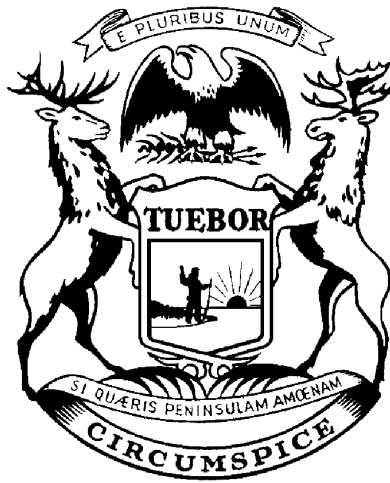


MICHIGAN STATE EMPLOYEES' RETIREMENT SYSTEM
A Pension and Other Postemployment Benefit Trust Fund of the State of Michigan

**Comprehensive Annual Financial Report
for the Fiscal Year Ended September 30, 2018**



M S E R S

Prepared by:
Financial Services
for
Office of Retirement Services
P.O. Box 30171
Lansing, Michigan 48909-7671
517-284-4400
1-800-381-5111

TABLE OF CONTENTS

INTRODUCTORY SECTION.....	3
Certificate of Achievement	4
Public Pension Standards Award	5
Letter of Transmittal	6
Administrative Organization	11
Retirement Board Members	11
Advisors and Consultants.....	11
Organization Chart	12
FINANCIAL SECTION	13
Independent Auditor's Report.....	14
Management's Discussion and Analysis	16
Basic Financial Statements	20
Statement of Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position	20
Statement of Changes in Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position	21
Notes to Basic Financial Statements.....	22
Required Supplementary Information.....	50
Schedule of Changes in Net Pension Liability.....	50
Schedule of Changes in Net OPEB Liability	51
Schedules of Contributions.....	52
Schedules of Investment Returns.....	53
Note to Required Supplementary Information	54
Supporting Schedules	55
Summary Schedule of Administrative and Other Expenses.....	55
Schedule of Investment Expenses	56
Schedule of Payments for Professional Services.....	56
Detail of Changes in Plan Fiduciary Net Position (Pension and Other Postemployment Benefits).....	57
INVESTMENT SECTION	59
Report on Investment Activity.....	60
Largest Assets Held	71
Schedule of Investment Fees.....	72
Schedule of Investment Commissions	73
Investment Summary	74
ACTUARIAL SECTION.....	75
Actuary's Certification.....	76
Summary of Actuarial Assumptions & Methods	79
Schedules of Active Member Valuation Data	81
Prioritized Solvency Test.....	83
Analysis of System Experience	85
Summary of Plan Provisions	86
STATISTICAL SECTION	89
Schedules of Additions by Source.....	91
Schedules of Deductions by Type.....	92
Schedules of Changes in Fiduciary Net Position	94
Schedules of Benefits and Refunds by Type	96
Schedules of Retired Members by Type of Benefit	97
Schedules of Funding Progress	99
Schedule of Other Postemployment Benefits.....	100
Schedules of Average Benefit Payments	101
Ten Year History of Membership	105
ACKNOWLEDGMENTS	106

INTRODUCTORY SECTION

Certificate of Achievement
Public Pension Standards Award
Letter of Transmittal
Retirement Board Members
Advisors and Consultants
Organization Chart

INTRODUCTORY SECTION

Certificate of Achievement



Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Michigan State Employees' Retirement System

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

September 30, 2017

Christopher P. Morill

Executive Director/CEO

Public Pension Standards Award



Public Pension Coordinating Council

***Public Pension Standards Award
For Funding and Administration
2018***

Presented to

Michigan Office of Retirement Services

In recognition of meeting professional standards for
plan funding and administration as
set forth in the Public Pension Standards.

Presented by the Public Pension Coordinating Council, a confederation of

National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

A handwritten signature in cursive script that reads "Alan H. Winkle".

Alan H. Winkle
Program Administrator

INTRODUCTORY SECTION

Letter of Transmittal

Michigan State Employees'
Retirement System
P.O. Box 30171
Lansing, Michigan 48909-7671
Telephone 517- 284-4400
Outside Lansing 1-800-381-5111

STATE OF MICHIGAN

GRETCHEN WHITMER, Governor

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

February 5, 2019

The Honorable Gretchen Whitmer
Governor, State of Michigan,

Members of the Legislature
State of Michigan,

Retirement Board Members
and
Members, Retirees and Beneficiaries

Ladies and Gentlemen:

We are pleased to present the comprehensive annual financial report of the Michigan State Employees' Retirement System (System) for fiscal year 2018.

INTRODUCTION TO REPORT

The System was established by legislation under Public Act 240 of 1943 (the Michigan State Employees' Retirement Act) and is administered by the Office of Retirement Services (ORS). The number of active and retired members and beneficiaries of the System is presented in Note 1 of the financial statements in the Financial Section in this report. The purpose of the System is to provide retirement, disability, death, and healthcare benefits for all State employees. The services performed by ORS staff provide benefits to members, retirees, and beneficiaries.

Responsibility

Responsibility for both the accuracy of the data and the completeness and fairness of the presentation, including all disclosures, rests with the leadership team of the System. To the best of our knowledge and belief, the enclosed data is accurate in all material respects and is reported in a manner designed to present fairly the financial position and results of operations of the System.

Internal Control Structure

The leadership team of the System is responsible for maintaining adequate internal accounting controls designed to provide reasonable assurance that transactions are executed in accordance with management's general or specific authorization, and are recorded as necessary to maintain accountability for assets and to permit preparation of financial statements in accordance with accounting principles generally accepted in the United States of America. The internal control structure is designed to provide reasonable assurance regarding the safekeeping of assets and reliability of all financial records.

Letter of Transmittal (continued)

The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits likely to be derived and that the valuation of costs and benefits requires estimates and judgments by management. This internal control structure includes maintaining written policies and procedures. Discussion and analysis of fiduciary net position and related additions and deductions are presented in the Management Discussion and Analysis which can be found immediately following the Independent Auditor's Report.

Independent Auditors and Actuary

The Office of the Auditor General (OAG), independent auditors, conducted an annual audit of the System. The independent auditor's report on the System's financial statements is included in the Financial Section in this report.

An actuarial valuation is conducted annually. The purpose of the valuation is to evaluate the mortality, service, compensation, and other financial experience of the System and to recommend employer contribution rates. The annual actuarial valuation was completed by Gabriel Roeder Smith & Company for the fiscal year ended September 30, 2017, and recommends employer contribution rates for the fiscal year ended September 30, 2020. Actuarial certification and supporting statistics are included in the Actuarial Section in this report.

Management's Discussion and Analysis (MD&A)

Generally Accepted Accounting Principles (GAAP) require that management provide a narrative introduction, overview, and analysis to accompany the Basic Financial Statements in the form of an MD&A. This letter of transmittal is intended to complement the MD&A and should be read in conjunction with it. The MD&A can be found immediately following the Independent Auditor's Report.

PROFILE OF THE GOVERNMENT

The System was established by Public Act 240 of 1943. A 9-member board and the director of the Department of Technology, Management, and Budget (DTMB), govern the System. Executive order 2015-13 created a State of Michigan Retirement Board responsible for the functions, duties, and responsibilities of the State Employees' Retirement System, the Judges Retirement System, and the Military Retirement Provisions. Effective March 31, 1997, Public Act 487 of 1996 closed the plan to new members and all new employees become participants of the State's defined contribution (DC) plan. The System serves over 72,000 members and is funded by employer contributions, member contributions, and investment earnings. A detailed plan description is included in Note 1 of the Financial Section in this report.

ECONOMIC CONDITIONS AND OUTLOOK

Despite challenging economic times, the System continues to show steady performance over the long term.

Investments

The State Treasurer is the investment fiduciary and custodian of all investments of the System pursuant to State law. The primary investment objective is to maximize the rate of return on the total investment portfolio, consistent with a high degree of prudence and sufficient diversity to eliminate inordinate risks and to meet the actuarial assumption for the investment rate of return. The investment activity for the year produced a total rate of return on the portfolio of 11.5 percent for the pension plan and 11.4 percent for the other postemployment benefits (OPEB) plan. For the last five years, the System has experienced an annualized rate of return of 10.1 percent for the pension plan and 9.9 percent for the OPEB plan. A summary of asset allocation and rates of return is presented in the Investment Section in this report.

INTRODUCTORY SECTION

Letter of Transmittal (continued)

Accounting System

Transactions of the System are reported on the accrual basis of accounting. Revenues are recorded when earned, and expenses are recorded when incurred. Participants' benefits are recorded when payable by law. We believe that the accounting and administrative internal controls established by the System provide reasonable assurance the System is carrying out its responsibilities in safeguarding its assets, in maintaining the reliability of the financial records for preparing financial statements, and in maintaining accountability for its assets.

Funding

Funds are derived from the excess of additions to plan fiduciary net position over deductions from plan fiduciary net position. Funds are accumulated by the System to meet future benefit obligations to retirees and beneficiaries. The percentage computed by dividing the actuarial value of assets by the actuarial accrued liability is referred to as the "funded ratio." This ratio provides an indication of the funding status of the System and generally, the greater this percentage, the stronger the System.

Pension – The actuarial value of the assets and actuarial accrued liability for pension benefits of the System were \$11.9 billion and \$17.9 billion, respectively, resulting in a funded ratio of 66.5 percent on September 30, 2017. A historical perspective of funding levels for the Pension Plan is presented on the Schedule of Funding Progress in the Statistical section in this report.

OPEB – Prefunding for OPEB began in fiscal year 2013. The actuarial value of the assets and actuarial accrued liability for OPEB were \$2.0 billion and \$9.6 billion, respectively, resulting in a funded ratio of 21.3 percent as of September 30, 2017. A historical perspective of funding levels is presented on the Schedule of Funding Progress in the Statistical section in this report.

MAJOR GOALS ACCOMPLISHED

Dedicated Gains Policy Successfully Reduces Assumed Rate of Return – In the summer of 2017, the DTMB director and the retirement board adopted a mechanism that gradually reduces the assumed rate of investment return (AROR). This policy was necessary to align the AROR with industry trends toward more prudent investment expectations. Whenever investment returns exceed the assumed return (e.g., we achieve 9% instead of the expected 7.50%), the Dedicated Gains Policy uses those excess returns to lower the AROR going forward. This is done without increasing unfunded actuarial accrued liabilities (UAAL) and largely off-setting contribution increases toward the UAAL from the employer. Excess investment returns in fiscal year 2017 resulted in the pension and Other Postemployment Benefit (OPEB) ARORs being reduced from 7.50% to 7.00% and 7.35% respectively, beginning with the actuarial valuation as of September 30, 2017.

Actuarial Experience Studies Result in Adjustments to Assumptions – Every five years the plan actuary evaluates how well the assumptions used to determine system liabilities and set employer contributions match the real experience of the plan. These experience studies are statutorily required and are an industry best practice that allows the system to make adjustments that ensure that the system is valued and funded properly. The most recent five-year cycle concluded on September 30, 2017, and the actuary delivered its evaluation in spring 2018. The results of the evaluation are more conservative economic and demographic assumptions. The actuary and ORS collaborated to provide detailed information to department leaders and the retirement board about the proposed adjustments and the impact to the State and school budgets. The proposed changes were approved for use with the actuarial valuations beginning September 30, 2018. These changes will protect the long-term security of both the pension and healthcare trusts.

Letter of Transmittal (continued)

Call Center Upgrade – ORS is modernizing its toll-free phone service from a dial-tone system to a modern voice-over-internet solution. This effort involved a sweeping overhaul of the existing software and hardware to ensure optimum performance, a redesign and rewrite of the call routing software, and improved security. Customers will reach a call agent more quickly because of streamlined menus and more automatic methods for authenticating the caller. ORS will have more flexibility in the way new menu options and associated queues are used for seasonal business topics. In total, the new system is more secure, more stable, provides a better experience for customers and gives ORS ways to adapt to changes in demand.

Redesign of Insurance Systems – In spring of 2018, ORS successfully deployed the redesign of insurance eligibility and enrollment systems. The redesign applied a flexible rules-based approach to systems development that allows ORS update business rules to match insurance offerings, regulations or requirements more quickly. The new system improves both the customer and staff experience with insurance enrollment management. New customer-focused features include: per-person itemized enrollment cost, a shopping cart so customers can clearly understand their costs, printable bills available in miAccount, and online account management for COBRA enrollees.

Publications Redesign – ORS redesigned the publications for communicating important messages to members and retirees. The primary goal was to help customers understand their plan quickly and easily; a secondary goal was to modernize the design so customers would recognize that the publication is from ORS and be interested in reading them. Content was simplified, graphics were added, and visual elements were integrated into the material to balance the publication and reinforce information in an alternative format. The publications used during the mid-career and late-career workshops were converted to workbooks and developed in tandem with reinvigorated workshops designed to engage the audience in their own retirement planning. These workshops use activities to encourage audience participation, help them determine what actions they need to consider before retirement, and give a place to record those actions and ideas.

Mobile Application Launch – ORS developed a mobile application for members and retirees of the defined benefit plans. The highlight of this new application is the ability to upload documents directly to ORS. This feature allows the user to take a picture of a form, birth certificate, or other insurance proof and send the document(s) securely to ORS, eliminating the need to locate a fax machine or rely on standard postal delivery. The application also allows ORS to send custom-crafted alerts and announcements to targeted user-types, based on their retirement system and account status. Active members will be able to estimate their pensions, update beneficiaries and dependents, and update contact information. Retirees will be able to manage their direct deposit, update tax withholdings, update dependents, and view their payment history.

Imaging Enhancements – The ORS team is heavily dependent on images of customer correspondence. These images are carefully indexed and stored in a way that call agents and processors can access them quickly and easily. This year, significant upgrades of both the hardware and the software applications for document storage and retrieval were completed and will ensure that this system is stable and secure for years to come. A pivotal change was a move away from a complex, custom-built solution to more standardized tools that are easier to maintain.

HONORS

Public Pension Standards Award – ORS was awarded the 2018 Standards Award from the Public Pension Coordinating Councils Standards Program (PPCC) for both funding and administration. ORS has received these awards every year since 2004. The PPCC Standards reflect expectations for public retirement system management and administration and serve as a benchmark for all DB public plans to be measured.

Government Finance Officers Association Award – The Government Finance Officers Association (GFOA) of the United States and Canada awarded the retirement system with the Certificate of Achievement for Excellence in Financial Reporting for the fiscal year 2017 Comprehensive Annual Financial Report (CAFR). This marks the 27th consecutive year ORS has received this prestigious award.

INTRODUCTORY SECTION

Letter of Transmittal (continued)

ACKNOWLEDGEMENTS

The preparation of this report was accomplished with the dedication and cooperation of many people. It is intended to provide complete and reliable information as a basis for making management decisions, as a means of determining compliance with legal provisions, and as a means for determining responsible stewardship of the funds of the System.

We would, therefore, like to express our appreciation for the assistance given by staff, the advisors, and the many people who contributed to its preparation. We believe their combined efforts have produced a report that will enable employers and plan members to better evaluate and understand the Michigan State Employees' Retirement System. Their cooperation contributes significantly to the success of the System.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tricia L. Foster', with a stylized, flowing script.

Tricia L. Foster, Director
Department of Technology, Management & Budget

A handwritten signature in black ink, appearing to read 'Kerrie Vanden Bosch', with a stylized, flowing script.

Kerrie Vanden Bosch, Director
Office of Retirement Services

INTRODUCTORY SECTION

Administrative Organization

RETIREMENT BOARD MEMBERS*

As of February 5, 2019

Judge Mark T. Boonstra
General Public
Term Expires Dec. 31, 2019

Ann Marie Storberg
Ex-officio Member Representing
State Treasurer

Matthew Fedorchuk
Active State Employee
Term Expires Dec. 31, 2018

John Gnodke
Ex-officio Member Representing
State Personnel Director

Laurie Hill - Chair
Retired State Employee
Term Expires Dec. 31, 2019

Molly Jason
Ex-officio Member Representing
Attorney General

Craig Murray
Ex-officio Member Representing
Auditor General

Judge David H. Sawyer
Active Judge
Term Expires Dec. 31, 2017

Col. John Wojcik
Michigan National Guard
Term Expires Dec. 31, 2018

*Statute provides that board members may continue to serve after their term expires until they are replaced or reappointed.

ADVISORS AND CONSULTANTS

As of February 5, 2019

Actuaries

Gabriel Roeder Smith & Co.
Mita D. Drazilov
Southfield, Michigan

Independent Auditors

Doug A. Ringler, C.P.A., C.I.A.
Auditor General
State of Michigan

Investment Manager and Custodian

Rachael Eubanks
State Treasurer
State of Michigan

Legal Advisor

Dana Nessel
Attorney General
State of Michigan

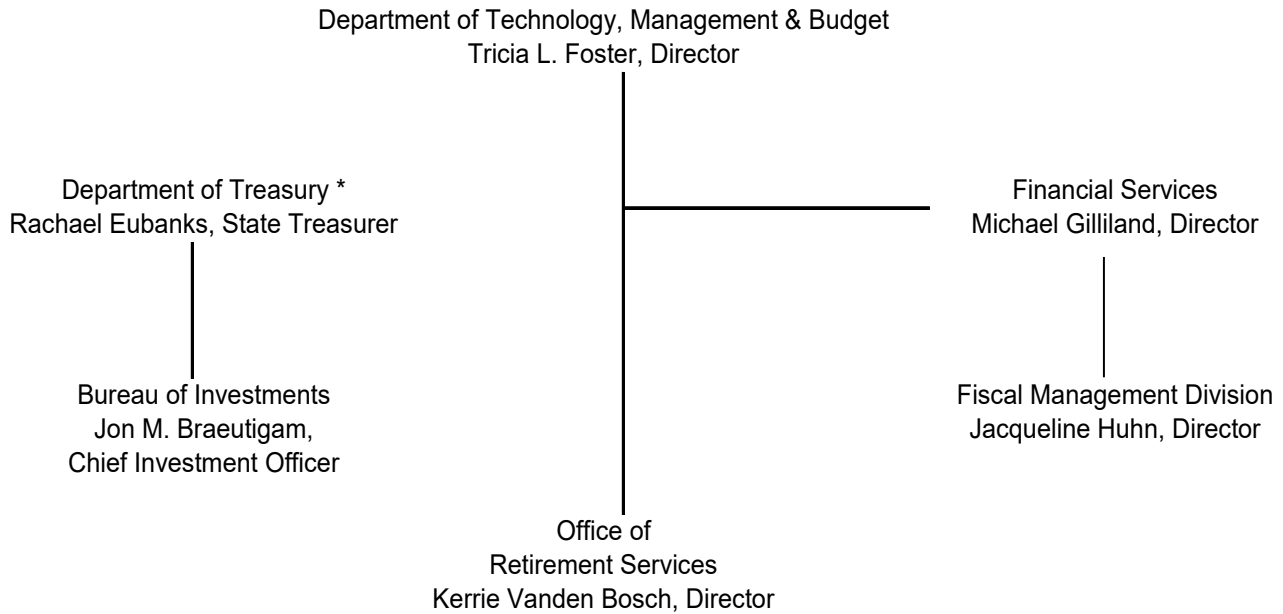
Investment Performance Measurement

State Street Corporation
State Street Investment Analytics
Boston, MA

INTRODUCTORY SECTION

Administrative Organization (continued)

Organization Chart As of February 5, 2019



*The investments of the System are managed by the Michigan Department of Treasury. Information on the investments and the fiduciary, Michigan Department of Treasury, can be found in the Investment Section, Introduction. In addition, see the Investment Section, Schedule of Investment Fees (page 72) and Schedule of Investment Commissions (page 73), for information regarding the investment fees and commissions paid as well as investment professionals utilized by the System.

FINANCIAL SECTION

Independent Auditor's Report
Management's Discussion and Analysis
Basic Financial Statements
Notes to Basic Financial Statements
Required Supplementary Information
Note to Required Supplementary Information
Supporting Schedules



OAG

Office of the Auditor General

201 N. Washington Square, Sixth Floor • Lansing, Michigan 48913 • Phone: (517) 334-8050 • audgen.michigan.gov

Doug A. Ringler, CPA, CIA
Auditor General

Independent Auditor's Report on the Financial Statements
and Other Reporting Required by *Government Auditing Standards*

Ms. Laurie Hill, Chair
State of Michigan Retirement Board
and
Ms. Tricia L. Foster, Director
Department of Technology, Management, and Budget
and
Ms. Kerrie L. Vanden Bosch, Director
Office of Retirement Services

Dear Ms. Hill, Ms. Foster, and Ms. Vanden Bosch:

Report on the Financial Statements

We have audited the accompanying financial statements of the Michigan State Employees' Retirement System as of and for the fiscal year ended September 30, 2018 and the related notes to the financial statements, which collectively comprise the System's basic financial statements as listed in the table of contents.

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.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves 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 entity'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 entity's internal control. Accordingly, we express no such opinion. 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 the 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 fiduciary net position of the Michigan State Employees' Retirement System as of September 30, 2018 and the changes in fiduciary net position for the fiscal year then ended in accordance with accounting principles generally accepted in the United States of America.



Doug A. Ringler, CPA, CIA
Auditor General

Ms. Laurie Hill, Chair
Ms. Tricia L. Foster, Director
Ms. Kerrie L. Vanden Bosch, Director
Page 2

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, schedule of changes in net pension liability, schedule of changes in net OPEB liability, schedules of contributions, schedules of investment returns, and related note, as listed in the table of contents, 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 inquiries 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.

Other Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the System's basic financial statements. The supporting schedules and the introductory, investment, actuarial, and statistical sections are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The supporting schedules are the responsibility of management and were derived from and relate 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 audit 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 basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the supporting schedules are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The introductory, investment, actuarial, and statistical sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on them.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we will also issue a report on our consideration of the System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the System's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the System's internal control over financial reporting and compliance.

Sincerely,

A handwritten signature in blue ink that reads "Doug Ringler".

Doug Ringler
Auditor General
February 5, 2019

FINANCIAL SECTION

Management's Discussion and Analysis

Our discussion and analysis of the Michigan State Employees' Retirement System's (System) financial performance provides an overview of the System's financial activities for the fiscal year ended September 30, 2018. Please read it in conjunction with the transmittal letter in the Introductory Section on page 6 and the basic financial statements, which follow this discussion.

FINANCIAL HIGHLIGHTS

- System assets exceeded liabilities at the close of fiscal year 2018 by \$15.0 billion (reported as *net position restricted for Pension Benefits and OPEB*). Fiduciary net position is restricted to meet future benefit payments.
- Additions for the year were \$3.0 billion, which are comprised primarily of contributions of \$1.5 billion and investment gains of \$1.5 billion.
- Deductions increased over the prior year from \$1.8 billion to \$1.9 billion or 2.8%. This increase is the result of increased pension and OPEB benefit payments.

THE STATEMENT OF PLAN FIDUCIARY NET POSITION AND THE STATEMENT OF CHANGES IN PLAN FIDUCIARY NET POSITION

This Comprehensive Annual Financial Report (CAFR) consists of two financial statements; *The Statement of Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position* (page 20) and *The Statement of Changes in Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position* (page 21). These financial statements report information about the System, as a whole, and about its financial condition that should help answer the question: Is the System, as a whole, better off or worse off as a result of this year's activities? These statements include all assets and liabilities using the economic resources measurement focus and the accrual basis of accounting. Under the accrual basis of accounting, all revenues and expenses are taken into account regardless of when cash is received or paid.

The Statement of Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position presents all of the System's assets and liabilities, with the difference between the two reported as fiduciary net position. Over time, increases and decreases in fiduciary net position measure whether the System's financial position is improving or deteriorating. *The Statement of Changes in Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position* presents how the System's fiduciary net position changed during the most recent fiscal year. These two financial statements should be reviewed along with the Schedule of Changes in Net Pension Liability (page 50), the Schedule of Changes in Net OPEB Liability (page 51), and Schedules of Contributions (page 52) to determine whether the System is becoming financially stronger or weaker.

FINANCIAL SECTION

Management's Discussion and Analysis (continued)

FINANCIAL ANALYSIS

System total assets as of September 30, 2018, were \$15.7 billion and were primarily comprised of cash, investments, and security lending collateral. Total assets increased \$914.8 million or 6.2% between fiscal years 2017 and 2018, due primarily to higher equity in investments.

Total liabilities as of September 30, 2018, were \$711.9 million and were comprised of accounts payables and securities lending. Total liabilities decreased \$191.8 million or 21.2% between fiscal years 2017 and 2018, primarily due to decrease in obligations in security lending.

System assets exceeded its liabilities at the close of fiscal year 2018 by \$15.0 billion. Total fiduciary net position restricted for pension and OPEB increased \$1.1 billion or 8.0% from the previous year, primarily due to net investment gains.

Plan Fiduciary Net Position (in thousands)

	2018	2017	Increase (Decrease)
Assets			
Equity in common cash	\$ 133,340	\$ 138,049	(3.4) %
Receivables	136,782	151,760	(9.9)
Investments	14,734,342	13,599,587	8.3
Securities lending collateral	668,255	868,542	(23.1)
Total Assets	<u>15,672,720</u>	<u>14,757,937</u>	<u>6.2</u>
Liabilities			
Warrants outstanding	-	116	(100.0)
Unearned revenue	27	27	0.0
Accounts payable and other accrued liabilities	43,434	35,455	22.5
Amounts due to other funds			
Obligations under securities lending	668,435	868,052	(23.0)
Total Liabilities	<u>711,897</u>	<u>903,649</u>	<u>(21.2)</u>
Net Position Restricted for Pension Benefits and OPEB	<u>\$ 14,960,823</u>	<u>\$ 13,854,288</u>	<u>8.0 %</u>

ADDITIONS TO PLAN FIDUCIARY NET POSITION

The reserves needed to finance pension and other postemployment benefits are accumulated through the collection of employer and employee contributions and through earnings on investments. Contributions and net investment income for fiscal year 2018 totaled approximately \$3.0 billion.

