MICHIGAN STATE POLICE 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 P R S

Prepared by:
Financial Services
for
Office of Retirement Services
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INTRODUCTORY SECTION

Certificate of Achievement

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Michigan State

Police Retirement System

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

September 30, 2017

Christopher P. Morrill

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)

Alan H. Winkle
Program Administrator

Letter of Transmittal

Michigan State Police
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

January 25, 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 Police Retirement System (System) for fiscal year 2018.

INTRODUCTION TO REPORT

The System was established by legislation under Public Act 251 of 1935. It now operates under the provisions of Public Act 182 of 1986, as amended, 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 Police officers. 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

Letter of Transmittal (Continued)

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.

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 of 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 MD&A. This letter of transmittal is intended to complement 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 State Police Retirement System was created by Public Act 251 of 1935 and later superseded by Public Act 182 of 1986. A 9-member board, under the direction of a chairperson elected from the membership, and the director of the Department of Technology, Management, and Budget (DTMB), govern the System. All individuals hired before June 10, 2012, are members of the legacy defined benefit pension plan, and those hired on or after June 10, 2012 are members of the Pension Plus Plan. The System serves over 5,100 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% for the Pension Plan and 11.3% for the Other Postemployment Benefits (OPEB) Plan. For the last five years, the System has experienced an annualized rate of return of 10.1% for the Pension Plan and 9.9% for the OPEB Plan. A summary of asset allocation and rates of return can be found in the Investment Section of this report.

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 of the System were $1.4 billion and $2.1 billion, respectively, resulting in a funded ratio of 65.1 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 of this report.

OPEB – Prefunding for OPEB began in fiscal year 2013. The actuarial value of the assets and actuarial accrued liability for OPEB were $150.7 million and $727.0 million respectively resulting in a funded ratio of 20.7 percent at September 30, 2017. A historical perspective of funding levels is presented on the Schedule of Funding Progress in the Statistical Section of 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 7.05% and 7.40% 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 budget. 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.

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

Letter of Transmittal (Continued)

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 to 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.

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 our fiscal year 2017 Comprehensive Annual Financial Report (CAFR). This marks the 27th consecutive year ORS has received this prestigious award.

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 Police Retirement System. Their cooperation contributes significantly to the success of the System.

Letter of Transmittal (Continued)

Sincerely,

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

Kerrie Vanden Bosch, Director
Office of Retirement Services

Administrative Organization

Retirement Board Members*
As of January 25, 2019

Captain Greg Zarotney
for Colonel Joseph Gasper
Representing Director,
Dept. of State Police
Statutory Member

Molly Jason
Representing Attorney General
Statutory Member

Detective Sergeant Mitchell Stevens
Vice Chair
Representing Sergeants and Below
Term Expires December 31, 2018

Bernard Kent
Representing General Public
Term Expires December 31, 2018

Cheryl Schmittdiel
Representing Director,
Office of State Employer
Statutory Member

Craig Murray
Representing Deputy Auditor General
Statutory Member

Ann Marie Storberg
Representing State Treasurer
Statutory Member

Inspector Steve O'Neill
Chair
Representing Lieutenants and Above
Term Expires December 31, 2019

Retired Inspector Diane Bockhausen
Representing Retirees
Term Expires December 31, 2020

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

Advisors and Consultants
As of January 25, 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

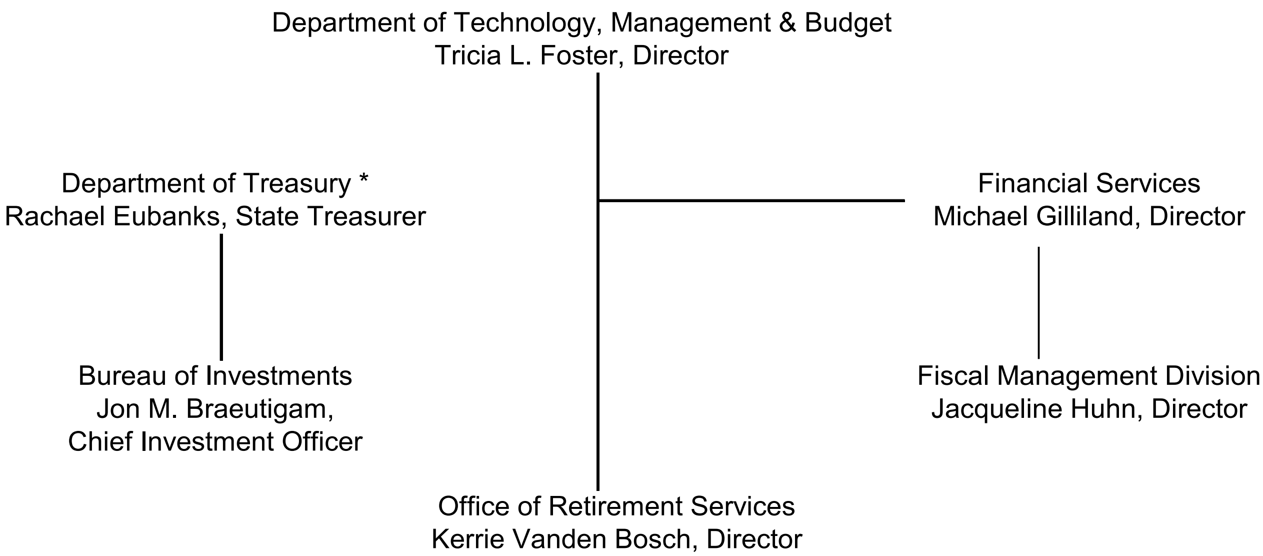
Legal Advisor
Dana Nessel
Attorney General
State of Michigan

Investment Performance Measurement
State Street Corporation
State Street Investment Analytics
Boston, MA

Administrative Organization (Continued)

Organization Chart

As of January 25, 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 70) and Schedule of Investment Commissions (page 71), 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
Doug A. Ringler, CPA, CIA
Auditor General
201 N. Washington Square, Sixth Floor • Lansing, Michigan 48913 • Phone: (517) 334-8050 • audgen.michigan.gov

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

Mr. Steve O'Neill, Chair
Michigan State Police Retirement System 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 Mr. O'Neill, Ms. Foster, and Ms. Vanden Bosch:

Report on the Financial Statements
We have audited the accompanying financial statements of the Michigan State Police 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 Police 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.

Mr. Steve O'Neill, 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,

Doug Ringler

Doug Ringler
Auditor General
January 25, 2019

FINANCIAL SECTION

Management's Discussion and Analysis

Our discussion and analysis of the Michigan State Police 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 $1.7 billion (reported as n*et position restricted for Pension Benefits and OPEB*). Fiduciary net position is restricted to meet future benefit payments.
- Additions for the year were $317.5 million, which are comprised primarily of contributions of $148.7 million and investment gains of $168.8 million.
- Deductions increased over the prior year from $164.9 million to $175.3 million or 6.3%. This increase is the result of increased pension and OPEB benefit payments and administrative expenses.

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 19) and *The Statement of Changes in Pension Plan and Other Postemployment Benefit Plan Fiduciary Net Position* (page 20*)*. 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 47), the Schedule of Changes in Net OPEB Liability (page 48), and Schedules of Contributions (page 49) to determine whether the System is becoming financially stronger or weaker.

FINANCIAL ANALYSIS

System total assets as of September 30, 2018, were $1.8 billion and were mostly comprised of cash, investments, and contributions due from employers. Total assets increased $121.7 million or 7.4% between fiscal years 2017 and 2018, due primarily to an increase in employer contributions.

Total liabilities as of September 30, 2018, were $78.9 million and were comprised of accounts payable and other accrued liabilities, and obligations under securities lending. Total liabilities decreased $20.4 million or (20.6)% between fiscal years 2017 and 2018 primarily due to decreased obligations under securities lending.

System assets exceeded its liabilities at the close of fiscal year 2018 by $1.7 billion. Total fiduciary net position restricted for pension and OPEB increased $142.2 million or 9.2% from the previous year, primarily due to higher contributions.

Management's Discussion and Analysis (Continued)

Plan Fiduciary Net Position
(in thousands)

	2018	2017	Increase (Decrease)
Assets			
Equity in common cash	$ 6,345	$ 13,057	(51.4) %
Receivables	12,306	10,228	20.3
Investments	1,667,956	1,520,262	9.7
Securities lending collateral	75,674	97,004	(22.0)
Total Assets	1,762,280	1,640,551	7.4
Liabilities			
Warrants outstanding	-	3	(100.0)
Accounts payable and other accrued liabilities	3,177	2,365	34.3
Obligations under securities lending	75,694	96,949	(21.9)
Total Liabilities	78,871	99,317	(20.6)
Net Position Restricted for Pension Benefits and OPEB	$ 1,683,409	$ 1,541,234	9.2 %

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 $317.5 million.

