
Other	4,046,158
Net change in plan fiduciary net position	472,613,595
Plan fiduciary net position	
Beginning of year	8,643,044,275
End of year	$ 9,115,657,870
Employer's net pension liability	$ 14,124,534,140
Plan fiduciary net position as a percentage of the total pension liability	39.22%
Covered payroll	$ 1,580,251,254
Employer's net pension liability as a percentage of covered payroll	893.82%

Note:

This schedule is intended to show information for ten years.
The additional years' information will be displayed as it becomes available.

Schedule of Changes in the Employer's Net Pension Liability and Related Ratios (continued)

	2015
Total pension liability	
Service cost	$ 496,161,454
Interest	994,674,970
Difference between expected and actual experience	(126,330,351)
Changes of assumptions	1,329,087,966
Expected benefit payments, including refunds of employee contributions	(676,470,215)
Net change in total pension liability	2,017,123,824
Total pension liability	
Beginning of year	21,945,961,866
End of year	$ 23,963,085,690
Plan fiduciary net position	
Contributions - employer	$ 136,075,504
Contributions - employee	137,707,719
Net investment income	(21,896,696)
Expected benefit payments, including refunds of employee contributions	(676,470,215)
Administrative expenses	(5,151,110)
Other	4,380,293
Net change in plan fiduciary net position	(425,354,505)
Plan fiduciary net position	
Beginning of year	9,068,398,780
End of year	$ 8,643,044,275
Employer's net pension liability	$ 15,320,041,415
Plan fiduciary net position as a percentage of the total pension liability	36.07%
Covered payroll	$ 1,572,417,298
Employer's net pension liability as a percentage of covered payroll	974.30%

Note:
This schedule is intended to show information for ten years.
The additional years' information will be displayed as it becomes available.

Schedule of Employer Contributions and Related Notes

Last Ten Fiscal Years

	2018	2017	2016	2015	2014
Actuarially determined contribution	$ 562,815,816	$ 514,888,487	$ 519,642,931	$ $595,370,046	$ 540,218,287
Contributions in relation to the actuarially determined contribution	(549,437,252)	(511,750,985)	(414,703,155)	(136,075,504)	(146,075,414)
Contribution deficiency	$ 13,378,564	$ 3,137,502	$ 104,939,776	$ 459,294,542	$ 394,142,873
Covered payroll	$ 1,533,721,507	$ 1,567,480,401	$ 1,580,251,254	$ 1,572,417,298	$ 1,514,550,023
Contributions as a percentage of covered payroll	35.82%	32.65%	26.24%	8.65%	9.64%

Notes to Schedule of Employer Contributions

Actuarially determined contribution rates are calculated as of December 31, one year prior to the fiscal year in which contributions are reported.

Valuation Date	December 31, 2018
Methods and assumptions used to determine contribution rates:	
Actuarial cost method	Entry Age Normal
Amortization method	Level Dollar - Open
Remaining amortization period	30 years
Asset valuation method	Five Year Smoothed Average Market
Inflation	2.75% per year, compounded annually
Salary increases	3.5% to 8.0%, based on age
Investment rate of return	7.25% per year, compounded annually
Retirement age	Based on actual past experience, assume all employees retire by age 80 (Tier 1 participants) and 75 (Tier 2 participants)
Mortality	RP-2014 Blue Collar Mortality Table, base year 2006, Buck Modified MP-2017 projection scale
Postretirement annuity increases	Tier 1 participants - 3.0% compounded annually. Tier 2 participants - the lesser of 3.0% or one half of the increase in the Consumer Price Index.

Schedule of Employer Contributions and Related Notes (continued)

Last Ten Fiscal Years

	2013	2012	2011	2010	2009
Actuarially determined contribution	$ 493,724,370	$ 454,327,461	$ 352,850,988	$ 283,892,734	$ 287,061,532
Contributions in relation to the actuarially determined contribution	(147,720,014)	(152,734,539)	(160,652,118)	(144,539,577)	(152,506,089)
Contribution deficiency	$ 346,004,356	$ 301,592,922	$ 192,198,870	$ 139,353,157	$ 134,555,443
Covered payroll	$ 1,484,269,715	$ 1,478,253,368	$ 1,456,444,123	$ 1,494,093,569	$ 1,498,161,713
Contributions as a percentage of covered payroll	9.95%	10.33%	11.03%	9.67%	10.18%

Schedule of Investment Returns

	2018	2017	2016	2015	2014
Annual money-weighted rate of return, net of investment expense	-3.79%	15.35%	7.67%	(0.10)%	5.90%

Note:

This schedule is intended to show information for ten years.
The additional years' information will be displayed as it becomes available.

Required Supplementary Information - Postemployment Healthcare

Schedule of Changes in the Employer's Net Postemployment Healthcare Liability and Related Ratios

	2018	2017
Total postemployment healthcare liability		
Service cost	$ 40,557,095	$ 82,344,830
Interest	68,565,681	84,911,522
Changes in benefit terms	(292,725,744)	(79,293,990)
Difference between expected and actual experience	(92,253,919)	(55,814,160)
Changes of assumptions	(300,028,016)	(66,330,809)
Benefit payments	(38,310,969)	(47,454,621)
Net change in total postemployment healthcare liability	(614,195,872)	(81,637,228)
Total postemployment healthcare liability		
Beginning of year	2,148,249,441	2,229,886,669
End of year	$ 1,534,053,569	$ 2,148,249,441
Plan fiduciary net position		
Contributions - employer	$ 38,310,969	$ 47,454,641
Benefit payments - net	(38,310,969)	(47,454,641)
Net change in plan fiduciary net position	-	-
Plan fiduciary net position		
Beginning of year	-	-
End of year	$ -	$ -
Employer's net postemployment healthcare liability	$ 1,534,053,569	$ 2,148,249,441
Plan fiduciary net position as a percentage of the total postemployment healthcare liability	0.00%	0.00%
Covered payroll	$ 1,576,658,158	$ 1,602,986,483
Employer's net postemployment healthcare liability as a percentage of covered payroll	97.30%	134.02%

Note:
This schedule is intended to show information for ten years. The additional years' information will be displayed as it becomes available.

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Schedule of Employer Contributions and Related Notes

Last Ten Fiscal Years

	2018	2017	2016	2015	2014
Actuarially determined contribution	$ 133,228,086	$ 187,348,423	$ 206,678,514	$ 190,871,452	$ 189,907,202
Contributions in relation to the actuarially determined contribution	(38,310,969)	(47,454,641)	(49,565,249)	(50,756,817)	(43,957,458)
Contribution deficiency	$ 94,917,117	$ 139,893,782	$ 157,113,265	$ 140,114,635	$ 145,949,744
Covered payroll	$ 1,576,658,158	$ 1,602,986,483	$ 1,609,559,234	$ 1,597,597,077	$ 1,514,550,023
Contributions as a percentage of covered payroll	2.43%	2.96%	3.08%	3.18%	2.90%

Notes to Schedule of Employer Contributions

Actuarially determined contribution rates are calculated as of December 31, one year prior to the fiscal year in which contributions are reported.

Valuation Date:	December 31, 2018
Methods and assumptions used to determine contribution rates:	
Actuarial cost method	Entry Age Normal
Amortization method	Level Dollar - Open
Remaining amortization period	30 years
Asset valuation method	Five Year Smoothed Average Market
Inflation	2.75% per year
Salary increases	3.5 % to 8.0%, based on age
Health care cost trend rate	7.25% in the first year, decreasing by .25% per year until an ultimate rate of 4.75% is reached for pre-Medicare
	5.75% in the first year, decreasing by .25% per year until an ultimate rate of 4.75% is reached for post-Medicare
Retirement age	Based on actual past experience, assume all employees retire by age 80 (Tier 1 participants) and 75 (Tier 2 participants)
Mortality	RP-2014 Blue Collar Mortality Table, base year 2006, Buck Modified MP-2017 projection scale

Schedule of Employer Contributions and Related Notes (continued)

Last Ten Fiscal Years

	2013	2012	2011	2010	2009
Actuarially determined contribution	$ 178,698,965	$ 156,700,388	$ 165,176,771	$ 163,823,488	$ 157,964,519
Contributions in relation to the actuarially determined contribution	(40,097,630)	(37,986,237)	(38,185,306)	(40,183,057)	(35,779,228)
Contribution deficiency	$ 138,601,335	$ 118,714,151	$ 126,991,465	$ 123,640,431	$ 122,185,291
Covered payroll	$ 1,484,269,715	$ 1,478,253,368	$ 1,456,444,123	$ 1,494,093,569	$ 1,498,161,713
Contributions as a percentage of covered payroll	2.70%	2.57%	2.62%	2.69%	2.39%

Supplementary Information

Schedules of Net Administrative Expenses and Professional and Consulting Fees

Years Ended December 31, 2018 and 2017

	2018	2017
Administrative expenses		
Bank charges	$ 32,791	$ 34,018
Document imaging	40,269	123,848
Election expense	109,904	100,228
Employee benefits	453,329	413,332
Insurance - fidelity, fiduciary and liability	133,047	137,327
Maintenance of equipment, systems, software and support	412,385	727,913
Membership, conference and training	25,058	33,996
Office expense	99,333	203,243
Postage	106,743	97,403
Printing and stationery	74,165	71,062
Professional and consulting fees	638,274	486,575
Recovery site expense	106,203	44,658
Regulatory filing fees	8,000	8,000
Rent	462,115	486,483
Salaries	2,532,058	2,538,938
Utilities	-	8,440
Total	5,233,674	5,515,464
Less administrative expenses allocated to Forest Preserve District Employees' Annuity and Benefit Fund of Cook County	(99,627)	(109,430)
Net administrative expenses	$ 5,134,047	$ 5,406,034
Professional and consulting fees		
Actuarial service	$ 135,986	$ 100,380
Audit	86,238	65,115
Consulting	181,907	89,276
Legal	206,461	205,102
Lobbyist	27,682	26,702
Total	$ 638,274	$ 486,575

Schedules of Investment Expenses

	Years Ended December 31, 2018 and 2017	
	2018	**2017**
Investment manager expense		
Adelante Capital Management	$ 457,100	$ $449,819
Angelo Gordon & Co.	244,784	241,141
Ariel Investments	623,201	509,823
Blackstone Alternative Asset Management	5,377,349	5,150,188
CastleArk Management	1,245,229	1,163,677
CBRE Global Investors	332,240	310,106
Channing Capital Management	1,606,152	1,638,207
Chicago Equity Partners	-	70,867
Fortaleza Asset Management, Inc.	-	134,560
Franklin Templeton Investments	2,937,650	2,810,259
Frontier Capital Management	1,304,572	1,241,310
Garcia Hamilton	73,848	-
Great Lakes Advisors, Inc.	469,673	449,812
J.P. Morgan Asset Management	3,474,764	3,547,930
Killian Capital Management	253,180	334,965
LaSalle Investment Management	135,598	170,213
Lazard Asset Management, LLC	658,675	602,502
LM Capital Group, LLC	614,451	616,532
Lombardia Capital	-	44,868
Loomis Sayles & Company, LP	-	298,909
MacKay Shields	911,975	897,458
Mellon Capital	168,333	145,469
Mesirow Financial	3,642,946	3,200,298

(continued)

Schedules of Investment Expenses (continued)

	Years Ended December 31, 2018 and 2017	
	2018	**2017**
Investment manager expense (continued)		
Mondrian Investment Partners, Ltd.	$ 1,157,706	$ 1,080,401
Muller and Monroe Asset Management	350,000	350,000
NCM Capital	423,628	371,817
New Century Investment Management	403,002	437,921
PGIM Investments	126,420	-
Progress Investment Management	2,141,325	1,968,659
Prudential Real Estate Investors	1,942,989	1,886,846
RhumbLine Advisers	172,931	136,749
Russell Investments	225,498	154,716
SPC Capital Management	70,000	70,000
Strategic Global Advisors	110,310	-
State Street Global Advisors	400,370	378,601
The Rock Creek Group	1,392,256	1,362,369
Wells Capital Management	1,152,034	1,026,097
William Blair & Company	1,263,872	1,169,647
	35,864,061	34,422,736
Investment consulting fees		
Callan Associates, Inc.	380,736	392,673
Total investment consulting fees	380,736	392,673
Investment custodian fees		
BNY Mellon	509,601	416,618
Total investment expenses	$ 36,754,398	$ 35,232,027

Additions by Source

Year Ended December 31,		Employer Contributions		Employee Contributions		Net Investment and Net Securities Lending Income (1)		Other (2)		Total Additions
2013	$	187,817,644	$	127,593,220	$	1,179,440,119	$	8,547,729	$	1,503,398,712
2014	$	190,032,872	$	129,325,318	$	488,890,897	$	9,742,062	$	817,991,149
2015	$	186,832,321	$	137,707,719	$	(21,896,696)	$	11,457,843	$	314,101,187
2016	$	464,268,404	$	139,355,592	$	629,442,470	$	14,019,340	$	1,247,085,806
2017	$	559,205,626	$	138,826,184	$	1,399,625,874	$	23,321,813	$	2,120,979,497
2018	$	587,748,221	$	134,159,171	$	(424,787,945)	$	27,479,205	$	324,598,652

Deductions by Type

Year Ended December 31,		Benefits		Refunds		Net Administrative Expenses		Total Deductions
2013	$	$601,770,020	$	$29,873,030	$	$4,324,634	$	$635,967,684
2014	$	$645,601,458	$	$26,347,361	$	$5,010,206	$	$676,959,025
2015	$	$701,031,411	$	$33,273,171	$	$5,151,110	$	$739,455,692
2016	$	$742,396,434	$	$26,702,222	$	$5,373,555	$	$774,472,211
2017	$	$790,352,526	$	$32,995,364	$	$5,406,034	$	$828,753,924
2018	$	$831,661,745	$	$33,662,521	$	$5,134,047	$	$870,458,313

1 - Includes realized and unrealized net gain or loss on investments and net securities lending income.

2 - Includes employer federal subsidized programs, EQWP/Medicare Part D, prescription/repayment plan rebates and miscellaneous income.

Schedule of Employer Contributions Receivable

December 31, 2018

Contribution Year	Contributions Receivable	Uncollected Balance	Reserved	Net Contributions Receivable
2017	$ 208,226,206	$ 19,279,122	$ 1,574,487	$ 17,704,635
2018	211,449,244	211,449,244	6,610,850	204,838,394
		$ 230,728,366	$ 8,185,337	$ 222,543,029

Note: Employer contributions are funded primarily through property taxies levied by Cook County, Illinois.

Investment Section

This section includes an investment report, Investment Consultant's Commentary, the Master Custodian's Certification, a summary of investment policy, and summary tables of investment data.

Investment Report

June 17, 2019

To the Retirement Board and Our Members:

The County Employees' and Officers' Annuity and Benefit Fund of Cook County ("the Fund") employs a prudent investment strategy to meet its long-term actuarial objective of growing fund assets to support member benefits. Together with fund staff and the investment consultant, Callan Associates, the Retirement Board oversees the investment strategy through ongoing study of the portfolio structure, return assumptions, and projected funding needs to support member benefits.

In 2018, the fund experienced a challenging investment year, returning -3.79% and trailing its custom benchmark, net of investment management fees. During that period, investments lost $475.4 million for the fund and reduced plan assets from $10.2 billion at the end of the previous year to just over $9.6 billion at December 31, 2018. A volatile financial market in the fourth quarter led active management and asset allocation to detract from performance. However, the fund's longer term investments in real estate, private equity and hedge funds all contributed positively to the full year return.

Although the fund's assets decreased in 2018, supplemental contributions from the employer mitigated further declines and enhanced the fund's ability to recover along with the financial market. During 2018, supplemental employer contributions of $378.4 million, of which $25 million pertains to 2019's IGA (Intergovernmental Agreement), resulting from a one-year IGA allowed the fund to meet benefit obligations with minimum liquidation of investment assets.

The fund continues to implement strategies towards policy allocation targets with the additional funding.

The Consultant's Commentary; Master Custodian's certification letter; a summary of the fund's goals, objectives, and guidelines; and selected investment schedules follow for your review.

Sincerely,

Regina Tuczak

Regina Tuczak
Executive Director

Data provided to the Fund by its investment consultant form the basis of the information that is presented throughout the Investment Section. All portfolio rates of return are presented using time and asset-weighted returns. Returns are calculated net of investment manager fees.

Investment Consultant's Commentary

Callan

Callan Associates Inc.
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www.callan.com

June 17, 2019

Board of Trustees
County Employees' and Officers' Annuity and
Benefit Fund of Cook County
70 W. Madison Street, Suite 1925
Chicago, IL 60602

Dear Trustees,

Callan LLC is pleased to present the County Employees' and Officers' Annuity and Benefit Fund of Cook County ("Fund") results for fiscal year ended December 31, 2018. As of year-end, the Fund reported a fair value of $9.6 billion, a decrease of approximately $611.7 million since December 31, 2017. This decrease included approximately $136.3 million in net withdrawals.

Investors' appetite for risk, while elevated for much of 2018, evaporated as the year drew to a close and wiped out positive returns for the year across broad asset classes (T-bills being a notable exception). U.S Equity markets as measured by the S&P 500 Index experienced the first negative year since 2008. Concerns over tighter monetary policy and the global withdrawal of stimulus measures, unresolved trade disputes, falling oil prices, slower global growth, and softer data in some U.S. indicators overshadowed other robust aspects of the domestic economy. U.S. Treasury prices rose, expectations for Fed hikes in 2019 dissipated, and the S&P 500 had its worst December since 1931. Market sentiment clearly reflected the "glass half empty" viewpoint, with the S&P 500 at one point falling nearly 20% from a record level hit only a few months earlier. Meanwhile, the "safe haven" status of U.S. Treasuries attracted investors and pushed yields lower—the yield of the 10-year Treasury dropped 55 bps from a multi-year high of 3.24% reached in early November to close the year at 2.69%.

For the year, the stock market reached new highs and gave it all back by the end of December. As spring approached, growth in equities began to pick up steam, leading to record highs in several of the benchmark indexes during the summer months. However, volatility reemerged in the fall, followed by a brief respite, and resumed in December. Larger capitalization securities outperformed smaller capitalization securities by a substantial margin. For the year, the S&P 500 Index fell (-4.4%) while small cap stocks experienced a greater downturn (-11.0%). Non-U.S. developed equity market investments also suffered as measured by the MSCI EAFE Index (-13.8%). U.S. investors were hurt by a strengthening dollar that detracted from $USD returns. Emerging markets were also negative for the year (-14.6%).

The negative total return of US 10-year Treasuries reflected the increase in the yield, which rose from 2.41% to 2.69% between the start of the year and the end of December. Strong growth, wage inflation, rate hikes and a seemingly more hawkish Federal Reserve chair all contributed to persistent upward pressure on yields. The significant 3% yield level was broken in September and remained above that level until early December when risk aversion returned. The return on the Bloomberg Barclays U.S. Aggregate Bond Index was flat for the year as the Fed increased the short-term rate four times, but took on a more dovish tone in December.

Callan

2

Real Estate returns were steady once again in 2018 as the NCREIF Open End Diversified Core Equity Index (ODCE value weighted net) produced a +7.36% return. U.S. core real estate returns continue to shift toward income with limited appreciation.

As noted in the Schedule of Investment Results, the Fund generated a total return of -3.79% net-of-fees for the year ended December 31, 2018, which trailed the -2.93% return of the Fund's target benchmark (the Policy Benchmark). In aggregate, the Fund's allocations to non-U.S. equity and private real estate exceeded their benchmarks, while domestic equity, fixed income, public real estate, and hedge fund investments trailed. For the last three- and five-year periods, the Fund return has exceeded that of the target benchmark.

Sincerely,

John P. Jackson, CFA
Senior Vice President, Callan LLC

Master Custodian's Certification

BNY MELLON

Asset Servicing

Michael J. Beggy
Vice President

June 17, 2019

To the Board of Trustees and the Executive Director of the County Employees' and Officers' Annuity & Benefit Fund of Cook County:

BNY Mellon as custodian of the County Employees' and Officers' Annuity & Benefit Fund of Cook County (the "client") has established an "Account" that holds the clients property in safekeeping facilities of the Custodian (or other custodian banks or clearing operations), provided the recordkeeping of certain property of the client and completed the annual accounting certification for the year January 1, 2018 through December 31, 2018.

In addition, in accordance with the terms of the Custody Agreement dated, November 1, 2007, BNY Mellon also provides the following services as Custodian:

- Market settlement of purchases and sales and engage in other transactions, including free receipts and deliveries, exchanges and other voluntary corporate actions, with respect to securities or property received by the Custodian
- Take actions necessary to settle transactions in futures and/or options contracts, short selling programs, foreign exchange or foreign exchange contracts, swaps and other derivative investments with third parties
- Lend the assets of the Account in accordance with a separate Securities Lending Agreement.
- Invest available cash in any collective fund, including a collective investment fund maintained by the Custodian or and affiliate of the Custodian for collective investment of employee benefit trusts or deposit in an interest bearing account of banking department of Custodian.
- Appoint subcustodians, including affiliates of the custodian, as to part or all of the Account.
- Hold property in nominee name, in bearer form or in book entry form, in a clearinghouse corporation or in a depository.
- Take all action necessary to pay for, and settle authorized transactions.
- Collect income payable to and distributions due to the Account.
- Collect all proceeds from securities, certificates of deposit or other investments which may mature or be called.
- Forward to the authorized party as designated by the client, proxies or ballots that are to be a voted by the authorized party.
- Attend to corporate actions that have no discretionary decision requirement
- Report the value of the Account as agreed upon by the client and custodian.
- Credit the account with income and maturity proceeds on securities contractual payment date.