Total additions for fiscal year 2018 decreased approximately \$115.6 million or 3.8% from those of fiscal year 2017 due primarily to net investment income. Total contributions increased between fiscal years 2017 and 2018 by \$11.9 million or .8%, while net investment income decreased \$126.3 million or 7.8%. The Investment Section of this report reviews the results of investment activity for fiscal year 2018.

FINANCIAL SECTION

Management's Discussion and Analysis (continued)

DEDUCTIONS FROM PLAN FIDUCIARY NET POSITION

The primary expenses of the System include the payment of pension benefits to members and beneficiaries, payment for health, dental and vision benefits, refund of contributions, and the cost of administering the System. Total deductions for fiscal year 2018 were \$1.9 billion, an increase of 2.8% over fiscal year 2017 deductions.

The health, dental and vision care expenses during the year increased \$9.1 million or 2.0%, from \$452.3 million to \$461.4 million. The payment of pension benefits increased by \$39.9 million or 3.0% between fiscal years 2017 and 2018. In fiscal year 2018, the increase in pension benefit expenses resulted from an increase in retirees (326) and an increase in benefit payments to retirees. Administrative expenses increased by \$1.1 million or 3.7% between fiscal years 2017 and 2018, primarily due to increased health administrative fees. Refunds and transfers to other systems decreased by \$126 thousand or 36.3% between fiscal years 2017 and 2018.

Changes in Plan Fiduciary Net Position (in thousands)

	2018	2017	Increase (Decrease)
Additions			
Member contributions	\$ 35,598	\$ 40,866	(12.9) %
Employer contributions	1,339,624	1,346,699	(0.5)
Other governmental contributions	83,620	59,762	39.9
Net investment income (loss)	1,503,048	1,629,351	(7.8)
Transfer from other systems		20	(100.0)
Miscellaneous income	236	1,052	(77.6)
Total additions	<u>2,962,126</u>	<u>3,077,750</u>	<u>(3.8)</u>
Deductions			
Pension benefits	1,362,276	1,322,339	3.0
Health care benefits	461,376	452,300	2.0
Refunds and transfers to other systems	220	346	(36.3)
Administrative and other expenses	31,720	30,602	3.7
Total deductions	<u>1,855,591</u>	<u>1,805,588</u>	<u>2.8</u>
Net Increase (Decrease) in Net Position	1,106,535	1,272,163	(13.0)
Net Position Restricted for Pension Benefits and OPEB:			
Beginning of Year	13,854,288	12,582,125	10.1
End of Year	<u>\$ 14,960,823</u>	<u>\$ 13,854,288</u>	<u>8.0</u> %

Management's Discussion and Analysis (continued)

RETIREMENT SYSTEM AS A WHOLE

The System's overall Fiduciary Net Position experienced an increase in fiscal year 2018. The System's rate of return for the Pension Plan's investments decreased an overall 2.3% from a 13.8% return during fiscal year 2017 to a 11.5% return in fiscal year 2018. The System's rate of return for the OPEB Plan's investments decreased an overall 2.3% from a 13.7% return in fiscal year 2017 to 11.4% return during fiscal year 2018. Management believes that the System remains financially sound and positioned to meet its ongoing benefit obligations due, in part, to a prudent investment program, cost controls, and strategic planning.

CONTACTING SYSTEM FINANCIAL MANAGEMENT

This financial report is designed to provide the Retirement Board, our membership, taxpayers, investors, and creditors with a general overview of the System's finances and to demonstrate the System's accountability for the money it receives. If you have any questions about this report or need additional financial information, contact the Office of Retirement Services, P.O. Box 30171, Lansing, MI 48909-7671.

FINANCIAL SECTION

Basic Financial Statements

Statement of Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position As of September 30, 2018 (in thousands)

	Pension Plan	OPEB Plan	Total
Assets:			
Equity in common cash	\$ 25,859	\$ 107,482	\$ 133,341
Receivables:			
Amounts due from members	141		141
Amounts due from employers	41,160	41,695	82,854
Amounts due from federal agencies		24,473	24,473
Amounts due from other		19,139	19,139
Amounts due from employer long term	9,639		9,639
Interest and dividends	448	86	535
Total receivables	51,389	85,393	136,782
Investments:			
Short term investment pools	276,699	52,356	329,054
Fixed income pools	1,492,615	292,206	1,784,821
Domestic equity pools	3,249,425	636,371	3,885,796
Real estate and infrastructure pools	1,300,164	254,538	1,554,703
Private equity pools	2,024,052	396,431	2,420,483
International equity pools	2,123,881	416,012	2,539,893
Absolute return pools	1,855,948	363,644	2,219,592
Total investments	12,322,783	2,411,559	14,734,342
Securities lending collateral	558,271	109,984	668,255
Total assets	12,958,302	2,714,418	15,672,720
Liabilities:			
Unearned revenue		27	27
Accounts payable and other accrued liabilities	1,878	41,556	43,434
Obligations under securities lending	558,422	110,014	668,435
Total liabilities	560,300	151,597	711,897
Net Position Restricted for Pension Benefits and OPEB:	\$ 12,398,002	\$ 2,562,821	\$ 14,960,823

The accompanying notes are an integral part of these financial statements.

Basic Financial Statements (continued)

**Statement of Changes in Pension Plan and Other Postemployment
Benefit Plan Fiduciary Net Position
For Fiscal Year Ended September 30, 2018 (in thousands)**

	Pension Plan	OPEB Plan	Total
Additions:			
Contributions:			
Member contributions	\$ 35,598		\$ 35,598
Employer contributions	650,740	\$ 688,884	1,339,624
Other governmental contributions		83,620	83,620
Total contributions	686,338	772,504	1,458,842
Investment income (loss):			
Net increase (decrease) in fair value of investments	1,031,772	184,272	1,216,044
Interest, dividends, and other	284,064	52,915	336,979
Investment expenses:			
Real estate operating expenses	(682)	(124)	(806)
Other investment expenses	(50,658)	(9,196)	(59,853)
Securities lending activities:			
Securities lending income	20,843	4,003	24,846
Securities lending expenses	(11,831)	(2,332)	(14,162)
Net investment income (loss)	1,273,509	229,539	1,503,048
Miscellaneous income	64	172	236
Total additions	1,959,911	1,002,215	2,962,126
Deductions:			
Benefits paid to plan members and beneficiaries:			
Retirement benefits	1,362,275		1,362,275
Health benefits		419,260	419,260
Dental/vision benefits		38,483	38,483
Personal health care		3,561	3,561
Health reimbursement account		72	72
Refunds of contributions	205	15	220
Administrative and other expenses	6,488	25,232	31,720
Total deductions	1,368,969	486,622	1,855,591
Net Increase (Decrease) in Net Position	590,943	515,592	1,106,535
Net Position Restricted for Pension Benefits and OPEB:			
Beginning of Year	11,807,059	2,047,229	13,854,288
End of Year	\$ 12,398,002	\$ 2,562,821	\$ 14,960,823

The accompanying notes are an integral part of these financial statements.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS SEPTEMBER 30, 2018

NOTE 1- PLAN DESCRIPTION

ORGANIZATION

The Michigan State Employees' Retirement System (System) is a single-employer, state-wide, defined benefit public employee retirement plan governed by the State of Michigan (State) and created under Public Act 240 of 1943, as amended. Section 2 of this act establishes the board's authority to promulgate or amend the provisions of the System. Executive Order 2015-13 signed by the Governor on October 27, 2015 established the State of Michigan Retirement Board. The executive order establishes the board's authority to promulgate or amend the provision of the System. The board consists of nine members:

- The Attorney General
- The State Treasurer
- The Legislative Auditor General
- The State Personnel Director
- One member or retirant of the State Employees' Retirement System appointed by the Governor
- One member of the Judges' Retirement System appointed by the Governor
- One current or former officer or enlisted person in the Michigan Military Establishment who is a member or retirant under the Military Retirement Provisions appointed by the Governor
- One retirant member of the State Employees' Retirement System appointed by the Governor
- One member of the general public appointed by the Governor

The System's pension plan was established by the State to provide retirement, survivor and disability benefits to the State's government employees. In addition, the System's OPEB plan provides all retirees with the option of receiving health, dental, and vision coverage under the Michigan State Employees' Retirement Act as well as eligible Special Duty Officers from the Military Retirement Provision (MRP). The System is a qualified pension trust fund under section 401(a) of the Internal Revenue Code. By statute, employees of the following employers are also covered by this plan: American Legion, American Veterans, Veterans of Foreign Wars, Disabled American Veterans, Mackinac Island State Park, Marine Corps League, Michigan Bar Association, Business Enterprise Program, Third Circuit Court, Records Court, 36th District Court, and Special Duty Officers who are members of the Military Retirement Provision (MRP). Although the System reports information for several small employers, the State is legally responsible for almost all contractually required contributions to the System. This level of responsibility is ongoing and is unlikely to change significantly in the foreseeable future. Therefore, the reporting requirements for a single employer plan have been adopted.

The System's financial statements are included as a pension and other employee benefit trust fund in the State of Michigan Comprehensive Annual Financial Report.

The System is administered by the Office of Retirement Services within the Michigan Department of Technology, Management & Budget. The Department Director appoints the Office Director, with whom the general oversight of the System resides. The State Treasurer serves as the investment officer and custodian for the System.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)**MEMBERSHIP**

At September 30, 2018, the System's membership consisted of the following:

Inactive plan members or their beneficiaries currently receiving benefits:	
Regular benefits	49,385
Survivor benefits	7,364
Disability benefits	3,261
Total	<u>60,010</u>
 Inactive plan members entitled to but not yet receiving benefits:	 <u>3,472</u>
 Active plan members:	
Vested	9,323
Non-vested	150
Total	<u>9,473</u>
 Total plan members	 <u>72,955</u>

At September 30, 2003, the System recognized 116 participants in the Defined Contribution (DC) Plan who elected to retire under the Early Out Retirement program. This program provided a .25% incentive for those DC members who qualified, which will be provided by the System. These 116 participants have not been included in the pension membership schedule above.

Enrollment in the health plan is voluntary. The number of participants is as follows:

Health, Dental and Vision Plan

Eligible participants	60,090
Participants receiving benefits:	
Health	52,305
Dental	53,408
Vision	53,213
Active members ^{1, 2}	49,453
Inactive vested members ²	7,185

¹ Active member count includes Personal Healthcare Fund members eligible for the \$1,000/\$2,000 lump sum at termination benefit.

² Includes members of the MRP who also participate in this plan.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

BENEFIT PROVISIONS – PENSION

Introduction

Benefit provisions of the defined benefit (DB) pension plan are established by State statute, which may be amended. Public Act 240 of 1943, State Employees' Retirement Act, as amended, establishes eligibility and benefit provisions for the defined benefit pension plan. Retirement benefits are determined by final average compensation and years of service.

Members are eligible to receive a monthly benefit when they meet certain age and service requirements. The System also provides duty disability, nonduty disability and survivor benefits.

A member who has separated from employment may request a refund of his or her member contribution account. A refund may cancel a former member's rights to future benefits. However, former members who return to employment and who previously received a refund of their contributions may reinstate their service through repayment of the refund upon satisfaction of certain requirements.

Effective March 31, 1997, Public Act 487 of 1996 closed the plan to new entrants. All new employees become members of the defined contribution plan. The Public Act allows returning employees and members who left State employment on or before March 31, 1997, to elect the defined benefit plan instead of the defined contribution plan.

Pension Reform 2012

On December 15, 2011, the Governor signed Public Act 264 of 2011 into law. The legislation granted members a choice regarding their future retirement plan. They had the following options:

- **Option 1: DB Classified** Members voluntarily elected to remain in the DB plan for future service and contribute 4% of their annual compensation to the pension fund until they terminate state employment. The 4% contribution began on April 1, 2012.
- **Option 2: DB 30** Members voluntarily elected to remain in the DB plan for future service and contribute 4% of pay until they reach 30 years of service. When they reach 30 years of service, they will switch to the State's DC plan. The 4% contribution began April 1, 2012, and continues until they switch to the DC plan or terminate employment, whichever comes first.
- **Option 3: DB/DC Blend** Members voluntarily elected not to pay the 4% and therefore became participants in the DC plan for future service beginning April 1, 2012. As a DC plan participant they receive a 4% employer contribution to their 401(k) account and are eligible for an additional dollar-for-dollar employer match of up to 3% of pay to the plan.

Deferred members of the DB plan (with 10 or more years of service) who are reemployed by the State on or after January 1, 2012, become participants in the DC plan. Their pension calculation is determined by their final average compensation (FAC) and years of service as of March 31, 2012. They retain their eligibility for the retiree health insurance premium subsidy offered by the State.

Former nonvested members of the DB plan (with less than 10 years of service) who are reemployed by the State on or after January 1, 2012, and before January 1, 2014, become participants in the DC plan. When they have earned sufficient service credit for vesting (10 years) they would be eligible for a pension based on their FAC and years of service in the DB plan as of March 31, 2012. They retain their eligibility for the retiree health insurance premium subsidy offered by the State.

Former nonvested members (with less than 10 years of service) of the DB plan who are reemployed by the State on or after January 1, 2014, become members of the DC plan. Any service credit previously earned would count towards vesting for the DC plan. They will not be eligible for any pension or retiree health insurance coverage premium but will become a participant in the Personal Healthcare Fund where they will contribute up to 2% of their compensation to a 401(k) or 457 account, earning a matching 2% employer contribution. They will also receive a credit into a health reimbursement account (HRA) at termination if they terminate employment with at least 10 years of service. The credit will be \$2,000 for participants who are at least 60 years old or \$1,000 for participants who are less than 60 years old at termination.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Regular Retirement

The retirement benefit is based on a member's years of credited service (employment) and FAC. The normal benefit equals 1.5% of a member's FAC multiplied by the years and partial year of credited service and is payable monthly over the member's lifetime.

Under PA 264 of 2011, FAC is initially determined as the annual average of the highest three years of compensation (including overtime paid before January 1, 2012, but excluding overtime paid after December 31, 2011). If the end date for the initial FAC calculation is between January 1, 2012, and January 1, 2015, then a prorated amount of post-2008 average overtime will be added to the initial FAC calculation. If the end date for the initial FAC calculation is January 1, 2015, or later, then an annual average of overtime – for the six-year period ending on the FAC calculation date – will be added to that initial FAC calculation to get the final FAC number.

For members who switch to the DC plan for future service, the pension calculation (FAC times 1.5% times years of service) will be determined as of the point the member switches to the DC plan. If the FAC period includes the date of the switch to the DC plan, then the FAC will include up to 240 hours of accrued annual leave multiplied by the rate of pay as of the date of the switch. The hours will be paid at separation.

A member may retire and receive a monthly benefit after attaining:

- age 60 with 10 or more years of credited service; or
- age 55 with 30 or more years of credited service; or
- age 55 with at least 15 but less than 30 years of credited service. The benefit allowance is permanently reduced 0.5% for each month from the member's age on the effective date of retirement to the date the member will attain age 60.

Employees in covered positions are eligible for supplemental benefits and may retire after attaining:

- age 51 with 25 or more years in a covered position; or
- age 56 with 10 or more years in a covered position.

In either case, the three years immediately preceding retirement must have been in a covered position. Employees in covered positions are responsible for the custody and supervision of inmates.

Employees of closing Department of Community Health facilities are eligible for retirement under one of the following conditions:

- age 51 with 25 years of service, the last 5 of which were rendered in the closing facility; or
- age 56 with 10 years of service, the last 5 of which were rendered in the closing facility; or
- 25 years of service at the closing facility regardless of age.

Employees of the State Accident Fund, Michigan Biologic Products, or Liquor Control Commission who were terminated as the result of privatization may retire if the member's age and length of service was equal to or greater than 70 on the date of transfer or termination.

Conservation Officers (CO) with a hire date on or before April 1, 1991, are eligible to retire after 25 years of service, 20 of which must have been rendered as a CO. COs hired after April 1, 1991, and before March 31, 1997, must have 23 years of service as a CO to be eligible for a full retirement benefit with only 25 years of service. In either case, two years immediately preceding retirement must be as a CO.

Deferred Retirement

Any member with 10 or more years of credited service who terminates employment but has not reached the age of retirement is a deferred member and is entitled to receive a monthly pension upon reaching age 60, provided the member's accumulated contributions have not been refunded. Deferred retirement is available after five years of service for State employees occupying unclassified positions in the executive and legislative branches and certain Department of Community Health employees subject to reduction in forced layoffs by reason of deinstitutionalization.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Nonduty Disability Benefit

A member with 10 or more years of credited service who becomes totally and permanently disabled not due to performing duties as a State employee is eligible for a nonduty disability pension. The nonduty disability benefit is computed in the same manner as an age and service allowance based upon service and salary at the time of disability.

Duty Disability Benefit

A member who becomes totally and permanently disabled from performing duties as a State employee as a direct result of State employment, and who has not met the age and service requirement for a regular pension, is eligible for a duty disability pension. Public Act 109 of 2004 amended the State Employees' Retirement Act to change the calculation of the pension benefit and increase the minimum annual payment. If the member is under age 60, the duty disability allowance is now a minimum of \$6,000 payable annually. At age 60 the benefit is recomputed under service retirement.

Survivor Benefit

Upon the death of a member who was vested, the surviving spouse shall receive a benefit calculated as if the member had retired the day before the date of death and selected a survivor pension. Certain designated beneficiaries can be named to receive a survivor benefit. Public Act 109 of 2004 amended the State Employees' Retirement Act to change the calculation of Duty Death benefits and redefines eligibility for deceased member's survivors. The new minimum duty-related death benefit has been increased to \$6,000.

Pension Payment Options

When applying for retirement, an employee may name a person other than his or her spouse as a beneficiary if the spouse waives this right. If a beneficiary is named, the employee must choose whether the beneficiary will receive 100%, 75% or 50% of the retiree's pension benefit after the retiree's death. The decision is irrevocable. A description of the options follows.

Regular Pension – The pension benefit is computed with no beneficiary rights. If the retiree made contributions while an employee and has not received the total accumulated contributions before death, a refund of the balance of the contributions is made to the beneficiary of record. If the retiree did not make any contributions, there will not be payments to beneficiaries.

100% Survivor Pension – Under this option, after the retiree's death, the beneficiary will receive 100% of the pension for the remainder of the beneficiary's lifetime. If this option is elected, the normal retirement benefit is reduced by a factor based upon the ages of the retiree and of the beneficiary. If the beneficiary predeceases the retiree, the pension "pops up" to the regular pension amount; another beneficiary cannot be named.

75% Survivor Pension – Under this option, after the retiree's death, the beneficiary will receive 75% of the pension for the remainder of the beneficiary's lifetime. If this option is elected, the normal retirement benefit is reduced by a factor based upon the ages of the retiree and of the beneficiary. The reduction factor is lower than the factor used in the 100% option previously described. If the beneficiary predeceases the retiree, the pension "pops up" to the regular pension amount; another beneficiary cannot be named.

50% Survivor Pension – Under this option, after the retiree's death, the beneficiary will receive 50% of the pension for the remainder of the beneficiary's lifetime. If this option is elected, the normal retirement benefit is reduced by a factor based upon the ages of the retiree and of the beneficiary. The reduction factor is lower than the factor used in the 100% or 75% option previously described. If the beneficiary predeceases the retiree, the pension "pops up" to the regular pension amount; another beneficiary cannot be named.

Equated Pension – An equated pension may be chosen by any member under age 65 except a disability retiree and an early supplemental retiree. Equated pensions provide an additional amount until age 65 and may be combined with Regular, 100%, 75% or 50% option. At age 65 the monthly amount is permanently reduced. The initial and reduced amounts are based on an estimate of social security benefits at age 65, provided by the Social Security Administration Office. In order to calculate this benefit, members choosing this option must provide ORS

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

with an estimate from the Social Security Administration Office. The actual amount received from social security may vary from the estimate.

Postretirement Adjustments

One-time upward benefit adjustments were made in 1972, 1974, 1976, 1977 and 1987. Beginning October 1, 1988, a 3% non-compounding increase, up to a maximum of \$25 monthly, is paid each October to recipients who have been retired 12 full months. Beginning in 1983, eligible benefit recipients share in a distribution of investment income earned in excess of 8% annually. This distribution is known as the supplemental payment. The supplemental payment is offset by one year's cumulative increases received after the implementation of the annual 3% increase in benefits. These adjustment payments were not issued during fiscal years 1991 through 1994. Members who retired on or after October 1, 1987, are not eligible for the supplemental payment.

Member Contributions – Under Public Act 264 of 2011, members who voluntarily elected to remain in the DB plan contribute 4% of compensation to the retirement system. In addition, members may voluntarily contribute to the System for the purchase of creditable service, such as military service or maternity leave, or a universal buy-in. If a member terminates employment before a retirement benefit is payable, the member's contribution and interest on deposit may be refunded. If the member dies before being vested, the member's contribution and interest are refunded to the designated beneficiaries.

Employer Contributions – The statute requires the employer to contribute to finance the benefits of plan members. These employer contributions are determined annually by the System's actuary and are based upon level-dollar value funding principles so the contribution rates do not have to increase over time.

Banked Leave Time

Public Act 33 of 2004 amended the State Employees' Retirement Act to include Banked Leave Time (BLT) for members. BLT is an extension of the State's current annual leave program, which banks a predetermined number of hours per pay period. However, the BLT program will not have an effect on a member's final average compensation calculation.

BENEFIT PROVISIONS – OTHER POSTEMPLOYMENT

Introduction

Benefit provisions of the other postemployment benefit (OPEB) plan are established by State statute, which may be amended. Public Act 240 of 1943, as amended, establishes eligibility and benefit provisions for the OPEB plan. Defined Benefit (Tier 1) members are eligible to receive health, prescription drug, dental, and vision coverage on the first day they start receiving pension benefits. Defined Contribution (Tier 2) participants who elected to retain the graded premium subsidy benefit under the reform elections of Public Act 264 of 2011 are also eligible to receive subsidized health prescription drug, dental and vision coverage after terminating employment, if they meet eligibility requirements. There is no provision for ad hoc or automatic increases. The State Employees' Retirement Act requires joint authorization by DTMB and the Civil Service Commission to make changes to retiree medical benefit plans. Defined Contribution (Tier 2) participants who elected the Personal Healthcare Fund under Public Act 264 of 2011, and those hired on or after January 1, 2012, are not eligible for any subsidized health, prescription drug, dental or vision coverage in retirement, but may purchase it at their own expense (certain conditions apply).

Former nonvested members of the DB plan who are reemployed by the state on or after January 1, 2014 are not eligible for retiree health insurance coverage premium subsidy but will become a participant in the Personal Healthcare Fund described on page 24.

Public Act 185 of 2010 required that each actively employed member or qualified participants of the System, beginning with the first pay date after November 1, 2010, and ending September 30, 2013, contribute an amount equal to 3% of the member's or qualified participant's compensation toward retiree healthcare. Public Act 264 of 2011 rescinded that provision and refunded any collected contributions to all members.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

In addition to member contributions, the employer funds OPEB benefits for both Tier 1 and Tier 2 members on a prefunded basis. Retirees with the Premium Subsidy benefit contribute 20% of the monthly premium amount for the health (including prescription coverage), dental and vision coverage. Retirees with a graded premium subsidy benefit accrue credit towards insurance premiums in retirement, earnings a 30% subsidy with ten years of service, with an additional 3% subsidy for each year of service thereafter, not to exceed the maximum allowed by statute or 80%. Retirees are provided with life insurance coverage equal to 25% of the active life insurance coverage, \$1,000 for spouse and \$1,000 for each dependent under age 23. Premiums are fully paid by the State.

The number of participants and other relevant financial information are as follows:

	<u>2018</u>
Health, Dental and Vision Plan	
Eligible participants	60,090
Participants receiving benefits:	
Health	52,305
Dental	53,408
Vision	53,213
Active members ^{1, 2}	49,453
Inactive vested members ²	7,185
Expenses for the year (in thousands) \$	486,622
Employer payroll contribution rates	22.14%
¹ Active member count includes Personal Healthcare Fund members eligible for the \$1,000/\$2,000 lump sum at termination benefit.	
² Includes members of the MRP who also participate in this plan.	

Applications for enrollment after retirement are accepted anytime during the year, with coverage effective six months

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting and Presentation

The System's financial statements are prepared using the accrual basis of accounting. Contributions from the employers are recognized as revenue when due and payable. Benefits and refunds are recognized when due and payable in accordance with the terms of the System. The reserves are described below and details are provided in the supporting schedules.

Governmental Accounting Standards Board (GASB) Statement No. 67 and Statement No. 74, which were adopted during the year ended September 30, 2014 and 2017, addresses accounting and financial reporting requirements for pension and other postemployment benefit plans, respectively. The requirements for both GASB Statement No. 67 and 74 require changes in presentation of the financial statements, notes to the financial statements, and required supplementary information. Significant changes include an actuarial calculation of the total and the net pension and other postemployment benefit liabilities. It also includes comprehensive note disclosures regarding the pension and other postemployment benefit liabilities the sensitivity of the net pension and other postemployment benefit liability to the discount rate, and increased investment activity disclosures. The implementation of GASB Statement No. 67 and 74 did not significantly impact the accounting for accounts receivable and investment balances. The total pension and other postemployment benefit liability, determined in accordance with GASB Statement No. 67 and 74, is presented in Note 4 on page 32, Note 5 on page 35, and in the Required Supplementary Information beginning on page 50.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

As of September 30, 2016, the System applied GASB Statement No. 72, *Fair Value Measurement and Application*. GASB Statement No. 72 provides guidance for determining a fair value measurement for reporting purposes and applying fair value to certain investments and disclosures related to all fair value measurements.