Total additions for fiscal year 2018 increased approximately $6.2 million or 2.0% from those of fiscal year 2017 due primarily to increased contributions. Total contributions increased between fiscal years 2017 and 2018 by $18.9 million or 14.6%, while net investment income decreased $12.7 million or (7.0)%. The Investment Section of this report reviews the results of investment activity for fiscal year 2018.

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 $175.3 million, an increase of 6.3% over fiscal year 2017 deductions.

The health, dental and vision care expenses during the year increased by $3.1 million or 9.6%, from $32.7 million to $35.8 million. The payment of pension benefits increased by $7.2 million or 5.5% between fiscal years 2017 and 2018. In fiscal year 2018, the increase in pension benefit expenses resulted from an increase in retirees (55) and an increase in benefit payments to retirees. Administrative expenses increased by $150 thousand or 7.5% between fiscal years 2017 and 2018, primarily due to increased pension administrative and health administrative fees. Refunds of contributions decreased by $5 thousand or (100.0)% between fiscal years 2017 and 2018.

Changes in Plan Fiduciary Net Position
(in thousands)

	2018	2017	Increase (Decrease)
Additions			
Member contributions	$ 3,489	$ 3,142	11.0 %
Employer contributions	141,709	124,231	14.1
Other governmental contributions	3,546	2,469	43.6
Net investment income (loss)	168,750	181,447	(7.0)
Miscellaneous income	13	42	(69.0)
Total additions	317,507	311,331	2.0
Deductions			
Pension benefits	137,367	130,203	5.5
Health care benefits	35,804	32,658	9.6
Refunds of contributions	-	5	(100.0)
Administrative and other expenses	2,162	2,011	7.5
Total deductions	175,332	164,878	6.3
Net Increase (Decrease) in Net Position	142,175	146,453	(2.9)
Net Position Restricted for Pension Benefits and OPEB:			
Beginning of Year	1,541,234	1,394,780	10.5
End of Year	$ 1,683,409	$ 1,541,234	9.2 %

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 in fiscal year 2017 to a 11.5% return during fiscal year 2018. The System's rate of return for the OPEB Plan's investments decreased an overall 2.3% from a 13.6% return in fiscal year 2017 to a 11.3% 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.

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	$ 2,278	$ 4,067	$ 6,345
Receivables:			
Amounts due from members	51		51
Amounts due from employers	5,991	4,061	10,052
Amounts due from federal agencies		1,238	1,238
Amounts due from other		904	904
Interest and dividends	54	7	61
Total receivables	6,096	6,210	12,306
Investments:			
Short-term investment pools	33,217	3,799	37,016
Fixed income pools	179,753	22,263	202,016
Domestic equity pools	391,400	48,500	439,900
Real estate and infrastructure pools	156,588	19,410	175,998
Private equity pools	244,085	30,170	274,255
International equity pools	255,816	31,692	287,508
Absolute return pools	223,559	27,704	251,262
Total investments	1,484,418	183,538	1,667,956
Securities lending collateral	67,335	8,338	75,674
Total assets	1,560,127	202,153	1,762,280
Liabilities:			
Accounts payable and other accrued liabilities	375	2,803	3,177
Obligations under securities lending	67,354	8,340	75,694
Total liabilities	67,728	11,143	78,871
Net Position Restricted for Pension Benefits and OPEB:	$ 1,492,399	$ 191,010	$ 1,683,409

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

STATEMENT OF CHANGES IN PENSION PLAN AND OTHER POSTEMPLOYMENT BENEFIT PLAN FIDUCIARY NET POSITION
For the Fiscal Year Ended September 30, 2018 (in thousands)

	Pension Plan	OPEB Plan	Total
Additions:			
Contributions:			
Member contributions	$ 3,489		$ 3,489
Employer contributions:	84,930	$ 56,779	141,709
Other governmental contributions		3,546	3,546
Total contributions	88,419	60,326	148,744
Investment income (loss):			
Net increase (decrease) in fair value of investments	122,748	13,823	136,572
Interest, dividends, and other	33,811	3,973	37,783
Investment expenses:			
Real estate operating expenses	(81)	(9)	(91)
Other investment expenses	(6,037)	(692)	(6,728)
Securities lending activities:			
Securities lending income	2,515	304	2,818
Securities lending expenses	(1,427)	(177)	(1,604)
Net investment income (loss)	151,529	17,222	168,750
Miscellaneous income	4	10	13
Total additions	239,951	77,557	317,507
Deductions:			
Benefits paid to plan members and beneficiaries:			
Retirement benefits	137,367		137,367
Health benefits		33,329	33,329
Dental/vision benefits		2,475	2,475
Refunds of contributions	-		-
Administrative and other expenses	749	1,413	2,162
Total deductions	138,116	37,217	175,332
Net Increase (Decrease) in Net Position	101,835	40,340	142,175
Net Position Restricted for Pension Benefits and OPEB:			
Beginning of Year	1,390,564	150,670	1,541,234
End of Year	$ 1,492,399	$ 191,010	$ 1,683,409

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

NOTES TO BASIC FINANCIAL STATEMENTS

September 30, 2018

NOTE 1- PLAN DESCRIPTION

ORGANIZATION

The Michigan State Police Retirement System (System) is a single employer, state-wide, defined benefit public employee retirement plan governed by the State of Michigan (State), created under Public Act 251 of 1935, recodified and currently operating under Public Act 182 of 1986. Section 7 of this act establishes the board's authority to promulgate or amend the provisions of the System. The board consists of nine members. Four members are appointed by the governor and consist of one officer having rank of sergeant or below, one officer having rank of lieutenant or above, one retirant, and one member of the general public to meet requirements within the act. The System's pension plan was established by the State to provide retirement, survivor, and disability benefits to Michigan State Police. In addition, the System's OPEB plan provides retirees hired prior to June 10, 2012 with the option of receiving health, dental, and vision coverage under the State Police Retirement Act. The System is a qualified pension trust fund under section 401(a) of the Internal Revenue Code.

A hybrid defined benefit and defined contribution plan was introduced for troopers and sergeants who became a member of the System on or after June 10, 2012 - this plan is called the Pension Plus plan for Michigan State Police.

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 (DTMB). 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	2,419
Survivor benefits	498
Disability benefits	200
Total	3,117
Inactive plan members entitled to but not yet receiving benefits:	43
Active plan members:	
Vested	822
Non-vested	965
Total	1,787
DROP program participants	213
Total plan members	5,160

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

Health, Dental and Vision Plan	
Eligible participants	2,901
Participants receiving benefits:	
Health	2,779
Dental	2,772
Vision	2,773
Active members[1]	1,787
Inactive vested and DROP members	256

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

BENEFIT PROVISIONS – PENSION

Introduction

Benefit provisions of the defined benefit plan are established by State statute, which may be amended. Public Act 182 of 1986, Michigan State Police Retirement Act, as amended, establishes eligibility and benefit provisions for the defined benefit pension plan and the Pension Plus plan. Retirement benefits for defined benefit plan members are determined by final average compensation and members are eligible to receive a monthly benefit when they meet certain age and service requirements. The pension benefit for Pension Plus plan members is determined by final average compensation and years of service and members are eligible to

NOTES TO BASIC FINANCIAL STATEMENTS (Continued)

receive a monthly benefit when they meet certain age and service requirements. In addition, the Pension Plus members' savings component includes the employee contributions into any combination of a member's 401(k), 457, or Roth 401(k) accounts, and an employer match into their 401(k) account. The System also provides duty disability, nonduty disability, and survivor benefits.

A member who leaves Michigan State Police employment may request a refund of his or her member pension contribution account. Effective in 2012, the System is contributory except for command officers. A refund cancels a former member's rights to a future pension and there is no provision for repaying the refund of contributions to restore the service represented by the refund.

Pension Reform 2012

The State Troopers' union and the State of Michigan negotiated a new retirement plan for new State Troopers and Sergeants. As a result, a State Trooper who became a member of the System on or after June 10, 2012, is a Pension Plus member. The Pension Plus plan pairs a guaranteed retirement income (Defined Benefit pension) with a flexible and transferable retirement investment (Defined Contribution) account.