Sincerely,

Michael J. Beggy

Michael J. Beggy
Relationship Executive

Asset Servicing
Room 410 ~ One Mellon Center ~ Pittsburgh, PA 15258-0001
(412) 234-6933 ~ (412) 236-1928 Fax

The Bank of New York Mellon

Summary of Investment Policy

Overview

Under the guidance and direction of the Board and governed by the "prudent man rule," it is the mission of the County Employees' and Officers' Annuity Fund of Cook County ("the Fund") and the Investment Staff to optimize the total return of the Fund's investment portfolio through a policy of diversified investments using parameters of prudent risk management as measured on the total portfolio, acting at all times in the exclusive interest of the participants and beneficiaries of the Fund.

To accomplish this mission, the Board and Investment Staff understand and accept their fiduciary obligations to the members of the Fund. These obligations are legal in nature and are outlined in the Illinois Pension Code [40 ILCS 5]. Investments made by the Fund shall satisfy the conditions of the Illinois Pension Code and applicable Illinois law and, in particular, the prudent man rule set forth in the Illinois Pension Code [40 ILCS 5/1-109].

Subject to these fiduciary standards, the Board and Investment Staff shall endeavor at all times to implement the Statement of Investment Policy in a manner consistent with the stated mission of the Fund, while ensuring transparency and compliance with all applicable laws and regulations.

The Policy is set forth by the Board in order to:

- Establish a clear understanding of all involved parties of the investment goals and objectives of the Fund.
- Define and assign the responsibilities of all involved parties.
- Establish the relevant investment horizon for which the Fund assets will be managed.
- Establish risk parameters governing assets of the Fund.
- Establish target asset allocation and re-balancing procedures.
- Establish a methodology and criteria for selecting, retaining and terminating Investment Professionals.
- Offer specific guidance to and define limitations for all Investment Managers regarding the investment of Fund assets.

In summary, the purpose of the Statement of Investment Policy is to formalize the Board's investment objectives, policies and procedures and to define the duties and responsibilities of the various entities involved in the investment process. The Statement of Investment Policy is intended to serve as a guide, reference tool and communication link between the Board, Investment Staff and Investment Professionals.

Investment Objectives

The primary return objectives of the Fund are to:

- Preserve the safety of principal.
- Exceed, after investment management fees, a customized blended benchmark consistent with prudent levels of risk.
- Create a stream of investment returns to ensure the systematic and adequate funding of actuarially determined benefit through contributions and professional management of Fund assets.

To achieve these objectives, the assets of the Fund have been allocated to meet its actuarial assumed rate of return of 7.25%. To evaluate success, the Board compares the performance of the Fund to the actuarial assumed rate of return and its custom benchmark. This benchmark represents a passive implementation of the historical investment policy target and it is re-balanced regularly.

While achieving the return objectives, the Fund is able to tolerate certain levels of risk, which are:

- To accept prudent levels of short-term and long-term volatility consistent with the near-term cash flow needs, funding level, and long-term liability structure of the Fund.
- To tolerate appropriate levels of downside risk relative to the Fund's actuarial assumed rate of return of 7.25%. In doing so, the Board will attempt to minimize the probability of underperforming the Fund's actuarial assumed rate of return over the long-term and to minimize the shortfall in the event such underperformance occurs.
- To accept certain variances in the asset allocation structure of the Fund relative to the broad financial markets and peer groups.
- To tolerate certain levels of short-term underperformance by the Fund's Investment Managers.

The investment objectives of the Fund are constrained by applicable law, time, taxes and liquidity. The Fund will operate in accordance with applicable law, as amended. The Fund has a long-term time horizon as the assets are used to pay qualified participant pension benefits. The Fund is a tax-exempt entity, but can be subject to taxes involving unrelated business taxable income ("UBTI"). UBTI is income earned by a tax-exempt entity that does not result from tax-exempt activities. The Fund will attempt to minimize or to avoid incurring UBTI. The liquidity needs of the Fund are to meet the regular cash flow requirements of the Fund.

Asset Allocation and Rebalancing Procedures

The Board reviews the target asset allocation of the Fund at least once every three years. It will take into consideration applicable statutes, the actuarial rate of return of the Fund, the long term nature of the asset pool, the cash flow needs of the Fund and the general asset allocation structure of the Fund's peers. It will make assumptions on the capital markets over the long term and optimize the asset allocation to best meet the actuarial and cash flow needs of the Fund at prudent levels of risk.

The Board establishes the asset allocation targets and ranges and reviews them periodically. To ensure that the allocations meet the risk/return objectives of the Fund, the target allocations will be reviewed annually for reasonableness relative to significant economic market changes or changes to the long-term goals and objectives. Proper implementation of this guideline may require that a periodic adjustment or rebalancing be made to ensure conformance with asset allocation targets. Rebalancing requirements shall be reviewed on a continual basis. Rebalancing may also occur in the event of a change in the allocation percentages by asset class by the Board or as a result of extraordinary market events. Rebalancing shall take place as soon as practical after said change or amendment has been approved.

Schedule of Investment Results

	For the Year End December 31, 2018	Annualized Returns 3 Years	5 Years
Total Fund	-3.79%	6.11%	4.69%
Policy Benchmark *	-2.93%	5.88%	4.92%
Domestic Equity	-6.78%	8.56%	6.69%
Russell 3000	-6.24%	8.97%	7.91%
International Equity	-13.59%	4.59%	1.52%
MSCI ACWI ex. U.S. IMI	-14.76%	4.25%	0.54%
Fixed Income	-0.49%	2.56%	2.51%
BloomBarc Aggregate	0.01%	2.06%	2.52%
Real Estate	5.44%	6.78%	8.82%
NFI-ODCE Value Weight Net	7.36%	7.27%	9.41%
Private Equity	29.77%	17.83%	7.53%
CCPF Fund Composite	30.45%	18.44%	14.33%
Hedge Funds	1.75%	3.80%	3.82%
Libor-3 Month+4%	6.35%	5.45%	4.97%

**The Policy Benchmark is as follows:*

-As of December 31, 2018: 26% Blmbg Aggregate, 33.0% Russell 3000 Index, 21.0% MSCI ACWI ex. U.S. Index, 6% Libor-3 Month+ 4.0% Index, 7.3% NFI-ODCE Value Weight Net, 4.0% Private Equity and 1.7% FTSE NAREIT Equity Index.

-As of December 31, 2016 & 2017: 32% BloomBarc Aggregate Index, 28.7% Russell 3000 Index, 20% MSCI ACWI ex. U.S. Index, 9% Libor-3 Month+ 4.0% Index, 5.7% NFI-ODCE Value Weight Net, 2.3% Private Equity and 2.3% FTSE NAREIT Equity Index.

-As of December 31, 2014, & 2015: 32% Barclays Aggregate Index, 31% Russell 3000 Index, 20% MSCI ACWI ex. U.S. Index, 9% Libor-3 Month+ 4.0% Index and 8% NCREIF Total Index.

Note: Returns are calculated using geometrically-linked, time and asset-weighted returns. Returns are calculated net of investment manager fees.

Schedule of Investment Summary and Asset Allocation

	For Year Ended December 31, 2018			For Year Ended December 31, 2017		
Asset Class	Fair Value	Percent of Total	Target	Fair Value	Percent of Total	Target
Domestic Equity	$ 3,256,213,211	34%	33%	$ 3,848,847,535	38%	33%
International Equity	1,828,172,677	19%	21%	2,209,023,495	22%	21%
Fixed Income	2,503,633,812	26%	26%	2,178,171,106	21%	26%
Real Estate	647,961,102	7%	9%	694,785,932	7%	9%
Hedge Funds of Funds	666,385,423	7%	4%	661,759,083	6%	4%
Private Equity	513,790,532	5%	6%	357,254,966	3%	6%
Short-term investments	218,141,023	2%	1%	296,147,797	3%	1%
Total Investments	$ 9,634,297,780	100%	100%	$ 10,245,989,914	100%	100%

Schedule of Top Ten Largest Holdings (Excludes Commingled Funds)

For year ended December 31, 2018

Top 10 Domestic Equity Holdings	Sector	Shares		Fair Value	% of Total
Microsoft Corp.	Technology	641,819	$	65,189,556	2.0%
Apple Inc.	Technology	375,299		59,199,664	1.8%
Alphabet Inc.	Communication	50,376		52,402,022	1.6%
Amazon.com Inc.	Consumer discretionary	34,158		51,304,291	1.6%
Berkshire Hathaway Inc.	Financial Services	161,548		32,984,871	1.0%
Johnson & Johnson	Healthcare	222,715		28,741,371	0.9%
JP Morgan Chase & Co.	Financial Services	276,162		26,958,934	0.8%
Facebook Inc.	Communication	199,504		26,152,979	0.8%
Exxon Mobile Corp	Oil and Gas	24,827		25,943,222	0.8%
Pfizer Inc.	Healthcare	351,565		23,973,217	0.7%
Total Top 10 Domestic Equity Holdings		2,337,973	$	392,850,128	12.1%
Total Domestic Equity			$	3,201,050,263	100.0%

Top 10 International Equity Holdings	Sector	Shares		Fair Value	% of Total
Nestle SA (Switzerland)	Consumer Goods	126,570	$	10,245,776	0.6%
Tencent Holdings LTD (China)	Internet	227,400		9,119,991	0.5%
Vivendi (France)	Media	311,523		7,578,181	0.4%
Sampo OYJ (Finland)	Insurance	171,594		7,534,417	0.4%
Samsung Electronic Co. LTD (South Korea)	Electronics	214,450		7,437,906	0.4%
Roche Holding AG (Switzerland)	Healthcare	29,590		7,305,951	0.4%
Informa PLC	Media	888,663		7,132,611	0.4%
Taiwan Semiconductor Manufacture (Taiwan)	Electronics	967,389		7,097,186	0.4%
Deutsche Boerse AG (Germany)	Bank	57,578		6,907,840	0.4%
Amer Sports OYJ (Finland)	Recreation	154,799		6,789,897	0.4%
Total Top 10 International Equity Holdings		3,149,556	$	77,149,754	4.2%
Total International Equity			$	1,757,801,402	100.0%

Schedule of Top Ten Largest Holdings
(Excludes Commingled Funds) (continued)

For year ended December 31, 2018

Top 10 Fixed Income Holdings	Sector	Par		Fair Value	% of Total
U.S. Treasury Note 2.000% 10/31/2022	U.S Government	48,950,000	$	48,082,117	1.9%
Federal Farm Credit Banks Funding Corp. Var Rt 02/10/2020	U.S Government	22,300,000		22,307,136	0.9%
Federal Homeloan Bank 05/08/2020	U.S Government	22,050,000		22,041,180	0.9%
U.S. Treasury Note 3.000% 08/15/2048	U.S Government	20,810,000		20,711,569	0.8%
U.S Treasury Note 2.375% 08/15/2024	U.S Government	19,100,000		18,924,662	0.8%
Federal Farm Credit Banks Funding Corp. Var Rt 08/19/2019	U.S Government	16,800,000		16,827,384	0.7%
U.S. Treasury Note 2.875% 10/31/2020	U.S Government	12,120,000		12,195,750	0.5%
U.S Treasury Note 2.625% 12/31/2023	U.S Government	12,110,000		12,173,335	0.5%
Federal Farm Credit Banks Funding Corp. Var Rt 04/03/2019	U.S Government	11,375,000		11,373,635	0.5%
U.S Treasury Note 3.500% 05/15/2020	U.S Government	10,800,000		10,934,568	0.4%
Total Top 10 Fixed Income Holdings		196,415,000	$	195,571,336	7.8%
Total Fixed Income			$	2,219,670,916	100.0%

A complete list of the portfolio holdings is available for review upon request.

Schedule of Investment Manager Fees and Assets Under Management

For year ended December 31, 2018

Asset Category	Investment Manager Fees	Assets Under Management
Global Equity		
Adelante Capital Management	$ 457,100	$ 76,801,994
Ariel Investments	623,201	97,794,002
CastleArk Management	1,245,229	81,925,611
Channing Capital Management	1,606,152	170,332,900
Franklin Templeton Investments	2,283,147	281,423,197
Frontier Capital Management	1,304,572	132,865,801
Mesirow Financial	752,726	39,467,115
Great Lakes Advisors, Inc.	469,673	306,572,254
J.P. Morgan Asset Management	1,303,146	147,761,530
Killian Capital Management *	253,180	-
Lazard Asset Management, LLC	658,675	314,569,284
Mondrian Investment Partners, Ltd.	1,157,706	131,794,744
Progress Investment Management	140,971	274,748,274
Strategic Global Advisors	110,310	94,895,616
RhumbLine Advisers	172,931	1,751,312,363
Russell Implementation Services, Inc.	225,498	346,114,934
State Street Global Advisors	400,370	681,308,468
Wells Capital Management	1,152,034	158,979,222
William Blair & Company	1,263,872	84,635,538
Total Global Equity	$ 15,580,492	$ 5,173,302,847
Fixed Income		
Franklin Templeton Investments	$ 654,503	$ 255,881,343
Garcia Hamilton	73,848	251,584,520
LM Capital Group, LLC	614,451	404,123,481
MacKay Shields	911,975	377,237,055
Mellon Capital	168,333	522,588,563
Piedmont Investment Advisors (Formerly NCM Capital)	423,628	248,021,604
New Century Investment Management	403,002	113,989,187
PGIM Investments	126,420	370,667,104
Progress Investment Management	2,000,354	21,770,199
Total Fixed Income	$ 5,376,514	$ 2,565,863,055

Schedule of Investment Manager Fees and Assets Under Management (continued)

For year ended December 31, 2018				
Asset Category		**Investment Manager Fees**		**Assets Under Management**
Real Estate				
Angelo Gordon & Co.	$	244,784	$	16,642,954
Blackstone Alternative Asset Management		450,000		23,566,345
CBRE Global Investors		332,240		31,893,674
J.P. Morgan Asset Management		2,171,618		272,741,485
LaSalle Investment Management		135,598		11,387,755
Mesirow Financial		625,507		44,640,195
Prudential Real Estate Investors		1,942,989		247,088,693
Total Real Estate	$	5,902,736	$	647,961,102
Hedge Funds of Funds				
Blackstone Alternative Asset Management	$	4,927,349	$	490,556,720
The Rock Creek Group		1,392,256		175,828,703
Total Hedge Funds	$	6,319,605	$	666,385,423
Private Equity**				
Legacy direct	$	-	$	5,921,600
Mesirow Financial		2,264,714		483,241,088
Muller and Monroe Asset Management		350,000		20,484,135
SPC Capital Management		70,000		4,143,709
Total Private Equity	$	2,684,714	$	513,790,532
Short-Term Investments				
BNY Mellon***		-		66,994,822
Total	$	$35,864,061	$	$9,634,297,780

** This Investment Manager was terminated and/or funds were transferred to another Investment Manager in 2018, therefore there were no assets under management as of 12/31/2018.*

*** Fees shown are for fund-of-fund managers and do not reflect fees of underlying managers of investments, which are reflected in the net income from the related investment.*

**** Investments are held in commingled funds and/or publicly traded funds, and related investment returns are net of fees.*

Schedule of Brokerage Commissions

For Year Ended December 31, 2018

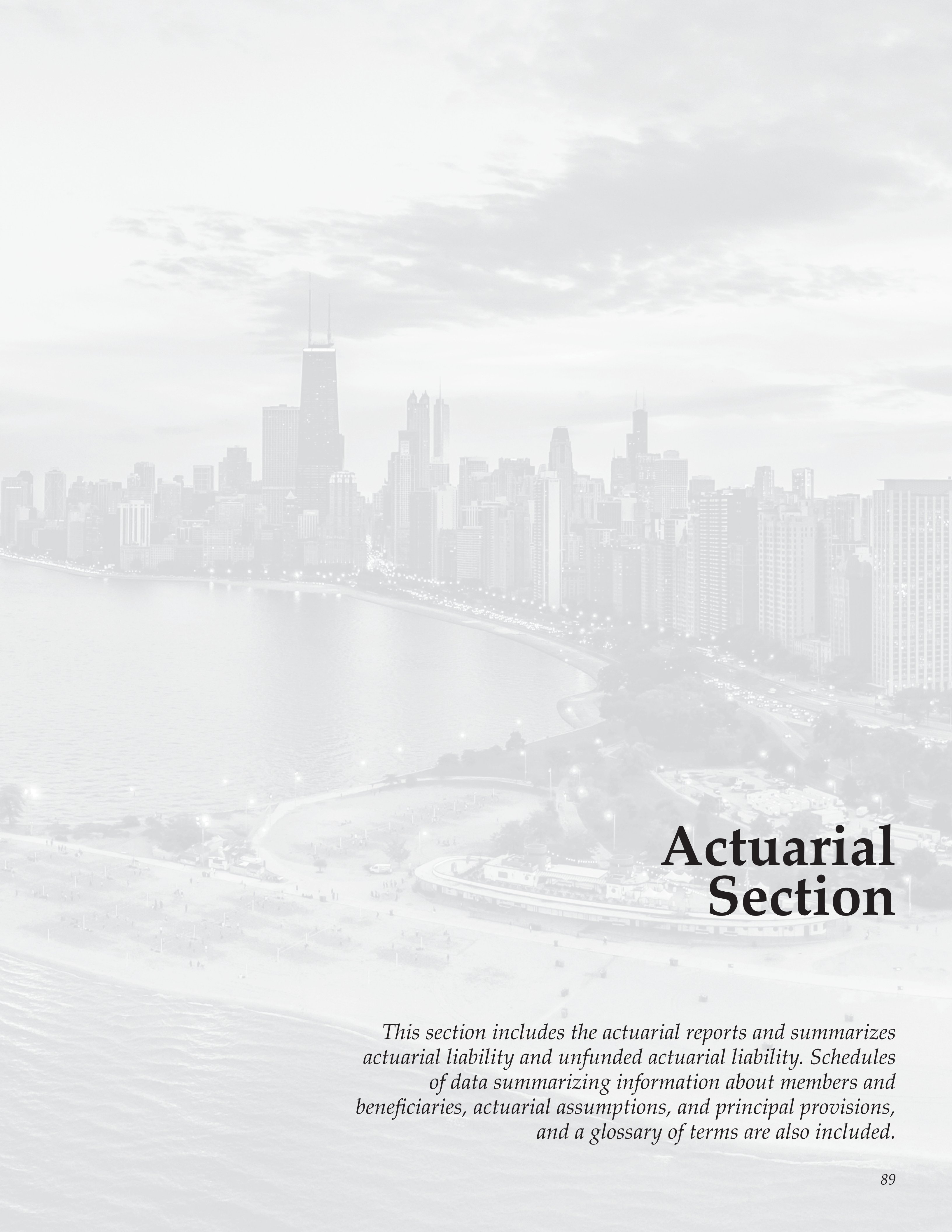
Broker Name	Number of Shares	Commissions	Cost per Share
Domestic Equity Commissions			
Loop Capital Markets, LLC*	17,684,305	$ 311,427	$ 0.018
Penserra Securities*	3,596,018	89,938	0.025
Baird, Robert W & Co.	2,220,309	73,956	0.033
Williams Capital Group	2,004,437	35,784	0.018
Credit Suisse	1,793,381	54,477	0.030
Drexel Hamilton	1,637,623	57,317	0.035
Goldman Sachs & Co.	1,451,122	40,772	0.028
Stiffel Nicolaus	1,450,033	41,295	0.028
Castle Oak Securities LP.	1,448,958	24,218	0.017
J.P. Morgan Securities	1,430,861	42,952	0.030
Cabrera Capital Markets*	1,319,867	34,841	0.026
Stephens Inc.	1,214,025	35,343	0.029
Investment Tech Group, Inc.	1,211,246	33,101	0.027
Liquident, Inc.	1,105,850	22,313	0.020
King & Associates	1,036,102	31,083	0.030
Raymond James & Associates, Inc.	935,929	26,917	0.029
William Blair & Co.	828,706	25,249	0.030
Telsey Advisory Group LLC,	736,820	21,544	0.029
Brokers with < $20,000 of Commissions	12,329,008	360,082	0.027
Total Domestic Equity Commissions	55,434,601	$ 1,362,608	$ 0.025

Schedule of Brokerage Commissions (continued)

For Year Ended December 31, 2018

Broker Name	Number of Shares	Commissions	Cost per Share
International Equity Commissions			
Goldman Sachs & Co.	9,472,227	$ 313,977	$ 0.033
Loop Capital Markets, LLC*	10,350,644	60,504	0.006
Merrill Lynch Securities	5,302,968	30,226	0.006
HSBC Bank PLC	587,457	30,216	0.051
J.P. Morgan Securities	3,753,347	29,043	0.008
UBS Warburg	4,428,478	26,906	0.005
Morgan Stanley & Co.	8,610,866	26,866	0.003
Penserra Securities*	2,246,174	25,217	0.011
Credit Suisse	2,541,685	25,025	0.010
Citigroup Global Markets, Inc.	3,004,208	17,363	0.006
Investment Technology Group LTD	1,518,725	17,018	0.011
Instinet Europe Limited	2,691,966	15,229	0.006
Mischler Financial Group, Inc.*	5,423,691	15,134	0.003
Societe Generale	1,824,729	14,911	0.008
RBC Dominion Security Services	863,519	13,172	0.015
Deutsche Bank Securities, Inc.	632,472	13,133	0.021
Cabrera Capital Markets*	968,911	12,404	0.013
Credit Lyonnais Sec	919,400	10,318	0.011
Macquarie Bank LTD	6,420,363	10,300	0.002
Barclays Capital	940,264	10,026	0.011
Brokers with <$10,000 of Commissions	58,338,887	239,294	0.004
Total International Equity Commissions	130,840,981	$ 956,280	$ 0.007

** Women/minority-owned brokerage firm. The Retirement Board's brokerage policy encourages investment manager, as they search for best possible trade execution, to utilize women/minority-owned enterprises, specifically firms headquartered in the State of Illinois.*



Actuarial Section

This section includes the actuarial reports and summarizes actuarial liability and unfunded actuarial liability. Schedules of data summarizing information about members and beneficiaries, actuarial assumptions, and principal provisions, and a glossary of terms are also included.