Reserves

Reserve for Employee Contributions – Beginning April 2012, members contribute 4% of their compensation to this reserve as well as purchases of eligible service credit and repay previously refunded contributions. This reserve represents active member contributions and interest less amounts transferred to the Reserve for Retired Benefit Payments for regular and disability retirement, amounts refunded to terminated members and unclaimed amounts transferred to the income account. At September 30, 2018, the balance in this reserve was \$289.8 million.

Reserve for Employer Contributions – All employer contributions are credited to this reserve. Interest from the income account is credited annually. Amounts are transferred annually from this reserve to the Reserve for Retired Benefit Payments to fund that reserve. At September 30, 2018, the balance in this reserve was (\$521.3) million.

Reserve for Retired Benefit Payments – This represents the reserves for payment of future retirement benefits to current retirees. At retirement, a member's accumulated contributions plus interest are transferred into this reserve from the Reserve for Employee Contributions. Monthly benefits, which are paid to the retiree, reduce the reserve. At the end of each fiscal year, an amount determined by an annual actuarial valuation is transferred from the Reserve for Employer Contributions to this reserve to bring the reserve into balance with the actuarial present value of retirement allowances. At September 30, 2018, the balance in this reserve was \$14.6 billion.

Reserve for Undistributed Investment Income – The net investment earnings (losses) are recorded in this reserve. Interest as authorized by the board is transferred annually to the other reserves. Administrative expenses are paid from this reserve. At September 30, 2018, the net balance of this reserve was (\$1.9) billion.

Reserve for Health (OPEB) Related Benefits – This reserve is credited with employee and employer contributions for retirees' health (including prescription coverage), dental, and vision benefits. Starting in fiscal year 2012, the employer contribution is based on a prefunded basis and represents a level of funding that, if paid on an ongoing basis, is projected to cover normal cost each year and amortize any unfunded actuarial liability (or funding excess) over a period not to exceed thirty years. In addition, in fiscal year 2018, this reserve includes revenue from the federal government for the Employee Group Waiver Plan (EGWP). Premiums for health, dental, and vision benefits are paid from this reserve. At September 30, 2018, the balance in this reserve was \$2.6 billion.

Reporting Entity

The System is a pension and other employee benefit trust fund of the State. As such, the System is considered part of the State and is included in the State's Comprehensive Annual Financial Report as a pension and other employee benefit trust fund. The System and its Board are not financially accountable for any other entities or other organizations. Accordingly, the System is the only entity included in this financial report.

Benefit Protection

Public Act 100 of 2002 was passed by the Michigan Legislature to protect pension benefits of public employees from alienation (being transferred). Alienation is attachment, garnishment, levy, execution, bankruptcy or other legal process except for divorce orders or eligible domestic relation orders. The statutes governing the System contained an "anti-alienation" clause to provide for this protection; however, many smaller public pension systems did not have the benefit of this protection. Therefore, Public Act 100 of 2002 was passed to establish legal protection of pension assets that encompasses all public employees.

Investments

Generally, investments are reported at fair value, consistent with the provisions of GASB Statement No. 72, *Fair Value Measurement and Application*. Short-term, highly liquid debt instruments including commercial paper are reported at amortized cost. Additional disclosures describing investments are provided in Note 6

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Investment Income

Dividend and interest income is recognized on the accrual basis. Fair value changes are recorded as investment income or loss. Purchases and sales of investments are recorded as of the trade date (the date upon which the transaction is initiated), except for purchase and sale of mortgages, real estate, and private equity investments which are recorded as of the settlement date (the date upon which the transaction is ultimately completed). The effect of recording such transactions as of the settlement date does not materially affect the financial statements.

Costs of Administering the System

Each year a restricted general fund appropriation is requested to fund the ongoing business operations of the System. These administrative costs are ultimately funded by the System through the regular transfer of funds from the System to the State's general fund based on either a direct cost or allocation basis depending on the nature of the expense. Costs of administering the System are financed by undistributed investment income of the System.

Property and Equipment

Office space is leased from the State on a year-to-year basis. Office equipment is capitalized if the value exceeds \$5,000. These assets are recorded at cost and are reported net of depreciation in the Statement of Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position. Such assets are depreciated on a straight-line basis over 10 years. As of September 30, 1998, all capitalized equipment was fully depreciated. No additional equipment has been capitalized for the System since that date.

Related Party Transactions

Leases and Services – The System leases operating space and purchases certain administrative, data processing, legal, and investment services from the State. The space and services are not otherwise available by competitive bid. The schedule below summarizes costs incurred by the System for such services.

	2018
	(in thousands)
Building Rentals	\$ 237
Technological Support	1,732
Attorney General	186
Investment Services	3,581
Personnel Services	2,899

Cash – At September 30, 2018, the System had \$133.3 million in a common cash investment pool maintained for various State operating funds. The participating funds in the common cash pool earn interest at various rates depending upon prevailing short-term interest rates. Earnings (Losses) from these activities amounted to \$577,554 for the year ended September 30, 2018.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)**NOTE 3 – CONTRIBUTIONS*****Contributions***

The State is required by Public Act 240 of 1943, as amended, to contribute amounts necessary to finance the coverage of members and retiree benefits. Members currently participate in the System on a contributory basis of 4% of the annual compensation to the pension plan. Under certain circumstances, members may contribute to the System for the purchase of creditable service, such as military service or maternity leave. Effective August 1, 1998, the retirement act was amended to permit a universal buy-in. With a universal buy-in, a member may elect to purchase no more than 5 years of service credit (less other service credit purchased). Contribution provisions are specified by State statute and may be amended only by action of the State Legislature.

Employer contributions to the System are determined on an actuarial basis using the entry age normal actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the actuarial valuation is allocated on a level basis over the service of the individual between entry age and assumed exit age. The portion of this cost allocated to the current valuation year is called the normal cost. The remainder is called the actuarial accrued liability. Normal cost is funded on a current basis.

Pension and OPEB contributions made in the fiscal year ending September 30, 2018, were determined as of the September 30, 2016 actuarial valuations. The unfunded (overfunded) actuarial accrued liabilities as of September 30, 2016, are amortized over a 19 year period beginning October 1, 2017 and ending September 30, 2036. The schedule below summarizes pension and OPEB contribution rates in effect for fiscal year 2018.

Pension Contribution Rates

Benefit Structure	Member	Employer
Defined Benefit*	0.0 - 4.0 %	24.60-28.50 %
Defined Contribution	0.0	22.4

* Employee Contributions are not mandatory if the member's pension is frozen.

OPEB Contribution Rates

Benefit Structure	Member	Employer
Defined Benefit	0.0 %	22.14 %
Defined Contribution - Premium Subsidy	0.0	22.14
Defined Contribution - Personal Health Care	0.0	22.14

The System is required to reconcile with actuarial requirements annually. Any funding excess or funding deficiency for pension benefits is smoothed over five years. One fifth (20%) of the funding excess or deficiency is included in each of the subsequent years' contribution and is not recognized as a payable or receivable in the accounting records.

In March 2001, the Internal Revenue Service issued a private letter ruling allowing the System's members to purchase service credit and repay refunds using tax-deferred (pre-tax) dollars. The program was implemented and payments began in fiscal year 2002.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

The program allows members to purchase service credit and repay refunds on a tax-deferred basis. Members sign an irrevocable agreement that identifies the contract duration, monthly payment, total contract amount, and years of service credit being purchased. The duration of the contract can range from 1 to 20 years. The amounts are withheld from the members' paycheck and are treated as employer pick-up contributions pursuant to Internal Revenue Code Section 414(h). At September 30, 2018, there were 1066 agreements. Agreement amounts that will not be collected within 12 months are discounted using the assumed actuarial rate of return of 7.5%. The average length remaining of a contract was approximately 7.3 years for 2018. The short-term receivable was \$1.7 million and the discounted long-term receivable was \$5.5 million at September 30, 2018.

NOTE 4 – NET PENSION LIABILITY

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Net Pension Liability (in thousands)	
Total Pension Liability	\$ 18,444,887
Plan Fiduciary Net Position	12,398,002
Net Pension Liability	<u>\$ 6,046,886</u>
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.22%
Net Pension Liability as a percentage of Covered Payroll	194.11%
Total Covered Payroll	\$ 3,115,261

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of arithmetic real rates of return were provided by the Bureau of Investments (BOI) for each major asset class included in the pension plan's target asset allocation as of September 30, 2018. These best estimates are summarized in the following table:

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Asset Allocation

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return*</u>
Domestic Equity Pools	28.0 %	5.7 %
Private Equity Pools	18.0	9.2
International Equity Pools	16.0	7.2
Fixed Income Pools	10.5	0.5
Real Estate and Infrastructure Pools	10.0	3.9
Absolute Return Pools	15.5	5.2
Short-Term Investment Pools	2.0	0.0
TOTAL	100.0 %	

* Long-term rates of return are net of administrative expenses and 2.3% inflation.

Rate of Return

For the fiscal year ended September 30, 2018, the annual money-weighted rate of return on pension plan investment, net of pension plan investment expense, was 11.1%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Discount Rate

A single discount rate of 7.0% was used to measure the total pension liability for fiscal year 2018. In fiscal year 2017, the single discount rate used to measure the total pension liability was 7.5%. This single discount rate was based on the expected rate of return on pension plan investments of 7.0%. The projection of cash flows used to determine this single discount rate was based on the assumption that in the future plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

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

As required by GASB Statement No. 67, we determined the sensitivity of the net pension liability to changes in the single discount rate. The following table presents the plan's net pension liability, in thousands, calculated using a single discount rate of 7.0% as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is one percent lower or one percent higher:

1% Decrease	Current Discount Rate Assumption	1% Increase
6.0%	7.0%	8.0%
\$7,909,239	\$6,046,886	\$4,460,823

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. If the actuarial valuation is not calculated as of the plan's fiscal year end, the total pension liability is required to be rolled forward from the actuarial valuation date to the pension plan's fiscal year end.

The total pension liability and sensitivity information shown in this report are based on actuarial valuation performed as of September 30, 2017, and rolled-forward using generally accepted actuarial procedures.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Actuarial Valuations and Assumptions

Actuarial valuation for the pension plan involves estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment and mortality. Amounts determined regarding the funded status of the plan and the actuarially determined contributions (ADC) are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future.

The Schedules of Contributions in Required Supplementary Information present trend information about the amounts contributed to the plan by employers in comparison to the ADC, an amount that is actuarially determined in accordance with the parameters of GASB Statement No. 67 for pension.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employer and plan members) and include the types of benefits provided at the time of each valuation and the historical pattern of sharing of benefit costs between the employer and plan members to that point. The actuarial methods and assumptions used include techniques that are designed to reduce the effects of short-term volatility in actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations.

The information presented in the Net Pension Liability schedules and notes was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Summary of Actuarial Assumptions

Valuation Date	September 30, 2017
Actuarial Cost Method	Entry Age, Normal
Asset Valuation Method	Fair Value
Actuarial Assumptions:	
Wage Inflation Rate	2.75%
Investment Rate of Return	7.0%
Projected Salary Increases	2.75% - 11.75%, including inflation at 2.75%
Cost-of-Living Pension Adjustments	3% Annual Non-Compounded with Maximum Annual Increase of \$300 for those eligible
Mortality	
Retirees	RP-2014 Male and Female Healthy Annuitant Mortality Table scaled by 93% for males and 98% for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
Active	RP-2014 Male and Female Employee Annuitant Mortality Table scaled by 100% for males and 100% for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
Disabled Retirees	RP-2014 Male and Female Disabled Annuitant Mortality Table scaled by 100% for males and 100% for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
Notes:	Assumption changes as a result of an experience study for the period 2012 through 2017 have been adopted by the System for use in the determination of the total pension liability beginning with the September 30, 2017 valuation.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

NOTE 5 – NET OPEB LIABILITY

Measurement of the Net OPEB Liability

The net OPEB liability is to be measured as the total OPEB liability, less the amount of the OPEB plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Net OPEB Liability (in thousands)

Total OPEB Liability	\$ 10,498,001
Plan Fiduciary Net Position	2,562,821
Net OPEB Liability	<u>\$ 7,935,180</u>
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability	24.41%
Net OPEB Liability as a Percentage of Covered Payroll	254.72%
Total Covered Payroll	\$ 3,115,261

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on OPEB plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of arithmetic real rates of return were provided by the Bureau of Investments (BOI) for each major asset class included in the pension plan's target asset allocation as of September 30, 2018. These best estimates are summarized in the following table:

Asset Allocation

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Domestic Equity Pools	28.0 %	5.7 %
Private Equity Pools	18.0	9.2
International Equity Pools	16.0	7.2
Fixed Income Pools	10.5	0.5
Real Estate and Infrastructure Pools	10.0	3.9
Absolute Return Pools	15.5	5.2
Short-Term Investment Pools	2.0	0.0
TOTAL	<u>100.0 %</u>	

* Long-term rates of return are net of administrative expenses and 2.3% inflation.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Rate of Return

For the fiscal year ended September 30, 2018, the annual money-weighted rate of return on OPEB plan investment, net of OPEB plan investment expense, was 10.86%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Discount Rate

A single discount rate of 7.0% was used to measure the total OPEB liability for fiscal year 2018. In fiscal year 2017, the single discount rate used to measure the total OPEB liability was 7.5%. This single discount rate was based on the expected rate of return on OPEB plan investments of 7.0%. The projection of cash flows used to determine this single discount rate assumed that in the future plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the OPEB plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on OPEB plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability.

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

As required by GASB Statement No. 74, we have determined the sensitivity of the net OPEB liability, in thousands, to changes in the single discount rate. The following table presents the plan's net OPEB liability, calculated using a single discount rate of 7.0%, as well as what the plan's net OPEB liability would be if it were calculated using a single discount rate that is one percent lower or one percent higher:

1% Decrease	Current Discount Rate Assumption	1% Increase
6.0%	7.0%	8.0%
\$9,163,805	\$7,935,180	\$6,904,703

Sensitivity of the Net OPEB Liability to Healthcare Cost Trend Rate

As required by GASB Statement No. 74, we have determined the sensitivity of the net OPEB liability, in thousands to changes in the healthcare cost trend rates. The following table presents the plan's net OPEB liability, calculated using the assumed trend rates as well as what the plan's net OPEB liability would be if it were calculated using a trend rate that is one percent lower or one percent higher:

1% Decrease	Current Healthcare Cost Trend Rate	1% Increase
\$6,842,013	\$7,935,180	\$9,205,334

Timing of the Valuation

An actuarial valuation to determine the total OPEB liability is required to be performed at least every two years. If the actuarial valuation is not calculated as of the plan's fiscal year end, the total OPEB liability is required to be rolled forward from the actuarial valuation date to the OPEB plan's fiscal year end.

The total OPEB liability as of September 30, 2018, is based on the results of an actuarial valuation date of September 30, 2017, and rolled-forward using generally accepted actuarial procedures.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Actuarial Valuations and Assumptions

Actuarial valuations for the OPEB plan involves estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and the healthcare cost trend. Amounts determined regarding the funded status of the plan and the actuarially determined contributions (ADC) are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future.

The Schedules of Contributions in Required Supplementary Information present trend information about the amounts contributed to the plan by employers in comparison to the ADC, an amount that is actuarially determined in accordance with the parameters of GASB Statement No. 74 for OPEB.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employer and plan members) and include the types of benefits provided at the time of each valuation and the historical pattern of sharing of benefit costs between the employer and plan members to that point. The actuarial methods and assumptions used include techniques that are designed to reduce the effects of short-term volatility in actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

The information presented in the Net OPEB Liability schedules and notes was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Summary of Actuarial Assumptions

Valuation Date	September 30, 2017
Actuarial Cost Method	Entry Age, Normal
Asset Valuation Method	Fair Value
Actuarial Assumptions:	
Wage Inflation Rate	2.75
Investment Rate of Return	7.00%
Projected Salary Increases	2.75% - 11.75%, including wage inflation at 2.75%
Healthcare Cost Trend Rate ²	8.25% Year 1 graded to 3.00% Year 10
Mortality	
Retirees	RP-2014 Male and Female Healthy Annuitant Mortality Table scaled by 93% for males and 98% for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
Active	RP-2014 Male and Female Employee Annuitant Mortality Table scaled by 100% for males and 100% for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
Disabled Retirees	RP-2014 Male and Female Disabled Annuitant Mortality Table scaled by 100% for males and 100% for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
Other Assumptions : ¹	
Opt Out Assumption	10% of eligible participants and 0% of eligible military participants are assumed to opt out of the retiree health plan
Survivor Coverage	80% of male and 67% of female future retirees and MRP: 100% of future retirees electing dependent coverage are assumed to have coverage continuing after the retiree's death
Coverage Election at Retirement	75% of male and 60% of female future retirees and MRP: 90% of male and 90% of female future retirees are assumed to elect coverage for 1 or more dependents

Notes:

Assumption changes as a result of an experience study for the period 2012 through 2017 have been adopted by the System for use in the determination of the total OPEB liability beginning with the September 30, 2017 valuation.

¹ Applies to individuals hired before January 1, 2012.

² Applies to medical and Rx payments.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

NOTE 6 – INVESTMENTS

Investment Authority

Under Public Act 380 of 1965, as amended, the authority for the purchase and the sale of investments resides with the State Treasurer. Investments are made subject to the Public Employee Retirement System Investment Act, Public Act 314 of 1965, as amended. The Public Employee Retirement System Investment Act authorizes, with certain restrictions, the investment of pension fund assets in stocks, corporate and government bonds and notes, mortgages, real estate, and certain short-term and private equity investments. Investments must be made for the exclusive purposes of providing benefits to active members, retired members and beneficiaries, and for defraying the expenses of investing the assets.

Derivatives

The State Treasurer employs the use of derivatives in the investment of the pension and other employee benefit trust funds (the trust funds).

Derivatives are used in managing the trust fund portfolios, but uses do not include speculation or leverage of investments. Less than 12% of the total trust funds' portfolio has been invested from time to time in future contracts, swap agreements, structured notes, option and forward contracts. State investment statutes limit total derivative exposure to 15% of a fund's total asset value, and restrict uses to replication of returns and hedging of assets. Swap agreements represent the largest category of derivative investments subject to this limitation. Option and Future contracts traded daily on an exchange and settling in cash daily or having a limited and fully defined risk profile at an identified, fixed cost are not subject to the derivative exposure limitation.

The derivative fair values are reported on the Statement of Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position as of September 30, 2018, in their respective investment pool's fair value. Derivative net increase and decrease are reported on the Statement of Changes in Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position for fiscal year ended September 30, 2018, under "Investment income (loss)", in "Net increase (decrease) in fair value of investments". Bond interest, swap payments, and dividends are reported under "Investment income (loss)", in "Interest, dividends, and other".

Derivative Investment Table as of September 30, 2018 (in millions):

Investment and Investment Type	Percentage of Fair Value	Notional Value	Investments At Fair Value	Net Increase (Decrease) in Fair Value	Investment Income	Fair Value Subject to Credit Risk
Government Bond Future Contract Fixed Income Investments	0.0 %	\$4.6	\$0.0	\$0.0	\$0.0	\$0.0
Option Contracts Equity and Fixed Income Investments	0.7	7,843.1	108.1	55.2	0.0	0.0
International Swap Agreements International Equity and Fixed Income Investments	3.0	519.1	441.4	(2.3)	(0.3)	0.0
Domestic Swap Agreements Domestic Equity and Fixed Income Investments	0.0	(6.1)	0.2	1.0	0.7	0.0

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

To diversify the trust funds' portfolio, the State Treasurer has entered into international swap agreements with investment grade counterparties, which are tied to stock market indices in approximately forty-six foreign countries. Generally, the notional amount of equity swaps tied to foreign stock market indices is executed via a net total return USD index. The swap agreements provide that the System will pay quarterly over the term of swap agreements, interest indexed to the three-month London Inter-Bank Offer Rate (LIBOR), adjusted for an interest rate spread, on the notional amount stated in the agreements. International equity swap agreement maturity dates range from October 2018 to June 2019. U.S. Treasury Bonds, U.S. Corporate Bonds, and other public market fixed income securities, as well as, other investments are held to correspond with the notional amount of the international swap agreements. The value of the international synthetic equity structures is a combination of the value of the swap agreements and the value of the notes and other investments. The book value represents the cost of the bonds, notes, and other investments. The current value represents the current value of the bonds, notes, and other investments and the change in the value of the underlying indices from the inception of the swap agreements. The current value is used as a representation of the fair value based on the intention to hold all swap agreements until maturity. At the maturity of the swap agreements, the trust funds will either receive the increase in the value of the equity indices from the level at the inception of the agreements or pay the decrease in the value of the indices. The combined swap structure generally realizes gains and losses on a rolling basis.

Domestic equity swap agreements provide that the System will pay interest monthly, quarterly, or annually over the term of the swap agreements, interest indexed to the LIBOR, adjusted for an interest rate spread, on the notional amount stated in the agreements. Domestic equity swaps value is a combination of the value of the swap agreements and the value of short-term investments. Book value represents the cost of short-term and equity investments. Current value represents the fair value of the short-term investments and the change in the value of the underlying indices from the inception of the swap agreements. Domestic equity swaps' increase (decrease) primarily reflects the net changes in the domestic indices and short-term investments. Domestic equity swap agreements matured in December 2017. At September 30, 2018, there were no domestic equity swaps.

To reduce the risk in the fixed income portfolio, the State Treasurer has entered into FX swap agreements, interest rate swap agreements and credit default swap agreements with investment grade counterparties. The FX swap agreements are tied to foreign currency forward exchange rates and are used to reduce the currency risk within the fixed income portfolio. The swap agreements are entered into on an as-needed basis and are generally tied to the maturity of a foreign government bond indenture denominated in a foreign currency. The purpose of the FX swap agreement that has a final maturity date of less than three months is to reduce or eliminate the currency risk on foreign bond transactions. U.S. Domestic LIBOR-based floating rate notes, U.S. Treasury securities, and portfolio cash are held to correspond with the notional amount of FX swap agreements within the fixed income portfolio. Interest rate swaps are used to adjust interest rate and yield curve exposure and substitute for physical securities. Long swap positions that receive fixed rate, increase exposure to long-term interest rates; short swap positions that pay fixed rate, decrease exposure. Credit default swaps (CDS) are used to manage credit exposure without buying or selling securities outright. Written CDS increase credit exposure, selling protection, obligating the portfolio to buy bonds from counterparties in the event of a default. Purchased CDS decrease exposure, buying protection, providing the right to "Put" bonds to the counterparty in the event of a default.

Counterparty credit risk is the maximum loss amount that would be incurred if the counterparties to the derivative instrument failed to perform according to the terms of the contract, without respect to any collateral or other security, or netting arrangement. As of October 2017, all derivative investments were collateralized.

The State Treasurer traded U.S. Treasury bond future contracts to manage duration, yield curve exposure, adjust interest rate exposures and replicate government bond positions.

To enhance returns while limiting downside risk, the State Treasurer traded equity options in single securities and on indices in the Large Cap Core, Large Cap Growth, and DED Tactical Allocation Pools. Domestic equity options were used for the purpose of stock replacement, in conjunction with dividend stocks to drive excess returns over the S&P 500, and to provide added exposure to strong equity markets while limiting principal at risk. Put options are used to protect against large negative moves in the market indices. Options traded by the State Treasurer in the fixed income pools are used to manage interest rate and volatility exposures. Written options generate income in expected interest rate scenarios and may generate capital losses, if unexpected interest rate environments are realized. Both written and purchased options will become worthless at expiration if the underlying instrument does not reach the strike price of the option.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Securities Lending

The System, pursuant to a Securities Lending Authorization Agreement, has authorized State Street Bank and Trust Company ("State Street") to act as the System's agent in lending System's securities to approved borrowers. State Street, as agent, enters into Securities Loan Agreements with borrowers.

During the fiscal year, State Street lent, on behalf of the State Treasurer, certain securities of the System held by State Street as custodian and received cash or other collateral including securities issued or guaranteed by the United States government. The types of securities lent were equity, and fixed income, which includes government and corporate bonds and notes. State Street does not have the ability to pledge or sell collateral securities delivered absent a borrower default. Borrowers were required to deliver collateral for each loan equal to at least 100% of the fair value of the loaned securities.

Pursuant to the Securities Lending Authorization Agreement, State Street had an obligation to indemnify the System in the event of default by a borrower. There were no failures by any borrowers to return loaned securities or pay distributions thereon during the fiscal year that resulted in a declaration or notice of default of the Borrower.

During the fiscal year, the System and the borrowers maintained the right to terminate securities lending transactions upon notice. The cash collateral received on each loan was invested, together with the cash collateral of other qualified tax-exempt plan lenders, in a collective investment pool. As of September 30, 2018, such investment pool had an average duration of 9 days and an average weighted final maturity of 96 days for USD. Because the loans were terminable at will their duration did not generally match the duration of the investments made with cash collateral. On September 30, 2018, the System had no credit risk exposure to borrowers. The fair value of collateral held and the fair value (USD) of securities on loan for the client as of September 30, 2018, was \$668,255,286 and \$656,048,976 respectively.

Risk

In accordance with GASB Statement No. 40, investments require certain disclosures regarding policies and practices and the risks associated with them. The credit risk, (including custodial credit risk and concentration of credit risk), the interest rate risk, and the foreign currency risk are discussed in the following paragraphs. Amounts represent the pro rata share of the underlying investments as required by GASB Statement No. 40. These investments are held in internal investment pools and reported as such in the financial statements.

Credit Risk – Credit risk is the risk that an issuer will not fulfill its obligations.