Regular Retirement

A pension is available to a defined benefit plan member after 25 years of credited service (employment). The pension equals 60% of a member's final average compensation and is payable monthly over the lifetime of a member. Final average compensation is the average annual salary for a member's last two years of service with the Department of State Police.

For a Pension Plus member, who became a member of the System on or after June 10, 2012, a pension is available at age 55 with 25 years of service or age 60 with 10 or more years of service. The pension equals 2% of a five-year final average compensation (excluding overtime) multiplied by the total number of years of credited service, not to exceed 25 years. After 25 years of credited service, the pension multiplier declines by 0.4% each year until reaching 0% at 30 years of service. The reduced pension multiplier applies only to years 26 through 30, not the first 25 years. Pension benefits are paid over the lifetime of a member.

Deferred Retirement

A defined benefit plan member with 10 or more years of credited service who terminates employment but has not reached the age of 50 is a deferred member and is entitled to receive a monthly allowance upon reaching age 50, provided the member's accumulated contributions have not been refunded. The deferred pension is equal to 2% of the final average compensation times the years and partial years of service credit.

A Pension Plus plan member who became a member of the System on or after June 10, 2012, with 10 or more years of credited service who terminates employment but has not reached the age of 60 is a deferred member and is entitled to receive a monthly allowance upon reaching age 60, provided the member's accumulated contributions have not been refunded.

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 an employee of the Michigan State Police may be eligible for a nonduty disability pension. The nonduty disability pension for a defined benefit plan member is 2.4% of the final average compensation times years and partial years of credited service (but not more than 25 years).

Duty Disability Benefit

A member who becomes totally and permanently disabled from performing duties as a Michigan State Police Officer is eligible for a duty disability pension. The amount, for a defined benefit plan member, is equal to 60% of the final average compensation.

Survivor Benefit

Upon the nonduty death of a defined benefit plan member who completed at least 10 years of service, the surviving spouse receives a benefit based on 2.4% of the final average compensation for each year and partial year of credited service. If there is no spouse, surviving children are entitled to equally share the benefit until age 18. If death occurs in the line of duty (a duty death), the surviving spouse receives a benefit of 60% of the final average compensation. Children receive $100 each month until age 18. A $1,500 funeral expense is also authorized by State statute payable by the system.

Postretirement Adjustments

Effective October 1, 1996, the monthly pension was increased 10% if certain requirements were met. This was a one-time increase.

Each October 1, the benefits of all pension recipients increase 2% (not to exceed $500). This non-compounding increase is paid to persons who have been retired 12 months.

A Pension Plus member who became a member of the System on or after June 10, 2012, does not receive an annual post-retirement increase.

Effective fiscal year 2016, ORS issued a supplemental payment to eligible recipients. This supplemental payment continues to be issued to eligible recipients each fiscal year, subject to an annual budget appropriation.

Member Contributions

Command Officers currently participate on a noncontributory basis. Effective October 1, 2012, troopers and sergeants hired before June 10, 2012 began contributing 1% of their compensation. Effective October 1, 2013 troopers and sergeants hired before June 10, 2012 began contributing 2% of their compensation. Troopers hired on or after June 10, 2012 contribute 4% of their compensation as described below. Under certain circumstances, defined benefit plan members may contribute to the System for the purchase of creditable service, such as military, maternity or paternity leave, Peace Corps or VISTA service. Pension Plus plan members are only eligible to receive active duty military service. If a member terminates employment before a retirement benefit is payable, the member’s contribution and interest on deposit are available to be refunded. If the member dies before being vested, the member’s contribution and interest are refunded to the designated beneficiaries.

Pension Plus members who became members of the System on or after June 10, 2012, contribute 4% of their gross wages for the pension component of their plan. An additional, optional, 4% contribution of their gross wages is withheld for the savings component of their plan. The first 2% of employee contributions are directed to the member’s Personal Heathcare Fund and receive an employer match of 100% up to a maximum of 2%. The next 2% employee contributions are identified as retirement savings and receive an employer match of 50% up to a maximum of 1%. These members will also receive a credit into a health reimbursement account (HRA) at termination if they have at least 10 years of service at termination. The credit will be up to $2,000 for participants.

Employer Contributions

The statute requires that the employer contribute to finance the benefits of plan members. These employer contributions are determined annually by the System’s actuary and are based upon level-percent-of-payroll funding principles so that the contribution rates do not have to increase over time.

For a Pension Plus member who became a member of the System on or after June 10, 2012, there is an employer match for retirement of 100% of the first 2% of employee deferrals for retiree healthcare up to a maximum employer contribution of 2%. In addition, employers match 50% of the next 2% of employee deferrals, up to a maximum employer contribution of 1%.

NOTES TO BASIC FINANCIAL STATEMENTS (Continued)

Deferred Retirement Option Plan

Public Act 83 of 2004 amended the State Police Retirement Act to create a Deferred Retirement Option Plan (DROP) for members with 25 years of service. This benefit program allows state police who are eligible to retire to defer their retirement and keep working for up to six years. The participant's pension amount is calculated on the day before the DROP period starts, and a percentage of the equivalent monthly pension is credited to an interest-bearing account in the participant's name. The DROP balance will be available at the time their DROP participation ends. At this time, only Defined Benefit members are eligible for DROP. The balance at the end of the fiscal year 2018 for the DROP accounts was $62.5 million.

Banked Leave Time

Public Act 50 of 2004 amended the State Police 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 postemployment benefit plan are established by State statute, which may be amended. Public Act 182 of 1986, as amended, establishes eligibility and benefit provisions for the OPEB plan. Defined benefit plan members are eligible to receive health, prescription drug, dental, and vision coverage on the first day they start receiving pension benefits (this benefit does not apply to Pension Plus members). There are no ad hoc or automatic increases. The State Police Retirement Act requires joint authorization by DTMB and the Civil Service Commission to make changes to retiree medical benefit plans.

Under the Michigan State Police Retirement Act, all defined benefit retirees have the option of continuing health, dental, and vision coverage. Retirees with this coverage contribute 5%, 10%, and 10% of the monthly premium amount for the health, dental, and vision coverage, respectively. The State funds 95% of the health and 90% of the dental and vision insurance. The employer payroll contribution rate to provide these benefits was 41.88% for fiscal year 2018.

The State Health Plan PPO is by far the most often selected health care option. This plan includes comprehensive coverage traditionally referred to as basic and major medical, with full coverage for most services received in-network after an annual deductible is met. Preventive services are not subject to a deductible and are fully covered if received in-network subject to an annual maximum. Both retail and mail order prescription drug coverage is included. Retiree health, dental, and vision plan benefits have generally matched those in place for active employees.

Retirees are also 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 the age of 23. Premiums are fully paid by the State.

Personal Healthcare Fund

A Pension Plus member who became a member of the System on or after June 10, 2012 will be enrolled into a Personal Healthcare Fund (PHF), which is a separate account within the State of Michigan 401(k) and 457 Plan. The first optional 2% of their contributions plus their employer match are directed into the PHF. These members will also receive a credit into a health reimbursement account (HRA) at termination if they have at least 10 years of service at termination. The credit will be up to $2,000 for participants.

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

	2018
Health, Dental and Vision Plan	
Eligible participants	2,901
Participants receiving benefits:	
Health	2,779
Dental	2,772
Vision	2,773
Active members[1]	1,787
Inactive vested and DROP Members	256
Expenses for the year (in thousands)	$37,217
Employer payroll contribution rates	41.88%

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

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 net, pension and other postemployment benefit liabilities. It also includes comprehensive note disclosures regarding the pension and other postemployment benefit liability, 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 30, Note 5 on page 32, and in the Required Supplementary Information beginning on page 47.

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.

NOTES TO BASIC FINANCIAL STATEMENTS (Continued)

Reserves

Public Act 182 of 1986, as amended, created the Reserve for Employee Contributions, Reserve for Employer Contributions, Reserve for Retired Benefit Payments, Reserve for Undistributed Investment Income, and Reserve for Health (OPEB) Related Benefits. The financial transactions of the System are recorded in these reserves as required by Public Act 182 of 1986, as amended. The reserves are described below, and details are provided in the supporting schedules.

Reserve for Employee Contributions - Command Officers currently participate on a noncontributory basis. Effective October 1, 2012, troopers and sergeants hired before June 10, 2012 began contributing 1% of their compensation. Effective October 1, 2013 troopers and sergeants hired before June 10, 2012 began contributing 2% of their compensation. Troopers hired on or after June 10, 2012 contribute 4% of their compensation. 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 reserve. At September 30, 2018, the balance in this reserve was $16.3 million.