Actuarial Certification – Pension Benefits

June 6, 2019

Board of Trustees
County Employees' and Officers' Annuity and Benefit Fund of Cook County
Chicago, Illinois

RE: December 31, 2018 Actuarial Valuation

Ladies and Gentlemen:

In accordance with your request, we have completed an actuarial valuation of the County Employees' and Officers' Annuity and Benefit Fund of Cook County ("CEABF" or "the Fund") as of December 31, 2018. The major findings of the valuation are contained in this report.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the CEABF's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information provided in prior years. The valuation results depend on the integrity of this information. The benefits considered are those delineated in the Plan, the CEABF was established on July 1, 1926 and is governed by legislation contained in the Illinois Compiled statutes, particularly Chapter 40, as amended and restated effective December 31, 2018. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: experience differing from that anticipated by the economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the CEABF's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

The CEABF is funded by Employer and Member Contributions. The County levies a tax annually equal to the total amount of contributions made by the members in the calendar year 2 years prior to the year of the levy, multiplied by 1.54. This funding mechanism is insufficient to meet the needs of the CEABF. We project that the CEABF will become insolvent in 2038. We recommend that a funding policy be legislated that is sufficient to pay the Normal Costs of active Plan members, Plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of payroll (or salary) over a period no longer than 30 years.

The economic and demographic assumptions used in the valuation were adopted by the Board and first reflected in the December 31, 2017 valuation. The Board's established practice is to review the experience of the CEABF at least once every five years to determine if any changes to the valuation assumptions are warranted. The assumptions used in the valuation meet the parameters set by the Actuarial Standards of Practice and are based on recommendations made and approved by the Board as part of an Experience Study covering plan years from January 1, 2013 through December 31, 2016. A summary of the actuarial assumptions and methods used in this actuarial valuation are shown beginning on page 120.

Actuarial computations presented in this report are for purposes of determining the actuarial contribution rates for funding the Fund based on the Board's funding policy report and all supporting schedules to meet the parameters and requirements for disclosure of Governmental Accounting Standards Board (GASB) Statement No. 67 and No. 68. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Fund's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

We have prepared required accounting information for GASB Statement Nos. 67 and 68 for the measurement year ending December 31, 2018, based on valuation dates of December 31, 2017 and December 31, 2018.

The actuary prepared, or assisted in preparing, the following supporting information for the Comprehensive Annual Financial Reporting:

- Comparative Summary of Key Actuarial Valuation Results
- Actuarial Liabilities and Normal Cost
- Actuarial Contributions
- Calculation of Actuarial (Gain)/Loss
- Analysis of Experience
- Actuarial Balance Sheet
- History of UAAL and Funded Ratio
- Solvency Test
- Reconciliation of Change in Unfunded Actuarial Liability
- Actuarial Value of Assets
- Schedule of Changes in Net Pension Liability
- Net Pension Liability
- GASB 67 Sensitivity of Net Pension Liability
- Membership Data
- Summary of Benefit Provisions
- Description of Actuarial Methods and Valuation Procedures
  - — Actuarial Cost Method
  - — Asset Valuation Method
  - — Valuation Procedures
- Summary of Actuarial Assumptions

The consultants who worked on this assignment are pension actuaries. CMC's advice is not intended to be a substitute for qualified legal or accounting counsel.

Actuarial Certification – Pension Benefits (continued)

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries, have experience in performing valuations for public retirement plans, and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board and the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement plan and on actuarial assumptions that are internally consistent and reasonable based on the actual experience of the Fund and future expectations. However, the Board of Trustees has the final decision regarding the selection of the assumptions and adopted them as indicated in Appendix C.

Respectfully submitted,

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Wendy T. Ludbrook, FSA, EA, MAAA Senior Actuary
Actuarial Valuation – Pension Benefits

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Actuarial Valuation – Pension Benefits

Overview

The County Employees' and Officers' Annuity and Benefit Fund of Cook County ("CEABF" or "the Fund) provides pension and ancillary benefit payments to the active, retired and separated employees of Cook County. A Retirement Board comprised of retiree, employee, and appointed representatives is responsible for administering the Plan and providing oversight of the investment policy. This report presents the results of the actuarial valuation of the Plan benefits as of the valuation date of December 31, 2018.

Purpose

An actuarial valuation is performed on the Plan annually as of the end of the fiscal year. The primary purposes of performing the valuation are:

- to estimate the liabilities for the future benefits expected to be provided by the Fund;
- to determine the actuarial contribution rate, based on the Fund's funding policy;
- to measure and disclose various asset and liability measures;
- to monitor any deviation between actual Fund experience and experience predicted by the actuarial assumptions so that recommendations for assumption changes can be made when appropriate;
- to analyze and report on any significant trends in contributions, assets and liabilities over the past several years.

Membership Data

Actives: As of December 31, 2018, there were 19,671 employees in active service (including 160 on disability) covered under the provisions of the Plan. The significant age, service, salary and accumulated contribution information for these employees is summarized below, along with comparative figures from the last actuarial valuation one year earlier.

	December 31, 2018	December 31, 2017
Number of active employees	19,671	20,349
Average age	47.9	47.7
Average years of service	14.1	14.0
Total annual payroll for year ended	$ 1,533,721,507	$ 1,567,480,401
Average annual salary	77,969	77,030
Total accumulated contributions	$ 1,811,815,691	$ 1,808,931,624
Average accumulated contributions	92,106	88,895

The number of active members decreased by 3.3% from the previous valuation date. The average age of the active members increased by 0.2 years, and the average service increased by 0.1 years. The total annual salary decreased by 2.2%. The average salary increased by 1.2% from the previous valuation.

Membership (continued)

Disabilities: There were 160 disabled members (included in the active data). There were 149 disabilities in the prior year.

Retirees and Beneficiaries: In addition to the active members, there were 15,280 retired members and 2,782 beneficiaries who are receiving monthly benefit payments on the valuation date. The significant age and annual benefit information for these members are summarized below with comparative figures from the last actuarial valuation performed one year earlier.

	December 31, 2018	December 31, 2017
Number of members receiving payments		
Retirees	15,820	15,488
Beneficiaries	2,782	2,729
Total	18,602	18,217
Average age	72.2	72.1
Annual benefit amounts		
Retirees	$ 725,247,543	$ 683,091,342
Beneficiaries	57,466,491	53,518,720
Total	$ 782,714,034	$ 736,610,062
Average annual benefit payments	$ 42,077	$ 40,435

The number of retired members and beneficiaries increased by 2.1% from the previous valuation date. The average age of the retired members increased by 0.1 years. The total annual benefit payments for these members increased by 6.3% from the previous valuation date.

Inactives: In addition to the active and retired members, there were 14,898 inactive members who did not elect to receive their accumulated contributions when they left covered employment. The age information for these inactive members is summarized below with comparative figures from the last actuarial valuation one year earlier.

	December 31, 2018	December 31, 2018
Number of inactive members	14,898	14,624
Average age	48.5	48.1

The number of inactive members increased by 1.9% from the previous valuation. The average age of the inactive members increased by 0.4 years.

Plan Assets

The Plan's assets are held in trust and invested for the exclusive benefit of Plan members. The trust is funded by member and employer contributions, and pays benefits directly to eligible members in accordance with Plan provisions. The assets are audited annually and are reported at fair value. On a fair value basis, the Plan has a Net Position Available for Benefits of $9.9 billion as of December 31, 2018. This includes a decrease of $0.5 billion from the Net Position Available for Benefits of $10.4 billion as of December 31, 2017. During the prior year, the fair value of assets experienced an investment rate of return of -3.8% (net of investment expenses), as reported by the investment consultant.

In order to reduce the volatility investment gains and losses can have on the Plan's actuarially required contribution and funded status, the Board has adopted a five-year smoothing method to determine the actuarial value of assets used for funding purposes. This method recognizes gains and losses, i.e. the difference between actual investment return during the year and the expected return based on the valuation interest rate, on a level basis over a five year period. In our opinion, this method complies with Actuarial Standards of Practice No. 44.

As of December 31, 2018, the assets available for benefits on an actuarial value basis were $10.5 billion. This includes an increase of $0.4 billion over the actuarial value of assets of $10.1 billion as of December 31, 2017. During 2018, the actuarial value of assets experienced an actuarial rate of return of 4.8% which is based on a five-year averaging of investment returns.

A summary of the assets held for investment, a summary of changes in assets, and the development of the actuarial value of assets is shown in Section 2 beginning on page 108.

Actuarial Experience

Differences between the expected experience based on the actuarial assumptions and the actual experience create changes in the actuarial accrued liability, actuarial value of assets, and the unfunded actuarial accrued liability from one year to the next. These changes create an actuarial gain if the experience is favorable and an actuarial loss if the experience is unfavorable. The Plan experienced a total net actuarial loss of $344.0 million during the prior year. This net loss is about 2.2% of the Plan's prior year actuarial accrued liability. The net loss is a combination of two principal factors, demographic experience and investment performance under actuarial smoothing. Below is a more detailed discussion.

The demographic experience tracks actual changes in the Plan's population compared to the assumptions for decrements such as mortality, turnover, and retirement, as well as pay increases. The Plan experienced a demographic loss of $98.2 million during the year ending December 31, 2018. This loss increased the unfunded actuarial accrued liability by $98.2 million and decreased the funded ratio by 0.4%.

There were 18,153 active members who were also reported active in the December 31, 2017 actuarial valuation. The total salary for this group increased by 2.2%, which was lower than the 3.9% increase that was expected.

Continued tracking of the demographic experience is warranted in order to confirm the appropriateness of the actuarial assumptions. Details of the demographic, economic, and other assumptions used to value the Plan liabilities and normal cost can be found in Section 6. In our opinion, the economic assumptions comply with Actuarial Standards of Practice No. 27 and the demographic assumptions comply with Actuarial Standards of Practice No. 35.

Actuarial Experience (continued)

On the asset side, the rate of return on the fair value of assets for the year ending December 31, 2018 was reported to be -3.8%, which was lower than the assumed rate of 7.25%.

The Plan experienced a loss on an actuarial value of assets basis. The rate of return on the actuarial value of Plan assets for the year ending December 31, 2018 was approximately 4.8% compared to the assumption of 7.25%, resulting in an asset loss of $245.8 million. This loss increased the unfunded actuarial accrued liability by $245.8 million and decreased the funded ratio by 1.5%.

The rate of return on the fair value of assets for the year ending December 31, 2018 was lower than the assumed rate of 7.25%. The actuarial value of the assets recognizes only 20% of the 2018 unexpected change in fair value, delaying the recognition of the remaining 80% over the next four years. Moreover, the actuarial value of assets also recognizes deferred portions of prior years' gains and losses on fair value. The investment loss recognized this year is primarily due to the investment loss in 2018. It should be noted that the Plan's assumed asset return of 7.25% during 2018 is a long-term rate and short-term performance is not necessarily indicative of expected long-term future returns.

A summary of the actuarial gains and losses experienced during the prior year is shown on page 105.

Actuarial Contributions

The current contribution mechanism is not sufficient to fund the CEABF in an actuarially sound manner. The County levies a tax annually equal to the total amount of contributions made by the members in the calendar year 2 years prior to the year of the levy, multiplied by 1.54. This funding policy is insufficient to meet the needs of the CEABF. We project that the CEABF will become insolvent in 2038. We recommend that a funding policy be legislated that is sufficient to pay the Normal Costs of active Plan members, Plan expenses, and amortize the unfunded actuarial accrued liability as a level percent of payroll (or salary) over a period no longer than 30 years. We summarize those costs based on 30 years in the next paragraph.

The normal cost represents the cost of the benefits that accrue during the year for active members under the Entry Age Actuarial Cost Method. It is determined as a level percentage of pay which, if paid from entry age to the assumed retirement age, assuming all the actuarial assumptions are exactly met by experience, would accumulate to a fund sufficient to pay all benefits provided by the Plan. The expected member contributions are subtracted from this amount to determine the employer normal cost. The employer normal cost for 2019 has been determined to be $74.1 million, or 4.60% of pay. This represents a decrease in the employer normal cost rate of 1.66% of pay from last year's employer normal cost rate of 6.26%.

The cost method also determines the actuarial accrued liability which represents the value of all accumulated past normal cost payments. This amount is compared to the actuarial value of assets to determine if the Plan is ahead or behind in funding as of the valuation date. The difference between the total actuarial accrued liability and the actuarial value of assets equals the amount of unfunded actuarial accrued liability or surplus (if negative) on the valuation date. This amount is amortized and added to the employer normal cost to determine the annual actuarially required employer contribution for the year.

Actuarial Contributions (continued)

The unfunded actuarial accrued liability as of December 31, 2018 is $5.8 billion. This represents an increase of $278 million in the unfunded actuarial accrued liability from last year's amount of $5.5 billion. The annual payment required to amortize the unfunded actuarial accrued liability of $5.8 billion, over a period of 30 years, as of December 31, 2018 is $462.8 million, or 28.70% of pay.

The annual actuarially required employer contribution for 2019 is $536.9 million, or 33.3% of pay. This represents a slight increase of $13.3 million in the employer contribution amount of $523.6 million for 2018, or a decrease of 0.1% of pay from last year's employer contribution rate of 33.4%.

The actuarial liabilities and development of the annual actuarial employer contribution is shown beginning on page 103.

Funded Status

The funded status is a measure of the progress that has been made in funding the Plan as of the valuation date. It is determined as a ratio of the actuarial value of assets divided by the total actuarial accrued liability on the valuation date. A ratio of over 100% represents a Plan that is ahead in funding, and a ratio of less than 100% represents a Plan that is behind in funding on the valuation date.

As of December 31, 2018 the funded ratio of the Plan is 64.44%. This represents a decrease of 0.31% from last year's funded ratio of 64.75% as of December 31, 2017.

Where presented, references to "funded ratio" and "unfunded accrued liability" are typically measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

A history of the unfunded actuarial accrued liability and the funded ratio is shown on page 107.

Accounting Information

The Governmental Accounting Standards Board (GASB) issues statements which establish financial reporting standards for defined benefit pension Plans and accounting for the pension expenditures and expenses for governmental employers. The required financial reporting information for the Plan and the Employer under GASB No. 67 and 68 can be found beginning on page 112.

Changes in Plan Provisions

There were no changes in benefits or other Plan provisions considered in this actuarial valuation since the last valuation performed as of December 31, 2017.

Changes in Actuarial Assumptions, Methods, or Procedures

The assumptions used in this valuation were developed as part of an Experience Study covering plan years from January 1, 2013 through December 31, 2016 and first used in the December 31, 2017 actuarial valuation. A description of these assumptions can be found beginning on page 120.

Change in Actuary

During 2018 the fund retained Cavanaugh Macdonald as their actuary. The December 31, 2018 valuation is the first valuation completed by Cavanaugh Macdonald. During the transitioning of actuarial services to a new firm, a replication valuation is performed to ensure that we have properly programmed our valuation software to reflect the plan provisions and assumptions and to benchmark any difference between our results and the prior actuary's results. Based on the results of our replication, as of December 31, 2018 the Actuarial Accrued Liability increased by $84.5M, or 0.5%.

All results presented in this report for years prior to the December 31, 2018 were performed by the prior actuary(s).

Comparative Summary of Key Actuarial Valuation Results

Principal Valuation Results	Actuarial Valuation as of December 31, 2018		Actuarial Valuation as of December 31, 2017	
Summary of Member Data				
Number of Members Included in the Valuation:				
Active Members		19,671		20,349
Retirees and Beneficiaries		18,602		18,217
Inactive Members		14,898		14,624
Total		53,171		53,190
Annual Payroll				
Average	$	77,969	$	77,030
Annual Benefit Payments				
Retirees and Beneficiaries (Average) [1]	$	42,077	$	40,435
Investment Returns				
Fair Value Rate of Return (net of investment expenses)[2]		-3.8%		15.4%
Actuarial Value Rate of Return		4.8%		8.1%
Summary of Assets and Liabilities				
Total Actuarial Accrued Liability	$	16,314,389,047	$	15,671,756,443
Actuarial Value of Assets		10,512,756,514		10,148,203,833
Unfunded Actuarial Accrued Liability	$	5,801,632,533	$	5,523,552,610
Funded Ratio		64.44%		64.75%

	Fiscal Year Ending December 31, 2020		Fiscal Year Ending December 31, 2019	
Employer Actuarial Required Contribution				
Employer Normal Cost	$	74,111,433	$	98,121,245
Amortization of Unfunded Actuarial Accrued Liability (Surplus)		462,844,125		425,504,720
Employer Actuarial Required Contribution	$	536,955,558	$	523,625,965

[1] The average annual benefit payments for retirees only is $45,844 as of December 31, 2018 and $44,105 as of December 31, 2017

[2] Rate of return Provided by the CCPF.

Actuarial Liabilities and Normal Cost

Actuarial Liabilities		Tier 1		Tier 2		Total		December 31, 2017 Total
1. Present Value of Projected Benefits								
a. Retirement Benefits	$	7,285,141,319	$	300,061,891	$	7,585,203,210	$	7,665,746,731
b. Withdrawal Benefits		207,151,957		134,945,243		342,097,200		355,012,296
c. Death Benefits		81,068,644		8,941,782		90,010,426		86,593,668
Total	**$**	**7,573,361,920**	**$**	**443,948,916**	**$**	**8,017,310,836**	**$**	**8,107,352,695**
2. Retired Members and Beneficiaries Receiving Benefits		9,049,745,507		287,151		9,050,032,658		8,583,373,041
3. Inactive Members with Deferred Benefits		730,377,797		17,623,764		748,001,561		536,355,401
4. Total Present Value of Projected Benefits (1. + 2. + 3.)	**$**	**17,353,485,224**	**$**	**461,859,831**	**$**	**17,815,345,055**	**$**	**17,227,081,137**
5. Present Value of Future Normal Costs		1,221,607,047		279,348,961		1,500,956,008		1,555,324,696
6. Total Actuarial Accrued Liability	**$**	**16,131,878,177**	**$**	**182,510,870**	**$**	**16,314,389,047**	**$**	**15,671,756,441**

Normal Cost as of December 31, 2018		Tier 1			Tier 2			Total			December 31, 2017 Total	
Projected Capped Payroll for Fiscal Year 2019	$	1,164,469,064		$	448,162,418		$	1,612,631,482		$	1,567,480,401	
1. Total Normal Cost		Amount	% of Pay		Amount	% of Pay		Amount	% of Pay		Amount	% of Pay
a. Retirement Benefits	$	149,658,480	12.85%	$	25,365,057	5.66%	$	175,023,537	10.85%	$	179,876,505	11.48%
b. Withdrawal Benefits		14,314,074	1.23%		8,697,639	1.94%		23,011,713	1.43%		38,410,978	2.45%
c. Duty Disability Benefits		14,540	0.00%		-	0.00%		14,540	0.00%		-	0.00%
d. Ordinary Disability Benefits		4,556,183	0.39%		-	0.00%		4,556,183	0.28%		4,556,041	0.29%
e. Death Benefits		2,635,573	0.23%		735,815	0.16%		3,371,388	0.21%		3,054,096	0.19%
f. Administrative Expenses		3,908,829	0.34%		1,534,464	0.34%		5,443,293	0.34%		5,676,336	0.36%
Total	**$**	**175,087,679**	**15.04%**	**$**	**36,332,975**	**8.11%**	**$**	**211,420,654**	**13.11%**	**$**	**231,573,956**	**14.77%**
2. Expected Member Contributions	**$**	**99,181,207**	**8.52%**	**$**	**38,128,014**	**8.51%**	**$**	**137,309,220**	**8.51%**	**$**	**133,452,711**	**8.51%**
3. Employer Normal Cost (1. - 2.)	**$**	**75,906,472**	**6.52%**	**$**	**(1,795,039)**	**-0.40%**	**$**	**74,111,433**	**4.60%**	**$**	**98,121,245**	**6.26%**

Actuarial Contributions*

		Fiscal Year Ending December 31,		
Valuation Date		**2018**		**2017**
1. Projected Payroll for Year Beginning	$	1,612,631,482	$	1,567,480,401
2. Total Actuarial Accrued Liability				
a. Active Members				
i. Retirement Benefits	$	6,295,012,243	$	6,320,251,408
ii. Withdrawal Benefits		155,592,010		167,463,162
iii. Death Benefits		65,750,575		64,313,431
iv. Total	$	6,516,354,828	$	6,552,028,001
b. Retired Members and Beneficiaries Receiving Benefits	$	9,050,032,658	$	8,583,373,041
c. Inactive Members with Deferred Benefits		748,001,561		536,355,401
d. Total (2a. + 2b. + 2c.)	$	16,314,389,047	$	15,671,756,443
3. Actuarial Value of Assets		10,512,756,514		10,148,203,833
4. Unfunded Actuarial Accrued Liability (UAAL) (2d. - 3.)	$	5,801,632,533	$	5,523,552,610
5. Funded Ratio (3. / 2d.)		64.44%		64.75%
6. UAAL as a Percent of Annual Payroll (4. / 1.)		359.76%		352.38%

		Fiscal Year Ending December 31,		
Development of Employer Contribution*		**2020**		**2019**
7. Amortization Payment for UAAL (30 year amortization)				
a. Amount	$	462,844,125	$	425,504,720
b. As a % of pay (7a. / 1.)		28.70%		27.15%
8. Employer Normal Cost				
a. Amount	$	74,111,433	$	98,121,245
b. As a % of pay (8a. / 1.)		4.60%		6.26%
9. Employer Actuarial Required Contribution				
a. Amount (8a. + 7a.)	$	536,955,558	$	523,625,965
b. As a % of pay (9a. / 1.)		33.30%		33.41%