- Short-Term Fixed Income Investments-Eligible commercial paper investments must be rated within one of the two highest ratings classifications ("1" or "2") at the time of purchase from one of the nationally recognized ratings organizations (NRSROs) specified in Public Act 314 of 1965, as amended. Borrowers must have a least \$400.0 million in commercial paper outstanding, and the State Treasurer may not invest in more than 10% of the borrower's outstanding debt.
- Long-Term Fixed Income Investments- Investment grade and noninvestment grade securities may be acquired in compliance with the parameters set forth in Public Act 314 of 1965, as amended, and the State Treasurer's Investment Policy Statement for the System. Public Act 314 defines investment grade as investments in the top four major grades as rated by one of the NRSROs. At September 30, 2018 the System was in compliance with Public Act 314 and the Investment Policy Statement in all material aspects.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Rated Debt Investments
(in thousands)
As of September 30, 2018

Investment Type	Fair Value	S&P	Fair Value	Moody's
Short Term	\$ 429,368	A-1	\$ 429,368	P-1
	54,427	A-2	9,862	P-2
	0	A-3	44,564	P-3
	0	NR	0	NR
Government Securities				
U.S. Agencies- Sponsored	382	AAA	128,929	Aaa
	128,547	AA	0	Aa
Corporate Bonds & Notes				
	31,584	AAA	78,204	Aaa
	57,642	AA	69,865	Aa
	143,338	A	172,194	A
	309,833	BBB	300,563	Baa
	66,055	BB	60,955	Ba
	49,498	B	58,637	B
	22,233	CCC	23,423	Caa
	5,067	CC	10,694	Ca
	0	C	252	C
	4,200	D	0	D
	294,987	NR	209,650	NR
International *				
	15,322	AAA	12,825	Aaa
	14,452	AA	14,452	Aa
	58,700	A	102,508	A
	201,329	BBB	157,521	Baa
	22,988	NR	25,486	NR
Securities Lending Collateral				
Short Term	39,201	A-1	39,201	P-1
	50,519	NR	104,474	NR
Corporate				
	0	AAA	0	Aaa
	10,714	AA	37,196	Aa
	158,301	A	77,864	A
	0	BBB	0	Baa
	0	BB	409,520	Ba
	0	B	0	B
	0	CCC	0	Caa
	0	CC	0	Ca
	0	C	0	C
	409,520	NR	0	NR
Mutual Fund				
	6,702	AAA	6,702	Aaa
	6,028	A	6,028	A
	14,211	BB	14,211	Ba
	4,389	B	4,389	B
Total	<u>\$ 2,609,537</u>		<u>\$ 2,609,537</u>	

NR - not rated

* International Investment types consist of domestic floating rate note used as part of a Swap strategy.

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Custodial Credit Risk – Custodial credit risk for investments is the risk that, in the event of a failure of the counterparty, the State will not be able to recover the value of the investment or collateral securities that are in the possession of an outside party.

Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the government and are held by either the counterparty or the counterparty's trust department or agent, but not in the government name.

The State Treasurer does not have a policy for custodial credit risk. However, the State's custodial bank had a credit rating of A at September 30, 2018. As of September 30, 2018, no securities were exposed to custodial credit risk.

Concentration of Credit Risk – Concentration of credit risk is the risk of loss attributed to the magnitude of a government's investment in a single issuer.

Other than obligations issued, assumed or guaranteed by the United States, its agencies or United States government sponsored enterprises, the System is prohibited by Public Act 314 of 1965, as amended, from investing more than 5% of the outstanding obligations of any one issuer or investing more than 5% of a System's assets in the obligations of any one issuer. When calculating the amount of outstanding obligations, the System includes publicly issued and privately held debt.

At September 30, 2018, there were no investments in any single issuer that accounted for more than 5% of the System's assets. The System held one investment that exceeded the 5% cap in obligations of any one issuer. The System is aware of the breach and in accordance with MCL 38.1133(3)(g), is developing a prudent plan for reallocating assets to comply with the prescribed limitations.

Interest Rate Risk – Fixed Income Investments – Interest rate risk is the risk that changes in interest rates of debt investments will adversely affect the fair value of an investment.

The State Treasurer's policy states that cash equivalents are invested in short-term fixed income securities with an average weighted maturity of less than one year to provide liquidity and safety of principal from capital market and default risk. At September 30, 2018, the fair value of the System's prime commercial paper was \$483.8 million with the weighted average maturity of 28 days.

The State Treasurer does not have a policy regarding interest rate risk for long-term debt investments. However, the trust funds are invested with a long-term strategy. The goal is to balance higher returns while accepting minimum risk for the return. Analyzing the yield curve on individual securities as compared to U.S. Treasuries determines, in part, what is an acceptable risk for the return. Therefore, market conditions such as lower interest rates result in shorter duration and higher interest rates result in longer duration.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Debt Securities (in thousands) As of September 30, 2018

	Fair Value	Effective Duration in Years
Government		
U. S. Treasury	\$ 436,593	7.3
U. S. Agencies - Backed	116,466	3.0
U. S. Agencies - Sponsored	128,939	4.0
Corporate	1,015,768	4.0
International*		
U. S. Treasury	129,548	2.7
Corporate	312,791	0.4
Total	<u>\$ 2,140,105</u>	

Debt securities are exclusive of securities lending collateral.

* International contains Domestic Government and Corporate Securities as a part of their derivative strategies. The interest rates reset on a quarterly basis for these securities.

Foreign Currency Risk – Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or deposit.

The System invests in various securities denominated in foreign currencies. Authorized global securities include equities, fixed income, mutual funds, real estate, and limited partnerships. These investments are limited to 30% of the total assets of the System with additional limits of not more than 5% of the outstanding global securities of any one issuer and no more than 5% of the System's assets in the global securities of any one issuer. In addition to these limits, the State Treasurer cannot acquire securities with companies that have active business operations in the state sponsors of terror as identified by the United States Secretary of State. At September 30, 2018, the total amount of foreign investment subject to foreign currency risk was \$2,735.1 million, which amounted to 18.4% of total investments (exclusive of securities lending collateral) of the System.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Foreign Currency Risk
(in thousands)
As of September 30, 2018

Region	Country	Currency	Equity Fair Value in U.S. \$	Fixed Income Fair Value in U.S. \$	International & Absolute Return Fair Value in U.S. \$*	Private Equity, Real Estate & Infrastructure Fair Value in U.S. \$
<u>AMERICA</u>						
	Brazil	Real		\$118		\$6,007
	Canada	Dollar		1,519	\$24,635	7,352
	Mexico	Peso		4,075		20,635
	Peru	Sol		297		
	Uruguay	Peso		135		
	Colombian	Peso		416		
	Chilean	Peso		613		
<u>PACIFIC</u>						
	Australia	Dollar	\$311		12,295	
	Hong Kong	Dollar	157		12,947	
	India	Rupee				30,079
	Indonesia	Rupiah		454		
	Japan	Yen		2,637	113,496	
	Malaysia	Ringgit		663		
	New Taiwan	Dollar	941		2,491	
	New Zealand	Dollar			105	
	Renminbi		25,364			7,454
	Singapore	Dollar	93	468	2,347	
	Thailand	Baht		739		
	Sri Lankan	Rupee		219		
<u>EUROPE</u>						
	Denmark	Krone			3,981	
	European Union	Euro	15,071	13,373	51,020	149,393
	Hungary	Forint				
	Norway	Krone	158		3,898	
	Poland	Zloty		488		
	U.K.	Sterling	14,259	2,608	35,718	13,061
	Romania	Leu		1,249		
	Sweden	Krona	28	692	6,089	
	Switzerland	Franc	5,378		22,661	
<u>AFRICA</u>						
	South Africa	Rand	161	1,372		
	Egypt	Pound		425		
	Zambia	Kwacha		3		
	Liberia	Dollar	11,782			
<u>MIDDLE EAST</u>						
	Israel	Shekel		1,137	4,574	
<u>OTHER</u>						
	Various				1,713,148	384,354
	Total		<u>\$ 73,702</u>	<u>\$ 33,701</u>	<u>\$ 2,009,407</u>	<u>\$ 618,334</u>

* International includes derivatives whose fair value exposure to foreign currency risk is the net amount of unrealized gains and unrealized losses. Maturity dates on these investments range from October 2018 through September 2019 with an average maturity of 0.3 years.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Fair Value Measurements

The Retirement System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Not all investments held by the Retirement System are recorded at fair value. GASB 72 allows for certain investments to be recorded at cost (or amortized cost or any other valuation method), and therefore, they are not presented in the fair value hierarchy table. Equity and fixed income securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Equity Swaps and Fixed Income securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique and other significant observable inputs. Equity and fixed income securities classified as Level 3 of the fair value hierarchy are valued using a third party data and reports that are unobservable. Securities reported at Net Asset Value (NAV) are valued using the most recent third party statement adjusted for cash flows as of September 30, 2018. Investments that are measured at fair value using the Net Asset Value per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy below.

In instances where inputs used to measure fair value fall into different levels in the above fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. The Retirement System's assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset or liability.

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

	Balance at September 30, 2018	Fair Value Measurement 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:				
Total cash and cash Equivalents	\$ 252,380	\$ 252,380		
Equity				
Depository Receipts	35,199,567	35,199,567		
Warrants	11,959			\$ 11,959
Common Stocks	3,360,749,314	3,360,367,752		381,562
Preferred Stocks	478,298	478,298		
Options on Equity	105,796,610	105,796,610		
Real Estate Investment Trusts	311,275,278	311,275,278		
Options on Index	2,357,032	2,357,032		
Swaps	(15,102,667)		\$ (15,102,667)	
Commingled Funds, ETF's and PTP's	1,966,685,605	1,966,685,605		
Convertible Bonds	128,651		128,651	
Total Equity	5,767,579,645	5,782,160,142	(14,974,017)	393,521
Fixed Income				
Asset Backed	206,734,331		206,734,331	
Corporate Bonds	839,540,815		834,209,520	5,331,295
Commercial mortgage-backed	347,880,105		347,880,105	
Government Issues	606,615,293	566,141,014	39,874,949	599,330
Swaps	298,680		298,680	
US Agency Issues	105,140,297		105,140,297	
Forwards				
Futures on Fixed Income	2,187,331	2,187,331		
Commingled Funds, ETF's and PTP's	24,627,930	24,627,930		
Options on Fixed Income	(5,879)		(5,879)	
Total Fixed Income	2,133,018,903	592,956,275	1,534,132,004	5,930,625
Total investments by fair value level	\$ 7,900,850,928	\$ 6,375,368,796	\$ 1,519,157,987	\$ 6,324,147
Investments measured at the net asset value (NAV)				
Private Equity	\$ 2,336,324,774			
Real Estate & Infrastructure	1,511,871,867			
Absolute Return	819,849,420			
Real Return & Opportunistic	1,318,621,238			
Other Limited Partnerships	320,714,881			
Total investments measured at the NAV	\$ 6,307,382,180			
Total investments measured at fair value	\$ 14,208,233,108			

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

Additional disclosures for fair value measurements of investments in certain entities that calculate the Net Asset Value per Share (or its equivalent)

Private Equity funds

Total investments measured at the NAV	\$ 2,336,324,774
Unfunded commitments	1,483,256,002

Private Equity funds includes investments in approximately 243 partnerships that invest in leveraged buyouts, venture capital, mezzanine debt, distressed debt, secondary funds and other investments. These type of investments can never be redeemed with the funds, but distributions are received through the liquidation of the underlying assets of the fund. It's expected that the underlying assets of the fund are liquidated over a period of five to eight years. However, as of September 30, 2018, it is probable that all of the investments in this group will be sold at an amount different from the NAV per share (or its equivalent). Therefore, the fair values of the investments in this type have been determined using recent observable transaction information for similar investments and nonbinding bids received from potential buyers of the investments. As of September 30, 2018, a buyer for these investments has not been identified.

Real Estate and Infrastructure

Total investments measured at the NAV	\$1,511,871,867
Unfunded commitments	253,204,986

Real Estate and Infrastructure funds include approximately 106 accounts (limited partnerships, limited liability companies, etc.) that invest in real estate or infrastructure related assets. The fair value of the Real Estate and Infrastructure funds have been determined in accordance with generally accepted accounting principles using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital. These types of investments cannot be redeemed with the funds. Distributions from these funds will be received as the underlying investments are sold and liquidated over time. It is expected that the underlying assets will be sold over the next 5 – 15 years. However, buyers have not been determined so the fair value has been determined using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital.

Absolute Return Portfolio

Total investments measured at the NAV	\$ 819,849,420
Unfunded commitments	33,726,081

This type invests in hedge funds and hedge fund of funds that pursue multiple strategies to diversify risks and reduce volatility. The fair values of the investments in this portfolio have been determined using the NAV per share (or its equivalent) of the investments. For 86.7% of the investments, investors may redeem at various dates between October 1, 2018 and April 1, 2021; 7.7% of the investments are redeemable between April 1, 2021 through August 12, 2027; and the remaining 5.6% is not redeemable on demand.

Real Return and Opportunistic Portfolio

Total investments measured at the NAV	\$ 1,318,621,238
Unfunded commitments	753,303,897

This type includes 82 funds that invest in private credit, tangible and intangible real assets, or other real return and opportunistic strategies. The fair values of the investments in this portfolio have been determined using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital. These investments can never be redeemed with the funds. Distributions from each fund will be received as the underlying investments of the funds

FINANCIAL SECTION

NOTES TO BASIC FINANCIAL STATEMENTS (CONTINUED)

are liquidated. It is expected that the underlying assets of the funds will be liquidated over the next 5 to 10 years. This type also includes one fund that offers quarterly redemptions with 65 day notice.

All Other Investments

Total investments measured at the NAV	\$ 320,714,881
Unfunded commitments	18,546,048

The balance of plan assets reported at fair value includes:

- A limited partnership (LP) that invests in the equity of Japanese companies. This LP permits partners to withdraw funds quarterly with 180 days of advanced notice.
- LPs that invest in senior secured debt financing of a third party investment fund. This investment cannot be redeemed by limited partners. The debt has a 10 year maturity, with partnership distributions to include principal as the loan collateral matures four years after the initial investment.
- LPs permitting partners to redeem its debt securities quarterly with 30 or 60 days advanced notice.
- A LP permitting partners to redeem its debt securities quarterly with 30 days of advanced notice.
- LPs that can never be redeemed, but distributions are received through the liquidation of the underlying assets of the fund.

NOTE 7 – COMMITMENTS AND CONTINGENCIES

Under the Administrative Procedures Act, members may appeal a decision made by the Board. Once the administrative procedure has been exhausted, the decision may be appealed in Michigan's court system. Various cases that have exhausted the administrative procedures have been appealed in the court system. These cases are in the normal course of business and the System does not anticipate any material loss as a result of the contingent liabilities.

FINANCIAL SECTION

Required Supplementary Information

Schedule of Changes in Net Pension Liability (in thousands)

	Fiscal Year				
	2018	2017	2016	2015	2014
Total Pension Liability					
Service Cost	\$ 71,912	\$ 68,311	\$ 74,042	\$ 80,413	\$ 84,040
Interest	1,226,594	1,251,600	1,250,117	1,242,353	1,206,258
Changes of benefit terms					
Differences between expected and actual experience	115,726	19,798	3,441	55,072	
Changes of assumptions	1,393,264	710,646			406,962
Benefit payments, including refunds of member contributions	(1,362,481)	(1,322,657)	(1,289,728)	(1,265,480)	(1,223,033)
Net Change in Total Pension Liability	<u>1,445,015</u>	<u>727,697</u>	<u>37,872</u>	<u>112,358</u>	<u>474,227</u>
Total Pension Liability - Beginning	<u>16,999,872</u>	<u>16,272,175</u>	<u>16,234,303</u>	<u>16,121,945</u>	<u>15,947,718</u>
Total Pension Liability - Ending (a)	<u><u>\$ 18,444,887</u></u>	<u><u>\$ 16,999,872</u></u>	<u><u>\$ 16,272,175</u></u>	<u><u>\$ 16,234,303</u></u>	<u><u>\$ 16,121,945</u></u>
Plan Fiduciary Net Position					
Contributions - Employer	\$ 650,740	\$ 703,131	\$ 716,465	\$ 749,332	\$ 705,100
Contributions - Member	35,598	40,839	46,666	46,688	47,527
Net Investment Income	1,273,509	1,411,395	781,528	232,588	1,529,626
Benefit payments, including refunds of member contributions	(1,362,481)	(1,322,657)	(1,289,728)	(1,265,480)	(1,223,033)
Administrative and Other Expenses	(6,488)	(6,285)	(6,629)	(6,228)	(6,931)
Other	64	294	278	55	
Net Change in Plan Fiduciary Net Position	<u>590,942</u>	<u>826,716</u>	<u>248,580</u>	<u>(243,045)</u>	<u>1,052,290</u>
Plan Fiduciary Net Position - Beginning	<u>11,807,059</u>	<u>10,980,343</u>	<u>10,731,762</u>	<u>10,974,806</u>	<u>9,922,516</u>
Plan Fiduciary Net Position - Ending (b)	<u><u>\$ 12,398,002</u></u>	<u><u>\$ 11,807,059</u></u>	<u><u>\$ 10,980,343</u></u>	<u><u>\$ 10,731,762</u></u>	<u><u>\$ 10,974,806</u></u>
Net Pension Liability - Ending (a) - (b)	<u><u>\$ 6,046,886</u></u>	<u><u>\$ 5,192,813</u></u>	<u><u>\$ 5,291,832</u></u>	<u><u>\$ 5,502,541</u></u>	<u><u>\$ 5,147,139</u></u>
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	67.22%	69.45%	67.48%	66.11%	68.07%
Covered Payroll	\$ 3,115,261 ¹	\$ 3,050,238 ¹	\$ 872,358	\$ 946,977	\$ 1,006,633
Net Pension Liability as a Percentage of Covered Payroll	194.11%	170.24%	606.61%	581.06%	511.32%

¹ Covered payroll based on implementation of GASB 82.

Required Supplementary Information (continued)

**Schedule of Changes in Net OPEB Liability
(in thousands)**

	Fiscal Year	
	2018	2017
Total OPEB Liability		
Service Cost	\$ 93,346	\$ 108,530
Interest	760,408	735,979
Changes of benefit terms		
Differences between expected and actual experience	(1,055,687)	(71,816)
Changes of assumptions	809,101	
Benefit payments, including refunds of member contributions	(402,543)	(476,200)
Net Change in Total OPEB Liability	<u>204,625</u>	<u>296,493</u>
Total OPEB Liability - Beginning	<u>10,293,376</u>	<u>9,996,883</u>
Total OPEB Liability - Ending (a)	<u><u>\$ 10,498,001</u></u>	<u><u>\$ 10,293,376</u></u>
Plan Fiduciary Net Position		
Contributions - Employer	\$688,884	\$703,330
Contributions - Member		27
Net Investment Income	229,539	217,955
Benefit payments, including refunds of member contributions	(402,543)	(476,200)
Administrative and Other Expenses	(459)	(445)
Other	172	778
Net Change in Plan Fiduciary Net Position	<u>515,592</u>	<u>445,447</u>
Plan Fiduciary Net Position - Beginning	<u>2,047,229</u>	<u>1,601,782</u>
Plan Fiduciary Net Position - Ending (b)	<u><u>\$ 2,562,821</u></u>	<u><u>\$ 2,047,229</u></u>
Net OPEB Liability - Ending (a) - (b)	<u><u>\$ 7,935,180</u></u>	<u><u>\$ 8,246,147</u></u>
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	24.41%	19.89%
Covered Payroll*	\$ 3,115,261	\$ 3,050,238
Net OPEB Liability as a Percentage of Covered Payroll	254.72%	270.34%

* Covered payroll based on implementation of GASB 85.

FINANCIAL SECTION

Required Supplementary Information (continued)

SCHEDULES OF CONTRIBUTIONS

Pension Benefits (in thousands)

Fiscal Year Ended Sept. 30	Actuarially Determined Contribution (ADC)	Actual Employer Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2009	\$ 351,647	\$ 343,787	\$ 7,859	\$ 1,734,325	19.8 %
2010	418,428	369,953	48,475	1,621,709	22.8
2011	447,924	424,547	23,377	1,276,058	33.3
2012 ¹	512,616	419,927	92,689	1,155,591	36.3
2013	611,132	604,845	6,287	1,081,729	55.9
2014	624,467	705,100	(80,633)	1,006,633	70.0
2015 ¹	654,515	749,332	(94,817)	946,977	79.1
2016	752,161	716,465	35,697	872,358	82.1
2017	709,651	703,131	6,520	3,050,238	23.1
2018	627,621	650,740	(23,118)	3,115,261	20.9

¹ Revised actuarial assumptions.

Beginning fiscal year 2017, Covered payroll based on implementation of GASB 82.

Other Postemployment Benefits (in thousands)

Fiscal Year Ended Sept. 30	Actuarially Determined Contribution (ADC)	Actual Employer Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2009	\$ 922,791	\$ 384,406	\$ 538,385	\$ 2,972,101	12.9 %
2010	870,012	387,184	482,828	2,937,995	13.2
2011	1,020,144	452,969	567,175	3,039,875	14.9
2012	960,640	672,655	287,984	2,895,193	23.2
2013 ¹	678,650	729,863	(51,213)	2,881,140	25.3
2014	619,512	755,883	(136,371)	2,857,324	26.5
2015 ¹	645,412	713,661	(68,249)	3,029,113	23.6
2016	659,698	686,652	(26,954)	2,989,101	23.0
2017	676,227	703,330	(27,103)	3,050,238	23.1
2018	744,210	688,884	55,326	3,115,261	22.1

¹ Revised actuarial assumptions.

Beginning fiscal year 2017, Covered payroll based on implementation of GASB 85.

Beginning with the fiscal year ended September 30, 2016, the amounts shown include reconciliation payments required by subsection 35(5) of the SERS statute.

Required Supplementary Information (continued)

Schedules of Investment Returns

Pension Benefits	
Fiscal Year	Annual Return¹
2014	14.01 %
2015	1.01
2016	5.90
2017	13.24
2018	11.10

¹ Annual money-weighted rate of return,
net of investment expenses

OPEB Benefits	
Fiscal Year	Annual Return¹
2017	13.30 %
2018	10.86

¹ Annual money-weighted rate of return,
net of investment expenses

FINANCIAL SECTION

Note to Required Supplementary Information

NOTE A – DESCRIPTION

Ten year historical trend information designed to provide information about the System's progress made in accumulating sufficient assets to pay benefits when due is presented in the preceding schedules. Other ten year historical trend information related to the System is presented in the Statistical and Actuarial Sections of the report. This information is presented to enable the reader to assess the progress made by the System in accumulating sufficient assets to pay pension and other postemployment benefits as they become due.

The comparability of trend information is affected by changes in actuarial assumptions, benefit provisions, actuarial funding methods, accounting policies, and other changes. Those changes usually affect trends in contribution requirements and in ratios that use the pension and other postemployment benefit obligations as a factor.

The Schedules of Contributions are presented to show the responsibility of the Employer in meeting the actuarial requirements to maintain the System on a sound financial basis.

The Schedules of Changes in Net Pension and OPEB Liability, Schedules of Contributions, and Schedules of Investment Returns are schedules that are required in implementing GASB Statement No. 67 for pension and No. 74 for OPEB. These schedules are required to show information for ten years; additional years will be displayed as it becomes available. The Schedules of Changes in Net Pension and OPEB Liability represents in actuarial terms, the accrued liability less the fair value of assets represents in actuarial terms, the accrued liability less the fair value of assets. The Schedules of Contributions is a comparison of the employer's contributions to the actuarially determined contributions. The Schedule of Investment Returns represents a money-weighted rate of return that expresses investment performance, net of pension and OPEB plan investment expense, adjusted for the changing amounts actually invested.

The information presented in the Schedule of Contributions was used in the actuarial valuation for purposes of determining actuarially determined contribution rate. Additional information as of the latest actuarial valuation for the pension plan follows.

Valuation:

Actuarially determined contribution amounts are calculated as of September 30, 2016.

Methods and Assumptions Used to Determine Contributions For Fiscal Year 2018

Actuarial Cost Method		Entry Age, Normal
Amortization Method		
	Pension	Level Dollar, Closed
	OPEB	Level Percent of Payroll, Closed
Remaining Amortization Period		19 years, as of October 1, 2017, ending September 30, 2036
Asset Valuation Method		
	Pension	5-Year smoothed fair value
	OPEB	Fair Value of Assets
Price Inflation		2.5%
Salary Increases		SERS: 3.50% - 12.5%, including wage inflation at 3.5% MRP: 3.50%
Investment Rate of Return		7.50% net of investment and administrative expenses
Retirement Age		Experience-based table of rates that are specific to the type of eligibility condition.
Mortality	SERS	RP-2000 Combined Health Life Mortality Table, adjusted for mortality improvements to 2015 using projection scale BB. For retirees, 100% of the table rates were used for males and females. For active members, 50% of the table rates were used for males and females.
Health Care Trend Rates		9.00% trend, gradually decreasing to 3.5% in year 10
Aging Factors		Based on the 2013 SOA "Health Care Costs - From Birth to Death"

Supporting Schedules

Summary Schedule of Pension Plan Administrative and Other Expenses For Fiscal Year Ended September 30, 2018 (in thousands)

Personnel Services:	
Staff Salaries	\$ 1,650
Retirement and Social Security	931
Other Fringe Benefits	319
Total	<u>2,899</u>
Professional Services:	
Accounting	330
Actuarial	205
Attorney General	186
Audit	139
Consulting	37
Medical	200
Total	<u>1,097</u>
Building and Equipment:	
Building Rentals	237
Equipment Purchase, Maintenance, and Rentals	7
Total	<u>244</u>
Miscellaneous:	
Bond Guarantee and Other	
Travel and Board Meetings	5
Office Supplies	2
Postage, Telephone, and Other	447
Printing	61
Technological Support	1,732
Total	<u>2,247</u>
Total Administrative and Other Expenses	<u><u>\$ 6,488</u></u>

Summary Schedule of OPEB Plan Administrative and Other Expenses For Fiscal Year Ended September 30, 2018 (in thousands)

Staff Salaries	\$ 459
Health Fees	22,806
Dental Fees	1,707
Vision Fees	259
Total Administrative and Other Expenses	<u><u>\$ 25,232</u></u>

FINANCIAL SECTION

Supporting Schedules (continued)

Schedule of Investment Expenses For Fiscal Year Ended September 30, 2018 (in thousands)

Real Estate Operating Expenses	\$ 806
Securities Lending Expenses	14,162
Other Investment Expenses ¹	
ORS-Investment Expenses ²	3,581
Custody Fees	336
Management Fees	54,885
Research Fees	1,051
Total Investment Expenses	\$ 74,821

¹ Refer to the Investment Section for fees paid to investment professionals.