Reserve for Employer Contributions - All employer contributions are credited to this reserve. Interest from the Reserve for Undistributed Investment Income 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 $123.7 million.

Reserve for Retired Benefit Payments - This represents the reserve 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 retirees, reduce this reserve. At the end of each fiscal year, an amount is transferred from the Reserve for Employer Contributions to bring the reserve into balance with the actuarial present value of retirement allowances. Also included are reserves for casualty experience (injury or death of a member, or vested former member). The initial actuarial casualty valuation determined the full funding reserve requirements to be allocated from assets of the reserve. All retiree casualty payments are made from this reserve. At September 30, 2018, the balance in this reserve was $1,474.9 million.

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 balance of this reserve was ($122.5) million.

Reserve for Health (OPEB) Related Benefits - This reserve is credited with member 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 $191.0 million.

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.

Investment Income

Dividend and interest income are 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 alternative 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 on-going 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. The System does not have equipment that falls within these parameters.

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 following summarizes costs incurred by the System for such services.

	2018 (in thousands)
Building Rentals	$ 16
Technological Support	114
Attorney General	25
Investment Services	399
Personnel Services	406

Cash – At September 30, 2018, the System had $6.3 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 from these activities amounted to $67,336 for the year ended September 30, 2018.

NOTES TO BASIC FINANCIAL STATEMENTS (Continued)

NOTE 3 – CONTRIBUTIONS

Contributions

The State is required by Public Act 182 of 1986, as amended to contribute amounts necessary to finance the coverage of member and retiree benefits. Command officers currently participate in the System on a noncontributory basis. Effective October 1, 2012, troopers and sergeants hired before June 10, 2012, began contributing 1% of their compensation. Effective October 1, 2013, they began contributing 2% of their compensation. Troopers hired on or after June 10, 2012 contribute 4% of their compensation. Under certain circumstances, members may contribute to the System for the purchase of creditable service, such as military service or maternity leave. The State is required by Public Act 182 of 1986, as amended, to contribute amounts necessary to finance the benefits of its employee and retiree OPEB. 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 schedules below summarize pension and OPEB contribution rates in effect for fiscal year 2018.

Pension Contribution Rates

Benefit Structure	Member	Employer
Non Command Officers	2.00 %	64.98 %
Command Officers	0.00	66.70
Pension Plus	4.00	57.75

OPEB Contribution Rates

Benefit Structure	Member	Employer
Premium Subsidy	0.00 %	41.88 %
Personal Healthcare Fund	2.00	41.88

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.

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 fair 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	$	2,197,152
Plan Fiduciary Net Position		1,492,399
Net Pension Liability	$	704,753
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		67.92%
Net Pension Liability as a percentage of Covered Payroll		525.24%
Total Covered Payroll	$	134,177

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 for each major asset class included in the pension plan's target asset allocation as of September 30, 2018, 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	**100.0 %**	

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

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 pension plan investment, net of pension plan investment expense, was 11.08%. 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 7.05% was used to measure the total pension liability (7.00% for the Hybrid Plan) for fiscal year 2018. In fiscal year 2017, the single discount rate used to measure the total pension liability was 7.50% (7.00% for the Hybrid Plan). This single discount rate was based on the expected rate of return on pension plan investments of 7.05% (7.00% for the Hybrid Plan). 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 in thousands presents the plan's net pension liability, calculated using a single discount rate of 7.05% (7.00% for the Hybrid Plan), as well as what the plan's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower or 1- percentage-point higher.

1% Decrease 6.05% / 6.00%	**Current Discount Rate Assumption** 7.05% / 7.00%	**1% Increase** 8.05% / 8.00%
$953,795	$704,753	$498,185

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 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.

Actuarial Valuations and Assumptions

Actuarial valuations for the pension plan involve 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.

NOTES TO BASIC FINANCIAL STATEMENTS (Continued)

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	
-Non-Hybrid Plan	7.05%
-Hybrid Plan	7.00%
Projected Salary Increases	3.27% - 87.75%, including wage inflation at 2.75%
Cost-of-Living Pension Adjustments [(1)]	2% Annual Non-Compounded with Maximum Annual Increase of $500 for those eligible
Mortality	
Retirees	RP-2014 Male and Female Healthy Annuitant Mortality Table scaled by 93% for males and 99% 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 periods 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.

[1] Applies to individuals hired before June 10, 2012.

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 fair 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	$	769,435
Plan Fiduciary Net Position		191,010
Net OPEB Liability	$	578,425
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability		24.82%
Net OPEB Liability as a percentage of Covered Payroll		431.09%
Total Covered Payroll	$	134,177

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 OPEB 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 for each major asset class included in the OPEB plan's target asset allocation as of September 30, 2018, 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	**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 OPEB plan investment, net of OPEB plan investment expense, was 10.83%. 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 7.00% 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 7.50%. This single discount rate was based on the expected rate of return on OPEB plan investments of 7.00%. The projection of cash flows used to determine this single discount rate was based upon 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 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 to changes in the single discount rate. The following table presents the plan's net OPEB liability, in thousands, 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 Single Discount Rate Assumption	1% Increase
6.00%	7.00%	8.00%
$674,460	$578,425	$449,118

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 to changes in the healthcare cost trend rates. The following table presents the plan's net OPEB liability, in thousands, 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 Assumption	1% Increase
$494,934	$578,425	$676,983

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.

Actuarial Valuations and Assumptions

Actuarial valuations for the OPEB plans involve 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.

NOTES TO BASIC FINANCIAL STATEMENTS (Continued)

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 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	3.27% - 87.75%, including wage inflation at 2.75%
Healthcare Cost Trend Rate[2]	8.25% Year 1 graded to 3.0% Year 10
Mortality	
Retirees	RP-2014 Male and Female Healthy Annuitant Mortality Table scaled by 93% for males and 99% 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 OPEB only:[1]	
Opt Out Assumption	6% of eligible participants are assumed to opt out of the retiree health plan.
Survivor Coverage	100% of male retirees and 100% of female retirees are assumed to have coverage continuing after the retiree's death when 2-person coverage was assumed to be elected.
Coverage Election at Retirement	85% of male and 70% 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 periods 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 June 10, 2012.

[2] Applies to medical and Rx payments.

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 gain / (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 Thousands)

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 Contracts Fixed Income Investments	0.0 %	$ 498.5	$ 0.6	$ 6.0	-	-
Option Contracts Equity and Fixed Income Investments	0.7	872,592.3	12,032.2	6,069.7	-	-
Swap Agreements International Equity and Fixed Income Investments	3.0	59,136.1	50,288.3	(266.5)	$ (33.6)	-
Swap Agreements Domestic Equity and Fixed Income Investments	0.0	(689.5)	22.3	135.1	84.1	-
		$ 931,537.4	$ 62,343.4	$ 5,944.3	$ 50.5	$ -

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 foreign 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 the 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 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 exposures 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 exposure 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.

Securities Lending

The System, pursuant to a Securities Lending Authorization Agreement, has authorized State Street Bank and Trust Company ("State Street") to act as 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 Client, certain securities of the Client 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 market value of the loaned securities.

Pursuant to the Securities Lending Authorization Agreement, State Street had an obligation to indemnify the Client 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 Client 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 Client 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 $75,673,630 and $74,291,973 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 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 at 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, 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.

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	$ 48,637	A-1	$ 48,637	P-1
	6,165	A-2	1,117	P-2
	-	A-3	5,048	P-3
	-	NR	-	NR
Government Securities				
U.S. Agencies - Sponsored	43	AAA	14,558	Aaa
	14,515	AA	-	Aa
Fixed Income	3,553	AAA	8,807	Aaa
	6,485	AA	7,901	Aa
	16,221	A	19,517	A
	35,082	BBB	34,025	Baa
	7,411	BB	6,845	Ba
	5,539	B	6,570	B
	2,453	CCC	2,597	Caa
	558	CC	1,177	Ca
	-	C	28	C
	466	D	-	D
	33,407	NR	23,709	NR
International *	1,746	AAA	1,461	Aaa
	1,646	AA	1,646	Aa
	6,687	A	11,678	A
	22,937	BBB	17,946	Baa
	2,619	NR	2,903	NR
Securities Lending Collateral				
Short Term	4,439	A-1	4,439	P-1
	5,721	NR	11,831	NR
Fixed Income	1,213	AA	4,212	Aa
	17,926	A	8,817	A
	-	BB	46,374	Ba
	46,374	NR	-	NR
Mutual Fund	764	AAA	764	Aaa
	681	A	681	A
	1,608	BB	1,608	Ba
	496	B	496	B
Total	$ 295,393		$ 295,393	

NR - not rated

* International Investment types consist of domestic floating rate notes 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 $54.8 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.