** Amount needed to fund the CEABF in an actuarially responsible manner.*

Calculation of Actuarial (Gain)/Loss

Development of Actuarial (Gain) / Loss		**Amount**
1. Expected Actuarial Accrued Liability		
a. Actuarial Accrued Liability at December 31, 2017	$	15,671,756,443
b. Normal Cost at December 31, 2017		225,897,620
c. Interest on a. + b. to End of Year		1,152,579,920
d. Benefit Payments and Refunds, with Interest to End of Year		834,079,449
e. Expected Actuarial Accrued Liability Before Changes (a. + b. + c. - d.)	$	16,216,154,534
f. Change in Actuarial Accrued Liability at December 31, 2018 due to:		
i. Change in Actuarial Assumptions		-
ii. Change in Actuarial Methods		-
g. Expected Actuarial Accrued Liability at December 31, 2018 (e. + f.i. + f.ii.)	$	16,216,154,534
2. Actuarial Accrued Liability at December 31, 2018		16,314,389,047
3. Liability (Gain) / Loss (2. – 1.g.)	**$**	**98,234,513**
4. Expected Actuarial Value of Assets		
a. Actuarial Value of Assets at December 31, 2017	$	10,148,203,833
b. Interest on a. to End of Year		735,744,778
c. Contributions Made for December 31, 2018		689,457,036
d. Interest on c. to End of Year		24,555,536
e. Benefit Payments and Administrative Expenses, with Interest to End of Year		839,396,349
f. Change in Actuarial Value of Assets at December 31, 2018 due to:		
i. Change in Asset Method		-
g. Expected Actuarial Value of Assets at December 31, 2018 (a. + b. + c. + d. – e. – f.i.)	$	10,758,564,834
5. Actuarial Value of Assets as of December 31, 2018		10,512,756,514
6. Actuarial Asset (Gain) / Loss (4.g. - 5.)	**$**	**245,808,320**
7. Actuarial (Gain) / Loss (3. + 6.)	**$**	**344,042,833**

Actuarial Valuation – Pension Benefits (continued)

Analysis of Experience

Type of (Gain) or Loss	Year Ending December 31, 2018	As a % of Last Year's AAL
1. (Gain) or Loss During the Year from Experience:		
a. Salary	$ (144,455,926)	-0.92%
b. Investment	245,808,320	1.57%
c. Retiree Mortality	(11,710,040)	-0.07%
d. Other (turnover, retirement ages, service purchase, etc.)	254,400,479	1.62%
e. Total Experience (Gain) or Loss (a. + b. + c. + d.)	$ 344,042,833	2.20%
2. Assumption and Method Changes	-	0.00%
3. Total (Gain) or Loss During Year (1.e. + 2.)	$ 344,042,833	2.20%

Actuarial Balance Sheet

Financial Resources	December 31, 2018
1. Actuarial Value of Assets	$ 10,512,756,514
2. Present Value of Future Contributions	
a. Expected Member Contributions	974,810,623
b. Employer Normal Cost	526,145,385
c. Total	$ 1,500,956,008
3. Unfunded Actuarial Accrued Liability/(Reserve)	$ 5,801,632,533
4. Total Assets [1. + 2.c. + 3.]	$ 17,815,345,055
Benefit Obligations	
1. Present Value of Future Benefits	
a. Active Members	$ 8,017,310,836
b. Retirees and Beneficiaries	9,050,032,658
c. Inactive Members	748,001,561
d. Total	$ 17,815,345,055

History of UAAL And Funded Ratio

Valuation Date	Actuarial Accrued Liability (AAL)	Actuarial Value of Assets (AVA)	Funded Ratio (AVA as a % of AAL)	Unfunded Actuarial Accrued Liability (UAAL)
December 31, 2009	$ 11,489,081,298	$ 7,945,567,096	69.16%	$ 3,543,514,202
December 31, 2010	12,023,222,885	7,982,368,659	66.39%	4,040,854,226
December 31, 2011	12,628,274,561	7,897,102,116	62.54%	4,731,172,445
December 31, 2012	13,418,486,943	7,833,882,926	58.38%	5,584,604,017
December 31, 2013	13,636,576,177	8,381,444,287	61.46%	5,255,131,890
December 31, 2014	14,140,547,353	8,810,509,070	62.31%	5,330,038,283
December 31, 2015	14,936,591,336	8,991,018,918	60.19%	5,945,572,418
December 31, 2016	15,456,773,985	9,488,223,349	61.39%	5,968,550,636
December 31, 2017	15,671,756,443	10,148,203,833	64.75%	5,523,552,610
December 31, 2018	16,314,389,047	10,512,756,514	64.44%	5,801,632,533

Reconciliation of Change in Unfunded Actuarial Liability

Development of Unfunded Actuarial Liability	Amount
1. Unfunded Actuarial Accrued Liability as of December 31, 2017	$ 5,523,552,610
2. Normal Cost December 31, 2017	98,121,245
3. Interest on 1. and 2.	407,571,354
4. Employer Contribution Requirement of Normal Cost Plus Interest on Unfunded Liability for Period January 1, 2018 to December 31, 2018	$ 505,692,599
5. Actual Employer Contribution for the Year*	549,437,252
6. Interest on 5.	19,568,625
7. Increase in Unfunded Liability Due to Employer Contribution Plus Interest Being Less Than Normal Cost Plus Interest on Unfunded Liability (4. - (5.+6.)	(63,313,278)
8. Increase/(Decrease) in Unfunded Liability Due to:	
a. Investment Return Lower/(Higher) Than Assumed	245,808,320
b. Salary Increases Higher/(Lower) Than Assumed	(144,455,926)
c. Assumption changes	-
d. Other Sources	240,040,807
9. Net Increase/(Decrease) in Unfunded Liability for the Year (7. + 8a. + 8b. + 8c. + 8d.)	278,079,923
10. Unfunded Actuarial Accrued Liability as of December 31, 2018 (1. + 9.)	$ 5,801,632,533

** Includes an additional $378.4 Million supplemental contribution from the employer*

Summary of Fair Value of Assets

Asset Category	Fair Value as of December 31, 2018 Amount	%	Fair Value as of December 31, 2017 Amount	%
1. **Short-Term Investments**	$ 218,141,022	2.06%	$ 296,147,797	2.58%
2. **Investments at Fair Value**				
a. U.S. and International Equities	$ 4,958,851,665	46.88%	$ 5,840,815,927	50.94%
b. U.S. Government and Government Agency Obligations	1,170,334,505	11.06%	1,042,879,014	9.10%
c. Corporate Bonds	1,049,336,411	9.92%	892,437,094	7.78%
d. Collective International Equity Fund	70,371,275	0.67%	77,439,593	0.68%
e. Commingled Fixed Income Fund	28,081,553	0.27%	28,067,670	0.24%
f. Exchange Traded Funds	55,162,948	0.52%	172,932,810	1.51%
g. Private Equities	773,068,815	7.31%	572,042,294	4.99%
h. Hedge Funds	666,385,423	6.30%	661,759,083	5.77%
i. Real Estate	644,564,162	6.09%	661,468,632	5.77%
j. Total	$ 9,416,156,758	89.02%	$ 9,949,842,117	86.78%
3. **Collateral Held for Securities Lending**	$ 942,725,617	8.91%	$ 1,218,975,757	10.63%
4. **Total Assets (1. + 2.j + 3.)**	$ 10,577,023,397	100.00%	$ 11,464,965,671	100.00%
5. **Receivables**				
a. Interest and Dividends	$ 29,686,644		$ 22,764,522	
b. Investments Sold	34,415,136		42,988,417	
c. Other Receivables	237,249,598		225,805,692	
d. Total	$ 301,351,378		$ 291,558,631	
6. **Payables**				
a. Investments Purchased	$ 60,991,248		$ 122,561,858	
b. Securities Lending Collateral	942,725,617		1,218,975,757	
c. Other Payables	12,634,128		7,103,244	
d. Total	$ 1,016,350,993		$ 1,348,640,859	
7. **Net Position for Pension Benefits [4. + 5.d – 6.d.]**	**$ 9,862,023,782**		**$ 10,407,883,443**	

Changes in Fair Value of Assets

Transactions		December 31, 2018		December 31, 2017
Additions				
1. **Contributions**				
a. Contributions from Employers	$	549,437,252	$	511,750,985
b. Contributions from Plan Members		134,159,171		138,826,184
c. Total	$	683,596,423	$	650,577,169
2. **Net Investment Income**				
a. Interest and Dividends	$	201,843,915	$	181,099,555
b. Net Appreciation (Depreciation)		(595,032,962)		1,248,856,354
c. Net Securities Lending Income		5,155,500		4,901,992
d. Total	$	(388,033,547)	$	1,434,857,901
e. Less Investment Expense		36,754,398		35,232,027
f. Net Investment Income	$	(424,787,945)	$	1,399,625,874
g. Miscellaneous		5,678,102		5,305,161
h. Employee Transfers		182,511		54,257
3. **Total Additions (1c. + 2f. + 2g. + 2.h)**	$	264,669,091	$	2,055,562,461
Deductions				
4. **Benefits and Expenses**				
a. Retirement Benefits	$	771,732,184	$	724,935,490
b. Refund of Contributions		33,662,521		32,995,364
c. Administrative Expenses		5,134,047		5,406,034
5. **Total Deductions**	$	810,528,752	$	763,336,888
6. **Net Increase (Decrease) (3. - 5.)**	$	(545,859,661)	$	1,292,225,573
Net Position Held in Trust for Pension Benefits				
a. **Beginning of Year**	$	10,407,883,443	$	9,115,657,870
b. **End of Year**	$	9,862,023,782	$	10,407,883,443

Actuarial Value of Assets

Determination of Actuarial Value of Assets				Amount
1. Actuarial Value of Assets as of December 31, 2017				$ 10,148,203,833
2. Unrecognized Return as of December 31, 2017				259,679,610
3. Fair Value of Assets as of December 31, 2017 (1. + 2.)				$ 10,407,883,443
4. Contributions				
a. Member (includes purchased service)				$ 134,159,171
b. Employer				549,437,252
c. Miscellaneous contributions				5,860,613
d. Total				$ 689,457,036
5. Distributions				
a. Benefit payments				$ 771,732,184
b. Refund of contributions				33,662,521
c. Administrative expenses				5,134,047
d. Total				$ 810,528,752
6. Expected Return at 7.25% on				
a. Item 1.				$ 735,744,778
b. Item 2.				18,826,772
c. Item 4.d.				24,555,536
d. Item 5.d.				28,867,597
e. Total (a. + b. + c. - d.)				$ 750,259,489
7. Actual Return on Fair Value for Fiscal Year, net of Investment Expenses				$ (424,787,945)
8. Return to be Spread for Fiscal year (7. - 6e.)*				$ (1,175,047,434)
9. Total Fair Value of Assets as of December 31, 2018				$ 9,862,023,782
10. Return to be Spread				
	Fiscal Year	Return to be Spread	Unrecognized Percent	Unrecognized Return
	2018	$ (1,175,047,434)	80.00%	$ (940,037,947)
	2017	719,906,235	60.00%	431,943,741
	2016	(13,011,088)	40.00%	(5,204,435)
	2015	(687,170,453)	20.00%	(137,434,091)
	2014	(167,852,724)	0.00%	-
				$ (650,732,732)
11. Actuarial Value of Assets (9. - 10.)				$ 10,512,756,514
12. Recognized rate of return for the Year on Actuarial Value of Assets				4.8%
13. Rate of Return for the Year on Market Value of Assets (reported by Cook County - net of inv. expenses)				-3.8%

** Annual Return to be Spread calculation is based on assumed 7.25% investment return which includes an assumption that all expenses and revenues are paid mid-year on average*

Schedule of Funding Progress

The liabilities and assets resulting from the last ten actuarial valuations are as follows:

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liabilities (AAL) (b)	Unfunded AAL (UAAL) (Actuarial Value) (b-a)	Funded Ratio (Actuarial Value) (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (Fair Value) (b-a)/(c)
2009	$ 7,945,567,096	$ 11,489,081,298	$ 3,543,514,202	69.16%	$ 1,498,161,713	236.5%
2010	7,982,368,659	12,023,222,885	4,040,854,226	66.39%	1,494,093,569	270.5%
2011	7,897,102,116	12,628,274,561	4,731,172,445	62.54%	1,456,444,123	324.8%
2012	7,833,882,926	13,418,486,943	5,584,604,017	58.38%	1,478,253,368	377.8%
2013	8,381,444,287	13,636,576,177	5,255,131,890	61.46%	1,484,269,715	354.1%
2014	8,810,509,070	14,140,547,353	5,330,038,283	62.31%	1,514,550,023	351.9%
2015	8,991,018,918	14,936,591,336	5,945,572,418	60.19%	1,572,417,298	378.1%
2016	9,488,223,349	15,456,773,985	5,968,550,636	61.39%	1,580,251,254	377.7%
2017	10,148,203,834	15,671,756,443	5,523,552,609	64.75%	1,567,480,401	352.4%
2018	10,512,756,514	16,314,389,047	5,801,632,533	64.44%	1,533,721,507	378.3%

Schedule of Employer Contributions

The actuarially determined contributions and actual percentages contributed over the last ten years are as follows:

Fiscal year Ended December 31,	Actuarially Determined Contribution (ADC)	Employer Contribution	Percentage Contributed
2009	$ 287,061,532	$ 152,506,089	53.13%
2010	283,892,734	144,539,577	50.91%
2011	352,850,988	160,652,118	45.53%
2012	454,327,461	152,734,539	33.62%
2013	493,724,370	147,720,014	29.92%
2014	540,218,287	146,075,414	27.04%
2015	595,370,046	136,075,504	22.86%
2016	519,642,931	414,703,155	79.81%
2017	514,888,487	511,750,985	99.39%
2018	562,815,816	549,437,252	97.62%

Schedule of Changes in Net Pension Liability

	2018	2017	2016	2015
Total Pension Liability				
Service Cost	$ 440,682,868	$ 478,904,097	$ 559,176,234	$ 496,161,454
Interest	1,027,348,255	1,082,982,064	1,002,950,495	994,674,970
Benefit changes	0	0	0	0
Difference between expected and actual experience	(278,982,116)	(152,859,373)	318,014,746	(126,330,351)
Changes of assumptions	(1,601,212,188)	(950,493,320)	(1,893,474,930)	1,329,087,966
Benefit payments, including refund of contributions	(805,394,705)	(757,930,854)	(709,560,225)	(676,470,215)
Net change in Total Pension Liability	(1,217,557,886)	(299,397,386)	(722,893,680)	2,017,123,824
Total Pension Liability – beginning	$ 22,940,794,624	$ 23,240,192,010	$ 23,963,085,690	$ 21,945,961,866
Total Pension Liability – ending (a)	$ 21,723,236,738	$ 22,940,794,624	$ 23,240,192,010	$ 23,963,085,690
Plan Fiduciary Net Position				
Contributions – employer	$ 549,437,252	$ 511,750,985	$ 414,703,166	$ 136,075,504
Contributions – member	134,159,171	138,826,184	139,355,592	137,707,719
Net investment income	(424,787,945)	1,399,625,874	629,442,470	(21,896,696)
Benefit payments, including refund of contributions	(805,394,705)	(757,930,854)	(709,560,225)	(676,470,215)
Administrative expense	(5,134,047)	(5,406,034)	(5,373,555)	(5,151,110)
Other	5,860,613	5,359,418	4,046,147	4,380,293
Net change in Plan Fiduciary Net Position	(545,859,661)	1,292,225,573	472,613,595	(425,354,505)
Plan Fiduciary Net Position – beginning	10,407,883,443	9,115,657,870	8,643,044,275	9,068,398,780
Plan Fiduciary Net Position – ending (b)	$ 9,862,023,782	$ 10,407,883,443	$ 9,115,657,870	$ 8,643,044,275
Net Pension Liability – ending (a) - (b)	$ 11,861,212,956	$ 12,532,911,181	$ 14,124,534,140	$ 15,320,041,415

Net Pension Liability (Asset)

	2018	2017	2016	2015
Total Pension Liability	$ 21,723,236,738	$ 22,940,794,624	$ 23,240,192,010	$ 23,963,085,690
Plan Fiduciary Net Position	9,862,023,782	10,407,883,443	9,115,657,870	8,643,044,275
Net Pension Liability	$ 11,861,212,956	$ 12,532,911,181	$ 14,124,534,140	$ 15,320,041,415
Ratio of Plan Fiduciary Net Position to Total Pension Liability	45.40%	45.37%	39.22%	36.07%
Covered-employee payroll	$ 1,533,721,507	$ 1,567,480,401	$ 1,580,251,254	$ 1,572,417,298
Net Pension Liability as a percentage of covered-employee payroll	773.36%	799.56%	893.82%	974.30%

Sensitivity of Net Pension Liability

	1% Decrease (3.98%)	Current Discount Rate (4.98%)	1% Increase (5.98%)
Total Pension Liability	$ 25,034,558,480	$ $21,723,236,738	$ $19,031,407,736
Fiduciary Net Position	9,862,023,782	9,862,023,782	9,862,023,782
Net Pension Liability	$ $15,172,534,698	$ $11,861,212,956	$ $9,169,383,954

The discount rate used to measure the total pension liability was 4.98%. The discount rate used to measure the total pension liability at December 31, 2017 was 4.47%. The projection of cash flows used to determine the discount rate assumed that CEABF contributions will continue to follow the current funding policy, which levies a tax annually equal to the total amount of contributions made by the members in the calendar year 2 years prior to the year of the levy, multiplied by 1.54. Based on this assumption, the Plan's fiduciary net position was projected to be insufficient to make all projected future benefit payments of current plan members. A municipal bond rate of 4.13% was used in the development of the blended GASB discount rate after that point. The 4.13% rate is based on the S&P Municipal Bond 20 Year High Grade Rate Index as of December 30, 2018. Based on the long-term rate of return of 7.25% and the municipal bond rate of 4.13%, the blended GASB discount rate would be 4.98%. Please see the supporting exhibits for additional detail.

GASB 67/68 Actuarial Assumptions and Methods

Actuarial Assumptions and Methods:

Measurement Date:	**December 31, 2018**	**December 31, 2017**
Valuation Date (VD):	December 31, 2017	December 31, 2016
Membership Data:		
Retirees	15,488	15,222
Beneficiaries	2,729	2,687
Inactive Vested Members	14,624	14,005
Active Employees	20,349	20,969
Total	53,190	52,883
Single Equivalent Interest Rate (SEIR):		
Long-Term Expected Rate of Return	7.25%	7.25%
Municipal Bond Index Rate at Measurement Date	4.13%	3.16%
Fiscal Year in which Fiduciary Net Position is Projected to be Depleted	2038	2042
Single Equivalent Interest Rate at Measurement Date	4.98%	4.47%
Actuarial Assumptions:		
- Projected Salary Increases	3.50%-8.00%	3.50%-8.00%
- Inflation Assumption	2.75%	2.75%

The projection of cash flows used to determine the discount rate assumed that CEABF contributions will continue to follow the current funding policy based on the tax levy. Based on this assumption, the Plan's fiduciary net position is projected to be insufficient to make all projected future benefit payments of current plan members. A municipal bond rate of 4.13% was used in the development of the blended GASB discount rate after that point. The 4.13% rate is based on the 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate (Municipal Bond Index Rate). The rate used for this purpose is the monthly average of the Bond Buyers General Obligation 20-year Municipal Bond Index Rate (formerly published monthly by the Board of Governors of the Federal Reserve System). Based on the long-term rate of return of 7.25% and the municipal bond rate of 4.13%, the blended GASB discount rate would be 4.98%. See the preceding exhibits for more detail.

Investment Rate of Return Detail

The long-term expected rate of return on the Fund's investments was determined based on the results of an experience review. The results of the experience review were presented to the Board at the Board's March 2018 Meeting and adopted at a subsequent meeting. The rate of return assumption was based on the target asset allocation of the fund. In the experience review, best estimate ranges of expected future real rates of return (net of inflation) for the portfolio were developed, based on the expected returns of each major asset class and their weights in the portfolio. An econometric model that forecasts a variety of economic environments and then calculates asset class returns based on functional relationships between the economic variables and the asset classes was then used. Expected Investment expenses were subtracted and expected inflation was added to arrive at the long term expected nominal return. A value for the expected long term expected return was selected for the portfolio such that there was a better than 50% likelihood of the emerging returns exceeding the expected return.

Best estimates of arithmetic real rates of return (net of inflation) for each major asset class included in the Fund's target asset allocation as of December 31, 2018 are listed in the table below:

Asset Category	Target Allocation	Long-Term Expected Real Rate of Return
US Large Cap	23.00%	10.23%
US Mid Cap	2.00%	12.12%
US Small Cap	8.00%	12.09%
Global Equity ex US	21.00%	9.51%
Aggregate Bonds	26.00%	4.77%
NCREIF	6.00%	9.77%
Hedge Funds	6.00%	7.31%
REIT	3.00%	6.94%
Private Equity	4.00%	11.43%
Cash	1.00%	3.98%
Total	100.00%	

Summary of Benefit Provisions

Participant. A person employed by Cook County whose salary or wages is paid in whole or in part by the Cook County. An employee in service on or after January 1, 1984 shall be deemed as a participant regardless of when he or she became an employee.

Service. For all purposes except the minimum retirement annuity and ordinary disability benefit, service during four months in any calendar year constitutes one year of service. For the minimum retirement annuity, all service is computed in whole calendar months. Service for any 15 days in a calendar month shall constitute a month of service.

For purposes of the minimum retirement annuity, service shall include:

a. Any time during which the employee performed the duties of his or her position and contributed to the Fund.
b. Vacations and leaves of absence with whole or part pay.
c. Periods during which the employee receives a disability benefit from the Fund, and
d. Certain periods of accumulated sick leave.