² Does not exclude Treasury Civil Service fees recorded as a pass through in the Schedule of Investment Fees - State Treasurer. As of September 30, 2018, fees totaled \$53,325.

Schedule of Payments for Professional Services For Fiscal Year Ended September 30, 2018 (in thousands)

Accounting	\$ 330
Actuary	205
Attorney General	186
Independent Auditors	139
Consulting	37
Medical Advisor	200
Total Payments	\$ 1,097

FINANCIAL SECTION

Supporting Schedules (continued)

Detail of Changes in Plan Fiduciary Net Position

(Pension and Other Postemployment Benefits)

For the Fiscal Year Ended September 30, 2018 (in thousands)

	Employee Contributions	Employer Contributions	Retired Benefit Payments	Undistributed Investment Income	OPEB	Total
Additions:						
Contributions:						
Member contributions	\$ 35,598					\$ 35,598
Employer contributions:		\$ 650,740			\$ 688,884	1,339,624
Other governmental contributions					83,620	83,620
Total contributions	35,598	650,740			772,504	1,458,842
Investment income (loss):						
Net increase (decrease) in fair value of investments				\$ 1,031,772	184,272	1,216,044
Interest, dividends, and other				284,064	52,915	336,979
Investment expenses:						
Real estate operating expenses				(682)	(124)	(806)
Other investment expenses				(50,658)	(9,196)	(59,853)
Securities lending activities:						
Securities lending income				20,843	4,003	24,846
Securities lending expenses				(11,831)	(2,332)	(14,162)
Net investment income (loss)				1,273,509	229,539	1,503,048
Transfers from other systems						
Miscellaneous income			\$ 64		172	236
Total additions	35,598	650,740	64	1,273,509	1,002,215	2,962,126
Deductions:						
Benefits paid to plan members and beneficiaries:						
Retirement benefits			1,362,275			1,362,275
Health benefits					419,260	419,260
Dental/vision benefits					38,483	38,483
Personal health care					3,561	3,561
Health reimbursement account					72	72
Refund of contributions	65	101	39		15	220
Administrative and other expenses				6,488	25,232	31,720
Total deductions	65	101	1,362,314	6,488	486,622	1,855,591
Net Increase (Decrease) before other changes	35,533	650,639	(1,362,250)	1,267,021	515,592	1,106,535
Other Changes in Net Position:						
Interest allocation	7,589	4,802	1,774,576	(1,786,967)		
Transfers upon retirement	(39,570)		39,570			
Transfers of employer shares		(1,244,821)	1,244,821			
Total other changes in net position	(31,981)	(1,240,018)	3,058,966	(1,786,967)		
Net Increase (Decrease) in Net Position	3,553	(589,379)	1,696,715	(519,946)	515,592	1,106,535
Net Position Restricted for Pension Benefits and OPEB:						
Beginning of Year	286,267	68,120	12,859,244	(1,406,572)	2,047,229	13,854,288
End of Year	\$ 289,820	\$ (521,259)	\$ 14,555,959	\$ (1,926,519)	\$ 2,562,821	\$ 14,960,823

FINANCIAL SECTION

This page was intentional left blank.

INVESTMENT SECTION

Prepared by Michigan Department of Treasury, Bureau of Investments
Jon M. Braeutigam, Chief Investment Officer

Report on Investment Activity
Asset Allocation
Investment Results
Largest Assets Held
Schedule of Investment Fees
Schedule of Investment Commissions
Investment Summary

INVESTMENT SECTION

Report on Investment Activity

INTRODUCTION

The State Treasurer reports investment activity quarterly to the Investment Advisory Committee (Committee), which reviews the investments, goals, and objectives of the retirement funds and may submit recommendations regarding them to the State Treasurer. The Investment Advisory Committee may also, by a majority vote, direct the State Treasurer to dispose of any holdings that, in the Committee's judgment, are not suitable for the funds involved, and may, by unanimous vote, direct the State Treasurer to make specific investments.

The Investment Advisory Committee was created by Act 380 of the Public Acts of 1965. The three public members of the five-member committee are appointed by the Governor with the advice and consent of the Senate for three-year terms. The Director of the Department of Licensing and Regulatory Affairs and the Director of the Department of Technology, Management and Budget are ex-officio members. As of September 30, 2018, members of the Committee were as follows: James B. Nicholson (public member), Reginald G. Sanders, CFA, CAIA (public member), Dina L. Richard, CPA (public member), Shelly Edgerton (ex-officio member), and David L. DeVries (ex-officio member). The public members serve without pay, but may be paid actual and necessary travel and other expenses.

INVESTMENT POLICY & GOALS

Investment policy states that the fiduciary will operate within standard investment practices of the prudent person and in accordance with Public Employee Retirement System Investment Act 314 of 1965. The fiduciary is authorized to invest in government obligations, corporate obligations, various short-term obligations, corporate (domestic and international) stocks, private equity interests, mutual funds, real estate interests, and other investments subject to specific parameters. Above all, trust fund assets are to be invested for the exclusive benefit of the members of the System, in a fiduciary capacity.

The System's Proxy Voting Policy sets forth directives on various issues including: Boards of Directors, corporate governance, social issues, corporate restructurings and defenses. All proxies are reviewed and voted in accordance with the System's policy.

The primary function of the System is to provide retirement, survivor and disability benefits along with health and other postemployment benefits to its members. The State Treasurer is the sole investment fiduciary and custodian of the System's investments pursuant to State law. The goals of the System are:

- Maintain sufficient liquidity to pay benefits.
- Meet or exceed the actuarial assumption over the long term.
- Perform in the top half of the public plan universe over the long term
- Diversify assets to preserve capital and avoid large losses.
- Exceed individual asset class benchmarks over the long term.

The strategy for achieving these goals is carried out by investing the assets of the System according to a five-year asset allocation model. The System currently invests in seven different asset classes, which provides for a well-diversified portfolio.

INVESTMENT SECTION

Report on Investment Activity (continued)

ASSET ALLOCATION

Asset Allocation
(Excludes Collateral on Loaned Securities)

<u>Investment Category</u>	<u>As of 9/30/18 Actual %</u>	<u>Five-Year Target %</u>
Domestic Equity Pools	26.1 %	28.0 %
International Equity Pools	17.1	16.0
Private Equity Pools	16.3	18.0
Real Estate and Infrastructure Pools	10.5	10.0
Fixed Income Pools	12.0	10.5
Absolute Return Pools	14.9	15.5
Short-Term Investment Pools	<u>3.1</u>	<u>2.0</u>
TOTAL	<u>100.0 %</u>	<u>100.0 %</u>

INVESTMENT AUTHORITY

Pursuant to State Law (Section 91 of Act No. 380 of the Public Acts of 1965, as amended, and Section 12c of Act No. 314 of 1965, as amended), the State Treasurer, State of Michigan, is the investment fiduciary for the State sponsored retirement systems: Michigan Public School Employees' Retirement System, Michigan State Employees' Retirement System, Michigan State Police Retirement System, Michigan Judges' Retirement System, and the Michigan Military Retirement Provisions. Additionally, the State Treasurer, State of Michigan, is custodian and ex officio treasurer of the retirement system for the Legislators, State of Michigan (Section 47 of Act No. 261 of the Public Acts of 1957, as amended).

Public Act 314 of 1965, as amended, authorizes the investment of assets of public employee retirement systems or plans created and established by the State or any political subdivision.

INVESTMENT RESULTS

Total Portfolio Results

For the fiscal year ended September 30, 2018, the total System's rate of return was 11.5% for the Pension Plan and 11.4% for the OPEB Plan as compiled by State Street Investment Analytics. Annualized rates of return for the Pension Plan for the three, five, and ten year periods ending September 30, 2018, were: 11.0%, 10.1%, and 8.4% respectively.

Investment return calculations are prepared using a Time-Weighted rate of return.

Domestic Equity Pools

The objective for investments made in domestic equities is to meet or exceed the total return of the S&P 1500 Super Composite for one, three, and five-year periods and a market cycle.

For active management strategies, the objective is to earn returns that exceed the most relevant S&P Index (or the most relevant Russell Index), adjusting for market capitalization and style, for one, three, and five-year periods and a market cycle. Rank above median in a universe of managers possessing a similar market cap and style characteristics.

INVESTMENT SECTION

Report on Investment Activity (continued)

For index, or passive return strategies, the objective is to return within 20 basis points of the S&P 500 Index, 50 basis points for the S&P 400 mid-cap, and 60 basis points for the S&P 600 small-cap over one, three, and five-year periods and a market cycle.

The pools are invested primarily in equities or equity-related securities of U.S. companies through internal and externally managed strategies. The goal is to build a portfolio of strategies that will provide excess returns relative to the S&P 1500 while providing minimal tracking error to the index. At times a portion of these pools may be invested in exchange traded funds (ETFs) and fixed-income short-term securities with maturities of less than one year.

The pools invest in equities and equity related securities that are listed on U.S. national securities exchanges, including American Depositary Receipts (ADRs). It may also invest in stocks that are traded over-the-counter. The pools diversify their investments by allocating their equity strategies with consideration of the capitalization weightings of the S&P 1500 Index.

The following summarizes the weightings of the pools as of September 30, 2018:

Active	55.7 %
Passive	<u>44.3</u>
Total	<u>100.0 %</u>

Large-Cap	64.8 %
Multi-Cap	27.0
Mid-Cap	6.8
Small-Cap	<u>1.4</u>
Total	<u>100.0 %</u>

The System's Domestic Equity pools total rate of return was 20.9% for the Pension Plan and 21.0% for the OPEB Plan for fiscal year 2018. This compared with 17.7% for the S&P 1500 Index.

At the close of fiscal year 2018, the Domestic Equity pools represented 26.1% of total investments. The following summarizes the System's 20.0% ownership share of the Domestic Equity pools at September 30, 2018:

Domestic Equity Pools (in thousands)

Short-Term Pooled Investments	\$	62,490
Equities		3,824,931
Settlement Principal Payable		(7,173)
Settlement Proceeds Receivable		447
Accrued Dividends		<u>5,101</u>
Total	\$	<u>3,885,796</u>

Report on Investment Activity (continued)

International Equity Pools

The objective for investments made in International Equity pools is to meet or exceed the total return of the MSCI ACWI Ex-US Net for one, three, and five-year periods and a market cycle.

For active management strategies, the objective is to earn returns that exceed the most relevant S&P Index (or the most relevant Russell Index), adjusting for market capitalization, style and geography for one, three, and five-year periods and a market cycle. Rank above median in a universe of managers possessing a similar market capitalization, style and geography characteristics.

For index, or passive return strategies, the objective is to return within 250 basis points of the S&P/Citigroup BMI-EPAC Index with 25% of the currency hedged for one, three, and five-year periods and a market cycle. Return within 400 basis points of the MSCI Emerging Markets Index, for one, three, and five-year periods and a market cycle.

Active exposure is invested primarily in equities or equity-related securities of non-U.S. companies through externally managed strategies.

Passive exposure to international equity returns is achieved primarily by investing in a combination of fixed income LIBOR notes, short-term fixed income investments, and equity swap agreements on foreign stock indices in developed markets. Interest on the dedicated notes and short-term fixed income investments is exchanged for international stock returns, and the total notional amount of the swap agreements is invested in the approximate proportions of the S&P Broad Market Index (BMI) Europe and Pacific Composite (EPAC) country weightings in related indices. Use of swap agreements for a core position began in 1993, an American Depositary Receipts (ADR) and index-related security portfolio was added in June of 1999 to increase portfolio management flexibility, and a multiple country fund portfolio with smaller capitalization stocks was added in September of 2002 to improve exposure to the smallest companies in the BMI index. Use of futures as an investment to hedge cash flows and balances began in December of 2008, and this use is expected to continue in the future. The combined Swap agreements, notes and short-term investments together continue to perform like a stock index fund that realizes all gains and losses on a rolling three year basis.

The pools diversify their investments by allocating its equity strategies with consideration of the economic development status weightings of the S&P/Citigroup BMI -World ex-US Index.

The following summarizes the weightings of the pool as of September 30, 2018:

Active	79.5 %
Passive	<u>20.5</u>
Total	<u>100.0 %</u>
Developed	92.9 %
Emerging	<u>7.1</u>
Total	<u>100.0 %</u>

The System's International Equity pools total rate of return was 2.0% for Pension and OPEB Plans for fiscal year 2018. This compared with 1.8% for the MSCI ACWI Ex US Net.

At the close of fiscal year 2018, the International Equity pools represented 17.1% of total investments. The following summarizes the System's 20.3% ownership share of the International Equity Pools at September 30, 2018:

INVESTMENT SECTION

Report on Investment Activity (continued)

International Equity Pools (in thousands)

Short-Term Pooled Investments	\$ 9,826
Equities	2,102,626
Fixed Income Securities	442,338
Market Value Equity Contracts	(16,959)
Accrued Dividends and Interest	2,062
Total	<u>\$2,539,893</u>

Private Equity Pools

The Private Equity pools objective is to meet or exceed the benchmark for all private equity investments over long time periods. The benchmark is a blend of the S&P 500 Index plus 300 basis points and the 10 year yield plus 300 basis points using ending weights of equity and fixed income holdings within the portfolio.

Private Equity Investments are investments in the private equity market, primarily through limited partnerships. The following summarizes the weightings of the pools as of September 30, 2018:

Buyout Funds	45.9 %
Special Situation Funds	15.7
Fund of Funds	14.4
Venture Capital Funds	11.9
Liquidation Portfolio	10.3
Mezzanine Funds	1.8
Total	<u>100.0 %</u>

The Private Equity pools had a return of 19.5% for the Pension and OPEB Plans for the fiscal year ended September 30, 2018, versus the benchmark of 17.7%.

At the close of fiscal year 2018, the Private Equity pools represented 16.3% of total investments. The following summarizes the System's 19.3% ownership share of the Private Equity pools at September 30, 2018:

Private Equity Pools (in thousands)

Short-Term Pooled Investments	\$ 83,266
Equities	2,334,329
Long Term Obligations	2,735
Accrued Interest	153
Total	<u>\$ 2,420,483</u>

Real Estate and Infrastructure Pools

The objective of the Real Estate and Infrastructure pools is to provide diversification and favorable risk adjusted returns primarily through income and appreciation of investments. Investments are typically held through investment entities, such as limited partnerships or limited liability companies, established for the

INVESTMENT SECTION

Report on Investment Activity (continued)

specific purpose of owning, leasing, managing, financing, or developing real estate and infrastructure related investments.

The Real Estate and Infrastructure pools diversify its holdings by:

- **Geography** - The pools are invested globally and are diversified geographically so that it is not concentrated in a limited number of markets or geographic areas.
- **Size and Value** - The pools diversify its holdings by size so that it is not concentrated in a limited number of large investments
- **Investment Type** – The pools are diversified by investment type as summarized below.

Multi-family apartments	42.8 %
Hotel	12.4
Commercial office buildings	11.2
Infrastructure	10.6
Industrial warehouse buildings	7.9
Retail shopping centers	4.4
For Rent Homes	4.1
For Sales Homes	3.7
Land	1.4
Short Term Investments	1.5
Total	<u>100.0 %</u>

The Real Estate and Infrastructure pools generated a return of 12.3% for the Pension and the OPEB plans for fiscal year 2018. The two benchmark returns from the National Council of Real Estate Investment Fiduciaries: the National Property Blended Index (less 130 basis points) was 5.8% and the Open-End Diversified Core Equity Index was 7.7%.

At the close of fiscal year 2018, the Real Estate and Infrastructure pools represented 10.5% of total investments. The following summarizes the System's 20.2% ownership share of the Real Estate and Infrastructure pools at September 30, 2018:

Real Estate and Infrastructure Pools (in thousands)

Short-Term Pooled Investments	\$ 22,877
Real Estate Equities	1,366,631
Infrastructure Equities	164,775
Dividend Receivable	420
Total	<u>\$ 1,554,703</u>

Fixed Income Pools

The objective for investments made in the Fixed Income pools is to meet or exceed the Barclays Aggregate Bond Index over one, three, and five-year periods and market cycles. Rank above median in a nationally recognized universe of managers possessing a similar style.

For Fixed Income sub-strategies, the objective return is to meet or exceed the most relevant Barclays benchmark index.

INVESTMENT SECTION

Report on Investment Activity (continued)

The pools are invested primarily in fixed income securities of U.S. companies through internal and externally managed strategies. The goal is to build a portfolio of strategies that will provide excess returns relative to the blended benchmark while providing minimal tracking error to the index. At times a portion of the pools may be invested in exchange traded funds (ETFs) and fixed-income short-term securities with maturities of less than one year.

The pools invest in fixed income and related securities in a diversified portfolio of investment grade corporate issues, treasuries, agencies, government sponsored enterprises and government guaranteed mortgages. The pools diversify its investments by allocating its strategies with consideration of credit risk.

The System's Fixed Income pools total rate of return was 1.2% for the Pension and OPEB Plans for fiscal year 2018. This compared with (1.2%) for the Barclays Aggregate Bond Index.

At the close of fiscal year 2018, the Fixed Income pools represented 12.0% of total investments. The following summarizes the System's 20.9% ownership share of the Fixed Income pools at September 30, 2018:

Fixed Income Pools (in thousands)

Short-Term Pooled Investments	\$ 7,259
Fixed Income Securities	1,772,240
Market Value of Equity Contracts	102
Settlement Proceeds Receivable	200
Accrued interest	5,020
Total	<u>\$ 1,784,821</u>

Absolute Return Pools

The Absolute Return pools consist of the Absolute Return Strategies Pool and the Real Return and Opportunistic Investment Pool.

The primary investment objective of the Absolute Return Strategies Pool is to generate a rate of return that meets or exceeds T-bills by 400 basis points net of fees over the one, three, and five-year periods and a market cycle. Also, exceed the appropriate HFN Fund of Funds median net of fees over one, three, and five-year periods and a market cycle.

The Absolute Return Strategies pool rate of return for the fiscal year was 6.0% for the Pension and OPEB Plans versus the benchmark's 3.7%.

The primary investment objective of the Real Return and Opportunistic Pool is to generate a rate of return that meets or exceeds the increase in the CPI by at least five percent (5%) annually net of fees over one, three, and five-year periods and a market cycle. If a peer universe is available, rank above median in a nationally recognized universe of managers possessing a similar style.

For sub-strategies targeting a commodities index, the objective is to generate a rate of return that meets or exceeds the Dow Jones-AIG Total Return Commodities Index over one, three, and five year periods and a market cycle. Rank above median in a nationally recognized universe of managers possessing a similar style.

The Real Return and Opportunistic Investments pool rate of return for the fiscal year was 14.4% for the Pension and OPEB Plans versus the benchmark's 7.6%.

At the close of fiscal year 2018, the Absolute Return pools represented 14.9% of total investments. The following summarizes the System's 20.2% ownership share of the Absolute Return Strategies pool at September 30, 2018:

INVESTMENT SECTION

Report on Investment Activity (continued)

Absolute Return Pools (in thousands)

Short-Term Pooled Investments	\$ 81,121
Equities	2,138,471
Total	<u><u>\$ 2,219,592</u></u>

Short-Term Investment Pools

The objective of the Short Term Investment pools is to closely match the return performance of its benchmark, the 30 day Treasury bill. The Short Term Investment pools return for the fiscal year was 2.0% for the Pension and OPEB plans versus the benchmark's 1.5%.

Potential areas of investment are:

- Obligations of the United States or its agencies.
- Banker's acceptances, commercial accounts, certificates of deposit or depository receipts.
- Repurchase agreements for the purchase of securities issued by the US government or its agencies.
- Commercial paper rated at the time of purchase within the two highest classifications established by not less than two national rating services as determined by the State Treasurer.
- Short duration investment grade corporate issues.

At the close of fiscal year 2018, the Short Term Investment pools represented 3.1% of total investments. The following summarizes the System's 21.2% ownership share of the Short Term Investment pools at September 30, 2018:

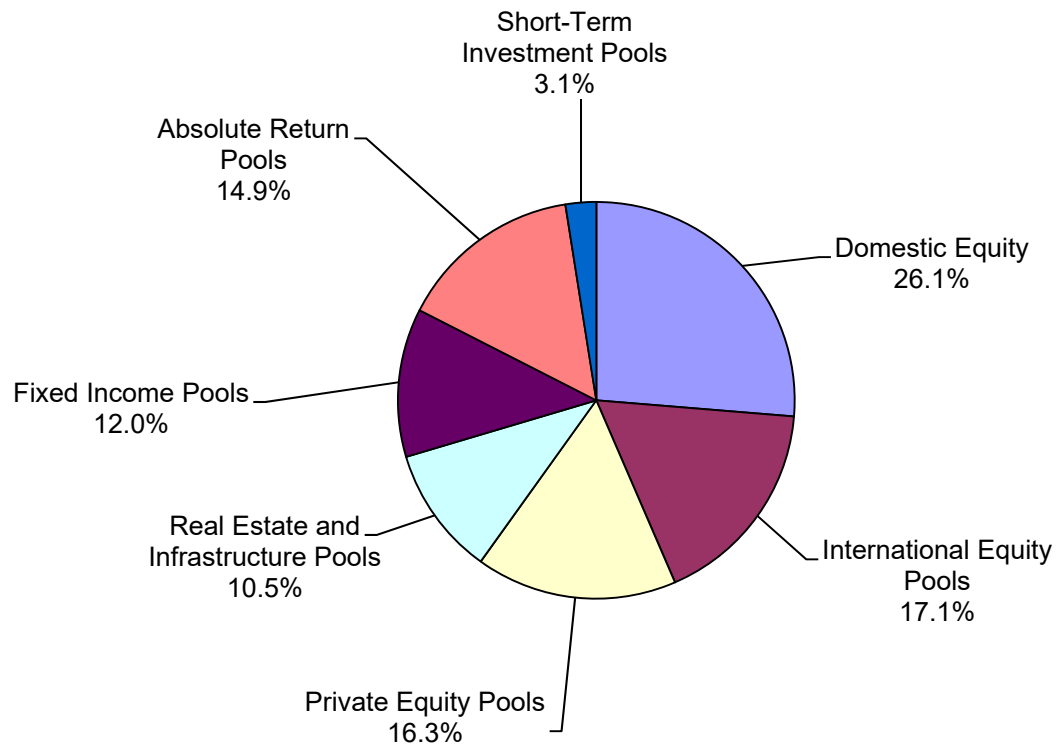
Short-Term Investment Pools (in thousands)

Short-Term Pooled Investments	\$ 216,742
Fixed Income Securities	245,516
Accrued interest	137
Total	<u><u>\$ 462,395</u></u>

INVESTMENT SECTION

Report on Investment Activity (continued)

ASSET ALLOCATION – SECURITY TYPE ONLY



INVESTMENT SECTION

Report on Investment Activity (continued)

Pension Plan Investment Results for the Period Ending September 30, 2018

Investment Category	Current Year	Annualized Rate of Return ¹		
		3 Years	5 Years	10 Years
Total Portfolio	11.5 %	11.0 %	10.1 %	8.4 %
Domestic Equity Pools	20.9	17.6	14.2	12.3
S&P 1500 Index	17.7	17.3	13.8	12.1
International Equity Pools	2.0	10.7	5.6	6.2
International Blended Benchmark ²	1.8	10.0	4.2	4.8
Private Equity Pools	19.5	12.9	15.1	11.4
Private Equity Blended Benchmark ³	17.7	15.2	16.7	15.5
Real Estate and Infrastructure Pools	12.3	10.2	12.4	4.7
NCREIF Property Blended Index ⁴	5.8	6.4	8.2	5.1
Fixed Income Pools	1.2	3.8	3.8	5.3
Barclays Aggregate Bond	(1.2)	1.3	2.2	3.8
Absolute Return Pools				
Total Absolute Return	6.0	4.0	4.7	2.6
HFRI Fund of Funds Cons 1 month lag	3.7	2.3	3.0	1.5
Total Real Return and Opportunistic	14.4	10.6	12.6	
Real Return and Opportunistic Benchmark ⁵	7.6	7.5	7.3	
Short Term Investment Pools	2.0	1.2	0.9	0.9
30 Day Treasury Bill	1.5	0.8	0.5	0.3

¹Calculations used a time-weighted rate of return based on the market rate of return in accordance with industry standards.

Excludes income and investment gains and losses from securities lending.

² As of 7/1/14 index is MSCI ACWI Ex-US Net. History 10/1/10 to 6/30/14 is MSCI ACWI Ex US Gross.

History 1/1/10 to 9/30/10 is S&P Developed BMI-EPAC Net 75/25.

History prior to 1/1/10 is S&P Developed BMI-EPAC Net 50/50.

³ As of 1/1/07, index is blend of S&P 500 plus 300 bps and 10 year yield plus 300 bps based on ending weights.

History prior to 1/1/07 is S&P500 plus 300 bps.

⁴ As of 10/1/05, index is NCREIF less 130 bp. History prior to 10/1/05 reflects NCREIF less 75 bp.

⁵ As of 8/1/18 Benchmark is 50% (CPI + 5%) and 50% (actuarial rate 7.05%).