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	$ 49,498	7.3
U. S. Agencies - Backed	13,255	3.0
U. S. Agencies - Sponsored	14,559	4.0
Corporate	114,723	4.0
International *		
U. S. Treasury	14,759	2.7
Corporate	35,635	0.4
Total	$ 242,430	

Debt securities are exclusive of securities lending collateral.
* International contains Domestic Government and Corporate Debt 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 $309.2 million, which amounted to 18.5% of total investments (exclusive of securities lending collateral) of the System.

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. $
AMERICA						
	Brazil	Real		$ 13		$ 680
	Canada	Dollar		172	$ 2,790	833
	Mexico	Peso		462		2,336
	Peruvian	Sol		34		
	Uruguayan	Peso		15		
	Colombian	Peso		47		
	Chilean	Peso		69		
PACIFIC						
	Australia	Dollar	$ 34		1,392	
	Hong Kong	Dollar	17		1,466	
	Indian	Rupee				3,407
	Indonesian	Rupiah		51		
	Japanese	Yen		298	12,853	
	Malaysian	Ringgit		75		
	New Taiwan	Dollar	107		282	
	New Zealand	Dollar			12	
	Renminbi		2,867			844
	Singapore	Dollar	10	53	265	
	Thai	Baht		84		
	Sri Lankan	Rupee		25		
EUROPE						
	Danish	Krone			451	
	European Union	Euro	1,692	1,512	5,778	16,913
	Hungarian	Forint				
	Norwegian	Krone	18		441	
	Polish	Zloty		55		
	Pound	Sterling	1,611	295	4,044	1,480
	Romanian	Leu		141		
	Sweden	Krona/Kronor	3	78	690	
	Switzerland	Franc	606		2,565	
AFRICA						
	South African	Rand	18	155		
	Egyptian	Pound		48		
	Zambian	Kwacha		-		
	Liberian	Dollar	1,333			
MIDDLE EAST						
	Israeli	New Shekel		129	518	
OTHER						
	Various				193,558	43,513
	Total		$ 8,316	$ 3,813	$ 227,106	$ 70,006

* International includes derivatives whose market 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.

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 on the following page.

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.

Investments by fair value level:	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)
Total cash and cash equivalents	$ 27,925	$ 27,925		
Equity				
Depository Receipts	3,981,449	3,981,449		
Warrants	1,403	-		$ 1,403
Common Stocks	381,270,135	381,223,069		47,066
Preferred Stocks	54,167	54,167		
Options on Equity	11,770,670	11,770,670		
Real Estate Investment Trusts	34,765,854	34,765,854		
Options on index	262,238	262,238		
Swaps	(1,720,592)	-	$ (1,720,592)	-
Commingled Funds, ETF's and PTP's	222,241,233	222,241,233		
Convertible Bonds	14,549	-	14,549	-
Total Equity	652,641,105	654,298,680	(1,706,043)	48,468
Fixed Income				
Asset Backed	23,287,442	-	23,287,442	-
Corporate Bonds	95,165,515	-	94,557,733	607,783
Commercial mortgage-backed	39,407,118	-	39,407,118	-
Government Issues	68,827,407	64,257,295	4,501,787	68,325
Swaps	33,822	-	33,822	-
US Agency Issues	11,869,298	-	11,869,298	-
Forwards	-	-	-	-
Futures on Fixed Income	227,977	227,977	-	
Commingled Funds, ETF's and PTP's	2,785,053	2,785,053	-	-
Options on Fixed Income	(666)	-	(666)	-
Total Fixed Income	241,602,967	67,270,325	173,656,535	676,108
Total investments by fair value level	$ 894,271,998	$ 721,596,930	$ 171,950,492	$ 724,576

Investments measured at the net asset value (NAV)	
Private Equity	$ 264,421,148
Real Estate & Infrastructure	171,149,744
Absolute Return	92,817,913
Real Return & Opportunistic	149,260,963
Other Limited Partnerships	36,414,950
Total investments measured at the NAV	714,064,717
Total investments measured at fair value	**$ 1,608,336,715**

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	$	264,421,148
Unfunded commitments		167,872,317

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	$	171,149,744
Unfunded commitments		28,659,439

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	$	92,817,913
Unfunded commitments		3,705,030

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 1, 2027; and the remaining 5.6% is not redeemable on demand.

Real Return and Opportunistic Portfolio

Total investments measured at the NAV	$	149,260,963
Unfunded commitments		85,270,024

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 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	$	36,414,950
Unfunded commitments		2,100,743

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 of 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.

Required Supplementary Information

Schedule of Changes in Net Pension Liability (in thousands)

	Fiscal Year 2018	2017	2016	2015	2014
Total Pension Liability					
Service Cost	$ 24,094	$ 20,908	$ 19,774	$ 19,952	$ 21,142
Interest	149,156	147,193	143,436	140,575	134,317
Changes of benefit terms					
Differences between expected and actual experience	7,959	18,289	8,440	(6,998)	
Changes of assumptions	106,681	94,280			36,683
Benefit payments, including refunds of member contributions	(137,367)	(130,208)	(119,094)	(115,469)	(110,551)
Net Change in Total Pension Liability	150,523	150,462	52,556	38,060	81,591
Total Pension Liability - Beginning	2,046,629	1,896,167	1,843,611	1,805,551	1,723,960
Total Pension Liability - Ending (a)	$ 2,197,152	$ 2,046,629	$ 1,896,167	$ 1,843,611	$ 1,805,551
Plan Fiduciary Net Position					
Contributions - Employer	$ 84,930	$ 74,814	$ 70,505	$ 70,351	$ 58,391
Contributions - Member	3,489	3,142	3,009	2,677	2,174
Net Investment Income	151,529	165,384	90,811	26,236	174,085
Miscellaneous Income	4	27	10	3	
Benefit payments, including refunds of member contributions	(137,367)	(130,208)	(119,094)	(115,469)	(110,551)
Administrative Expenses	(749)	(666)	(575)	(561)	(575)
Net Change in Plan Fiduciary Net Position	101,835	112,492	44,666	(16,762)	123,524
Plan Fiduciary Net Position - Beginning	1,390,564	1,278,071	1,233,405	1,250,168	1,126,643
Plan Fiduciary Net Position - Ending (b)	$ 1,492,399	$ 1,390,564	$ 1,278,071	$ 1,233,405	$ 1,250,168
Net Pension Liability - Ending (a) - (b)	$ 704,753	$ 656,066	$ 618,096	$ 610,206	$ 555,384
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	67.92%	67.94%	67.40%	66.90%	69.24%
Covered Payroll	$ 134,177	$ 125,085	$ 118,060	$ 114,278	$ 114,480
Net Pension Liability as a Percentage of Covered Payroll	525.24%	524.50%	523.55%	533.97%	485.14%

Schedule of Changes in Net OPEB Liability (in thousands)

	Fiscal Year 2018	Fiscal Year 2017
Total OPEB Liability		
Service Cost	$ 9,173	$ 9,855
Interest	57,650	55,607
Changes of benefit terms	25	
Differences between expected and actual experience	(71,325)	(4,142)
Changes of assumptions	26,627	
Benefit payments, including refunds of member contributions	(33,583)	(33,904)
Net Change in Total OPEB Liability	(11,432)	27,416
Total OPEB Liability - Beginning	780,868	753,452
Total OPEB Liability - Ending (a)	$ 769,435	$ 780,868
Plan Fiduciary Net Position		
Contributions - Employer	$ 56,779	$ 51,886
Contributions - Member		
Net Investment Income	17,222	16,063
Benefit payments, including refunds of member contributions	(33,583)	(33,904)
Administrative and Other Expenses	(87)	(100)
Other	10	15
Net Change in Plan Fiduciary Net Position	40,340	33,961
Plan Fiduciary Net Position - Beginning	150,670	116,709
Plan Fiduciary Net Position - Ending (b)	$ 191,010	$ 150,670
Net OPEB Liability - Ending (a) - (b)	$ 578,425	$ 630,197
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	24.82%	19.30%
Covered Payroll	$ 134,177	$ 125,085
Net OPEB Liability as a Percentage of Covered Payroll	431.09%	503.81%