Retirement Annuity - Eligibility. An employee who withdraws from service with 10 or more years of service is entitled to a retirement annuity upon attainment of age 50.

Retirement Annuity - Amount

Money Purchase Annuity. The amount of annuity based on the sum accumulated from the employee's salary deductions for age and service annuity plus 1/10 of the sum accumulated from the contributions by the County for age and service annuity for each completed year of service after the first 10.

Minimum Formula Annuity. The amount of annuity provided is equal to 2.4% of final average salary for each year of service. Final average salary is the highest average monthly salary for any 48 consecutive months within the last 10 years of service. Salary for pension purposes is actual salary earned exclusive of overtime or extra salary. The maximum amount of annuity is 80% of final average salary.

If an employee retires before age 60, the annuity is reduced by .5% for each full month or fraction thereof that the employee is under age 60 when the annuity begins, unless the employee has 30 or more years of service, in which case there is no reduction for retirement before age 60.

If the Minimum Formula Annuity is greater than the Money Purchase Annuity, the employee is entitled to receive the Minimum Formula Annuity.

Automatic Increase in Retirement Annuity. Employees who retire from service having attained age 60 or more, or, if retirement occurs on or after January 1, 1991, with at least 30 years of service, 3% of the annuity beginning January of the year following the year in which the first anniversary of retirement occurs. If retirement is before age 60 with less than 30 years of service, increases begin in January of the year immediately following the year in which age 60 is attained. Beginning January 1, 1998, increases are calculated as 3% of the monthly annuity payable at the time of the increase.

Summary of Benefit Provisions (continued)

Optional Plan of Contributions and Benefits. During the period through June 30, 2005, an employee may establish optional credit for additional benefits by making additional contributions of 3% of salary. The additional benefit is equal to 1% of final average salary for each year of service for which optional contributions have been paid. The additional benefit shall be included in the calculation of the automatic annual increase and the calculation of the survivor's annuity.

Alternate Annuity for County Officers. An alternate annuity is available for county officers elected on or before January 1, 2008. The amount of this alternate annuity is equal to 3% of final salary for the first 8 years of service, 4% for the next 4 years of service, and 5% thereafter, subject to a maximum of 80% of final salary. The elected county officer is required to contribute an additional 3% of salary to be eligible for the alternate annuity. The alternate survivor's annuity for survivors of elected county officers is 66-2/3% of the amount of the elected county officer's earned retirement annuity on the date of death, subject to a minimum payment of 10% of salary.

Annuities for Members of the Cook County Police Department. In lieu of the regular of minimum retirement annuity, a deputy sheriff who is a member of the County Police Department may be entitled to the following annuity:

Upon withdrawal from service after having attained age 50 in service with 20 or more years of service credit as a police officer, the officer shall be entitled to an annuity computed as follows: 50% of final average salary, plus 2% of final average salary for each year of service in excess of 20 years, subject to a maximum of 80% of final average salary.

Surviving Spouse's Annuity - Death in Service

Money Purchase Annuity. The amount of annuity based on the accumulated salary deductions and County contributions for both the employee and the spouse.

Minimum Formula Annuity. A minimum annuity is provided for the eligible surviving spouse of an employee who dies in service with any number of years of service. The amount of such minimum spouse's annuity is equal to 65% of the annuity the employee would have been entitled to as of the date of death, provided the spouse on such date is age 55 or older, or that the employee had 30 or more years of service. If the spouse is under age 55 and the employee had less than 30 years of service, the amount of the spouse's annuity shall be discounted by .5% for each month that the spouse is less than age 55 on the date of the employee's death. The amount of the surviving spouse's annuity shall not be less than 10% of the employee's final average salary as of the date of death.

If the Minimum Formula Annuity is greater than the Money Purchase Annuity, the surviving spouse shall be entitled to receive the Minimum Formula Annuity.

Surviving Spouse's Annuity - Death after Retirement. The amount of the annuity is the greater of the money purchase annuity or the minimum formula annuity. The surviving spouse of an annuitant who dies on or after July 1, 2002 shall be entitled to an annuity of 65% of the employee's annuity at the time of death if the employee had at least 10 years of service, reduced by .5% per month that the spouse is under age 55 at the time of the employee's death. There is no reduction for age if the employee had at least 30 years of service.

Summary of Benefit Provisions (continued)

Automatic Annual Increase in Surviving Spouse's Annuity. On the January 1 occurring on or immediately after the first anniversary of the deceased employee's death, the surviving spouse's annuity shall be increased by 3% of the amount of annuity payable at the time of the increase. On each January 1, thereafter, the annuity shall be increased by an additional 3% of the amount of annuity payable at the time of the increase.

Child's Annuity. Annuities are provided for unmarried children of a deceased employee who are under age 18. An adopted child is entitled to the child's annuity if such child was legally adopted at least one year before the child's annuity becomes payable. The child's annuity is payable under the following conditions:

(a) the death of the employee was a duty related death; or (b) if the death is not a duty related death, the employee died while in service and had completed at least four years of service from the date of his or her original entrance in service and at least two years from the latest re-entrance: or (c) if the employee died while in receipt of an annuity, he or she must have withdrawn from service after attainment of age 50

The amount of the annuity is the greater of 10% of the employee's final salary at the date of death or $140 per month for each child.

Duty Disability Benefits. Duty disability benefits are payable to an employee who becomes disabled as a result of an accidental injury incurred while in the performance of an act of duty. Benefits begin on the first regular and normal work date for which the employee does not receive a salary. The amount of the duty disability benefit is equal to 75% of the employee's salary at the date of injury, reduced by the amount the employee receives from Workers' Compensation. However, if the disability, in any measure has resulted from any physical defect or disease that existed at the time such injury was sustained, the duty disability benefit shall be 50% of salary. The CEABF contributes the 8.5% (9% for County Police) of salary normally contributed by the employee for pension purposes.

If the disability commences prior to age 60, duty disability benefits are payable during disability until the employee attains age 65. If the disability begins after age 60, the benefit is payable during disability for a period of 5 years.

Recipients of duty disability benefits also have a right to receive child's disability benefits of $10 per month on account of each unmarried child less than age 18. Total children's disability benefits shall not exceed 15% of the employee's salary.

Ordinary Disability Benefits. Ordinary disability benefits are provided for employees who become disabled as the result of any cause other than injury incurred in the performance of an act of duty. The amount of the benefit is 50% of the employee's annual salary at the time of disability. The Fund contributes the 8.5% (9% for County Police) of salary normally contributed by the employee for pension purposes.

Ordinary disability benefits are payable after the first 30 days of disability provided the employee is not then in receipt of salary. Ordinary disability benefits are payable until the first of the following shall occur:

a. the disability ceases; or
b. the date that total payments equal the lesser of (1) 1/4 of the total service rendered prior to disability, and (2) five years.

An employee unable to return to work at the expiration of ordinary disability benefit is entitled to an annuity beginning on the date of the employee's withdrawal from service regardless of age on such date.

Summary of Benefit Provisions (continued)

Death Benefit. Upon the death of an active or retired employee, a death benefit of $1,000 is payable to the employee's designated beneficiary or to the employee's estate if no beneficiary has been designated.

Group Health Benefits. The CEABF may pay all or any portion of the premium for health insurance on behalf of each annuitant who participates in any of the CEABF's health care Plans. As of January 1, 2019, CEABF pays 41% of the total premium for all post-Medicare retiree annuitants and 48% of the total premium for all pre-Medicare retiree annuitants on the Choice plan, including the cost of family coverage, and 54% of the total premium for all post-Medicare survivor annuitants and 61% of the total premium for all pre-Medicare survivor annuitants on the Choice plan, including the cost of family coverage.

CEABF pays 38% of the total premium for all post-Medicare retiree annuitants and 43% of the total premium for all pre-Medicare retiree annuitants on the Choice Plus plan, including the cost of family coverage, and 51% of the total premium for all post-Medicare survivor annuitants and 56% of the total premium for all pre- Medicare survivor annuitants on the Choice Plus plan, including the cost of family coverage

Refund to Employee upon Withdrawal From Service. Upon withdrawal from service, an employee under the age of 55, or anyone with less than 10 years of service is eligible for a refund. The employee is entitled to a refund of the amount accumulated to his or her credit for age and service annuity and the survivor's annuity together with the total amount contributed for the automatic annual increase, without interest. Upon receipt of such refund, the employee forfeits all rights to benefits from the Fund.

Election of Refund in Lieu of Annuity. If an employee's annuity or spouse's annuity is less than $150.00 per month, such employee or spouse annuitant may elect a refund of the employee's accumulated contributions in lieu of a monthly annuity.

Refund For Surviving Spouse's Annuity. If an employee is unmarried at the time of retirement, all contributions for surviving spouse's annuity will be refunded with interest at the rate of 3% per year, compounded annually.

Refund of Remaining Amounts. In the event that the total amount accumulated to the account of employee from employee contributions for annuity purposes has not been paid to the employee and surviving spouse as a retirement or surviving spouse's annuity before the death of the survivor of the employee and spouse, a refund of any excess amount shall be paid to the children of the employee, in equal parts, or if there are no children, to the beneficiaries of the employee or the administrator of the estate.

Employee Contributions. Employees contribute through salary deductions 8.5% (9% for County Police) of salary to the Fund, 6.5% (7% for County Police) being for the retirement annuity. 1.5% being for the surviving spouse's annuity, and .5% being for the automatic increase in retirement annuity.

Employer Contributions. The County levies a tax annually equal to the total amount of contributions made by employees in the calendar year 2 years prior to the year of the levy, multiplied by 1.54.

Employer Pick-up of Employee Contributions. Since April 15, 1982, regular employee contributions have been designated for federal income tax purposes as being made by the employer. The employee's W-2 salary is therefore reduced by the amount of contribution. For pension purposes, the salary remains unchanged. For purposes of benefits, refunds, and financing, these contributions are treated as employee contributions.

Summary of Benefit Provisions (continued)

Persons Who First Become Participants On or After January 1, 2011

The following changes to the aforementioned provisions apply to persons who first become participants on or after January 1, 2011:

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 2011, the annual salary is limited to the Social Security wage base of $106,800. Limitations for future years shall automatically be increased by the lesser of 3% or one-half of percentage change in the Consumer Price Index-U for the 12 months ending in September.

3. A participant is eligible to retire with unreduced benefits at 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 one-half of 1% for each month that his or her age is under 67.

4. 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 for the 12 months ending in September, based on the originally granted survivor's annuity.

5. Automatic annual increases in the retirement annuity then being paid 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.

6. Refund upon withdrawal from service. Upon withdrawal from service, an employee who withdraws from service before age 62 regardless of length of service or withdraws with less than 10 years of service regardless of age is entitled to a refund of total contributions made by the employee without interest.

Description of Actuarial Methods and Valuation Procedures

Actuarial Cost Method

Liabilities and contributions shown in this report are computed using the **Entry Age Actuarial Cost Method** of funding.

Sometimes called a "funding method," this is a particular technique used by actuaries for establishing the amount and incidence of the annual actuarial cost of pension Plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily the annual contribution to the Plan is comprised of (1) the normal cost and (2) an amortization payment on the unfunded actuarial accrued liability. Under the Entry Age Actuarial Cost Method, the **Normal Cost** is computed as the level percentage of pay which, if paid from the earliest time each Member would have been eligible to join the Plan if it then existed (thus, entry age) until his retirement or termination, would accumulate with interest at the rate assumed in the valuation to a fund sufficient to pay all benefits under the Plan.

The Normal Cost for the Plan is determined by summing individual results for each active Member and determining an average normal cost rate by dividing the summed individual normal costs by the total payroll of Members before assumed retirement age.

Description of Actuarial Methods and Valuation Procedures (continued)

The **Actuarial Accrued Liability** under this method at any point in time is the theoretical amount of the fund that would have accumulated had annual contributions equal to the Normal Cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date.)

The **Unfunded Actuarial Accrued Liability** is the excess of the Actuarial Accrued Liability over the Actuarial Value of Plan Assets actually on hand on the valuation date. The Unfunded Actuarial Accrued Liability is amortized as a level percent of payroll over an open 30-year period.

Under this method experience gains or losses, i.e. decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the Unfunded Actuarial Accrued Liability.

Asset Valuation Method

The actuarial value of assets is based on a five-year smoothing method and is determined by spreading the effect of each year's investment return in excess of or below the expected return. The Fair Value of assets at the valuation date is reduced by the sum of the following:

(i) 80% of the return to be spread during the first year preceding the valuation date,

(ii) 60% of the return to be spread during the second year preceding the valuation date,

(iii) 40% of the return to be spread during the third year preceding the valuation date, and

(iv) 20% of the return to be spread during the fourth year preceding the valuation date.

The return to be spread is the difference between (1) the actual investment return on Fair Value and (2) the expected return on Fair Value.

Valuation Procedures

No actuarial liability is included for members who terminated non-vested prior to the valuation date, except those due a refund of contributions.

No termination or retirement benefits were projected to be greater than the dollar limitation required by the Internal Revenue Code Section 415 for governmental Plans.

Annual increases in salary were limited to the dollar amount defined under Internal Revenue Code Section 401(a)(17) for affected members.

Summary of Actuarial Assumptions

The actuarial assumptions used for the December 31, 2018 actuarial valuation are summarized below.

The mortality rate, termination rate, retirement rate, and salary assumptions are based on an experience analysis of the Fund over the period 2013 through 2016. These assumptions were adopted by the Board as of December 31, 2017, based on the recommendation from the actuary.

Mortality Rates. The RP-2014 Blue Collar table with the following adjustments:

Pre-commencement: adjust all rates by 75%

Post-commencement: adjust rates as follows:

Age	Adjustment Factor
Less than 50	No adjustment
50 - 64	150%
65-69	130%
70-79	110%
80 and over	No adjustment

Fully generational mortality improvement projection assumptions are applied to the above table from base year 2006 using the Buck Modified MP-2017 projection scale. The substantive difference between the Buck scale and that published by the SOA is that the Buck scale reaches an ultimate improvement rate of 0.75% versus the SOA's scale which reaches an ultimate improvement rate of 1.0%.

Termination Rates. Termination rates based on the recent experience of the Fund were used. The following is a sample of the termination rates used:

	Age at Entry							
	Male				Female			
Attained Age	22	27	32	37	22	27	32	37
22	.330				.321			
27	.075	.174			.122	.161		
32	.028	.117	.140		.030	.128	.158	
37	.028	.037	.093	.200	.030	.033	.096	.200
42	.028	.037	.034	.070	.030	.033	.034	.056
47	.028	.037	.034	.025	.030	.033	.034	.026

Summary of Actuarial Assumptions (continued)

Retirement Rates. For persons who became participants prior to January 1, 2011, rates of retirement for each age from 50 to 80 based on the recent experience of the Fund. The following are samples of the rates of retirement used:

	Male		Female	
Age	Less than 30 years of service	30 or more years of service	Less than 30 years of service	30 or more years of service
<50	0.0%	0.0%	0.0%	0.0%
50	2.5%	40.0%	2.0%	38.0%
51	2.5%	40.0%	2.0%	30.0%
52-53	2.5%	35.0%	2.0%	30.0%
54	4.0%	30.0%	3.0%	30.0%
55-56	4.0%	30.0%	4.5%	30.0%
57	6.0%	30.0%	4.5%	30.0%
58	7.0%	30.0%	5.0%	30.0%
59	12.5%	32.0%	10.0%	35.0%
60	15.0%	25.0%	15.0%	35.0%
61	12.5%	18.0%	12.0%	30.0%
62	12.5%	24.0%	12.0%	30.0%
63	12.5%	30.0%	13.0%	30.0%
64	15.0%	22.5%	16.0%	30.0%
65	20.0%	24.0%	22.0%	35.0%
66	20.0%	30.0%	20.0%	30.0%
67-68	20.0%	24.0%	20.0%	30.0%
69	20.0%	24.0%	20.0%	30.0%
70	25.0%	35.0%	24.0%	35.0%
71	28.0%	35.0%	20.0%	24.0%
72	25.0%	35.0%	28.0%	28.0%
73	30.0%	60.0%	24.0%	25.0%
74-75	30.0%	75.0%	25.0%	30.0%
76-77	40.0%	75.0%	40.0%	40.0%
78-79	50.0%	75.0%	50.0%	50.0%
80+	100.0%	100.0%	100.0%	100.0%

Summary of Actuarial Assumptions (continued)

Retirement Rates. For persons who became or will become participants on or after January 1, 2011, rates of retirement for each age from 62 to 75 were used. The following are samples of the rates of retirement that were used:

Rates of Retirement

Age	Males	Females
62	.400	.350
64	.225	.150
67	.400	.350
70	.450	.200
75	1.000	1.000

Retirement rates. For Deputy Sheriffs who are members of the Cook County Police Department with 20 or more years of service at retirement.

Age	Rate
50	10.0%
51	10.0%
52	10.0%
53	10.0%
54	10.0%
55	10.0%
56	15.0%
57	25.0%
58	10.0%
59	10.0%
60	35.0%
61	35.0%
62	35.0%
63	35.0%
64	35.0%
65	100.0%

Interest Rate. 7.25% per year, compounded annually.

Inflation Rate. 2.75% per year, compounded annually.

Summary of Actuarial Assumptions (continued)

Salary Rate (net of inflation):

Age	Rate
25	4.85%
30	4.25%
35	2.75%
40	1.50%
45+	0.75%

Loading for Reciprocal Benefits. Costs and liabilities of active employees were loaded by 1% for reciprocal annuities where the County is the last employer. It was assumed that 50% of inactive members with one or more year of service would receive a reciprocal annuity where the County is not the last employer. These reciprocal annuities were valued as of the member's retirement date as 10 times an inactive member's accumulated contributions.

Marital Status. 70% of participants were assumed to be married.

Spouse's Age. The spouse of a male employee was assumed to be four years younger than the employee. The spouse of a female employee was assumed to be four years older than the age of the employee.

Inactives. Benefits were estimated based on service and pay and valued as deferred to 55 annuities.

Glossary of Terms

Actuarial Accrued Liability	Total accumulated cost to fund pension benefits arising from service in all prior years.
Actuarial Cost Method	Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension Plan for a group of Plan members to the years of service that give rise to that cost.
Actuarial Present Value of Future Benefits	Amount which, together with future interest, is expected to be sufficient to pay all future benefits.
Actuarial Valuation	Study of probable amounts of future pension benefits and the necessary amount of contributions to fund those benefits.
Actuary	Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.
Annual Determined Contribution	Disclosure measure of annual pension cost.
GASB 67	Governmental Accounting Standards Board Statement Number 67
Maturity Ratio	The ratio of the actuarial accrued liability for members who are no longer active to the total actuarial accrued liability. A ratio of over 50% indicates a mature Plan. The higher the maturity ratio, the more volatile the contribution rate will be from year to year given actuarial gains and losses.
Normal Cost	That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the Plan as a whole.
Vested Benefits	Benefits which are unconditionally guaranteed regardless of employment status.

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Actuarial Certification – Postemployment Healthcare

June 6, 2019

Board of Trustees

County Employees' and Officers' Annuity and Benefit Fund of Cook County
Chicago, Illinois

Ladies and Gentlemen:

Presented in this report is information to assist the County Employees' and Officers' Annuity and Benefit Fund of Cook County ("CEABF" or "the Fund") in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statements No. 74 and 75 for the December 31, 2018 Measurement Date. The calculations in this report have been made on a basis that is consistent with our understanding of this accounting standard (GASB 74 and 75). Please note that the discount rate used to determine the Total OPEB Liability (TOL) changed from 3.16% at the Prior Measurement Date to 4.13% at the current Measurement Date.

The information is based on an actuarial valuation performed by Cavanaugh Macdonald (CMC) as of December 31, 2018, with plan asset information provided by CEABF for its fiscal year ended December 31, 2018.

The valuation was based upon data, furnished by CEABF staff, concerning active, inactive and retired members along with pertinent financial information. This information was reviewed for completeness and internal consistency, but was not audited by us. The valuation results depend on the integrity of the data. If any of the information is inaccurate or incomplete our results may be different and our calculations may need to be revised. Please see the actuarial valuation for additional details on the funding requirements for CEABF including actuarial assumptions and methods and the funding policy.

To the best of our knowledge, the information contained in this report is complete and accurate. The calculations were performed by qualified actuaries according to generally accepted actuarial principles and practices, as well as in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board. The calculations are based on the current provisions of CEABF, and on actuarial assumptions that are internally consistent and individually reasonable based on the actual experience of CEABF. In addition, the calculations were completed in compliance with applicable law and, in our opinion, meet the requirements of GASB 74 and 75.

These results are only for financial reporting and may not be appropriate for funding purposes or other types of analysis. Calculations for purposes other than satisfying the requirements of GASB 74 and 75 may produce significantly different results. Future actuarial results may differ significantly from the current results presented in this report due to such factors as changes in plan experience or changes in economic or demographic assumptions.

The actuary prepared, or assisted in preparing, the following supporting information for the Comprehensive Annual Financial Reporting:

- Changes in the GASB 74/75 Total OPEB Liability (TOL)
- GASB 74 Components of the Net OPEB Liability
- GASB 74 Schedule of Employer Contributions
- GASB 74 Schedule of Changes in Net OPEB Liability
- GASB 74 Schedule of Net OPEB Liability
- GASB 74 Sensitivity of Net OPEB Liability
- Solvency Test
- Membership Data
- Summary of Substantive Plan Provisions
- Summary of Assumptions and Methods
- Description of Actuarial Methods

We, Larry F. Langer, ASA, Patrice A. Beckham, FSA, Wendy T. Ludbrook, FSA, and Bradley R. Wild, ASA are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein. We are available to answer any questions on the material contained in this report or to provide explanations or further details as may be appropriate.