History prior to 8/1/18 reflects 50% (CPI + 5%) and 50% (actuarial rate 8%)

INVESTMENT SECTION

Report on Investment Activity (continued)

OPEB Investment Results for the Period Ending September 30, 2018

Investment Category	Current Year	Annualized Rate of Return ¹	
		3 Years	5 Years
Total Portfolio	11.4 %	10.8 %	9.9 %
Domestic Equity Pools	21.0	17.6	14.2
S&P 1500 Index	17.7	17.3	13.8
International Equity Pools	2.0	10.7	5.6
International Blended Benchmark ²	1.8	10.0	4.2
Private Equity Pools	19.5	12.9	15.1
Private Equity Blended Benchmark ³	17.7	15.2	16.7
Real Estate and Infrastructure Pools	12.3	10.2	12.4
NCREIF Property Blended Index ⁴	5.8	6.4	8.2
Fixed Income Pools	1.2	3.8	3.8
Barclays Aggregate Bond	(1.2)	1.3	2.3
Absolute Return Pools			
Total Absolute Return	6.0	4.0	4.7
HFRI Fund of Funds Cons 1 month lag	3.7	2.3	3.0
Total Real Return and Opportunistic	14.4	10.6	12.6
Real Return and Opportunistic Benchmark ⁵	7.6	7.5	7.3
Short-Term Investment Pools	2.0	1.2	0.9
30-Day Treasury Bill	1.5	0.8	0.5

¹Calculations used a time-weighted rate of return based on the market rate of return in accordance with industry standards. Excludes income and investment gains and losses from securities lending.

² As of 7/1/14 index is MSCI ACWI Ex-US Net. History 10/1/10 to 6/30/14 is MSCI ACWI Ex US Gross.

History 1/1/10 to 9/30/10 is S&P Developed BMI-EPAC Net 75/25.

History prior to 1/1/10 is S&P Developed BMI-EPAC Net 50/50.

³ As of 1/1/07, index is blend of S&P 500 plus 300 bps and 10 year yield plus 300 bps based on ending weights.

History prior to 1/1/07 is S&P500 plus 300 bps.

⁴ As of 10/1/05, index is NCREIF less 130 bp. History prior to 10/1/05 reflects NCREIF less 75 bp.

⁵ As of 8/1/18 Benchmark is 50% (CPI + 5%) and 50% (actuarial rate 7.05%).

History prior to 8/1/18 reflects 50% (CPI + 5%) and 50% (actuarial rate 8%)

INVESTMENT SECTION

Largest Assets Held¹

Largest Stock Holdings (By Market Value) September 30, 2018

Rank	Shares	Stocks	Market Value
1	578,100	Apple Inc.	\$ 130,500,261
2	768,830	Microsoft Corp.	87,931,030
3	4,547,793	AGNC Investment Corp.	84,725,381
4	40,972	Amazon.com Inc.	82,067,248
5	50,618	Alphabet Inc. CL A	61,100,565
6	273,031	Berkshire Hathaway Inc CL B	58,458,691
7	5,575,269	Annaly Capital Management Inc.	57,035,005
8	359,347	Visa Inc. CL A	53,934,349
9	229,598	Home Depot Inc.	47,561,216
10	273,688	Facebook Inc.	45,010,671

Largest Bond Holdings (By Market Value)² September 30, 2018

Rank	Par Amount	Bonds & Notes	Market Value
1	48,308,503	US Treasury N/B 2.75% Due 02/15/2028	\$ 47,098,904
2	37,957,574	US Treasury N/B 3% Due 02/15/2048	36,529,717
3	35,533,485	US Treasury N/B 1.5% Due 05/15/2020	34,813,099
4	35,838,951	US Treasury N/B 2.25% Due 02/15/2027	33,734,813
5	30,777,876	US Treasury N/B 1.875% Due 07/31/2022	29,612,885
6	25,244,786	US Treasury N/B 2.25% Due 11/15/2027	23,629,514
7	23,973,205	US Treasury N/B 2.125% Due 05/15/2025	22,698,692
8	24,972,088	US Treasury N/B 1.625% Due 02/15/2026	22,661,195
9	21,326,937	Ford Motor Credit Co. LLC 3.548750% FRN Due 02/15/2023	21,208,616
10	20,119,752	AT&T Inc. 3.514250% FRN Due 06/12/2024	20,210,291

¹ A complete list of holdings is available from the Michigan Department of Treasury.

The System's investments are commingled in various pooled accounts. Amounts, par value and number of shares represent the System's pro-rata share based on its ownership of the investment pools.

² Largest Bond Holdings are exclusive of securities lending collateral.

INVESTMENT SECTION

Schedule of Investment Fees

The State Treasurer is the investment fiduciary and custodian of the System's funds pursuant to State law. Outside advisors are utilized to augment the State Treasurer's internal staff. 68.86% of the total investment portfolio is managed by fully discretionary outside advisors. The Michigan Department of Treasury's cost of operations applicable to the System for the fiscal year amounted to \$4,601 thousand or seven and eight tenths basis points (.078%) of the fair value of the Assets under Management of the State Treasurer.

Public Act 380 of 1965 created an Investment Advisory Committee (Committee) comprised of the directors of the Department of Licensing and Regulatory Affairs and the Department of Technology, Management & Budget, or their duly authorized representatives, and three public members appointed by the Governor with the advice and consent of the Senate. The public members serve without pay, but may be paid actual and necessary travel and other expenses. The Committee meets quarterly to review investments, goals and objectives and may submit recommendations to the State Treasurer. The Committee may also, by a majority vote, direct the State Treasurer to dispose of any holding which, in the Committee's judgment, is not suitable for the fund involved, and may by unanimous vote direct the State Treasurer to make specific investments.

Schedule of Investment Fees

Investment Managers' Fees:

	Assets under Management (in thousands)	Fees (in thousands)	Basis Points*
State Treasurer	\$ 4,694,412	\$ 4,601	7.8
Outside Advisors for			
Fixed Income	923,867	2,829	30.6
Absolute Return	2,205,703	10,248	46.5
International Equity	2,094,778	3,848	18.4
Domestic Equity	973,951	2,074	21.3
Private Equity	2,420,483	20,699	85.5
Real Estate and Infrastructure	1,554,703	15,187	97.7
Total	\$ 14,867,897	\$ 59,486	

Other Investment Services Fees:

Assets in Custody	\$ 14,734,342	\$ 1,387
Securities on Loan	668,255	844

- * Private Equity partnership agreements that define the management fees, the asset management fees range from 75 basis points of remaining assets under management to 250 basis points of the committed capital. For Real Estate/Infrastructure, the asset management fees range from 40 to 200 basis points. For Absolute Return, the asset management fees range from 0 to 200 basis points. These fees, in most cases, are netted against income.

INVESTMENT SECTION

Schedule of Investment Commissions

Fiscal Year Ended September 30, 2018

	Actual Commissions Paid ¹	Actual Number of Shares Traded ¹	Average Commission Per Share	Estimated Trade Costs Per Share	Estimated Research Costs Per Share	Estimated Trade Costs	Estimated Research Costs
Investment Brokerage Firms:							
Banc Of America Securities LLC	\$ 8,213	250,237	\$ 0.03	\$ 0.01	\$ 0.02	\$ 2,503	\$ 5,004
BTIG LLC	152,242	28,497,894	0.01	0.01	-	284,978	-
Capital Institutional Services Inc.	46,331	8,557,621	0.01	0.01	-	85,576	-
Citigroup Global Markets Inc.	5,578	557,737	0.01	0.01	-	5,578	-
Cowen & Company LLC	29,219	1,460,906	0.02	0.01	0.01	14,609	14,610
Credit Suisse Securities LLC	10,619	559,809	0.02	0.01	0.01	5,598	5,598
Drexel Hamilton LLC	9,106	1,821,282	0.01	0.01	-	18,213	-
J. P. Morgan Securities Inc.	13,117	679,104	0.02	0.01	0.01	6,791	6,791
Mischler Financial Group Inc.	3,344	167,190	0.02	0.01	0.01	1,672	1,672
Morgan Stanley & Co. Inc.	28,600	1,359,506	0.02	0.01	0.01	13,595	13,597
RBC Capital Markets	-	54	0.01	0.01	-	-	-
Stifel, Nicolaus & Co. Inc.	1,602	40,846	0.04	0.01	0.03	408	1,225
Wayne & Company	117,976	39,518,484	0.00	0.01	-	395,185	-
Total	\$ 425,947	83,470,670	\$ 0.02 ²	\$ 0.01	\$ 0.01	\$ 834,706	\$ 48,497

¹ Commissions are included in purchase and sale prices of investments. The commissions and shares represent the System's pro-rat share based on ownership of commission and share transactions in the investment pools.

² The average commission per share for all brokerage firms.

INVESTMENT SECTION

Investment Summary

Fiscal Year Ended September 30, 2018

	<u>Fair Value ¹</u>	<u>Percent of Total Fair Value</u>	<u>Investment & Interest Income²</u>	<u>Percent of Total Investment & Interest Income</u>
Fixed Income Pools	\$ 1,784,820,797	12.0 %	\$ 16,922,891	1.1 %
Domestic Equity Pools	3,885,796,403	26.1	680,484,127	43.8
Real Estate and Infrastructure Pools	1,554,702,602	10.5	182,288,972	11.7
Private Equity Pools	2,420,482,537	16.3	398,917,262	25.7
International Equity Pools	2,539,893,283	17.1	45,850,182	3.0
Absolute Return Pools	2,219,591,847	14.9	219,009,856	14.1
Short Term Investment Pools	<u>462,394,785 ³</u>	<u>3.1</u>	<u>9,493,240</u>	<u>0.6</u>
Total	<u><u>\$ 14,867,682,254</u></u>	<u><u>100.0 %</u></u>	<u><u>\$ 1,552,966,530</u></u>	<u><u>100.0 %</u></u>

¹ Fair Value excludes \$668,255,286, in securities lending collateral for fiscal year 2018.

² Total Investment & Interest Income excludes net security lending income of \$10,683,816 and unrealized loss of \$669,460 for securities lending collateral.

³ Short term investment pools fair value includes \$133,340,824 of equity in common cash.

ACTUARIAL SECTION

Actuary's Certification
Summary of Actuarial Assumptions and Methods
Schedules of Active Member Valuation Data
Prioritized Solvency Test
Analysis of System Experience
Summary of Plan Provisions

ACTUARIAL SECTION

Actuary's Certification



800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

October 25, 2018

Mr. David Devries, Director
Department of Technology, Management and Budget
and
The Retirement Board
Michigan State Employees' Retirement System
P.O. Box 30171
Lansing, Michigan 48909

Ladies and Gentlemen:

The basic financial objective of the Michigan State Employees' Retirement System (SERS) is to establish and receive contributions which when combined with present assets and future investment return will be sufficient to meet the financial obligations of the System to present and future benefit recipients. The progress towards meeting those financial objectives is illustrated in the Schedules of Funding Progress and the Schedules of Employer Contributions.

We performed actuarial funding valuations and issued actuarial funding reports for the SERS pension and retiree health (i.e., OPEB) plans as of September 30, 2017. The purpose of the September 30, 2017 annual actuarial valuations was to determine the contribution requirements for the fiscal year ending September 30, 2020, to measure the System's funding progress, and to provide actuarial information in connection with applicable Governmental Accounting Standards Board statements. The valuations should not be relied upon for any other purpose. The valuation process develops employer contributions that are sufficient to fund the System's normal cost (i.e., the costs assigned by the valuation method to the year of service about to be rendered), as well as to fund any unfunded accrued liabilities over a reasonable period. The valuation was completed based upon population data, asset data and plan provisions in effect on September 30, 2017.

In addition to the funding valuation reports, separate reports are issued to provide financial reporting information for SERS in accordance with Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 (pension benefits) and Nos. 74 and 75 (retiree health benefits, or OPEB). Reports containing the actuarial results of the financial reporting valuations are produced annually after the publication of this letter. Financial reporting information is based upon a measurement date of September 30, 2018 for GASB Statement Nos. 67 and 68 and for GASB Statement Nos. 74 and 75.

The valuations were based upon information provided by the System's administrative staff concerning System benefit provisions, financial transactions, and individual members, terminated members, retirees and beneficiaries. We checked the data for internal and year to year consistency, but did not audit the data. As a result, we do not assume responsibility for the accuracy or completeness of the data provided by the System's administrative staff. The actuary summarizes and tabulates population data in order to analyze long term trends. The System's auditor audits the actuarial data annually.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

Actuary's Certification (continued)

Mr. David Devries
October 25, 2018
Page 2

Annual actuarial valuations are based upon assumptions regarding future activity in specific risk areas including the rate of investment return and payroll growth, eligibility for the various classes of benefits and longevity among retired lives. These assumptions are adopted by the Board and the Department after considering the advice of the actuary and other professionals. Each actuarial valuation takes into account all prior differences between actual and assumed experience in each risk area and adjusts the contribution requirements as needed.

The following schedules in the Financial Section, the Actuarial Section, and the Statistical Section of the CAFR were prepared by the Department of Financial Services based upon certain information presented in the previously mentioned funding and financial reporting valuation reports:

Financial Section

- Note 1 - Table of System's Membership
- Summary of Actuarial Assumptions
- Schedules of Employer Contributions – Pension and OPEB Benefits
- Schedules of Changes in the Net Pension Liability (NPL) and the Net OPEB Liability (NOL) and Related Ratios
- Schedules of Contributions Multiyear
- Sensitivity of the NPL to Changes in the Discount Rate
- Sensitivity of the NOL to Changes in the Discount Rate
- Sensitivity of the NOL to Changes in the Healthcare Cost Trend Rate Assumption

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Percent of Eligible Active Members Retiring Within Next Year
- Separation from Active Employment Before Age and Service Retirement and Individual Pay Increase Assumptions
- Schedule of Active Member Pension Valuation Data
- Schedule of Changes in the Retirement Rolls
- Prioritized Solvency Tests
- Analyses of System Experience
- Schedule of Active Member OPEB Valuation Data
- Schedule of Changes in the OPEB Rolls

Statistical Section

- Schedule of Retired Members by Type of Retirement
- Schedule of Retired Members by Type of Pension Benefit (Selected Option)
- Schedule of Retired Members by Type of Health Benefit
- Schedule of Average Benefit Payments – Pension, Medical, Dental, and Vision
- Schedules of Funding Progress



ACTUARIAL SECTION

Actuary's Certification (continued)

Mr. David Devries

October 25, 2018

Page 3

In addition, we provided the information for the Schedule of OPEB Unfunded Actuarial Accrued Liability by Tier.

The September 30, 2017 funding valuations for the pension and OPEB plans were based upon assumptions that were recommended in connection with a study of System experience covering the period from October 1, 2007 through September 30, 2012. The September 30, 2018 financial reporting valuations are based upon assumptions that were recommended in connection with a study of System experience covering the period from October 1, 2012 through September 30, 2017. Future actuarial measurements may differ significantly from those presented in the annual valuations due to such factors as experience differing from that anticipated by actuarial assumptions, or changes in plan provisions, actuarial assumption/methods or applicable law. Due to the limited scope of the assignment, we did not perform an analysis of the potential range of future measurements.

The signing actuaries are independent of the plan sponsor.

The actuarial valuations of SERS were performed by qualified actuaries in accordance with standards of practice prescribed by the Actuarial Standards Board and in compliance with applicable State statutes. The assumptions and methods used for funding and financial reporting purposes are in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Louise M. Gates and Mita D. Drazilov are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. It is our opinion that the calculated employer contribution meets the financial objective of the Retirement System.

Respectfully submitted,



Louise M. Gates, ASA, FCA, MAAA



Mita D. Drazilov, ASA, FCA, MAAA



Summary of Actuarial Assumptions & Methods

1. The investment return rate used in the valuations was 7.0% per year net of expenses, compounded annually. This rate of return is not the assumed real rate of return. The real rate of return is the rate of investment return in excess of the inflation rate. Considering other financial assumptions, this investment return rate translates to an assumed long-term real rate of return of 3.5%. Adopted 2017.
2. The healthy life mortality table used in evaluating allowances to be paid was the RP-2000 Combined Healthy Mortality Table, adjusted for mortality improvements to 2015 using projection scale BB. Adopted 2014.
3. Sample probabilities of regular, unreduced retirement are shown in Schedule 1 on the next page. Adopted 2010.
4. Sample probabilities of withdrawal from service and disability, together with individual pay increase assumptions, are shown in Schedule 2 on the next page of this report. Adopted withdrawal 2014 and disability/pay increase 2010.
5. The active member population is closed to new hires. This will result in a gradual reduction in the total active member payroll over time.
6. An individual entry age actuarial cost method of valuation was used in determining actuarial liabilities and normal cost. Adopted 1975. Unfunded actuarial accrued liabilities are financed over a declining 40-year period beginning October 1, 1996. Adopted 1996.
7. The Department of Technology, Management & Budget approved the use of market value of assets as of September 30, 2006, for valuation purposes. For investment gains and losses that occur after that date, a 5-year smoothing technique will be used. Specifically, the excess (shortfall) of actual investment income (including interest, dividends, realized and unrealized gains or losses) over the imputed-income at the valuation interest rate is considered the gain (loss), which is spread over five years. Adopted 2007.
8. The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the actuary.
9. The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA). The assumptions used in the actuarial valuations were adopted by the System's Board and the Department of Technology, Management & Budget after consulting with the actuary.
10. A 5-year experience investigation, covering the period from October 1, 2007, through September 30, 2012, was completed in 2014. The purpose of the study was to analyze the actual experience of the System versus that anticipated by actuarial assumptions then in use. Adopted 2014.
11. Gabriel Roeder Smith and Co. was awarded the actuarial and consulting services contract beginning October 4, 2006.

ACTUARIAL SECTION

Summary of Actuarial Assumptions & Methods (continued)

SCHEDULE 1

Percent of Eligible Active Members Retiring Within Next Year			
Retirement Ages	Correction Officers	Conservaton Officers	OtherMembers
45		28 %	
48		28	
51	27 %	28	
55	16	28	15 %
58	12	28	10
61	18	28	13
64	22	40	16
67	30	50	21
70	100	100	50

SCHEDULE 2

Separation From Active Employment Before Age & Service Retirement & Individual Pay Increase Assumptions

Sample Ages	Years of Service	Percent of Active Members Withdrawing Within Next Year (Men and Women)	Percent of Active Members Becoming Disabled Within Next Year		Percent Increase in Pay During Next Year
			Non-Duty Disabilities	Duty Disabilities	
All	0	12.00 %			
	1	8.50			
	2	6.50			
	3	5.00			
	4	4.00			
25	5 & Over	3.50	.03 %	0.00 %	9.5 %
35	"	2.38	.10	0.01	4.7
45	"	1.84	.34	0.04	4.0
55	"	1.60	.92	0.08	3.9
60	"	1.60	2.10	0.11	3.5

ACTUARIAL SECTION

Schedules of Active Member Valuation Data

Schedule of Active Member Pension Valuation Data						
Valuation Date Sept. 30	Number	Reported Annual Payroll*	Average Annual Pay	Increase (Decrease)	Average Age	Average Service
2008	28,568	\$ 1,763,672	\$ 61,736	4.4 %	51.4	22.7
2009	27,455	1,734,325	63,170	2.3	52.1	23.5
2010	25,478	1,621,709	63,651	0.8	52.6	24.1
2011	19,650	1,276,058	64,939	2.0	51.9	23.3
2012 ¹	17,860	1,551,591	64,703	(0.4)	52.5	24.2
2013	16,466	1,081,729	65,695	1.5	53.2	25.0
2014	14,985	1,010,987	67,467	2.7	53.7	25.8
2015	13,404	922,093	68,792	2.0	54.2	26.5
2016	11,965	850,584	71,089	3.3	54.7	27.2
2017	10,459	780,135	74,590	4.9	55.1	27.8

¹ Excludes 516 individuals who became active members of Defined Contribution Plan during the 2011-2012 plan year

* In thousands of dollars

Schedule of Active Member OPEB Valuation Data						
Valuation Date Sept. 30	Number	Reported Annual Payroll*	Average Annual Pay	Increase (Decrease)	Average Age	Average Service
2012	50,609	\$ 2,895.2	\$ 57,207		45.4	13.3
2013	50,419	2,881.1	57,144	(0.11) %	45.5	13.4
2014	49,744	2,857.3	57,441	0.52	45.5	13.4
2015	49,020	3,208.6	61,784	7.56	45.5	13.3
2016	53,308	2,989.1	56,072	(9.25)	44.4	12.2
2017	49,348	3,243.7	65,730	17.22	45.0	12.7

* In millions of dollars.

ACTUARIAL SECTION

Schedules of Active Member Valuation Data (continued)

Schedule of Changes in the Retirement Rolls

Year Ended Sept. 30	Added to Rolls		Removed from Rolls		Rolls - End of Year		Increase in Annual Allowances	Average Annual Allowances
	No.	Annual Allowances*	No.	Annual Allowances*	No.	Annual Allowances*		
2008	2,653	\$ 63,219	1,461	\$ 22,625	48,078	\$ 842,612	5.1	\$ 17,526
2009	2,423	61,683	1,472	23,531	49,029	880,763	4.5	17,964
2010	2,937	78,647	1,504	23,518	50,462	934,092	6.1	18,511
2011	6,656	205,413	1,470	25,542	55,648	1,113,963	19.3	20,018
2012	2,186	59,238	1,546	29,801	56,288	1,143,400	2.6	20,313
2013	2,181	63,061	1,615	31,132	56,854	1,175,329	2.8	20,673
2014	2,421	69,805	1,660	32,801	57,615	1,212,333	3.1	21,042
2015	2,490	76,224	1,652	33,955	58,453	1,254,602	3.5	21,463
2016	2,306	71,644	1,721	35,486	59,038	1,290,760	2.9	21,863
2017	2,452	78,842	1,806	38,217	59,684	1,331,385	3.1	22,307

* In thousands of dollars.

Schedule of Changes in the OPEB Rolls

Year Ended Sept. 30	Added to Rolls		Removed from Rolls		Rolls - End of Year		Increase in Annual Allowances	Average Annual Allowances
	No.	Annual Allowances*	No.	Annual Allowances*	No.	Annual Allowances*		
2011					50,194	\$ 476,201		
2012	1,915	\$ 22,870	1,530	\$ 27,052	45,491	472,019	(0.9) %	\$ 9,332
2013	1,852	20,413	1,630	46,270	50,801	446,162	(5.5)	8,783
2014	2,052	22,366	1,643	25,398	51,210	443,130	(0.7)	8,653
2015	2,168	24,216	1,630	24,904	51,748	442,442	(0.2)	8,550
2016	1,989	60,150	1,716	22,012	52,021	480,580	8.6	9,238
2017	2,080	56,820	1,825	25,580	52,276	511,820	6.5	9,791

* In thousands of dollars.

Notes:

No. refers to number of retiree health contracts

Annual allowances added to rolls includes increases due to medical inflation and contract changes.

Annual allowances removed from rolls includes decreases due to contract changes.

Prioritized Solvency Test

The System's funding objective is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will pay all promised benefits when due, the ultimate test of financial soundness. Testing for level contribution rates is the long-term solvency test.

A prioritized solvency test is another means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with: (1) active member contributions on deposit; (2) the liabilities for future benefits to present retired lives; and (3) the liabilities for service already rendered by active and inactive members. In a system that has been following the discipline of level percent of payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) are normally partially covered by the remainder of present assets. Generally, if the System has been using level-cost financing, the funded portion of liability 3 will increase over time. Liability 3 being fully funded is not necessarily a by-product of level percent of payroll funding methods.

The schedules that follow illustrate the history of the liabilities of the System and are indicative of the System's policy of following the discipline of level percent of payroll financing.

Other Postemployment Benefits (\$ in millions)								
Valuation Date	Actuarial Accrued Liability (AAL)			Valuation Assets	Portion of AAL Covered by Assets			
	(1) Active Member Contributions	(2) Retirants and Beneficiaries	(3) Active and Inactive Members (Employer Financed Portion) ³		(1)	(2)	(3)	(4) ¹
Sept. 30								
2008		\$ 6,759	\$ 6,783		0.0 %	0.0 %	0.0 %	0.0 %
2009		6,425	6,193		0.0	0.0	0.0	0.0
2010		7,655	7,011		0.0	0.0	0.0	0.0
2011		8,418	5,833		0.0	0.0	0.0	0.0
2012 ²		5,633	3,124	\$ 344	0.0	6.1	0.0	3.9
2013		5,335	2,864	663	0.0	12.4	0.0	8.1
2014 ²		5,792	2,957	1,058	0.0	18.3	0.0	12.1
2015		6,047	2,951	1,302	0.0	21.5	0.0	14.5
2016 ²		6,680	3,317	1,602	0.0	24.0	0.0	16.0
2017		6,414	3,035	2,047	0.0	31.9	0.0	21.7
2017 ²		6,498	3,097	2,047	0.0	31.5	0.0	21.3

¹ Percents funded on a total valuation asset and total actuarial accrued liability basis.

² Revised actuarial assumptions and/or methods.