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	$ 36,698	$ 35,435	$ 1,263	$ 123,238	28.8 %
2010	41,607	37,898	3,709	118,571	32.0
2011	47,248	38,574	8,674	110,280	35.0
2012	52,276	40,687	11,589	104,876	38.8
2013	57,668	49,004	8,663	110,244	44.5
2014	61,401	58,391	3,010	114,480	51.0
2015 [1]	63,271	70,351	(7,080)	114,278	61.6
2016	70,858	70,505	353	118,060	59.7
2017	72,632	74,814	(2,182)	125,085	59.8
2018	78,531	84,930	(6,399)	134,177	63.3

[1] Revised actuarial assumptions

Other Post Employment Benefits
(in thousands)

Fiscal Year Ended Sept. 30	Actuarially Determined Contribution (ADC)	Actual Employer Contribution[2]	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2009	$ 63,929	$ 30,213	$ 33,716	$ 123,238	24.5 %
2010	60,004	33,213	26,791	118,571	28.0
2011	73,690	35,271	38,419	110,280	32.0
2012	68,335	47,252	21,083	104,876	45.1
2013 [1]	46,803	45,659	1,144	110,244	41.4
2014	43,383	48,373	(4,990)	114,480	42.3
2015 [1]	47,674	47,722	(48)	114,278	41.8
2016	50,857	47,348	3,509	118,060	40.1
2017	52,301	51,886	415	125,085	41.5
2018	58,368	56,779	1,589	134,177	42.3

[1] Revised actuarial assumptions
[2] Years 2009 through 2017 include Other Governmental Contributions

Schedules of Investment Returns

Pension Benefits

Fiscal Year	Annual Return[1]
2014	13.97 %
2015	1.92
2016	7.00
2017	13.22
2018	11.08

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

OPEB Benefits

Fiscal Year	Annual Return[1]
2017	13.26 %
2018	10.83

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

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 Liability 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 the Net Pension and Net OPEB Liability represents in actuarial terms, the accrued liability less the fair value of assets. The Schedule 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 Required Supplementary Schedules 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	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
Price Inflation	2.5%
Salary Increases	4.02% - 93.5%, including wage inflation at 3.5%
Investment Rate of Return (net of investment and administrative expenses)	
- Non Pension Plus Plan	7.50%
- Pension Plus Plan	7.00%
- OPEB Plan	7.50%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility conditions.
Mortality	RP-2000 Combined Healthy Life Mortality Table, adjusted for mortality improvements to 2030 for males and to 2015 for females, using projection scale BB. For retirees, 100% of the table rates were used. 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"
Other Information	Some of the assumptions used to develop the 2018 Total OPEB Liability (TOL) are different than the assumptions shown above.

Supporting Schedules

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

Personnel Services:		
Staff Salaries	$	181
Retirement and Social Security		102
Other Fringe Benefits		35
Total		318
Professional Services:		
Accounting		20
Actuarial		136
Attorney General		25
Audit		72
Consulting		9
Medical		10
Total		271
Building and Equipment:		
Building Rentals		16
Equipment Purchase, Maintenance, and Rentals		-
Total		16
Miscellaneous:		
Travel and Board Meetings		1
Office Supplies		-
Postage, Telephone, and Other		25
Printing		3
Technological Support		114
Total		143
Total Administrative and Other Expenses	$	749

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

Staff Salaries	$	50
Staff Retirement and Social Security		28
Staff Other Fringe Benefits		10
Health Fees		1,223
Dental Fees		88
Vision Fees		14
Total Administrative and Other Expenses	$	1,413

Supporting Schedules (Continued)

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

Real Estate Operating Expenses	$	91
Securities Lending Expenses		1,604
Other Investment Expenses[1]		
ORS-Investment Expenses[2]		399
Custody Fees		38
Management Fees		6,173
Research Fees		119
Total Investment Expenses	$	8,423

[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 $5,942

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

Accounting	$	20
Actuary		136
Attorney General		25
Independent Auditors		72
Consulting		9
Medical Advisor		10
Total Payments	$	271

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	Employee Contributions Pension Plus	Employer Contributions	Employer Contributions Pension Plus
Additions:				
Contributions:				
Member contributions	$ 1,661	$ 1,828		
Employer contributions:			$ 79,798	$ 4,973
Other governmental contributions				
Total contributions	1,661	1,828	79,798	4,973
Investment income (loss):				
Net increase (decrease) in fair value of investments				
Interest, dividends, and other				
Investment expenses:				
Real estate operating expenses				
Other investment expenses				
Securities lending activities:				
Securities lending income				
Securities lending expenses				
Net investment income (loss)				
Miscellaneous income				
Total additions	1,661	1,828	79,798	4,973
Deductions:				
Benefits paid to plan members and beneficiaries:				
Retirement benefits				
Health benefits				
Dental/vision benefits				
Refund of contributions				
Administrative and other expenses				
Total deductions		-	-	-
Net Increase (Decrease) before other changes	1,661	1,828	79,798	4,973
Other Changes in Net Position:				
Interest allocation	381		10,659	894
Transfers upon retirement	(487)			
Transfers of employer shares			(136,686)	79
Total other changes in net position	(105)		(126,027)	974
Net Increase (Decrease) in Net Position	1,555	1,828	(46,229)	5,946
Net Position Restricted for Pension Benefits and OPEB:				
Beginning of Year	8,636	4,264	151,189	12,776
End of Year	$ 10,192	$ 6,092	$ 104,960	$ 18,722

Supporting Schedules (Continued)

Retired Benefit Payments	Retired Benefit Payments Pension Plus	Undistributed Investment Income	OPEB	Total
				$ 3,489
$ 159			$ 56,779	141,709
			3,546	3,546
159	-	-	60,326	148,744
		$ 122,748	13,823	136,572
		33,811	3,973	37,783
		(81)	(9)	(91)
		(6,037)	(692)	(6,728)
		2,515	304	2,818
		(1,427)	(177)	(1,604)
		151,529	17,222	168,750
4			10	13
163	-	151,529	77,557	317,507
137,295	$ 71			137,367
			33,329	33,329
			2,475	2,475
		749	1,413	2,162
137,295	71	749	37,217	175,332
(137,133)	(71)	150,780	40,340	142,175
178,784	90	(190,808)		
487				
136,686	(79)			
315,956	10	(190,808)		
178,824	(61)	(40,028)	40,340	142,175
1,295,536	644	(82,481)	150,670	1,541,234
$ 1,474,360	$ 584	$ (122,510)	$ 191,010	$ 1,683,409

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INVESTMENT SECTION

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

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.

Report on Investment Activity (Continued)

Asset Allocation
(Excludes Collateral on Loaned Securities)

Investment Category	As of 9/30/18 Actual %	Five Year Target %
Domestic Equity Pools	26.2 %	28.0 %
International Equity Pools	17.2	16.0
Private Equity Pools	16.4	18.0
Real Estate and Infrastructure Pools	10.5	10.0
Fixed Income Pools	12.1	10.5
Absolute Return Pools	15.0	15.5
Short-Term Investment Pools	2.6	2.0
TOTAL	**100.0** %	**100.0** %

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).

Act No. 314 of the Public Acts of 1965, as amended, authorizes the investment of assets of public employee retirement systems or plans created and establish 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 11.3% 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.

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 Depository Receipts (ADRs). They 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	44.3
Total	**100.0 %**
Large Cap	64.8 %
Multi Cap	27.0
Mid Cap	6.8
Small Cap	1.4
Total	**100.0 %**

The System’s Domestic Equity pools total rate of return was 20.9% for 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 26.2% of total investments. The following summarizes the System's 2.4% ownership share of the Domestic Equity pools at September 30, 2018:

Domestic Equity Pools
(in thousands)

Short-Term Pooled Investments	$	7,020
Equities		433,057
Settlement Principal Payable		(800)
Settlement Proceeds Receivable		51
Accrued Dividends		572
Total	**$**	**439,900**

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 Depository 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 their 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 pools as of September 30, 2018:

Active	79.5 %
Passive	20.5
Total	**100.0 %**

Developed	92.9 %
Emerging	7.1
Total	**100.0 %**

The System's International Equity pools total rate of return was 1.9% for the Pension and 2.0% for the OPEB Plans for fiscal year 2018. This compared with 1.8% for the MSCI ACWI Ex US Net.