Respectfully submitted,

Patrice Beckham

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Wendy Ludbrook

Wendy T. Ludbrook, FSA, EA, MAAA
Senior Actuary

Bradley R. Wild, ASA, FCA, MAAA
Senior Actuary

Actuarial Valuation – Postemployment Healthcare

Overview

The County Employees' and Officers' Annuity and Benefit Fund of Cook County ("CEABF" or "the Fund") offers health benefits to retired employees of Cook County and their eligible dependents. This report presents the results of the actuarial valuation of the Plan benefits as of the valuation date of December 31, 2018.

Purpose

This report had been prepared at the request of the Fund for use in financial reporting of CEABF under GASB 74 and GASB 75. It may not be appropriate for other purposes, such as analyzing proposed design alternatives, funding, pricing or option evaluation. Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies or inapplicability of the report for that purpose. No one may make any representations or warranties based on any statements or conclusions contained in this report without the written consent of Cavanaugh Macdonald.

Membership Data

Summary of Membership Data	**Year Ending December 31,**	
	2018	**2017**
Annuitants Currently Receiving Benefits	9,085	8,997
Covered Spouses of Annuitants Currently Receiving Benefits	2,724	2,608
Separated Employees Entitled To Benefits But Not Yet Receiving Them	1,592	1,528
Active Employees	19,671	20,349
Total Number of Members	33,072	33,482

Changes in Plan Provisions

The following changes in benefits and other plan provisions in the Retiree Health Insurance actuarial valuation have been made since the last valuation performed as of December 31, 2017:

- The 2019 subsidy for member health benefits was changed from 50% to 41% for annuitants in the Choice Plan Medicare, and from 50% to 38% for annuitants in the Choice Plus Plan Medicare.
- The 2019 subsidy for member health benefits was changed from 50% to 48% for annuitants in the Choice Plan non-Medicare, and from 45% to 43% for annuitants in the Choice Plus Plan non-Medicare.
- The 2019 subsidy for survivor health benefits was changed from 65% to 54% for survivors in the Choice Plan Medicare, and from 65% to 51% for survivors in the Choice Plus Plan Medicare.
- The 2019 subsidy for survivor health benefits was changed from 65% to 61% for survivors in the Choice Plan non-Medicare, and from 60% to 56% for survivors in the Choice Plus Plan non-Medicare.

Effective January 1, 2019, all future plan participants who are ineligible for free Medicare Part A must purchase Medicare Part A and Part B in order to receive coverage under the CEABF health plan. CEABF will provide a reduced monthly premium for annuitants and spouses who are ineligible for premium free Medicare Part A.

Changes in Actuarial Assumptions, Methods, or Procedures

The following changes in the actuarial assumptions or valuation procedures in the Retiree Health Insurance actuarial valuation have been made since the last valuation performed as of December 31, 2017:

- The per capita plan costs were updated to reflect the most recent year of claims experience, drug rebates and Employer Group Waiver Plan (EGWP) subsidies. Additionally, working premium rates were updated for 2019.
- Due to the uncertainty of the timing of the implementation of the Excise Tax attributable to the Affordable Care Act, the Excise Tax load on liabilities from the previous valuation was removed and no adjustment was made to future retiree health care liabilities.
- The assumption pertaining to health care cost trend rates was reset to begin in fiscal year 2019.

Change in Actuary

During 2018 the fund retained Cavanaugh Macdonald as their actuary. The December 31, 2018 valuation is the first valuation completed by Cavanaugh Macdonald. During the transitioning of actuarial services to a new firm, a replication valuation is performed to ensure that we have properly programmed our valuation software to reflect the plan provisions and assumptions and to benchmark any difference between our results and the prior actuary's results. Based on the results of our replication, as of December 31, 2018 the Actuarial Accrued Liability decreased $103.3M. All results presented in this report for years prior to December 31, 2018 were performed by the prior actuary(s).

Changes in the GASB 74/75 Total OPEB Liability (TOL)

		TOL	% Change
December 31, 2017	**$**	**2,148,249,441**	
Expected Growth Due to Passage of Time		70,811,807	3.3%
Demographic Experience*		(63,858,420)	-3.0%
Updated Per Capita Health Plan Experience		(28,395,499)	-1.3%
Change in Participant Contributions		(263,350,531)	-12.3%
Change in Trend Assumption		24,225,879	1.1%
Removal of Excise Tax Assumption		(69,020,051)	-3.2%
Change in Discount Rate		(255,233,844)	-11.9%
Change in Plan Provisions regarding Medicare Pt. A		(29,375,213)	-1.4%
Total Change in TOL	**$**	**(614,195,872)**	**-28.6%**
December 31, 2018	**$**	**1,534,053,569**	**-28.6%**

**Includes a decrease in liability of approximately $103.3 million resulting from the transition to a new actuary.*

GASB 74 Components of the Net OPEB Liability

Valuation Date (VD):		December 31, 2018
Prior Measurement Date:		December 31, 2017
Measurement Date (MD):		December 31, 2018
Membership Data:		
Retirees and Beneficiaries		9,085
Inactive Members Eligible for Allowances		1,592
Active Employees		19,671
Total		30,348
Single Equivalent Interest Rate (SEIR):		
Long-Term Expected Rate of Return		7.25%
Municipal Bond Index Rate at Prior Measurement Date		3.16%
Municipal Bond Index Rate at Measurement Date		4.13%
Year in which Fiduciary Net Position is Projected to be Depleted		2018
Single Equivalent Interest Rate at Prior Measurement Date		3.16%
Single Equivalent Interest Rate at Measurement Date		4.13%
Net OPEB Liability:		
Total OPEB Liability (TOL)	$	1,534,053,569
Fiduciary Net Position (FNP)		-
Net OPEB Liability (NOL = TOL – FNP)	$	1,534,053,569
FNP as a percentage of TOL		0.00%

Fiscal Year Ending December 31, 2018

Total OPEB Liability	$	1,534,053,569
Fiduciary Net Position		-
Net OPEB Liability	$	1,534,053,569
Ratio of Fiduciary Net Position to Total OPEB Liability		0.00%

GASB 74 Schedule of Employer Contributions

	2018	2017
Actuarially determined employer contribution	$ 133,228,086	$ 187,348,423
Actual employer contributions	38,310,969	47,454,621
Annual contribution deficiency (excess)	$ 94,917,117	$ 139,893,802
Covered employee payroll	$ 1,576,658,158	$1,602,986,483
Actual contributions as a percentage of covered payroll	2.43%	2.96%

GASB 74 Schedule of Changes in Net OPEB Liability

	2018	2017
Total OPEB Liability		
Service Cost	$ 40,557,095	$ 82,344,830
Interest	68,565,681	84,911,522
Benefit changes	(292,725,744)	(79,293,990)
Difference between expected and actual experience	(92,253,919)	(55,814,160)
Changes of assumptions	(300,028,016)	(66,330,809)
Benefit payments	(38,310,969)	(47,454,621)
Net change in Total OPEB Liability	$ (614,195,872)	$ (81,637,228)
Total OPEB Liability - beginning	$ 2,148,249,441	$ 2,229,886,669
Total OPEB Liability - ending (a)	$ 1,534,053,569	$ 2,148,249,441
Plan Fiduciary Net Position		
Employer contributions	$ 38,310,969	$ 47,454,621
Net investment income	-	-
Net Benefit payments	(38,310,969)	(47,454,621)
Administrative expense	-	-
Other	-	-
Net change in Plan Fiduciary Net Position	$ -	$ -
Plan Fiduciary Net Position – beginning	$ -	$ -
Plan Fiduciary Net Position - ending (b)	$ -	$ -
Net OPEB Liability - ending (a) - (b)	$ 1,534,053,569	$ 2,148,249,441

GASB 74 Schedule of the Net OPEB Liability

	2018	2017
Total OPEB Liability	$ 1,534,053,569	$ 2,148,249,441
Plan Fiduciary Net Position	-	-
Net OPEB Liability	$ 1,534,053,569	$ 2,148,249,441
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	0.00%	0.00%
Covered employee payroll	$ 1,576,658,158	$ 1,602,986,483
Net OPEB Liability as a percentage of covered employee payroll	97.30%	134.02%

GASB 74 Sensitivity of the Net OPEB Liability

Sensitivity of the Net OPEB Liability to changes in the discount rate. The following presents the Net OPEB Liability as of December 31, 2018, calculated using the discount rate of 4.13%, as well as what the Plan's Net OPEB Liability would be if it were calculated using a discount rate that is 1-percentage-point lower (3.13%) or 1-percentage-point higher (5.13%) than the current rate:

	1% Decrease (3.13%)	Current Discount Rate (4.13%)	1% Increase (5.13%)
Total OPEB Liability	$ 1,803,057,515	$ 1,534,053,569	$ 1,319,144,094
Fiduciary Net Position	-	-	-
Net OPEB Liability	$ 1,803,057,515	$ 1,534,053,569	$ 1,319,144,094

Sensitivity of the Net OPEB Liability to changes in the healthcare cost trend rates. The following presents the Net OPEB Liability as of December 31, 2018, calculated using the healthcare cost trend rates as summarized in this report, as well as what the Plan's Net OPEB Liability would be if it were calculated using trend rates that are 1-percentage-point lower or 1- percentage-point higher than the current healthcare cost trend rates:

	1% Decrease	Current Trend Rate	1% Increase
Total OPEB Liability	$ 1,289,159,107	$ 1,534,053,569	$ 1,850,456,464
Fiduciary Net Position	-	-	-
Net OPEB Liability	$ 1,289,159,107	$ 1,534,053,569	$ 1,850,456,464

Summary of Substantive Plan Provisions

Eligibility.

Tier 1 retirement (hired before January 1, 2011)
- Age 50 and 10 years of service

Tier 2 retirement (hired on or after January 1, 2011)
- Age 62 and 10 years of service

All active employee members who separate with 10 or more years of service can receive post retirement health benefits under the Plan upon receipt of annuity benefits, provided that if they elect to retire under the Illinois Reciprocal Act, CEABF is their final retirement system.
Surviving dependents of actively employed members and surviving dependents of covered annuitants are eligible for postretirement health benefits under the Plan upon receipt of annuity benefits.

Eligible annuitants may cover their spouses and dependent children under the age of 26 and all disabled children (no age limitation).

Effective January 1, 2019, all future plan participants who are ineligible for free Medicare Part A must purchase Medicare Part A and Part B in order to receive coverage under the CEABF health plan. CEABF will provide a reduced monthly premium for annuitants and spouses who are ineligible for premium free Medicare Part A.

Medical Plans

Non-Medicare retirees can choose from:
- United Healthcare Choice PPO
- United Healthcare Choice Plus PPO

Medicare eligible retirees can choose from:
- United Healthcare Choice PPO
- United Healthcare Choice Plus PPO

When Medicare is primary, the medical benefits coordinate by reducing the plan allowed charge amount by Medicare's payment, and then subsequently applying any applicable plan copays, coinsurances or deductibles to the remainder. A retail and mail pharmacy benefit through CVS/Caremark is included with the election of any medical plan. For Medicare primary participants, prescriptions are provided via an Employer Group Waiver Plan, with the same copays as the commercial prescription plan.

Summary of Substantive Plan Provisions (continued)

Contributions

CEABF pays the following percentage subsidies of the total premium, including the cost of family coverage:

	Choice PPO	Choice Plus PPO
Retiree Annuitant w/o Medicare	48%	43%
Retiree Annuitant with Medicare	41%	38%
Survivor Annuitant w/o Medicare	61%	56%
Survivor Annuitant with Medicare	54%	51%

The following are the annual working rates effective January 1, 2019. These rates represent an estimated cost of self-insured coverage and include administrative expenses.

	Choice PPO	Choice Plus PPO
Single w/o Medicare	$15,531	$20,926
Two w/o Medicare	$31,062	$41,853
Single with Medicare	$4,881	$4,452
Two with Medicare	$9,763	$8,903

Summary of Assumptions and Methods

The actuarial assumptions used for the December 31, 2018 actuarial valuation are summarized below. The mortality rates, termination rates, retirement rates, salary, inflation, participation, and Medicare primary assumptions are based on an experience analysis of CEABF, over the period 2013 through 2016. These assumptions were adopted by the Board on April 5, 2018. Per capita cost and medical trend rate assumptions are revisited annually.

Valuation Date. December 31, 2018

Measurement Date. December 31, 2018

Discount Rate. 4.13% at December 31, 2018 (Municipal Bond Index Rate)
3.16% at December 31, 2017 (Municipal Bond Index Rate)

Benefit payments are funded on a pay-as-you-go basis. The discount rate is the single equivalent rate which results in the same present value as discounting future benefit payments made from assets at the long term expected rate of return and discounting future benefit payments funded on a pay-as-you-go basis on the Municipal Bond 20-year Index Rate.

Summary of Assumptions and Methods (continued)

Mortality Rates. The RP-2014 Blue Collar table with the following adjustments:

Pre-commencement: adjust all rates by 75%

Post-commencement: adjust rates as follows:

Age	Adjustment Factor
Less than 50	No adjustment
50 - 64	150%
65-69	130%
70-79	110%
80 and over	No adjustment

Fully generational mortality improvement projection assumptions are applied to the above table from base year 2006 using the Buck Modified MP-2017 projection scale. The substantive difference between the Buck scale and that published by the SOA is that the Buck scale reaches an ultimate improvement rate of 0.75% versus the SOA's scale which reaches an ultimate improvement rate of 1.0%.

Termination Rates. Termination rates based on the recent experience of the Fund were used. The following is a sample of the termination rates used:

	Age at Entry							
	Male				Female			
Attained Age	22	27	32	37	22	27	32	37
22	.330				.321			
27	.075	.174			.122	.161		
32	.028	.117	.140		.030	.128	.158	
37	.028	.037	.093	.200	.030	.033	.096	.200
42	.028	.037	.034	.070	.030	.033	.034	.056
47	.028	.037	.034	.025	.030	.033	.034	.026

Summary of Assumptions and Methods (continued)

Retirement Rates. For persons who became participants prior to January 1, 2011, rates of retirement for each age from 50 to 80 based on the recent experience of the Fund. The following are samples of the rates of retirement used:

	Male		Female	
Age	Less than 30 years of service	30 or more years of service	Less than 30 years of service	30 or more years of service
<50	0.0%	0.0%	0.0%	0.0%
50	2.5%	40.0%	2.0%	38.0%
51	2.5%	40.0%	2.0%	30.0%
52-53	2.5%	35.0%	2.0%	30.0%
54	4.0%	30.0%	3.0%	30.0%
55-56	4.0%	30.0%	4.5%	30.0%
57	6.0%	30.0%	4.5%	30.0%
58	7.0%	30.0%	5.0%	30.0%
59	12.5%	32.0%	10.0%	35.0%
60	15.0%	25.0%	15.0%	35.0%
61	12.5%	18.0%	12.0%	30.0%
62	12.5%	24.0%	12.0%	30.0%
63	12.5%	30.0%	13.0%	30.0%
64	15.0%	22.5%	16.0%	30.0%
65	20.0%	24.0%	22.0%	35.0%
66	20.0%	30.0%	20.0%	30.0%
67-68	20.0%	24.0%	20.0%	30.0%
69	20.0%	24.0%	20.0%	30.0%
70	25.0%	35.0%	24.0%	35.0%
71	28.0%	35.0%	20.0%	24.0%
72	25.0%	35.0%	28.0%	28.0%
73	30.0%	60.0%	24.0%	25.0%
74-75	30.0%	75.0%	25.0%	30.0%
76-77	40.0%	75.0%	40.0%	40.0%
78-79	50.0%	75.0%	50.0%	50.0%
80+	100.0%	100.0%	100.0%	100.0%

Summary of Assumptions and Methods (continued)

Retirement Rates. For persons who became or will become participants on or after January 1, 2011, rates of retirement for each age from 62 to 75 were used. The following are samples of the rates of retirement that were used:

	Rates of Retirement	
Age	Males	Females
62	.400	.350
64	.225	.150
67	.400	.350
70	.450	.200
75	1.000	1.000

Retirement Rates. For Deputy Sheriffs who are members of the Cook County Police Department with 20 or more years of service at retirement.

Age	Rate
50	10.0%
51	10.0%
52	10.0%
53	10.0%
54	10.0%
55	10.0%
56	15.0%
57	25.0%
58	10.0%
59	10.0%
60	35.0%
61	35.0%
62	35.0%
63	35.0%
64	35.0%
65	100.0%

Inflation Rate. 2.75% per year, compounded annually.

Summary of Assumptions and Methods (continued)

Disability Rates. Included in termination and retirement rates.

Anticipated Plan Participation.

65% of eligible employees are assumed to elect retiree medical benefits. Of those who elect retiree medical benefits, 94% are assumed to be eligible for free Medicare Part A. For those assumed to be ineligible for free Medicare Part A, a reduced premium will be provided by CEABF.

40% of vested terminated employees are assumed to elect retiree medical benefits upon retirement, and are assumed to retire at age 61.

Based on recent experience, future annuitants are assumed to elect from among the available plans as follows:

% Who Elect	Choice PPO	Choice Plus PPO
Pre-Medicare	95%	5%
Post-Medicare	77%	23%

Current annuitants who elect coverage are assumed to remain in coverage. Current annuitants who have waived or deferred coverage are not assumed to participate in the future.

Dependent Coverage.

35% of future annuitants are assumed to cover a dependent. 35% of surviving dependents are assumed to elect coverage upon the death of an actively employed member and are assumed to commence benefits when the actively employed member would have reached age 61. Males are assumed to be 4 years older than females. Actual ages were used for dependents of current annuitants.

Medicare Coordination.

Medicare is assumed to remain the primary payer for current and future retirees and spouses who are at least age 65 and who are currently on Medicare. Medicare is assumed to become primary for 100% of retirees and spouses who retired before January 1, 2019 and who are not yet age 65, when they attain that age. However, 5% of this group is assumed to be ineligible for free Medicare Part A and a reduced premium will be provided by CEABF. For all other retirees and spouses, Medicare is assumed to be the primary payer at the time they reach age 65.

Summary of Assumptions and Methods (continued)

Per Capita Health Plan Costs.

Estimated net annual per capita incurred claim costs per covered adult for fiscal year 2019 at age 65, reflecting administrative expenses, drug rebates and EGWP subsidies.

	Choice PPO	Choice Plus PPO
Not Medicare eligible	$17,547	$24,149
Medicare eligible	$4,487	$4,119

Per capita medical costs were developed using claims, enrollment, drug rebates and EGWP subsidies for the period from January 1, 2018 through December 31, 2018 provided by the Fund. The resulting costs were adjusted for age morbidity.

The valuation relies on the accuracy of the rate calculations. We understand that the rates represent medical and prescription drug benefit costs only for annuitants under the Fund.

Age-based Morbidity.

Per capita costs are adjusted to reflect expected cost differences due to age and gender. The morbidity factors for pre-Medicare morbidity were developed from “Health Care Costs—From Birth to Death” sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto (May 2013). Table 4 from Mr. Yamamoto’s study formed the basis of Medicare morbidity factors that are gender distinct and assumed a cost allocation of 60% for pharmacy, 20% for inpatient, 10% for outpatient, and 10% for professional services. Adjustments were made to Table 4 factors for inpatient costs at age 70 and below to smooth out what appears to be a spike in utilization for Medicare retirees gaining healthcare for the first time through Medicare. While such retirees were included in the study, their specific experience is not applicable for a valuation of an employer retiree medical plan where participants had group active coverage before retirement. Morbidity factors at sample ages are shown below:

Age	Male	Female
50	0.4612	0.5736
55	0.6085	0.6667
60	0.7829	0.7791
65	1.0000	0.9438
70	1.1873	1.1094
75	1.2752	1.2009
80	1.3381	1.2697
85	1.3479	1.3171
90	1.3235	1.3303

Summary of Assumptions and Methods (continued)

Health Care Cost Trend Rates.

Health care cost trend rates apply to expected claims, premiums and retiree contributions:

Year	Pre- Medicare	Post- Medicare
2019	7.25%	5.75%
2020	7.00%	5.50%
2021	6.75%	5.25%
2022	6.50%	5.00%
2023	6.25%	4.75%
2024	6.00%	4.75%
2025	5.75%	4.75%
2026	5.50%	4.75%
2027	5.25%	4.75%
2028	5.00%	4.75%
2029+	4.75%	4.75%

Census Data.

The active, deferred vested and retiree census were provided by the Fund.

Actuarial Cost Method.

The entry age actuarial cost as a percentage of earnings was used.

Amortization Method.

30 years open, level dollar.

Assets.

The valuation assumes CEABF or the District has not set aside any assets to prefund its retiree medical liabilities.

Retiree Drug Subsidy and Employer Group Waiver Plan.

CEABF will no longer be receiving the Retiree Drug Subsidy due to their switch to an EGWP plan effective January 1, 2017. Per capita claims costs for fiscal year 2019 include approximately 20% savings due to drug rebates and EGWP subsidies.

IBNR.

The calculations do not include any explicit amount for incurred but not reported claims (IBNR).

Summary of Assumptions and Methods (continued)

Miscellaneous.

The valuation was prepared on an on-going plan basis. This assumption does not imply that an obligation to continue the plan actually exists.

Considerations of the Patient Protection and Affordable Care Act (PPACA)

Summary of Effects of Selected Provisions:

Expansion of Child Coverage to Age 26. The impact of covering retiree children to age 26 is assumed to be reflected in the working rates provided and in the claims experience.

Medicare Part D Retiree Drug Subsidy. CEABF will no longer be receiving the Retiree Drug Subsidy due to their switch to an EGWP plan effective January 1, 2017. Per capita claims costs for fiscal year 2019 include approximately 20% savings due to drug rebates and EGWP subsidies.