³ Includes liability for 'Monetized' members

ACTUARIAL SECTION

Prioritized Solvency Test (continued)

Pension Benefits
(\$ in millions)

Valuation Date	Actuarial Accrued Liability (AAL)			Valuation Assets	Portion of AAL Covered by Assets			
	(1)	(2)	(3)					
	Active Member	Retirants and	Active and Inactive Members (Employer					
Sept. 30	Contributions	Beneficiaries	Financed Portion)		(1)	(2)	(3)	(4) ¹
2008	\$ 119	\$ 8,361	\$ 5,286	\$ 11,403	100.0 %	100.0 %	55.3 %	82.8 %
2009	127	8,681	5,426	11,107	100.0	100.0	42.4	78.0
2010	138	9,151	5,239	10,782	100.0	100.0	28.5	74.2
2010 ¹	138	9,265	5,457	10,782	100.0	100.0	25.3	72.6
2011	93	11,197	4,307	10,212	100.0	90.4	0.0	65.5
2012	121	11,392	4,141	9,447	100.0	81.9	0.0	60.3
2013	162	11,612	3,874	9,438	100.0	79.9	0.0	60.3
2014	195	11,869	3,707	9,962	100.0	82.3	0.0	63.2
2014 ¹	195	12,149	3,829	9,962	100.0	80.4	0.0	61.6
2015	220	12,483	3,534	10,417	100.0	81.7	0.0	64.2
2016 ¹	239	13,240	3,537	10,937	100.0	80.8	0.0	64.3
2017	246	13,549	3,313	11,407	100.0	82.4	0.0	66.7
2017 ¹	246	14,104	3,531	11,884	100.0	82.5	0.0	66.5

¹ Revised actuarial assumptions.

ACTUARIAL SECTION

Analysis of System Experience

ANALYSIS OF SYSTEM EXPERIENCE - PENSION Gains/(Losses) in Accrued Liabilities During Year Ended September 30, 2017 Resulting from Differences Between Assumed Experience & Actual Experience

<u>Type of Activity</u>	<u>Gain/(Loss)</u>
1. Retirements (including Disability Retirement). If members retire at older ages or with lower final average pay than assumed, there is a gain. If younger ages or higher average pays, a loss.	\$ (29,688,269)
2. Withdrawal From Employment (including death-in-service). If more liabilities are released by withdrawals and deaths than assumed, there is a gain. If smaller releases, a loss.	2,398,954
3. Pay Increases . If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(59,909,048)
4. Investment Income . If there is greater investment income than assumed, there is a gain. If less income, a loss.	726,397,671
5. Death After Retirement . If retirants live longer than assumed, there is a loss. If not as long, a gain.	(9,629,805)
6. Rehires . Rehires into the System will generally result in an actuarial loss.	-
7. Other . Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, etc.	(10,800,278)
8. Composite Gain (or Loss) During Year	<u>\$ 618,769,225</u>

<u>Type of Activity</u>	<u>Gain/(Loss)</u>
1. Premiums . Gains and losses from actual premiums in valuation year versus that assumed from prior valuation.	\$ 811,399,860
2. Investment Income . If there is greater investment income than assumed, there is a gain. If less income, a loss	89,637,015
3. Demographic and Other . Gain and losses resulting from demographic experience data adjustments, timing of financial transactions, etc.	<u>104,517,090</u>
4. Composite Gain/(Loss) During Year	<u><u>\$ 1,005,553,965</u></u>

ACTUARIAL SECTION

Summary of Plan Provisions

Our actuarial valuation of the System as of September 30, 2017, is based on the present provisions of the Michigan State Employees' Retirement Act (Public Act 240 of 1943, as amended).

REGULAR RETIREMENT (NO REDUCTION FACTOR FOR AGE)

Eligibility – Age 55 with 30 years service, or age 60 with 10 or more years of service. Corrections Officers may retire at age 51 with 25 or more years of service, or age 56 with 10 or more years of service. Conservation Officers may retire after 25 years of service regardless of age.

Annual Amount – Total service times 1.5% of FAC. For members with 20 or more years of service, a \$3,000 minimum annual benefit is payable. Corrections Officers receive an additional temporary supplement to age 62 equal to the product of supplemental service times 0.5% of FAC. Conservation Officers retiring after 25 years receive a benefit equal to 60% of FAC.

EARLY RETIREMENT (AGE REDUCTION FACTOR USED)

Eligibility – Age 55 with 15 or more years of service.

Annual Amount – Computed as regular retirement benefit but reduced by 0.5% for each month under age 60.

DEFERRED RETIREMENT (VESTED BENEFIT)

Eligibility – 10 years of service (five years for unclassified persons in the executive or legislative branch). Benefit commences at age 60

Annual Amount – Regular retirement benefit based on service and final average compensation at time of termination.

DUTY DISABILITY RETIREMENT

Eligibility – No age or service requirement.

Annual Amount – Disability age 60+: Computed as regular retirement benefit with minimum benefit based on 10 years service. Disability prior to age 60: To age 60, benefit is computed as a regular retirement benefit using service at the time of disability retirement with a minimum benefit of \$6,000 per year. Additional limitation such that benefit plus workers' compensation does not exceed final compensation. At age 60, benefit is recomputed as a regular retirement benefit with service granted for period in receipt of disability benefit before age 60. If the member dies before age 60, benefits are payable to a surviving spouse computed as a regular retirement benefit but based on service at time of disability retirement plus elapsed time between date of retirement and age 60.

NON DUTY DISABILITY RETIREMENT

Eligibility – 10 years of service.

Annual Amount – Computed as regular retirement benefit based on service and FAC at time of disability. Minimum annual benefit is \$600. Eligible Group 2 and Group 3 members may elect this benefit (in lieu of PA 264 benefits).

Summary of Plan Provisions (continued)

DUTY DEATH BEFORE RETIREMENT

Eligibility – No age or service requirement.

Annual Amount – Accumulated employee contributions are refunded. Surviving spouse receives annual benefit computed as a regular retirement benefit as if the deceased member retired the day before date of death and elected Option A. Benefit is based on member's service at time of death, or 10 years of service, whichever is greater. A minimum benefit of \$6,000 per year is payable. Children under age 21 each receive equal share of one-half of the benefit payable (surviving spouse receives the other half), to a maximum of one-half for all children. A given child's share of benefits terminates upon the child's marriage, death or attainment of age 21. In the event that there is no surviving spouse, the benefit is allocated equally among all children subject to the limitations described above. In the event that there is no surviving spouse or eligible children, benefits may be paid to an eligible, dependent parent. Benefits end upon the marriage or death of the surviving parent. Additional limitation such that benefit plus workers' compensation does not exceed final compensation.

NON DUTY DEATH BEFORE RETIREMENT

Eligibility - 10 years of service. In the case of a deceased vested former member, the survivor benefit commences when the deceased former member would have attained age 60.

Annual Amount - Computed as regular retirement benefit but reduced in accordance with a 100% joint and survivor election.

POST RETIREMENT COST-OF-LIVING ADJUSTMENTS

One-time upward adjustments have been made in 1972, 1974, 1976, 1977 and 1987. Beginning in 1983, some benefit recipients share in a distribution of a portion of investment income earned in excess of 8% annually (supplemental payment). Beginning in 1988, all benefit recipients are eligible for automatic 3% annual (non-compounded) benefit increases, with a maximum \$300 annual increase. Eligibility for the above benefits:

Retired before October 1, 1987 Greater of supplemental payment or the combination of the 1987 one-time adjustment and the automatic increases.

Retired on or after October 1, 1987 Automatic increases only.

POST RETIREMENT HEALTHCARE BENEFITS

Persons in receipt of retirement allowance (including members who did not retire directly from the System, but come from a vested deferred status), and their dependents, are eligible for 90% System paid health insurance coverage and 90% System paid dental and vision insurance

MEMBER CONTRIBUTIONS

Group 1 Members: 4% of annual pay effective April 1, 2012.

Group 2 Members: 4% of annual pay effective April 1, 2012 until the date of transfer to DC pension plan.

Group 3 Members: N/A

ACTUARIAL SECTION

Summary of Plan Provisions (continued)

DEFINED CONTRIBUTION LEGISLATION (PUBLIC ACT 487 OF 1996)

New state employees hired on or after March 31, 1997 become participants in Tier 2 (*i.e.*, a defined contribution plan) rather than Tier 1 (*i.e.*, the above described defined benefit plan).

Active members on March 30, 1997 could irrevocably elect to terminate membership in Tier 1 and become participants in Tier 2. Elections had to be in writing and submitted between January 2, 1998 and April 30, 1998. Such members became Tier 2 participants on June 1, 1998, and had the actuarial present value of their Tier 1 accrued benefit transferred into Tier 2 by September 30, 1998.

A defined benefit disability pension or death-in-service pension may be payable if a Tier 2 participant becomes disabled or dies in service.

Former Tier 1 Members

A former non-vested member who is reemployed on or after January 1, 2014 is not eligible for membership in Tier 1. This type of member shall become a qualified participant in Tier 2, and shall be treated as being first employed by the State as of his or her date of reemployment.

STATISTICAL SECTION

Schedules of Additions by Source
Schedules of Deductions by Type
Schedules of Changes in Fiduciary Net Position
Schedules of Benefits and Refunds by Type
Schedules of Retired Members by Type of Benefit
Schedules of Funding Progress
Schedule of Other Postemployment Benefits
Schedules of Average Benefit Payments
Ten Year History of Membership

STATISTICAL SECTION

This part of the System's comprehensive annual financial report presents detailed information as a context for understanding what the information in the financial statements, note disclosures, and required supplementary information says about the System's overall financial health.

Contents

Financial Trends

These schedules contain trend information to help the reader understand how the System's financial performance and fiscal health has changed over time. The schedules are presented for the last ten fiscal years. Schedules included are:

- Schedule of Pension Plan Additions by Source
- Schedule of OPEB Plan Additions by Source
- Schedule of Pension Plan Deductions by Type
- Schedule of OPEB Plan Deductions by Type
- Schedule of Changes in Fiduciary Net Position – Pension Plan
- Schedule of Changes in Fiduciary Net Position – OPEB Plan
- Schedule of Pension Benefit and Refunds by Type
- Schedule of OPEB Benefits and Refunds by Type

Operating Information

These schedules contain contextual information to assist the reader's understanding of how the System's financial information relates to the combination of participating members and the benefits it provides. Schedules are presented for the last ten fiscal years, except where noted. Schedules included are:

- Schedule of Retired Members by Type of Pension Benefit
- Schedule of Retired Members by Type of Other Postemployment Benefits
- Schedule of Retired Members by Type of Retirement
- Schedule of Funding Progress – Pension Plan
- Schedule of Funding Progress – OPEB Plan
- Schedule of Other Postemployment Benefits
- Schedule of Average Benefit Payments – Pension
- Schedule of Average Benefit Payments – Health
- Schedule of Average Benefit Payments – Dental
- Schedule of Average Benefit Payments – Vision
- Ten Year History of Membership

STATISTICAL SECTION

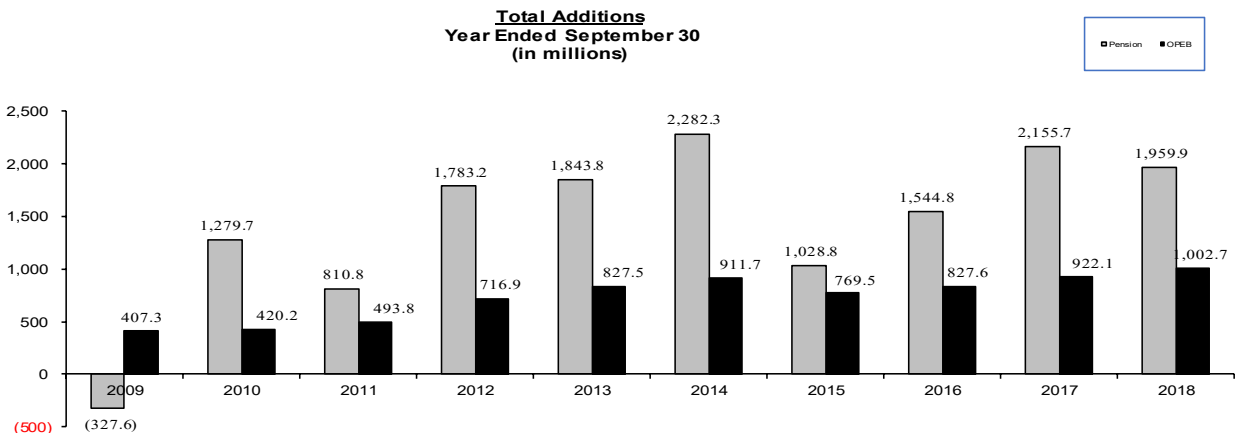
Schedules of Additions by Source

Schedule of Pension Plan Additions by Source Last Ten Years

Fiscal Year Ended Sept. 30	Member Contributions	Employer Contributions		Net Investment & Other Income	Total
		Dollars	% of Annual Covered Payroll		
2009	\$ 6,994,975	\$ 343,787,486	19.8 %	\$ (678,361,614)	\$ (327,579,153)
2010	26,055,668	369,952,868	22.8	883,696,454	1,279,704,990
2011	25,830,556	424,546,805	32.1	360,432,214	810,809,575
2012	33,290,784	419,926,997	36.3	1,330,021,741	1,783,239,522
2013	53,035,321	604,845,495	55.9	1,185,983,179	1,843,863,995
2014	47,527,233	705,100,454	70.0	1,529,625,882	2,282,253,569
2015	46,689,032	749,487,469	81.3	232,642,604	1,028,819,105
2016	46,665,882	716,464,627	84.2	781,651,240	1,544,781,748
2017	40,838,900	703,130,797	23.1	1,411,689,735	2,155,659,433
2018	35,598,366	650,739,520	20.1	1,273,573,539	1,959,911,425

Schedule of OPEB Plan Additions by Source Last Ten Years

Fiscal Year Ended Sept. 30	Member Contributions	Employer Contributions		Net Investment & Other Income	Total
		Dollars	% of Annual Covered Payroll		
2009	\$ 20,982,595	\$ 362,419,285	20.9 %	\$ 23,861,475	\$ 407,263,355
2010	20,905,488	360,125,502	12.3	39,150,651	420,181,641
2011	27,647,644	388,196,118	30.4	77,916,883	493,760,645
2012	27,431,916	648,881,078	22.4	40,613,600	716,926,594
2013	43,590,023	688,348,987	23.9	95,530,670	827,469,680
2014	40,441,402	700,938,446	24.5	170,312,487	911,692,335
2015	37,687,750	664,368,713	21.9	67,437,137	769,493,600
2016	38,661,386	617,662,359	20.7	171,309,486	827,633,231
2017	27,000	643,568,646	23.1	278,495,329	922,090,975
2018		688,884,013	22.1	313,330,737	1,002,214,750



STATISTICAL SECTION

Schedules of Deductions by Type

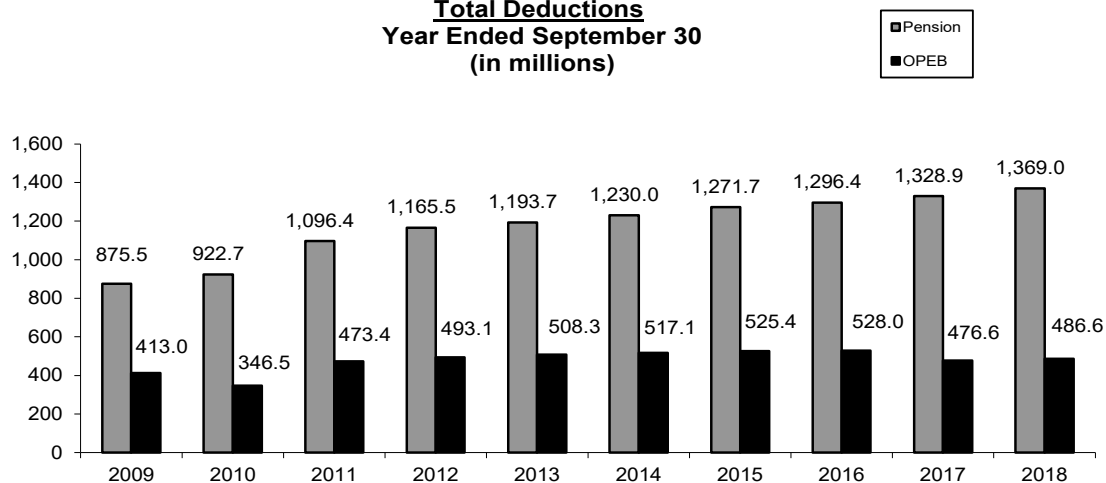
Schedule of Pension Plan Deductions by Type Last Ten Years

Fiscal Year Ended Sept. 30	Benefit Payments	Refunds and Transfers	Administrative and Other Expenses	Total
2009	\$ 870,278,863	\$ 366,039	\$ 4,865,232	\$ 875,510,134
2010	917,328,820	315,367	5,073,446	922,717,633
2011	1,089,822,880	474,986	6,079,017	1,096,376,883
2012	1,156,035,451	188,926	9,253,880	1,165,478,257
2013	1,187,911,357	114,053	5,658,318	1,193,683,728
2014	1,222,881,091	151,929	6,930,656	1,229,963,676
2015	1,265,335,477	144,115	6,227,748	1,271,707,340
2016	1,289,597,875	130,258	6,628,719	1,296,356,853
2017	1,322,339,410	318,670	6,284,973	1,328,943,054
2018	1,362,275,032	205,121	6,488,354	1,368,968,507

Schedule of OPEB Plan Deductions by Type Last Ten Years

Fiscal Year Ended Sept. 30	Benefit Payments	Refunds and Transfers	Administrative and Other Expenses	Total
2009	\$ 392,135,386	\$ 2,431	\$ 20,896,664	\$ 413,034,481
2010	330,512,704	10,741	15,955,963	346,479,408
2011	456,878,993	21,085	16,536,168	473,436,246
2012	476,508,499	16,904	16,618,156	493,143,559
2013	485,707,110	14,735	22,603,899	508,325,744
2014	491,569,369	22,624	25,536,117	517,128,110
2015	500,629,557	17,402	24,754,938	525,401,896
2016	502,316,967	39,053	25,605,860	527,961,880
2017	452,299,965	27,039	24,317,443	476,644,447
2018	461,375,750	14,937	25,231,700	486,622,386

Total Deductions
Year Ended September 30
(in millions)



STATISTICAL SECTION

This page was intentional left blank.

STATISTICAL SECTION

Schedules of Changes in Fiduciary Net Position

Schedule Of Changes In Fiduciary Net Position – Pension Plan

Last Ten Years (in thousands)

	Fiscal Year			
	2009	2010	2011	2012
Member contributions	\$ 6,995	\$ 26,056	\$ 25,831	\$ 33,291
Employer contributions	343,787	369,953	424,547	419,927
Net investment income	(678,588)	883,511	360,284	1,329,925
Transfer from other systems	93	50	2	
Transfer from pension/OPEB Plan				
Miscellaneous income	133	135	146	96
Total Additions	<u>(327,579)</u>	<u>1,279,705</u>	<u>810,810</u>	<u>1,783,240</u>
Pension benefits	870,279	917,329	1,089,823	1,156,035
Refunds of contributions	316	299	470	189
Transfer to other systems	50	17	5	
Transfer to pension/OPEB Plan				
Administrative and Other Expenses	4,865	5,073	6,079	9,254
Total Deductions	<u>875,510</u>	<u>922,718</u>	<u>1,096,377</u>	<u>1,165,478</u>
Changes in net position	<u>\$ (1,203,089)</u>	<u>\$ 356,987</u>	<u>\$ (285,567)</u>	<u>\$ 617,762</u>

Schedule Of Changes In Fiduciary Net Position – OPEB Plan

Last Ten Years (in thousands)

	Fiscal Year			
	2009	2010	2011	2011
Member contributions	\$ 20,983	\$ 20,905	\$ 27,648	\$ 27,432
Employer contributions	362,419	360,126	388,196	648,881
Other governmental contributions	21,987	27,058	64,773	23,774
Net investment income	1,359	11,815	12,851	16,592
Transfer from other systems				
Transfer from pension/OPEB Plan				
Miscellaneous income	516	278	293	248
Total Additions	<u>407,263</u>	<u>420,182</u>	<u>493,761</u>	<u>716,927</u>
Health care benefits	392,135	330,513	362,598	476,508
Refunds of contributions	2	11		17
Transfer to other systems				
Transfer to pension/OPEB Plan				
Administrative and Other Expenses	20,897	15,956		16,618
Total Deductions	<u>413,034</u>	<u>346,479</u>	<u>362,598</u>	<u>493,144</u>
Changes in net position	<u>\$ (5,771)</u>	<u>\$ 73,702</u>	<u>\$ 131,163</u>	<u>\$ 223,783</u>

STATISTICAL SECTION

Schedules of Changes in Fiduciary Net Position (continued)

Fiscal Year (continued)					
2013	2014	2015	2016	2017	2018
\$ 53,035	\$ 47,527	\$ 46,688	\$ 46,666	\$ 40,839	\$ 35,598
604,845	705,100	749,487	716,465	703,131	650,740
1,185,726	1,529,583	232,588	781,528	1,411,395	1,273,509
1		1	3	20	
256	43	54	120	274	64
1,843,864	2,282,253	1,028,819	1,544,782	2,155,659	1,959,911
1,187,911	1,222,881	1,265,335	1,289,598	1,322,339	1,362,275
105	152	144	130	318	205
9				1	
5,658	6,931	6,228	6,629	6,285	6,488
1,193,684	1,229,964	1,271,707	1,296,357	1,328,943	1,368,968
\$ 650,180	\$ 1,052,290	\$ (242,888)	\$ 248,425	\$ 826,716	\$ 590,943

Fiscal Year (Continued)					
2013	2014	2015	2016	2017	2018
\$ 43,590	\$ 40,441	\$ 37,688	\$ 38,661	\$ 27	
688,349	700,938	664,369	617,662	643,569	\$ 688,884
41,514	54,945	49,292	68,990	59,762	83,620
53,592	115,308	18,034	102,120	217,955	229,539
425	60	111	199	778	172
827,470	911,692	769,494	827,633	922,091	1,002,215
485,707	491,569	500,630	502,317	452,300	461,376
15	23	17	39	27	15
22,604	25,536	24,755	25,606	24,317	25,232
508,326	517,128	525,402	527,962	476,644	486,622
\$ 319,144	\$ 394,564	\$ 244,092	\$ 299,671	\$ 445,447	\$ 515,592

STATISTICAL SECTION

Schedules of Benefits and Refunds by Type

Schedule of Pension Benefits and Refunds by Type
Last Ten Years

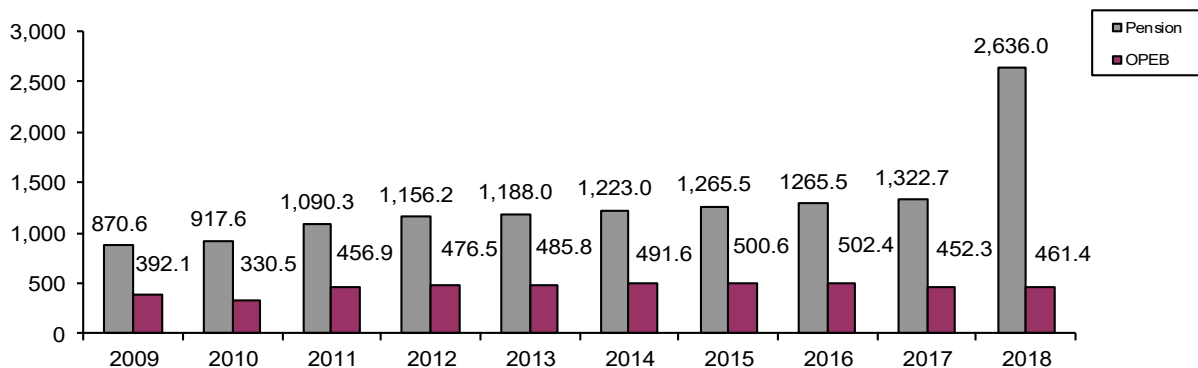
Fiscal Year Ended Sept. 30	Regular Benefits*	Disability Benefits	Survivor Benefits	Refunds			Investment Income	Total
				Employer	Employee	Retired Benefits		
2009	\$ 752,155,935	\$ 40,876,663	\$ 77,246,265	\$ 177,079	\$ 133,294	\$ 5,618		\$ 870,594,854
2010	793,100,996	42,118,014	82,109,810	12,698	280,046	6,119		917,627,683
2011	960,389,210	42,816,787	86,616,883	44,655	417,337	8,411		1,090,293,283
2012	1,020,591,855	44,263,358	91,180,238	54,635	111,837	20,419	\$ 2,035	1,156,224,377
2013	1,046,440,379	44,960,182	96,510,796	46,830	47,317	11,111		1,188,016,615
2014	1,075,606,289	46,058,694	101,216,109	77,348	75,536	(955)		1,223,033,020
2015	1,113,035,295	46,634,211	105,665,971	91,170	50,383	2,562		1,265,479,592
2016	1,132,833,858	46,774,427	109,989,590	84,564	23,706	2,164	19,824	1,289,728,133
2017	1,159,969,953	46,735,053	115,634,404	202,297	108,860	6,870		1,322,657,438
2018	1,194,267,310	46,440,568	121,567,154	100,673	64,959	39,489		1,362,480,153

*Includes prior post retirement adjustments

Schedule of OPEB Benefits and Refunds by Type
Last Ten Years

Fiscal Year Ended Sept. 30	Health Benefits	Dental Benefits	Vision Benefits	Personal Health Care	Health Reimbursement Account	OPEB Refunds	Total
2009	\$ 358,691,332	\$ 30,140,662	\$ 3,303,392			\$ 2,431	\$ 392,137,817
2010	295,928,047	31,532,621	3,052,036			10,741	330,523,445
2011	417,417,811	35,820,611	3,640,571			21,085	456,900,078
2012	433,878,978	37,327,504	3,961,792	\$ 1,340,225		16,904	476,525,403
2013	440,197,204	37,726,459	3,377,956	4,433,182	\$ 10,126	14,735	485,759,661
2014	446,022,465	38,154,766	3,466,375	3,907,862	17,902	22,624	491,591,993
2015	453,617,812	38,919,834	3,163,993	4,893,957	33,959	17,401	500,646,957
2016	455,156,486	39,769,337	3,191,534	4,151,445	48,211	39,054	502,356,067
2017	408,393,708	36,329,749	4,338,876	3,198,031	39,600	27,039	452,327,004
2018	419,259,759	35,925,100	2,558,035	3,560,830	72,026	14,937	461,390,687

Total Benefit Deductions
Year Ended September 30
(in millions)



STATISTICAL SECTION

Schedules of Retired Members by Type of Benefit

Schedule of Retired Members by Type of Pension Benefits

September 30, 2017

Monthly Pension Benefit Amt	Number of Retirees	Selected Option**							
		Reg.	Opt. A	Opt. B	Opt. C	Opt. E	Opt. E1	Opt. E2	Opt. E3
\$ 1 - 200	339	125	96	80	9	20	5	4	0
201 - 400	1,786	741	516	343	44	84	29	27	2
401 - 600	3,205	1,351	920	528	86	170	51	89	10
601 - 800	4,212	1,800	1,121	667	118	269	90	136	11
801 - 1,000	4,300	1,590	1,076	733	122	456	105	201	17
1,001 - 1,200	4,307	1,612	1,128	647	134	452	99	199	36
1,201 - 1,400	4,159	1,757	1,144	540	159	317	75	142	25
1,401 - 1,600	4,315	1,840	1,301	579	189	231	81	74	20
1,601 - 1,800	4,526	1,880	1,462	691	236	146	57	41	13
1,801 - 2,000	4,281	1,803	1,280	739	249	102	63	35	10
over 2,000	24,254	10,173	6,857	4,158	1,852	606	247	255	106
Totals	59,684	24,672	16,901	9,705	3,198	2,853	902	1,203	250

**Selected Option

Reg. - Straight life allowance Opt. E1 - Social Security equated w/100% survivor option
 Opt. A - 100% survivor option Opt. E2 - Social Security equated w/50% survivor option
 Opt. B - 50% survivor option Opt. E3 - Social Security equated w/75% survivor option
 Opt. C - 75% survivor option
 Opt. E - Social Security equated
 Source: Gabriel Roeder Smith & Co.