Report on Investment Activity (Continued)

At the close of fiscal year 2018, the International Equity pools represented 17.2% of total investments. The following summarizes the System's 2.3% ownership share of the International Equity Pools at September 30, 2018:

International Equity Pools
(in thousands)

Short-Term Pooled Investments	$1,117
Equities	237,694
Fixed Income Securities	50,394
Market Value of Equity Contracts	(1,932)
Accrued Dividends and Interest	235
Total	**$ 287,508**

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	**100.0 %**

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 16.4% of total investments. The following summarizes the System's 2.5% ownership share of the Private Equity pools at September 30, 2018:

Private Equity Pools
(in thousands)

Short-Term Pooled Investments	$ 9,660
Equities	264,268
Long Term Obligations	310
Accrued Interest	17
Total	**$ 274,255**

Report on Investment Activity (Continued)

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 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 Sale Homes	3.7	
Land	1.4	
Short-Term Investments	1.5	
Total	**100.0**	**%**

The Real Estate and Infrastructure pools generated a return of 12.3% for the Pension and 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 2.3% ownership share of the Real Estate and Infrastructure pools at September 30, 2018:

Real Estate and Infrastructure Pools
(in thousands)

Short-Term Pooled Investments	$	2,590
Real Estate Equities		154,684
Infrastructure Equities		18,676
Dividend Receivable		48
Total	**$**	**175,998**

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.

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 pool 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 their investments by allocating their 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 12.1% of total investments. The following summarizes the System's 2.3% ownership share of the Fixed Income pools at September 30, 2018:

Fixed Income Pools
(in thousands)

Short-Term Pooled Investments	$	826
Fixed Income Securities		200,584
Market Value of Equity Contracts		11
Settlement Proceeds Receivable		23
Accrued interest		572
Total	**$**	**202,016**

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 for the fiscal year was 14.4% for the Pension and OPEB Plans versus the benchmark’s 7.6 %.

Report on Investment Activity (Continued)

At the close of fiscal year 2018, the Absolute Return Pools represented 15.0% of total investments. The following summarizes the System's 2.3% ownership share of the Absolute Return Pools at September 30, 2018:

Absolute Return Pools
(in thousands)

Short Term Pooled investments	$	9,183
Equities		242,079
Total	**$**	**251,262**

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 Plan and 1.9 % for the OPEB Plan 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.

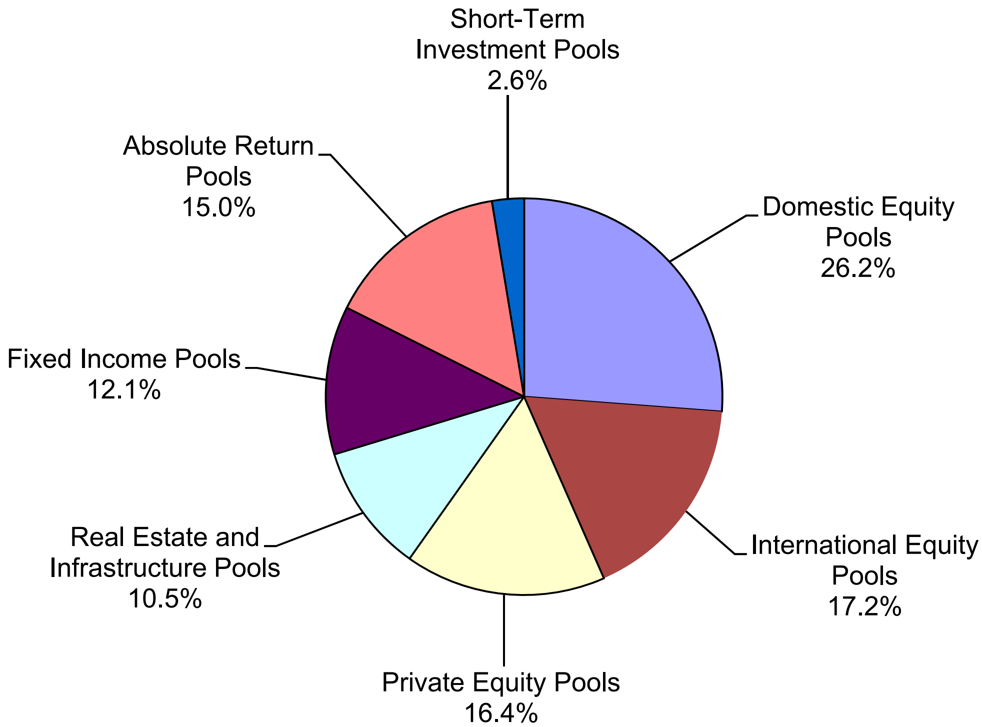
At the close of fiscal year 2018, the Short-Term Investment pools represented 2.6% of total investments. The following summarizes the System's 2.5% ownership share of the Short-Term Investment pools at September 30, 2018:

Short-Term Investment Pools
(in thousands)

Short Term Pooled Investments	$	23,322
Fixed Income Securities		20,024
Accrued Interest		15
Total	**$**	**43,361**

Report on Investment Activity (Continued)

ASSET ALLOCATION – SECURITY TYPE ONLY



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	1.9	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	11.3
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	3.0
HFRI Fund of Fund 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	0.8
30 Day Treasury Bill	1.5	0.8	0.5	0.3

[1] Calculations 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 8/1/18 reflects 50% (CPI + 5%) and 50% (actuarial rate 8%).

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	11.3 %	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	2.2
Absolute Return Pools			
Total Absolute Return	6.0	4.0	4.7
HFRI Fund of Fund 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	1.9	1.1	0.8
30 Day Treasury Bill	1.5	0.8	0.5

[1] Calculations 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%).

Largest Assets Held[1]

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

Rank	Shares	Stocks	Fair Value
1	65,721	Apple Inc.	$ 14,835,829
2	87,342	Microsoft Corp.	9,989,305
3	505,972	AGNC Investment Corp.	9,426,258
4	4,673	Amazon.com Inc.	9,360,350
5	5,784	Alphabet Inc. CL A	6,981,318
6	30,988	Berkshire Hathaway Inc CL B	6,634,734
7	620,291	Annaly Capital Management Inc.	6,345,574
8	41,274	Visa Inc. CL A	6,194,885
9	26,343	Home Depot Inc.	5,456,878
10	31,197	Facebook Inc.	5,130,680

Largest Bond Holdings (By Fair Value)[2]
September 30, 2018

Rank	Par Amount	Bonds & Notes	Fair Value
1	5,494,209	US Treasury N/B 2.75% Due 02/15/2028	$ 5,356,639
2	4,327,269	US Treasury N/B 3% Due 02/15/2048	4,164,490
3	4,046,946	US Treasury N/B 1.5% Due 05/15/2020	3,964,901
4	4,085,740	US Treasury N/B 2.25% Due 02/15/2027	3,845,862
5	3,504,095	US Treasury N/B 1.875% Due 07/31/2022	3,371,459
6	2,877,976	US Treasury N/B 2.25% Due 11/15/2027	2,693,830
7	2,733,012	US Treasury N/B 2.125% Due 05/15/2025	2,587,714
8	2,846,888	US Treasury N/B 1.625% Due 02/15/2026	2,583,439
9	2,429,700	Ford Motor Credit Co. LLC 3.548750% FRN Due 02/15/2023	2,416,220
10	2,292,170	AT&T Inc. 3.514250% FRN Due 06/12/2024	2,302,485

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

2 Largest Bond Holdings are exclusive of securities lending collateral.

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

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. 68.77% 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 $399 thousand or seven and six tenths basis points (.076%) of the market 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

	Assets under Management (in thousands)	Fees (in thousands)	Basis Points*
Investment Managers' Fees:			
State Treasurer	$ 523,251	$ 399	7.6
Outside Advisors for			
Fixed Income	103,913	316	30.4
Absolute Return	249,690	1,152	46.1
International Equity	236,826	431	18.2
Domestic Equity	111,450	236	21.2
Private Equity	274,255	2,332	85.0
Real Estate and Infrastructure	175,998	1,707	97.0
Total	**$ 1,675,383**	**$ 6,573**	
Other Investment Services Fees:			
Assets in Custody	$ 1,667,956	$ 157	
Securities on Loan	75,674	96	

* Private Equity partnership agreements that define the management fees, the asset management fees range from 75 basis points on 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.