Affordable Care Act. The impact of the Affordable Care Act (ACA) was addressed in this valuation. Review of the information currently available did not identify any specific provisions of the ACA that are anticipated to significantly impact results. While the impact of certain provisions such as the future implementation of the excise tax on high-value health insurance plans (if applicable), mandated benefits and participation changes due to the individual mandate should be recognized in the determination of liabilities, overall future plan costs and the resulting liabilities are driven by amounts employers and retirees can afford (i.e., trend). The trend assumption forecasts the anticipated increase to initial per capita costs, taking into account health care cost inflation, increases in benefit utilization, plan changes, government-mandated benefits, and technological advances. Given the uncertainty regarding the ACA's implementation (e.g., the impact of excise tax on high-value health insurance plans, changes in participation resulting from the implementation of state-based health insurance exchanges), continued monitoring of the ACA's impact on the Plan's liability will be required.

Description of Actuarial Methods

Actuarial Cost Method

Liabilities and contributions shown in this report are computed using the **Entry Age Actuarial Cost Method** of funding.

Sometimes called a "funding method," this is a particular technique used by actuaries for establishing the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily the annual contribution to the plan is comprised of (1) the normal cost and (2) an amortization payment on the unfunded actuarial accrued liability.

Under the Entry Age Actuarial Cost Method, the **Normal Cost** is computed as the level percentage of pay which, if paid from the earliest time each Member would have been eligible to join the Plan if it then existed (thus, entry age) until his retirement or termination, would accumulate with interest at the rate assumed in the valuation to a fund sufficient to pay all benefits under the Plan.

Description of Actuarial Methods (continued)

The **Actuarial Accrued Liability** under this method at any point in time is the theoretical amount of funding that would have accumulated had annual contributions equal to the Normal Cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date).

The **Unfunded Actuarial Accrued Liability** is the excess of the Actuarial Accrued Liability over the Actuarial Value of Plan Assets actually on hand on the valuation date. The Unfunded Actuarial Accrued Liability is amortized as a level dollar amount over an open 30-year period.

Under this method experience gains or losses, i.e. decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the Unfunded Actuarial Accrued Liability.

Glossary of Terms

Actuarially determined contribution

A target or recommended contribution to a defined benefit OPEB plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

Actuarial present value of projected benefit payments

Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

Actuarial valuation

The determination, as of a point in time (the actuarial valuation date), of the service cost, total OPEB liability, and related actuarial present value of projected benefit payments for OPEB performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.

Actuarial valuation date

The date as of which an actuarial valuation is performed.

Ad hoc postemployment benefit changes

Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions.

Automatic hoc postemployment benefit changes

Postemployment benefit changes that occur without a requirement for a decision to grand by a responsible authority.

Covered-employee payroll

The payroll for employees that are provided with OPEB through the OPEB plan.

Glossary of Terms (continued)

Discount rate

The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

a. The actuarial present value of benefit payments projected to be made in future periods in which (1) the amount of the OPEB plan's fiduciary net position is projected (under the requirements of this Statement) to be greater than the benefit payments that are projected to be made in that period and

   (2) OPEB plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on OPEB plan investments.

b. The actuarial present value of projected benefit payments not included in (a), calculated using a yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher (or equivalent quality on another rating scale).

Entry age actuarial cost method

A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the Actuarial accrued liability.

Healthcare cost trend rates

The rates of change in per capita health claims costs over time as a result of factors such as medical inflation, utilization of healthcare services, plan design, and technological developments.

Inactive employees

Individuals no longer employed by an employer in the OPEB plan, or the beneficiaries of those individuals. Inactive employees include individuals who have accumulated benefits under the terms of an OPEB plan but are not yet receiving benefit payments and individuals currently receiving benefits.

Measurement period

The period between the prior and the current measurement dates.

Net OPEB liability

The liability of employers and non-employer contributing entities to employees for benefits provided through a defined benefit OPEB plan that is administered through a trust that meets the criteria in paragraph 4 of this Statement. Other postemployment benefits (OPEB) Benefits (such as death benefits, life insurance, disability, and long-term care) that are paid in the period after employment and that are provided separately from a pension plan, as well as healthcare benefits paid in the period after employment, regardless of the manner in which they are provided. OPEB does not include termination benefits or termination payments for sick leave.

Glossary of Terms (continued)

Projected benefit payments

All benefits (including refunds of employee contributions) estimated to be payable through the OPEB plan (including amounts to be paid by employers or non-employer contributing entities as the benefits come due) to current active and inactive employees as a result of their past service and their expected future service.

Real rate of return

The rate of return on an investment after adjustment to eliminate inflation.

Service costs

The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.

Total OPEB liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service.

Additional Actuarial Tables

Schedule of Active Member Valuation Data - Pension Benefits

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase In Average Pay
12/31/2009	23,570	$ 1,498,161,713	$ 63,562	1.8%
12/31/2010	23,165	1,494,093,569	64,498	1.5%
12/31/2011	22,037	1,456,444,123	66,091	2.5%
12/31/2012	21,447	1,478,253,368	68,926	4.3%
12/31/2013	21,287	1,484,269,715	69,727	1.2%
12/31/2014	21,656	1,514,550,023	69,937	0.3%
12/31/2015	21,596	1,572,417,298	72,811	4.1%
12/31/2016	20,969	1,580,251,254	75,361	3.5%
12/31/2017	20,349	1,567,480,401	77,030	2.2%
12/31/2018	19,671	1,533,721,507	77,969	1.2%

Schedule of Retirees and Beneficiaries Added to and Removed From Rolls - Pension Benefits

	Added-To-Rolls		Removed-From-Rolls		Rolls-End-of-Year			
Year Ended	Number	Annual Benefits	Number	Annual Benefits	Number	Annual Benefits	Average Annual Benefit	% Increase in Average Annual Benefit
2009	693	$ 43,524,587	510	$ 9,455,204	14,475	$ 407,498,417	$ 28,152	7.7%
2010	917	40,259,064	538	10,616,859	14,854	437,140,622	29,429	4.5%
2011	1,158	55,308,088	580	12,124,191	15,432	480,324,519	31,125	5.8%
2012	1,374	58,601,319	632	14,697,753	16,174	524,228,085	32,412	4.1%
2013	992	52,564,737	489	10,006,848	16,677	566,785,974	33,986	4.9%
2014	929	52,208,075	530	11,628,617	17,076	607,365,432	35,568	4.7%
2015	1,323	69,890,199	802	22,262,895	17,597	654,992,736	37,222	4.7%
2016	968	58,252,392	656	18,067,979	17,909	695,177,149	38,817	4.3%
2017	902	57,971,733	594	16,538,820	18,217	736,610,062	40,435	4.2%
2018	1,109	68,372,858	724	22,268,886	18,602	78,271,404	42,077	4.1%

Schedule of Retirees and Benficiaries Added To and Removed From Rolls - Postemployment Health

	Added-To-Rolls		Removed-From-Rolls		Rolls-End-of-Year			
Year Ended	Number	Annual Benefits	Number	Annual Benefits	Number	Annual Benefits	Average Annual Benefit	% Increase in Average Annual Benefit
2011	752	$ 4,513,262	381	$ 2,509,723	7,925	$ 46,904,340	$ 5,919	-0.4%
2012	640	3,715,909	386	6,655,532	8,179	43,964,717	5,375	-9.2%
2013	703	3,970,847	346	3,986,309	8,536	43,949,255	5,149	-4.2%
2014	556	2,308,094	501	2,229,694	8,591	48,487,043	5,644	9.6%
2015	631	8,261,563	439	2,119,662	8,783	54,628,944	6,220	10.2%
2016	570	989,701	399	1,962,607	8,954	53,656,038	5,992	-3.7%
2017	540	(3,945,464)*	497	2,255,953	8,997	47,454,621	5,275	-12.0%
2018	567	(6,942,823)*	479	2,200,829	9,085	38,310,969	4,217	-20.10%

** Employer contributions decreased, resulting in reduction of employer paid benefits from the level in prior years.*

Solvency Test - Pension Benefits

	Accrued Liabilities For						
Fiscal Year	(1) Active and Inactive Member Accumulated Contributions	(2) Member Currently Receiving Benefits	(3) Active and Inactive Member Employer Portion	Actuarial Value of Assets	Percent of Accrued Liabilities Covered By Assets (1)	(2)	(3)
2009	$ 1,749,058,834	$ 5,043,516,963	$ 4,696,505,501	$ 7,945,567,096	100%	100%	25%
2010	1,824,472,753	5,373,790,587	4,824,959,545	7,982,368,659	100%	100%	16%
2011	1,662,273,117	5,902,779,764	5,063,221,680	7,897,102,116	100%	100%	7%
2012	1,821,792,594	6,431,295,762	5,168,398,587	7,833,882,926	100%	93%	0%
2013	1,854,155,647	6,822,552,230	4,959,868,300	8,381,444,287	100%	96%	0%
2014	1,897,951,260	7,295,515,219	4,947,080,874	8,810,509,070	100%	95%	0%
2015	1,914,569,837	7,864,534,443	5,157,487,056	8,991,018,918	100%	90%	0%
2016	1,967,965,799	8,305,339,574	5,183,468,612	9,488,223,349	100%	91%	0%
2017	2,001,714,113	8,583,373,041	5,086,669,289	10,148,203,834	100%	95%	0%
2018	2,020,570,657	9,050,032,658	5,243,785,732	10,512,756,514	100%	94%	0%

Solvency Test - Postemployment Healthcare

	Accrued Liabilities For						
Fiscal Year	(1) Active and Inactive Member Accumulated Contributions	(2) Member Currently Receiving Benefits	(3) Active and Inactive Member Employer Portion	Actuarial Value of Assets	Percent of Accrued Liabilities Covered By Assets (1)	(2)	(3)
2009	$ -	$ 588,250,913	$1,098,621,105	$ -	0%	0%	0%
2010	-	606,821,210	1,117,801,252	-	0%	0%	0%
2011	-	605,375,403	1,073,195,985	-	0%	0%	0%
2012	-	776,395,244	1,069,213,888	-	0%	0%	0%
2013	-	818,201,554	1,160,565,936	-	0%	0%	0%
2014	-	826,052,274	1,154,036,343	-	0%	0%	0%
2015	-	879,319,447	1,254,787,260	-	0%	0%	0%
2016	-	825,328,625	1,132,476,063	-	0%	0%	0%
2017	-	811,486,860	1,075,129,583	-	0%	0%	0%
2018	-	701,048,505	833,005,063	-	0%	0%	0%

Statistical Section

This section contains additional schedules that are designed to supplement the information in the Comprehensive Annual Financial Report:

Statements of Changes in Plan Net Position – Pension Benefits and Postemployment Healthcare provides details on the specific sources and uses of funds.

Schedules of Retired Members by Benefit Type – Pension Benefits and Postemployment Healthcare provides details on the monthly pension amounts for retirement and survivor members, including those with postemployment healthcare.

Schedule of Average Benefit Payments – Pension Benefits and Postemployment Healthcare provides details on years of credited service, average monthly pension, average monthly final average salary, and the number of new retirees, including those with postemployment healthcare.

Schedule of Principal Participating Employers – Pension Benefits and Postemployment Healthcare provides details on employers who participate in the Plan.

Additional Schedules Required by Employer provides details on historical financial, investment and actuarial performance.

Statement of Changes in Pension Plan Fiduciary Net Position

For year ended December 31, 2018, with comparative totals for 9 years

	2018	2017	2016	2015	2014
Additions:					
Employer contributions	$ 549,437,252	$ 511,750,985	$ 414,703,155	$ 136,075,504	$ 146,075,414
Employee contributions	134,159,171	138,826,184	139,355,592	137,707,719	129,325,318
Net investment and net securities lending income (loss)	(424,787,945)	1,399,625,874	629,442,470	(21,896,696)	488,890,897
Other	5,860,613	5,359,418	4,046,158	4,380,293	3,753,960
Total additions	264,669,091	2,055,562,461	1,187,547,375	256,266,820	768,045,589
Deductions:					
Benefits					
Retirement	704,246,643	661,594,080	624,231,419	587,861,744	543,274,840
Survivors	55,983,104	51,874,102	47,919,324	45,002,859	41,865,298
Disability	11,502,437	11,467,308	10,707,260	10,332,441	10,515,760
Refunds					
Death	3,961,280	4,511,674	2,792,846	4,983,186	3,187,363
Separation	16,909,520	16,792,901	13,967,392	14,486,833	13,082,086
Other	12,791,721	11,690,790	9,941,984	13,803,152	10,077,912
Net adminstrative and miscellaneous expenses	5,134,047	5,406,034	5,373,555	5,151,110	5,010,206
Total deductions	810,528,752	763,336,888	714,933,780	681,621,325	627,013,465
Net increase (decrease)	(545,859,661)	1,292,225,573	472,613,595	(425,354,505)	141,032,124
Net Position:					
Beginning of period	10,407,883,443	9,115,657,870	8,643,044,275	9,068,398,780	8,927,366,656
End of period	$ 9,862,023,782	$ 10,407,883,443	$ 9,115,657,870	$ 8,643,044,275	$ 9,068,398,780

Statement of Changes in Pension Plan Fiduciary Net Position (continued)

For year ended December 31, 2018, with comparative totals for 9 years (continued)

	2013	2012	2011	2010	2009
Additions:					
Employer contributions	$ 147,720,014	$ $152,734,539	$ $162,667,160	$ $141,326,266	$ $147,934,643
Employee contributions	127,593,220	128,869,508	127,577,473	129,449,866	127,795,881
Net investment and net securities lending income (loss)	1,179,440,119	887,687,519	82,701,033	832,882,639	1,013,615,250
Other	4,041,145	4,212,209	3,380,437	8,248,307	6,087,899
Total additions	1,458,794,498	1,173,503,775	376,326,103	1,111,907,078	1,295,433,673
Deductions:					
Benefits					
Retirement	507,494,409	469,398,775	429,527,599	393,525,707	369,226,987
Survivors	38,761,919	35,762,286	33,003,057	30,307,794	27,837,079
Disability	10,909,478	12,265,257	13,961,631	13,789,106	13,510,567
Refunds					
Death	3,461,166	4,636,647	3,036,462	5,569,966	3,424,156
Separation	15,180,523	16,740,836	15,813,775	12,704,374	11,582,869
Other	11,231,341	11,704,243	10,315,098	6,767,478	5,397,886
Net adminstrative and miscellaneous expenses	4,324,634	4,303,353	4,078,843	4,074,955	4,248,287
Total deductions	591,363,470	554,811,397	509,736,465	466,739,380	435,227,831
Net increase (decrease)	867,431,028	618,692,378	(133,410,362)	645,167,698	860,205,842
Net Position:					
Beginning of period	8,059,935,628	7,441,243,250	7,574,653,612	6,929,485,914	6,069,280,072
End of period	$ 8,927,366,656	$ 8,059,935,628	$ 7,441,243,250	$ 7,574,653,612	$ 6,929,485,914

Statement of Changes in Postemployment Healthcare Plan Net Position

For year ended December 31, 2018, with comparative totals for 9 years	2018	2017	2016	2015	2014
Additions:					
Employer contributions	$ 38,310,969	$ 47,454,641	$ 49,565,249	$ 50,756,817	$ 43,957,458
Annuitant healthcare benefits contributions*	-	-	41,650,333	37,635,349	37,358,502
Other	21,618,592	17,962,395	9,973,182	7,077,550	5,988,102
Total additions	59,929,561	65,417,036	01,188,764	95,469,716	87,304,062
Deductions:					
Healthcare Benefits	59,929,561	65,417,036	01,188,764	95,469,716	87,304,062
Net increase (decrease)	-	-	-	-	-
Net Position:					
Beginning of period	-	-	-	-	-
End of period	$ -	$ -	$ -	$ -	$ -

Note: Beginning 2017, the annuitants Healthcare contribution ($46,679,437 in CY 2017 and $50,903,709 in CY 2018) is netted against Healthcare benefits expense.

Statement of Changes in Postemployment Healthcare Plan Net Position (continued)

For year ended December 31, 2018, with comparative totals for 9 years (continued)	2013	2012	2011	2010	2009
Additions:					
Employer contributions	$ 40,097,630	$ 37,986,237	$ 32,670,461	$ 40,183,057	$ 35,779,227
Annuitant healthcare benefits contributions	35,927,206	33,948,728	33,236,282	30,108,884	28,809,395
Other	4,506,584	5,978,480	14,233,879	4,717,744	5,653,995
Total additions	80,531,420	77,913,445	80,140,622	75,009,685	70,242,617
Deductions:					
Healthcare Benefits	80,531,420	77,913,445	80,140,622	75,009,685	70,242,617
Net increase (decrease)	-	-	-	-	-
Net Position:					
Beginning of period	-	-	-	-	-
End of period	$ -	$ -	$ -	$ -	$ -

Schedule of Retired Members by Benefit Type - Pension Benefits

As of December 31, 2018

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit 1	Type of Pension Benefit 2	Option Selected 1	Option Selected 2	Option Selected 3
$ 1 – $ 500	1,757	1,217	540	1,101	590	66
501 – 1,000	1,791	1,168	623	1,181	568	42
1,001 – 1,500	1,506	1,097	409	989	517	0
1,501 – 2,000	1,344	1,055	289	852	491	1
2,001 – 2,500	1,321	1,090	231	804	517	0
2,501 – 3,000	1,434	1,248	186	886	548	0
3,001 – 3,500	1,264	1,074	190	750	514	0
3,501 – 4,000	1,274	1,169	105	736	538	0
4,001 – 4,500	1,120	1,023	97	633	487	0
4,501 – 5,000	1,006	965	41	471	535	0
5,001 – 5,500	1,033	1,007	26	449	584	0
5,501 – 6,000	752	741	11	308	444	0
6,001 – 6,500	708	702	6	283	425	0
6,501 – 7,000	749	744	5	256	493	0
7,001 – 7,500	411	407	4	174	237	0
7,501 – 8,000	294	292	2	115	179	0
8,001 – 8,500	211	209	2	71	140	0
8,501 – 9,000	158	156	2	50	108	0
9,001 – 9,500	95	93	2	31	64	0
9,501 – 10,000	38	37	1	10	28	0
10,001 – 10,500	39	34	5	14	25	0
10,501 – 11,000	25	25	0	4	21	0
11,001 – 11,500	16	16	0	1	15	0
11,501 – 12,000	21	20	1	5	16	0
12,001 – 12,500	20	18	2	4	16	0
12,501 – 13,000	25	25	0	7	18	0
13,001 – 13,500	16	16	0	5	11	0
13,501 – 14,000	17	17	0	4	13	0
14,001 – 14,500	12	12	0	2	10	0
14,501 – 15,000	18	18	0	5	13	0
Over $15,000	127	125	2	31	96	0
Totals	**18,602**	**15,820**	**2,782**	**10,232**	**8,261**	**109**

Type of Pension Benefit

1. *Regular Retirement*
2. *Survivor Payment*

Option Selected

1. *Whole Life Annuity*
2. *65% Joint and Contingent Annuity*
3. *Temporary Annuity*

Schedule of Retired Members by Benefit Type - Postemployment Healthcare

As of December 31, 2018

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit 1	Type of Pension Benefit 2	Benefit Payment Form 1	Benefit Payment Form 2	Benefit Payment Form 3
$ 1 – $ 500	129	47	82	102	20	7
501 – 1,000	311	119	192	252	56	3
1,001 – 1,500	435	262	173	334	101	0
1,501 – 2,000	555	402	153	394	161	0
2,001 – 2,500	639	509	130	436	203	0
2,501 – 3,000	780	669	111	522	258	0
3,001 – 3,500	737	604	133	496	241	0
3,501 – 4,000	838	768	70	546	292	0
4,001 – 4,500	729	665	64	469	260	0
4,501 – 5,000	634	602	32	351	283	0
5,001 – 5,500	675	657	18	355	320	0
5,501 – 6,000	512	504	8	255	257	0
6,001 – 6,500	482	478	4	235	247	0
6,501 – 7,000	544	539	5	223	321	0
7,001 – 7,500	292	289	3	149	143	0
7,501 – 8,000	211	209	2	105	106	0
8,001 – 8,500	160	158	2	64	96	0
8,501 – 9,000	115	113	2	44	71	0
9,001 – 9,500	59	58	1	18	41	0
9,501 – 10,000	26	25	1	10	16	0
10,001 – 10,500	25	22	3	9	16	0
10,501 – 11,000	17	17	0	3	14	0
11,001 – 11,500	10	10	0	0	10	0
11,501 – 12,000	14	13	1	5	9	0
12,001 – 12,500	17	15	2	4	13	0
12,501 – 13,000	17	17	0	6	11	0
13,001 – 13,500	10	10	0	2	8	0
13,501 – 14,000	9	9	0	2	7	0
14,001 – 14,500	8	8	0	1	7	0
14,501 – 15,000	11	11	0	4	7	0
Over $15,000	84	83	1	20	64	0
Totals	**9,085**	**7,892**	**1,193**	**5,416**	**3659**	**10**

Type of Pension Benefit

1. *Regular Retirement*
2. *Survivor Payment*

Option Selected

1. *Whole Life Annuity*
2. *65% Joint and Contingent Annuity*
3. *Temporary Annuity*