Schedule of Retired Members by Type of Other Postemployment Benefits*

September 31, 2017

Monthly Pension Benefit Amt	Retirees	Health	Dental	Vision
\$ 1 - 200	339	133	140	142
201 - 400	1,786	925	968	958
401 - 600	3,205	1,964	2,059	2,054
601 - 800	4,212	3,092	3,172	3,149
801 - 1,000	4,300	3,425	3,492	3,465
1,001 - 1,200	4,307	3,619	3,676	3,671
1,201 - 1,400	4,159	3,635	3,688	3,683
1,401 - 1,600	4,315	3,854	3,902	3,897
1,601 - 1,800	4,526	4,097	4,139	4,132
1,801 - 2,000	4,281	3,918	3,969	3,947
Over 2,000	24,254	22,273	22,632	22,576
Totals	59,684	50,935	51,837	51,674

* Number counts only include members participating in the defined benefit pension plan only

Source: Gabriel Roeder Smith & Co.

STATISTICAL SECTION

Schedule of Retired Members by Type of Retirement September 30, 2017

Monthly Pension Benefit Amt	Number of Retirees	Type of Retirement							
		1	2	3	4	5	6	7	8
\$ 1 - 200	339	234	64	1	22	5	7	3	3
201 - 400	1,786	1,262	247	11	167	2	53	3	41
401 - 600	3,205	2,110	445	18	374	0	120	8	130
601 - 800	4,212	2,419	571	90	648	12	209	30	233
801 - 1,000	4,300	2,619	631	11	550	1	203	58	227
1,001 - 1,200	4,307	2,631	480	14	578	2	191	151	260
1,201 - 1,400	4,159	2,550	380	11	562	0	192	255	209
1,401 - 1,600	4,315	2,757	425	12	448	1	187	350	135
1,601 - 1,800	4,526	3,079	406	11	313	0	149	466	102
1,801 - 2,000	4,281	3,163	292	8	153	1	90	527	47
over 2,000	24,254	18,949	882	9	202	0	236	3,874	102
Totals	59,684	41,773	4,823	196	4,017	24	1,637	5,725	1,489

* Type of Retirement

- 1 - Normal retirement for age & service
- 2 - Survivor payment - normal or early retirement
- 3 - Duty disability retirement (incl. survivors)
- 4 - Non-duty disability retirement (incl. survivors)
- 5 - Survivor payment - duty death in service
- 6 - Survivor payment - non-duty death in service
- 7 - Retirees with supplemental benefits for early retirement incentive factors
- 8 - Retirees with reduced benefits for early retirement reduction factors

Source: Gabriel Roeder Smith & Co.

STATISTICAL SECTION

Schedules of Funding Progress

Schedule of Funding Progress - Pension Plan (\$ in millions)

Last Ten Years

Valuation Date Sept 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded (Overfunded) Accrued Liability (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
2008	\$ 11,403	\$ 13,766	\$ 2,363	82.8 %	\$ 1,764	134.0 %
2009	11,107	14,234	3,127	78.0	1,734	180.3
2010 ¹	10,782	14,860	4,078	72.6	1,622	251.5
2011	10,212	15,597	5,385	65.5	1,276	422.0
2012	9,447	15,654	6,207	60.3	1,156	537.1
2013	9,438	15,648	6,210	60.3	1,082	574.1
2014	9,962	15,771	5,809	63.2	1,011	574.6
2014 ¹	9,962	16,173	6,211	61.6	1,011	614.4
2015	10,417	16,237	5,821	64.2	922	631.3
2016	10,937	16,291	5,353	67.1	851	629.3
2016 ¹	10,937	17,016	6,078	64.3	851	714.6
2017	11,407	17,108	5,700	66.7	780	730.7
2017 ¹	11,884	17,881	5,997	66.5	780	768.7

¹ Revised actuarial assumptions

Schedule of Funding Progress - OPEB Plan (\$ in millions)

Last Ten Years

Valuation Date Sept 30	Actuarial Value of Assets (a)	Accrued Liability (AAL) Entry Age (b)	(Overfunded) Accrued Liability (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
2008		\$ 13,542	\$ 13,542	0 %	\$ 2,822	479.9 %
2009		12,618	12,618	0	2,972	424.6
2010		14,666	14,666	0	2,938	499.2
2011		14,251	14,251	0	3,040	468.8
2012 ¹	\$ 344	8,757	8,413	3.9	2,895	290.6
2013	663	8,199	7,536	8.1	2,881	261.6
2014 ¹	1,058	8,749	7,691	12.1	2,857	269.2
2015	1,302	8,999	7,697	14.5	3,029	254.1
2016 ¹	1,602	9,997	8,395	16.0	2,989	280.9
2017	2,047	9,449	7,402	21.7	3,244	228.2
2017 ¹	2,047	9,595	7,548	21.3	3,244	232.7

¹ Revised acturial assumptions

Source: Gabriel Roeder Smith & Co.

STATISTICAL SECTION

Schedule of Other Postemployment Benefits

Schedule of Other Postemployment Benefits For Year Ended September 30, 2018 (In thousands)

Claims	
Health insurance	\$ 400,413
Vision insurance	2,434
Dental insurance	35,259
Total Claims	<u>438,105</u>
Estimated Claims Liability	
Health insurance	18,847
Vision insurance	124
Dental insurance	<u>666</u>
Total Estimated Claims Liability	<u>19,637</u>
Administrative Fees	
Staff Salaries	459
Health insurance	22,806
Vision insurance	259
Dental insurance	<u>1,707</u>
Total Administrative Fees	<u>25,232</u>
Subtotal	482,974
Refunds	15
Personal Health Care	3,561
Health Reimbursement Account	<u>72</u>
Grand Total	<u><u>\$ 486,622</u></u>

STATISTICAL SECTION

Schedules of Average Benefit Payments

Schedule of Average Benefit Payments - Pension

Last Ten Years

Payment Periods

	Credited Service (Years) as of September 30							Total
	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30+	
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	\$ 751	\$ 645	\$ 594	\$ 888	\$ 1,227	\$ 1,731	\$ 2,182	\$ 1,460
Average Final Average Salary	25,963	38,066	33,076	35,846	39,066	43,268	47,724	40,996
Number of Active Retirants	571	640	7,054	7,550	7,553	10,428	14,282	48,078
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	\$ 870	\$ 847	\$ 624	\$ 924	\$ 1,268	\$ 1,757	\$ 2,234	\$ 1,497
Average Final Average Salary	28,021	39,237	34,045	36,778	40,234	44,008	48,993	41,965
Number of Active Retirants	915	956	7,070	7,554	7,578	10,378	14,578	49,029
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	\$ 942	\$ 940	\$ 650	\$ 958	\$ 1,315	\$ 1,788	\$ 2,292	\$ 1,543
Average Final Average Salary	30,076	39,552	34,746	37,805	41,761	44,946	50,437	43,123
Number of Active Retirants	1,227	1,218	7,106	7,531	7,734	10,402	15,224	50,462
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	\$ 987	\$ 1,005	\$ 670	\$ 993	\$ 1,373	\$ 1,850	\$ 2,440	\$ 1,668
Average Final Average Salary	31,075	39,981	35,412	39,132	43,695	47,053	54,109	45,804
Number of Active Retirants	1,298	1,386	7,139	7,656	8,199	11,216	18,754	55,648
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	\$ 1,048	\$ 1,079	\$ 692	\$ 1,027	\$ 1,407	\$ 1,881	\$ 2,464	\$ 1,693
Average Final Average Salary	31,733	41,222	36,014	40,175	44,698	48,067	54,671	46,556
Number of Active Retirants	1,539	1,592	7,155	7,655	8,279	11,311	18,757	56,288
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	\$ 1,055	\$ 1,126	\$ 707	\$ 1,051	\$ 1,434	\$ 1,902	\$ 2,489	\$ 1,723
Average Final Average Salary	31,296	41,294	36,418	41,064	45,578	48,834	53,324	47,333
Number of Active Retirants	1,102	1,795	7,192	7,710	8,388	11,554	19,113	56,854
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	\$ 386	\$ 487	\$ 669	\$ 1,037	\$ 1,433	\$ 1,908	\$ 2,505	\$ 1,753
Average Final Average Salary	26,402	40,117	35,776	41,152	45,886	49,336	55,821	48,120
Number of Active Retirants	112	462	7,423	7,949	8,814	12,361	20,494	57,615
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	\$ 383	\$ 456	\$ 681	\$ 1,058	\$ 1,455	\$ 1,938	\$ 2,541	\$ 1,789
Average Final Average Salary	26,312	40,611	36,081	41,764	46,623	50,309	56,758	48,985
Number of Active Retirants	103	467	7,434	7,903	8,851	12,679	21,016	58,453
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	\$ 372	\$ 489	\$ 694	\$ 1,077	\$ 1,479	\$ 1,959	\$ 2,572	\$ 1,822
Average Final Average Salary	25,879	41,265	36,401	42,229	47,363	51,031	57,582	49,759
Number of Active Retirants	96	456	7,416	7,816	8,814	12,854	21,586	59,038
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	\$ 356	\$ 491	\$ 705	\$ 1,092	\$ 1,503	\$ 1,985	\$ 2,610	\$ 1,859
Average Final Average Salary	27,282	41,193	36,628	42,565	48,094	51,844	58,576	50,596
Number of Active Retirants	89	457	7,406	7,719	8,779	12,984	22,250	59,684

STATISTICAL SECTION

Schedules of Average Benefit Payments (continued)

Schedule of Average Benefit Payments - Health*

Last Ten Years

Payment Periods	Credited Service (Years) as of September 30							Total
	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30+	
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	\$ 836	\$ 622	\$ 618	\$ 912	\$ 1,258	\$ 1,752	\$ 2,218	\$ 1,502
Average Final Average Salary	29,453	35,651	33,645	36,130	39,275	43,094	47,598	41,221
Number of Active Retirants	423	730	5,821	6,572	6,933	9,596	12,881	42,956
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	\$ 956	\$ 822	\$ 652	\$ 947	\$ 1,299	\$ 1,779	\$ 2,271	\$ 1,541
Average Final Average Salary	30,647	37,602	34,597	37,020	40,435	5	48,829	42,190
Number of Active Retirants	713	1,000	5,778	6,538	6,929	9,519	13,129	43,606
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	\$ 1,018	\$ 922	\$ 682	\$ 982	\$ 1,344	\$ 1,813	\$ 2,329	\$ 1,591
Average Final Average Salary	31,884	38,449	35,351	37,985	41,901	44,759	50,256	42,190
Number of Active Retirants	982	1,218	5,721	6,487	7,046	9,516	13,741	44,711
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	\$ 1,060	\$ 995	\$ 707	\$ 1,017	\$ 1,402	\$ 1,875	\$ 2,484	\$ 1,721
Average Final Average Salary	32,687	39,054	36,121	39,281	43,823	46,829	53,921	46,043
Number of Active Retirants	1,057	1,358	5,678	6,542	7,454	10,241	16,843	49,171
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	\$ 1,120	\$ 1,075	\$ 731	\$ 1,055	\$ 1,439	\$ 1,910	\$ 2,512	\$ 1,751
Average Final Average Salary	33,240	40,547	36,734	40,426	44,805	47,850	54,591	46,845
Number of Active Retirants	1,257	1,526	5,612	6,520	7,503	10,286	16,816	49,520
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	\$ 1,157	\$ 1,128	\$ 751	\$ 1,083	\$ 1,467	\$ 1,934	\$ 2,538	\$ 1,787
Average Final Average Salary	34,086	40,640	37,226	41,330	45,600	48,606	55,128	47,648
Number of Active Retirants	861	1,694	5,525	6,481	7,544	10,467	17,053	49,625
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	\$ 353	\$ 538	\$ 707	\$ 1,072	\$ 1,472	\$ 1,946	\$ 2,563	\$ 1,824
Average Final Average Salary	28,776	37,647	36,473	41,481	46,100	49,180	55,718	48,477
Number of Active Retirants	75	509	5,599	6,643	7,863	11,128	18,169	49,986
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	\$ 356	\$ 543	\$ 722	\$ 1,097	\$ 1,497	\$ 1,980	\$ 2,600	\$ 1,864
Average Final Average Salary	29,236	37,933	36,778	42,156	46,822	50,187	56,622	49,372
Number of Active Retirants	69	498	5,527	6,574	7,582	11,372	18,606	50,498
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	\$ 342	\$ 552	\$ 738	\$ 1,119	\$ 1,522	\$ 2,005	\$ 2,636	\$ 1,905
Average Final Average Salary	28,929	38,799	37,113	47,671	47,557	50,920	57,484	50,208
Number of Active Retirants	62	476	5,427	6,430	7,780	11,495	19,062	50,732
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	\$ 344	\$ 561	\$ 752	\$ 1,139	\$ 1,548	\$ 2,035	\$ 2,677	\$ 1,949
Average Final Average Salary	29,457	38,961	37,368	43,045	48,313	51,723	58,464	51,089
Number of Active Retirants	55	468	5,321	6,273	7,700	11,540	19,578	50,935

*Average monthly benefits shown are pension benefits

Source: Gabriel Roeder Smith & Co.

STATISTICAL SECTION

Schedules of Average Benefit Payments (continued)

Schedule of Average Benefit Payments - Dental*

Last Ten Years

Payment Periods	Credited Service (Years) as of September 30							Total
	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30+	
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	\$ 830	\$ 627	\$ 619	\$ 916	\$ 1,262	\$ 1,758	\$ 2,226	\$ 1,507
Average Final Average Salary	29,547	36,106	33,801	36,371	39,459	43,267	47,776	41,414
Number of Active Retirants	425	733	5,857	6,546	6,901	9,599	12,930	42,991
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	\$ 958	\$ 823	\$ 652	\$ 950	\$ 1,302	\$ 1,784	\$ 2,277	\$ 1,545
Average Final Average Salary	30,843	37,869	34,704	37,227	40,591	43,967	48,964	42,344
Number of Active Retirants	712	1,009	5,835	6,548	6,928	9,549	13,209	43,790
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	\$ 1,018	\$ 920	\$ 682	\$ 984	\$ 1,347	\$ 1,817	\$ 2,335	\$ 1,593
Average Final Average Salary	31,970	38,623	35,431	38,181	42,047	44,884	50,397	43,487
Number of Active Retirants	988	1,232	5,806	6,523	7,063	9,559	13,833	45,004
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	\$ 1,060	\$ 985	\$ 706	\$ 1,020	\$ 1,404	\$ 1,879	\$ 2,488	\$ 1,724
Average Final Average Salary	32,815	39,018	36,186	39,483	43,935	46,955	54,041	46,163
Number of Active Retirants	1,058	1,380	5,761	6,587	7,487	10,300	17,014	49,585
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	\$ 1,116	\$ 1,061	\$ 730	\$ 1,056	\$ 1,440	\$ 1,912	\$ 2,515	\$ 1,752
Average Final Average Salary	33,242	40,446	36,738	40,577	44,914	47,929	54,697	46,926
Number of Active Retirants	1,265	1,552	5,722	6,574	7,533	10,360	17,004	50,010
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	\$ 1,148	\$ 1,113	\$ 749	\$ 1,083	\$ 1,469	\$ 1,936	\$ 2,542	\$ 1,786
Average Final Average Salary	33,972	40,611	37,229	41,452	45,774	48,676	55,250	47,723
Number of Active Retirants	873	1,727	5,657	6,580	7,602	10,555	17,282	50,276
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	\$ 348	\$ 532	\$ 705	\$ 1,072	\$ 1,473	\$ 1,947	\$ 2,567	\$ 1,823
Average Final Average Salary	28,959	37,747	36,488	41,585	46,202	49,257	55,836	48,546
Number of Active Retirants	81	538	5,749	6,748	7,936	11,237	18,424	50,713
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	\$ 350	\$ 536	\$ 720	\$ 1,096	\$ 1,497	\$ 1,981	\$ 2,604	\$ 1,863
Average Final Average Salary	29,008	34,048	36,778	42,238	46,913	50,248	56,729	49,424
Number of Active Retirants	74	528	5,683	6,690	7,929	11,486	18,879	51,269
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	\$ 337	\$ 543	\$ 735	\$ 1,119	\$ 1,522	\$ 2,006	\$ 2,639	\$ 1,903
Average Final Average Salary	28,700	38,807	37,072	42,758	47,647	50,992	57,571	50,243
Number of Active Retirants	67	503	5,605	6,548	7,864	11,628	19,344	51,559
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	\$ 335	\$ 550	\$ 749	\$ 1,137	\$ 1,548	\$ 2,035	\$ 2,680	\$ 1,945
Average Final Average Salary	29,087	39,004	37,346	43,099	48,379	51,763	58,540	51,102
Number of Active Retirants	58	498	5,514	6,403	7,793	11,685	19,886	51,837

*Average monthly benefits shown are pension benefits

Source: Gabriel Roeder Smith & Co.

STATISTICAL SECTION

Schedules of Average Benefit Payments (continued)

Schedule of Average Benefit Payments - Vision*

Last Ten Years

Payment Periods	Credited Service (Years) as of September 30							Total
	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30+	
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	\$ 837	\$ 624	\$ 617	\$ 915	\$ 1,262	\$ 1,755	\$ 2,225	\$ 1,505
Average Final Average Salary	29,578	36,009	33,699	36,302	39,449	43,189	47,742	41,355
Number of Active Retirants	418	739	5,877	6,577	6,915	9,632	12,933	43,091
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	\$ 962	\$ 820	\$ 651	\$ 949	\$ 1,301	\$ 1,782	\$ 2,276	\$ 1,544
Average Final Average Salary	30,904	37,745	34,664	37,158	40,563	43,908	48,936	42,298
Number of Active Retirants	705	1,012	5,844	6,572	6,944	9,578	13,207	43,862
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	\$ 1,002	\$ 920	\$ 681	\$ 984	\$ 1,346	\$ 1,815	\$ 2,334	\$ 1,592
Average Final Average Salary	32,028	38,597	35,398	38,124	42,003	44,829	50,368	43,449
Number of Active Retirants	983	1,230	5,798	6,539	7,072	9,583	13,828	45,033
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	\$ 1,060	\$ 986	\$ 706	\$ 1,019	\$ 1,404	\$ 1,878	\$ 2,487	\$ 1,723
Average Final Average Salary	32,787	39,015	36,150	39,380	43,901	46,904	54,014	46,119
Number of Active Retirants	1,059	1,379	5,745	6,600	7,485	10,312	16,995	49,575
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	\$ 1,119	\$ 1,064	\$ 731	\$ 1,055	\$ 1,439	\$ 1,910	\$ 2,514	\$ 1,751
Average Final Average Salary	33,334	40,464	36,727	40,487	44,846	47,885	54,663	46,886
Number of Active Retirants	1,262	1,549	5,695	6,583	7,528	10,363	16,979	49,959
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	\$1,148	\$1,116	\$749	\$1,082	\$1,468	\$1,934	\$2,541	\$1,786
Average Final Average Salary	33,953	40,564	37,214	41,381	45,661	48,628	55,216	47,682
Number of Active Retirants	872	1,724	5,633	6,577	7,590	10,557	17,255	50,208
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	\$342	\$526	\$705	\$1,071	\$1,473	\$1,946	\$2,566	\$1,823
Average Final Average Salary	28,635	37,368	36,480	41,507	46,145	49,221	55,796	48,503
Number of Active Retirants	78	537	5,719	6,742	7,914	11,228	18,384	50,602
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	\$ 344	\$ 531	\$ 720	\$ 1,095	\$ 1,497	\$ 1,980	\$ 2,603	\$ 1,863
Average Final Average Salary	29,065	37,721	36,785	42,191	46,869	50,207	56,690	49,392
Number of Active Retirants	72	529	5,647	6,678	7,905	11,476	18,838	51,145
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	\$ 335	\$ 538	\$ 735	\$ 1,117	\$ 1,522	\$ 2,006	\$ 2,639	\$ 1,903
Average Final Average Salary	28,458	38,466	37,086	42,702	47,608	50,963	57,537	50,216
Number of Active Retirants	66	505	5,562	6,535	7,843	11,610	19,300	51,421
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	\$ 327	\$ 546	\$ 749	\$ 1,137	\$ 1,548	\$ 2,035	\$ 2,680	\$ 1,946
Average Final Average Salary	28,751	38,743	37,345	43,062	48,350	51,756	58,516	51,088
Number of Active Retirants	59	498	5,466	6,385	7,771	11,660	19,835	51,674

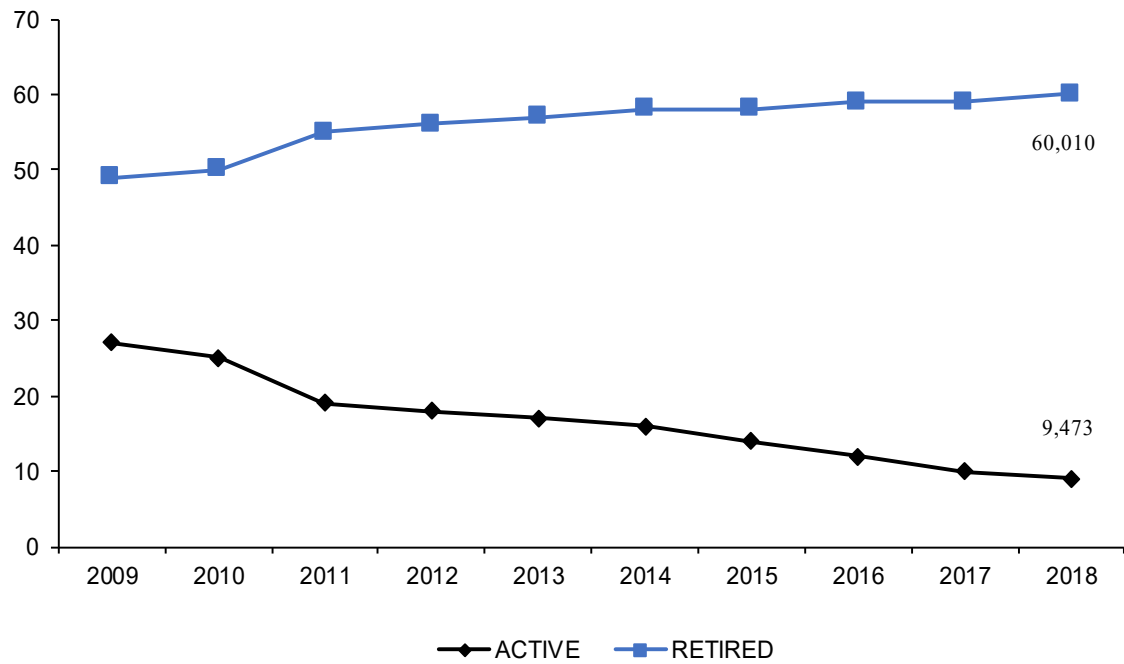
*Average monthly benefits shown are pension benefits

Source: Gabriel Roeder Smith & Co.

STATISTICAL SECTION

Ten Year History of Membership (in thousands)

Fiscal Year Ended September 30



Source: Gabriel Roeder Smith & Co.

ACKNOWLEDGMENTS

The *Michigan State Employees' Retirement System Comprehensive Annual Financial Report* is prepared by Financial Services, Fiscal Management Division. Staff of the division for the fiscal year 2018 report included:

Management:

Jacqueline Huhn, Director
Aver Hamilton, Accounting Manager

Accountants:

Dan Harry
Rick Legal
Cindy Molzan
Hope Richardson
Paula Webb
Carol Wheaton

Technical and Support Staff:

Jamin Schroeder

Special thanks are also extended to the Office of Retirement Services personnel, accounting and support personnel throughout Financial Services, Investments Division of Treasury, Department of Community Health cashiering personnel, Office of the Auditor General, Gabriel Roeder Smith & Co., and the staff at the Office of Financial Management. Preparation of this report would not have been possible without the efforts of these individuals.

This report may be viewed online at: www.michigan.gov/ors