Schedule of Average Benefit Payments - Pension Benefits

		Years of Credited Service						
		0-4	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**
2009	Average Monthly Pension	$302	$1,311	$2,055	$2,671	$3,682	$3,854	$4,491
	Average Monthly Final Average Salary	N/A	N/A	$6,649	$5,778	$6,095	$5,931	$5,992
	Number of New Retirees	58	30	77	96	100	59	120
2010	Average Monthly Pension	$335	$1,144	$1,855	$2,598	$3,349	$3,968	$4,278
	Average Monthly Final Average Salary	$5,927	$6,780	$5,616	$5,512	$5,319	$5,466	$5,408
	Number of New Retirees	74	38	92	122	153	72	176
2011	Average Monthly Pension	$439	$955	$1,931	$2,705	$3,686	$4,316	$4,537
	Average Monthly Final Average Salary	$6,747	$6,114	$6,090	$5,667	$5,948	$6,123	$5,712
	Number of New Retirees	74	30	138	157	212	131	267
2012	Average Monthly Pension	$432	$982	$1,828	$2,579	$3,273	$4,273	$4,578
	Average Monthly Final Average Salary	$7,369	$6,598	$5,733	$5,475	$5,391	$5,882	$5,795
	Number of New Retirees	97	35	110	167	210	113	287
2013	Average Monthly Pension	$469	$1,150	$1,864	$2,567	$3,334	$4,864	$4,813
	Average Monthly Final Average Salary	$7,331	$7,653	$5,999	$5,419	$5,597	$6,609	$6,087
	Number of New Retirees	60	44	113	123	168	132	275
2014	Average Monthly Pension	$421	$1,336	$1,767	$2,643	$3,770	$4,620	$4,829
	Average Monthly Final Average Salary	$6,611	$8,364	$5,943	$5,968	$6,296	$6,447	$6,131
	Number of New Retirees	53	33	104	119	155	135	246
2015	Average Monthly Pension	$485	$1,153	$1,756	$2,683	$3,696	$4,796	$5,011
	Average Monthly Final Average Salary	$8,264	$7,364	$6,060	$6,286	$6,382	$6,770	$6,363
	Number of New Retirees	73	43	106	110	180	165	329
2016	Average Monthly Pension	$466	$1,255	$2,105	$2,838	$3,683	$4,772	$4,977
	Average Monthly Final Average Salary	$7,292	$8,242	$6,926	$6,393	$6,256	$6,887	$6,339
	Number of New Retirees	44	31	101	108	131	128	233
2017	Average Monthly Pension	$431	$1,315	$2,133	$2,875	$3,796	$4,577	$5,106
	Average Monthly Final Average Salary	$7,456	$7,640	$6,952	$6,696	$6,670	$6,508	$6,518
	Number of New Retirees	49	35	84	100	136	173	261
2018	Average Monthly Pension	$524	$1,151	$2,236	$2,813	$3,701	$4,561	$5,028
	Average Monthly Final Average Salary	$8,557	$7,697	$7,602	$6,616	$6,414	$6,583	$6,457
	Number of New Retirees	34	31	91	111	134	175	312

N/A - Not Available

Schedule of Average Benefit Payments - Postemployment Healthcare

		Years of Credited Service						
		0-4	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**
2009	Average Monthly Pension	$399	0	$2,031	$2,672	$3,434	$3,906	$4,398
	Average Monthly Final Average Salary	N/A	0	$6,679	$5,804	$6,652	$5,994	$6,031
	Number of New Retirees	4	0	31	64	46	41	88
2010	Average Monthly Pension	$199	$1,468	$1,931	$2,784	$3,273	$4,141	$4,239
	Average Monthly Final Average Salary	$2,747	$7,743	$5,740	$5,673	$5,151	$5,639	$5,361
	Number of New Retirees	1	5	41	72	110	58	118
2011	Average Monthly Pension	$239	$783	$1,839	$2,852	$3,787	$4,056	$4,574
	Average Monthly Final Average Salary	$4,669	$5,044	$5,376	$5,729	$5,991	$5,710	$5,750
	Number of New Retirees	2	7	58	89	144	96	196
2012	Average Monthly Pension	$635	$1,127	$1,767	$2,746	$3,462	$4,572	$4,479
	Average Monthly Final Average Salary	$5,149	$7,880	$5,489	$5,552	$5,457	$6,193	$5,672
	Number of New Retirees	2	4	36	88	142	82	197
2013	Average Monthly Pension	$607	$868	$2,014	$2,674	$3,562	$4,739	$4,705
	Average Monthly Final Average Salary	$5,833	$4,857	$6,140	$5,441	$5,737	$6,441	$5,952
	Number of New Retirees	1	5	48	76	110	87	190
2014	Average Monthly Pension	0	$609	$1,786	$2,682	$3,631	$4,768	$4,781
	Average Monthly Final Average Salary	0	$4,183	$5,834	$5,718	$6,035	$6,521	$6,062
	Number of New Retirees	0	4	31	63	104	97	162
2015	Average Monthly Pension	$2,419	$1,150	$1,915	$3,078	$3,881	$4,965	$4,860
	Average Monthly Final Average Salary	$26,180	$8,620	$6,239	$6,854	$6,375	$6,890	$6,175
	Number of New Retirees	1	5	37	60	101	95	232
2016	Average Monthly Pension	$257	$1,148	$2,236	$3,009	$3,860	$5,242	$4,893
	Average Monthly Final Average Salary	$4,469	$6,816	$7,156	$6,548	$6,363	$7,282	$6,219
	Number of New Retirees	1	5	36	54	72	80	154
2017	Average Monthly Pension	0	$1,693	$2,013	$2,873	$4,136	$4,729	$5,047
	Average Monthly Final Average Salary	0	$13,707	$6,838	$6,506	$7,098	$6,615	$6,441
	Number of New Retirees	0	3	18	41	77	106	157
2018	Average Monthly Pension	0	$1,247	$2,543	$3,098	$3,813	$4,941	$4,967
	Average Monthly Final Average Salary	0	$7,320	$8,545	$7,260	$6,338	$6,943	$6,343
	Number of New Retirees	0	2	33	52	70	105	189

N/A - Not Available

Schedule of Principal Participating Employers - Pension Benefits and Postemployment Healthcare Combined

As of December 31, 2018 and 2009

	2018		2009	
Participating Employer	**Covered Employees**	**Percentage of Total Covered Employees**	**Covered Employees**	**Percentage of Total Covered Employees**
Cook County	19,641	99.86%	23,543	99.89%
County Employees' and Officers' Annuity and Benefit Fund of Cook County	28	0.14%	27	0.11%
Total	**19,669**	**100.00%**	**23,570**	**100.00%**

Additional Schedules Required by Employer

Schedule of Investment Rate of Return - Pension and Postemployment Healthcare Benefits Combined

Year Ended December 31,	Investment Rate of Return (Net of Fees)
2009	18.0%
2010	12.4%
2011	1.2%
2012	12.5%
2013	15.1%
2014	5.9%
2015	-0.1%
2016	7.7%
2017	15.4%
2018	-3.8%

Schedule of Actuarial Value of Assets vs. Fair Value of Assets - Pension And Postemployment Healthcare Benefits Combined

Year Ended December 31,	Actuarial Value of Assets	Fair Value of Assets	Actuarial Value as a Percentage of Fair Value
2009	$ 7,945,567,096	$ 6,929,485,914	114.7%
2010	7,982,368,659	7,574,653,612	105.4%
2011	7,897,102,116	7,441,243,250	106.1%
2012	7,833,882,926	8,059,935,628	97.2%
2013	8,381,444,287	8,927,366,656	93.9%
2014	8,810,509,070	9,068,398,780	97.2%
2015	8,991,018,918	8,643,044,275	104.0%
2016	9,488,223,349	9,115,657,870	104.1%
2017	10,148,203,834	10,407,883,443	97.5%
2018	10,512,756,514	9,862,023,782	106.6%

Schedule of Employer Contributions - Pension And Postemployment Healthcare Benefits Combined

Year Ended December 31,	Actuarially Required Contribution (ARC)	Tax Levy Requested	Actual Employer Contribution	Percentage of ARC Contributed
2009	$ 406,625,773	$ 186,099,854	$ 88,285,317	46.3%
2010	468,181,943	186,523,677	184,722,634	39.5%
2011	572,318,384	192,234,211	198,837,424	34.7%
2012	613,952,848	196,139,483	190,720,776	31.1%
2013	655,800,100	192,969,505	187,817,644	28.6%
2014	719,890,057	194,668,229	190,032,872	26.4%
2015	634,722,132	192,786,468	186,832,321	29.4%
2016	639,794,759	195,653,930	464,268,404 [1]	72.6%
2017	696,007,249	208,226,206	559,205,626 [1]	80.3%
2018	691,620,570	211,449,244	587,748,221 [1]	85.0%

[1] *Includes supplemental employer contribution.*

Additional Schedules Required by Employer (continued)

Schedule of Financial Condition - Pension and Postemployment Healthcare Benefits Combined
or year ended December 31, 2018, with comparative totals for 9 years

	2018	2017	2016	2015	2014
Beginning Net Position (Fair Value)	$ 10,407,883,443	$ 9,115,657,870	$ 8,643,044,275	$ 9,068,398,780	$ 8,927,366,656
Additions:					
Employer contributions	587,748,221	559,205,626	464,268,404	186,832,321	190,032,872
Employee contributions	134,159,171	138,826,184	139,355,592	137,707,719	129,325,318
Annuitant Health Benefit Contributions	- *	- *	41,650,333	37,635,349	37,358,502
Net investment income (loss)	(424,787,945)	1,399,625,874	629,442,470	(21,896,696)	488,890,897
Other	27,479,205	23,321,813	14,019,340	11,457,843	9,742,062
Total additions	324,598,652	2,120,979,497	1,288,736,139	351,736,536	855,349,651
Deductions:					
Benefits	831,661,745	790,352,526	784,046,767	738,666,760	682,959,960
Refunds	33,662,521	32,995,364	26,702,222	33,273,171	26,347,361
Administrative Expenses	5,134,047	5,406,034	5,373,555	5,151,110	5,010,206
Total deductions	870,458,313	828,753,924	816,122,544	777,091,041	714,317,527
Ending Net Position (Fair Value)	$ 9,862,023,782	$ 10,407,883,443	$ 9,115,657,870	$ 8,643,044,275	$ 9,068,398,780
Actuarial Value of Assets	10,512,756,514	10,148,203,834	9,488,223,349	8,991,018,918	8,810,509,070
Actuarial Accrued Liabilities (AAL)	17,303,773,833	16,889,499,662	16,726,457,108	16,232,185,534	15,318,790,688
Unfunded AAL (UAAL) (Fair Value)	7,441,750,051	6,481,616,219	7,610,799,238	7,589,141,259	6,250,391,908
Unfunded AAL (UAAL) (Actuarial Value)	6,791,017,319	6,741,295,828	7,238,233,759	7,241,166,616	6,508,281,618
Funded Ratio (Fair Value)	57.0%	61.6%	54.5%	53.2%	59.2%
Funded Ratio (Actuarial Value)	60.8%	60.1%	56.7%	55.4%	57.5%

* *Beginning 2017, the annuitants Healthcare contribution ($46,679,437 in CY 2017 amd $50,903,709 in CY 2018) is netted against Healthcare benefits expense.*

Schedule of Financial Condition - Pension and Postemployment Healthcare Benefits Combined or year ended December 31, 2018, with comparative totals for 9 years

	2013	2012	2011	2010	2009
Beginning Net Position (Fair Value)	$ 8,059,935,628	$ 7,441,243,250	$ 7,574,653,612	$ 6,929,485,914	$ 6,069,280,072
Additions:					
Employer contributions	187,817,644	190,720,776	195,337,621	181,509,323	183,713,870
Employee contributions	127,593,220	128,869,508	127,577,473	129,449,866	127,795,881
Annuitant Health Benefit Contributions	35,927,206	33,948,728	33,236,282	30,108,884	28,809,395
Net investment income (loss)	1,179,440,119	887,687,519	82,701,033	833,052,844	1,013,615,250
Other	8,547,729	10,190,689	17,614,316	12,795,846	11,741,894
Total additions	1,539,325,918	1,251,417,220	456,466,725	1,186,916,763	1,365,676,290
Deductions:					
Benefits	637,697,226	595,339,763	556,632,909	512,632,292	480,817,250
Refunds	29,873,030	33,081,726	29,165,335	25,041,818	20,404,911
Administrative Expenses	4,324,634	4,303,353	4,078,843	4,074,955	4,248,287
Total deductions	671,894,890	632,724,842	589,877,087	541,749,065	505,470,448
Ending Net Position (Fair Value)	$ 8,927,366,656	$ 8,059,935,628	$ 7,441,243,250	$ 7,574,653,612	$ 6,929,485,914
Actuarial Value of Assets	8,381,444,287	7,833,882,926	7,897,102,116	7,982,368,659	7,945,567,096
Actuarial Accrued Liabilities (AAL)	14,812,087,677	14,630,250,955	13,724,012,399	13,142,137,175	12,575,515,749
Unfunded AAL (UAAL) (Fair Value)	5,884,721,021	6,570,315,327	6,282,769,149	5,567,483,563	5,646,029,835
Unfunded AAL (UAAL) (Actuarial Value)	6,430,643,390	6,796,368,029	5,826,910,283	5,159,768,516	4,629,948,653
Funded Ratio (Fair Value)	60.3%	55.1%	54.2%	57.6%	55.1%
Funded Ratio (Actuarial Value)	56.6%	53.5%	57.5%	60.7%	63.2%

Additional Schedules Required by Employer (continued)

Schedule of Funding Progress - Pension and Postemployment Healthcare Benefits Combined

Year Ended December 31,	Actuarial Accrued Liabilities (AAL)*	Actuarial Value of Assets	Fair Value of Net Position	Unfunded AAL (UAAL) (Actuarial Value)
2009	$ 12,575,515,749	$ 7,945,567,096	$ 6,929,485,914	$ 4,629,948,653
2010	13,142,137,175	7,982,368,659	7,574,653,612	5,159,768,516
2011	13,724,012,399	7,897,102,116	7,441,243,250	5,826,910,283
2012	14,630,250,955	7,833,882,926	8,059,935,628	6,796,368,029
2013	14,812,087,677	8,381,444,287	8,927,366,656	6,430,643,390
2014	15,318,790,688	8,810,509,070	9,068,398,780	6,508,281,618
2015	16,232,185,534	8,991,018,918	8,643,044,275	7,241,166,616
2016	16,726,457,108	9,488,223,349	9,115,657,870	7,238,233,759
2017	16,889,499,662	10,148,203,834	10,407,883,443	6,741,295,828
2018	17,303,773,833	10,512,756,514	9,862,023,782	6,791,017,319

These amounts are determined using the assumed discount rate for the actuarial funding calculations. These discount rates differ from the GASB accounting rates assumptions utilized in the AAL detailed in the Pension and OPEB benefits tables below.

Schedule of Funding Progress - Pension Benefits

Year Ended December 31,	Actuarial Accrued Liabilities (AAL)	Actuarial Value of Assets	Fair Value of Net Position	Unfunded AAL (UAAL) (Actuarial Value)
2009	$ 11,489,081,298	$ 7,945,567,096	$ 6,929,485,914	$ 3,543,514,202
2010	12,023,222,885	7,982,368,659	7,574,653,612	4,040,854,226
2011	12,628,274,561	7,897,102,116	7,441,243,250	4,731,172,445
2012	13,418,486,943	7,833,882,926	8,059,935,628	5,584,604,017
2013	13,636,576,177	8,381,444,287	8,927,366,656	5,255,131,890
2014	14,140,547,353	8,810,509,070	9,068,398,780	5,330,038,283
2015	14,936,591,336	8,991,018,918	8,643,044,275	5,945,572,418
2016	15,456,773,985	9,488,223,349	9,115,657,870	5,968,550,636
2017	15,671,756,443	10,148,203,834	10,407,883,443	5,523,552,609
2018	16,314,389,047	10,512,756,514	9,862,023,782	5,801,632,533

Schedule of Funding Progress - Pension and Postemployment Healthcare Benefits Combined (continued)

Unfunded AAL (UAAL) (Fair Value)	Funded Ratio (Actuarial Value)	Funded Ratio (Fair Value)	Covered Payroll	UAAL as a Percentage of Covered Payroll (Actuarial Value)	UAAL as a Percentage of Covered Payroll (Fair Value)
$ 5,646,029,835	63.2%	55.1%	$ 1,498,161,713	309.0%	376.9%
5,567,483,563	60.7%	57.6%	1,494,093,569	345.3%	372.6%
6,282,769,149	57.5%	54.2%	1,456,444,123	400.1%	431.4%
6,570,315,327	53.5%	55.1%	1,478,253,368	459.8%	444.5%
5,884,721,021	56.6%	60.3%	1,484,269,715	433.3%	396.5%
6,250,391,908	57.5%	59.2%	1,514,550,023	429.7%	412.7%
7,589,141,259	55.4%	53.2%	1,572,417,298	460.5%	482.6%
7,610,799,238	56.7%	54.5%	1,580,251,254	458.0%	481.6%
6,481,616,219	60.1%	61.6%	1,567,480,401	430.1%	413.5%
7,441,750,051	60.8%	57.0%	1,533,721,507	442.8%	485.2%

Schedule of Funding Progress - Pension Benefits (continued)

Unfunded AAL (UAAL) (Fair Value)	Funded Ratio (Actuarial Value)	Funded Ratio (Fair Value)	Covered Payroll	UAAL as a Percentage of Covered Payroll (Actuarial Value)	UAAL as a Percentage of Covered Payroll (Fair Value)
$ 4,559,595,384	69.2%	60.3%	$ 1,498,161,713	236.5%	304.3%
4,448,569,273	66.4%	63.0%	1,494,093,569	270.5%	297.7%
5,187,031,311	62.5%	58.9%	1,456,444,123	324.8%	356.1%
5,358,551,315	58.4%	60.1%	1,478,253,368	377.8%	362.5%
4,709,209,521	61.5%	65.5%	1,484,269,715	354.1%	317.3%
5,072,148,573	62.3%	64.1%	1,514,550,023	351.9%	334.9%
6,293,547,061	60.2%	57.9%	1,572,417,298	378.1%	400.2%
6,341,116,115	61.4%	59.0%	1,580,251,254	377.7%	401.3%
5,263,873,000	64.8%	66.4%	1,567,480,401	352.4%	335.8%
6,452,365,265	64.4%	60.4%	1,567,480,401	370.1%	411.6%

Additional Schedules Required by Employer (continued)

Schedule of Funding Progress - Postemployment Healthcare

Year Ended December 31,	Actuarial Accrued Liabilities (AAL)	Actuarial Value of Assets	Fair Value of Net Position	Unfunded AAL (UAAL) (Actuarial Value)
2009	$ 1,686,872,018	$ -	$ -	$ 1,686,872,018
2010	1,724,622,462	-	-	1,724,622,462
2011	1,678,571,388	-	-	1,678,571,388
2012	1,845,609,132	-	-	1,845,609,132
2013	1,978,767,490	-	-	1,978,767,490
2014	1,980,088,617	-	-	1,980,088,617
2015	2,134,106,707	-	-	2,134,106,707
2016	1,957,804,688	-	-	1,957,804,688
2017	1,886,616,443	-	-	1,886,616,443
2018	1,534,053,569	-	-	1,534,053,569

Schedule of Components of Change in Unfunded Liability - Pension Benefits and Postemployment Healthcare Combined

Year Ended December 31,	Salary Increase Higher / (Lower) than Assumed	Investment Returns (Higher) / Lower than Assumed	Employer Contributions Higher / (Lower) than Normal Cost Plus Interest	Legislative Amendments
2008	$ 160,614,779	$ 481,086,534	$ 198,154,784	$ -
2009	(138,750,205)	534,155,051	258,309,848	-
2010	(185,530,277)	364,312,504	349,354,012	-
2011	(138,554,686)	459,875,129	371,793,485	-
2012	34,073,219	376,601,751	252,886,106	-
2013	(184,385,510)	(586,433,767)	513,419,056	-
2014	(148,871,075)	(161,124,113)	423,103,748	-
2015	164,977,011	61,964,372	431,124,367	-
2016	2,613,304	14,518,350	196,813,036	-
2017	(78,486,650)	(59,718,736)	93,692,715	-
2018	(144,455,926)	245,808,320	13,181,699	-

Schedule of Funding Progress - Postemployment Healthcare (continued)

Unfunded AAL (UAAL) (Fair Value)	Funded Ratio (Actuarial Value)	Funded Ratio (Fair Value)	Covered Payroll	UAAL as a Percentage of Covered Payroll (Actuarial Value)	UAAL as a Percentage of Covered Payroll (Fair Value)
$ 1,686,872,018	0.0%	0.0%	$ 1,498,161,713	112.6%	112.6%
1,724,622,462	0.0%	0.0%	1,494,093,569	115.4%	115.4%
1,678,571,388	0.0%	0.0%	1,456,444,123	115.3%	115.3%
1,845,609,132	0.0%	0.0%	1,478,253,368	124.9%	124.9%
1,978,767,490	0.0%	0.0%	1,484,269,715	133.3%	133.3%
1,980,088,617	0.0%	0.0%	1,514,550,023	130.7%	130.7%
2,134,106,707	0.0%	0.0%	1,597,597,077	133.6%	133.6%
1,957,804,688	0.0%	0.0%	1,609,559,234	121.6%	121.6%
1,886,616,443	0.0%	0.0%	1,602,986,483	117.7%	117.7%
1,534,053,569	0.0%	0.0%	1,576,658,158	97.3%	97.3%

Schedule of Components of Change in Unfunded Liability -
Pension Benefits and Postemployment Healthcare Combined (continued)

Changes in Actuarial Assumptions	Plan Changes	Other Sources (1)	Total Change in Unfunded Liability
$ -	$ -	$ (166,599,641)	$ 673,256,456
810,786,835	-	128,340,572	1,592,842,101
-	-	1,683,624	529,819,863
-	-	(25,972,161)	667,141,767
-	-	305,896,670	969,457,746
-	-	(108,324,418)	(365,724,639)
-	-	(35,470,332)	77,638,228
-	-	74,819,248	732,884,998
-	-	(216,877,547)	(2,932,857)
(323,327,660)	(50,292,826)	(78,804,774)	(496,937,931)
(24,987,447)	(164,731,446)	124,906,290	49,721,490

(1) Includes but is not limited to health insurance, optional retirement experience and death, retirement and withdrawal experience.

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