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	$1,730	52,684	$0.03	$0.01	$0.02	$527	$1,053
BTIG LLC	16,920	3,156,374	0.01	0.01	-	31,564	-
Capital Institutional Services Inc.	5,119	945,402	0.01	0.01	-	9,454	-
Citigroup Global Markets Inc.	622	62,236	0.01	0.01	-	622	-
Cowen & Company LLC	3,285	164,235	0.02	0.01	0.01	1,643	1,644
Credit Suisse Securities LLC	1,180	62,191	0.02	0.01	0.01	621	621
Drexel Hamilton LLC	1,011	202,299	0.01	0.01	-	2,023	-
J. P. Morgan Securities Inc.	1,471	76,086	0.02	0.01	0.01	761	761
Mischler Financial Group Inc.	376	18,784	0.02	0.01	0.01	187	187
Morgan Stanley & Co. Inc.	3,505	160,411	0.02	0.01	0.01	1,604	1,604
RBC Capital Markets	-	11	0.01	0.01	-	-	-
Stifel, Nicolaus & Co. Inc.	337	8,599	0.04	0.01	0.03	86	258
Wayne & Company	13,039	4,368,808	0.00	0.01	-	43,689	-
Total	**$48,595**	**$9,278,120**	**$0.02** [2]	**$0.01**	**$0.01**	**$92,781**	**$6,128**

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

[2] The average commission per share for all brokerage firms.

Investment Summary

Fiscal Year Ended September 30, 2018

	Market Value (a)(c)	Percent of Total Market Value	Investment & Interest Income (b)	Percent of Total Investment & Interest Income
Fixed Income Pools	$ 202,016,398	12.1 %	$ 1,889,788	1.1 %
Domestic Equity Pools	439,899,909	26.3	76,497,997	43.9
Real Estate and Infrastructure Pools	175,998,340	10.5	20,489,879	11.8
Private Equity Pools	274,255,263	16.4	44,857,300	25.7
International Equities Pools	287,507,505	17.2	5,009,044	2.9
Absolute Return Pools	251,262,312	15.0	24,606,744	14.1
Short-Term Investment Pools	43,360,929	2.6	1,027,380	0.6
Total	$1,674,300,657	100.0 %	$174,378,132	100.0 %

[a] Market value excludes $75,673,630 in security lending collateral for fiscal year 2018.

[b] Total Investment & Interest Income excludes net security lending income of $1,214,049 and unrealized loss of $75,049 for securities lending collateral.

[c] Short term investment pools market value includes $6,344,963 of equity in common cash.

ACTUARIAL SECTION

Actuary's Certification

GRS Retirement Consulting

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 Police Retirement System
P.O. Box 30171
Lansing, Michigan 48909

Ladies and Gentlemen:

The basic financial objective of the Michigan State Police Retirement System (SPRS) 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 these 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 SPRS 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 SPRS 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.

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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 and Related Ratios
- Schedules of Contributions Multiyear
- Sensitivity of the NPL to Changes in the Discount Rate
- Sensitivity of the Net OPEB Liability to Changes in the Discount Rate
- Sensitivity of the Net OPEB Liability 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 OPEB Rolls

Statistical Section

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

Actuary's Certification (Continued)

Mr. David Devries
October 25, 2018
Page 3

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 SPRS 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 Gates

Louise M. Gates, ASA, FCA, MAAA

Mita Drazilov

Mita D. Drazilov, ASA, FCA, MAAA

Summary of Actuarial Assumptions and Methods

1. The investment return rate used in the pension valuation was 7.05% per year net of expenses (7.00% for the Hybrid Plan), compounded annually. This rate of return is not the assumed real rate of return. Considering other financial assumptions, this 7.05% investment return rate translates to an assumed real rate of return of 3.55% (3.50% for the Hybrid Plan). Adopted 2017 for the Non-Hybrid Plan. Adopted 2012 for the Hybrid Plan.
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 2030 using projection scale BB for males and adjusted for mortality improvements to 2015 using projection scale BB for females. Adopted 2014.
3. Sample probabilities of retirement with an age and service allowance are shown in Schedule 1 on the next page. Adopted 2014.
4. Sample probabilities of withdrawal from service and disability, together with individual pay increase assumptions, are shown in Schedule 2 on the next page. Adopted 2014.
5. Total active member payroll is assumed to increase 3.5% per year. This represents the portion of the individual pay increase assumptions attributable to inflation. In effect, this assumes no change in the number of active members. Adopted 1998.
6. An individual entry age actuarial cost method of valuation was used in determining actuarial liabilities and normal cost. Unfunded actuarial accrued liabilities, including actuarial gains and losses, are financed over a declining 40-year period for years beginning October 1, 1986. Adopted or readopted 1996.
7. The Department of Technology, Management & Budget approved the use of market value of assets as of September 30, 2006, for actuarial 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 the actuarial assumptions then in use. Adopted 2014.
11. Gabriel Roeder Smith & Co. was awarded the actuarial and consulting services contract beginning October 4, 2006.

Summary of Actuarial Assumptions and Methods (Continued)

SCHEDULE 1

Percent of Eligible Active Members Retiring Within Next Year[1]

Retirement After 25 or More Years of Service (Non Pension Plus Plan)

Service	% Retiring
25-27	60 %
28-44	35
45 and over	100

Retirement at or After Age 50 with 10 Years of Service (Non Pension Plus Plan), or After Age 55 with 25 Years of Service (Pension Plus Plan), or After Age 60 with 10 Years of Service (Pension Plus Plan)

Age	% Retiring
50	15 %
51-53	25
54-59	35
60	40
61-66	50
67 and over	100

[1] Of those Non Pension Plus Plan members assumed to retire with 25 or more years of service, based on the percents above, 70% are assumed to elect the DROP and 30% are assumed to retire without the DROP.

SCHEDULE 2

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

Sample Ages	Completed 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
All	0	10.00 %			93.50 %
	1	8.00			21.50
			Duty	Non-duty	
20	2 & Over	1.35	0.20 %	0.00 %	9.40
25	"	1.22	0.20	0.00	9.40
30	"	1.02	0.20	0.03	6.18
35	"	0.84	0.20	0.06	4.82
40	"	0.74	0.20	0.15	4.38
45	"	0.64	0.20	0.33	4.29
50	"	0.60	0.20	0.57	4.18
55	"	0.60	0.20	0.81	4.06
60 & Over	"	0.60	0.20	1.14	4.02

Actuarial 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	1,660	$ 120,723,943	$ 72,725	(0.3) %	40.1	13.8
2009	1,655	123,237,957	74,464	2.4	41.0	14.6
2010	1,556	118,570,985	76,202	2.3	41.8	15.5
2011	1,451	110,279,709	76,003	(0.3)	41.7	15.4
2012	1,426	104,875,847	73,545	(3.2)	41.2	14.9
2013	1,521	110,244,195	72,481	(1.4)	39.8	13.3
2014	1,603	112,453,562	70,152	(3.2)	38.8	12.3
2015	1,516	112,122,615	73,960	5.4	39.0	12.7
2016	1,688	119,044,254	70,524	(4.6)	38.0	11.8
2017	1,777	129,874,976	73,087	3.6	37.9	11.8

Excludes DROP program participants who are still actively employed.

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	1,426	$ 104,875,847	$ 73,545		41.2	14.9
2013	1,521	110,244,195	72,481	(1.5) %	39.8	13.3
2014	1,603	112,453,562	70,152	(3.2)	38.8	12.3
2015	1,516	112,122,615	73,960	5.4	39.0	12.7
2016	1,688	119,044,254	70,524	(4.6)	38.0	11.8
2017	1,777	129,874,976	73,087	3.6	37.9	11.8

Actuarial Valuation Data (Continued)

Schedule of Changes in the Retirement Rolls

Year Ended Sept. 30	Added to Rolls No.	Added to Rolls Annual Allowances*	Removed from Rolls No.	Removed from Rolls Annual Allowances*	Rolls – End of Year No.	Rolls – End of Year Annual Allowances*	Increase in Annual Allowances	Average Annual Allowances
2008	62	$ 2,964	59	$ 1,317	2,736	$ 87,063	1.9 %	$ 31,821
2009	51	2,692	66	1,471	2,721	88,284	1.4	32,446
2010	110	5,572	69	1,586	2,762	92,270	4.5	33,407
2011	157	7,362	62	1,522	2,857	98,110	6.3	34,340
2012	93	5,115	37	972	2,913	102,253	4.2	35,102
2013	105	5,206	65	1,704	2,953	105,755	3.4	35,813
2014	95	4,797	85	2,340	2,963	108,212	2.3	36,521
2015	95	4,801	71	1,718	2,987	111,295	2.8	37,260
2016	104	5,471	73	2,023	3,018	114,743	3.1	38,019
2017	112	6,143	68	1,848	3,062	119,038	3.7	38,876

* In thousands of dollars.

Schedule of Changes in the OPEB Rolls

Year Ended Sept. 30	Added to Rolls[1] No.	Added to Rolls[1] Annual Allowances*	Removed from Rolls[1] No.	Removed from Rolls[1] Annual Allowances*	Rolls – End of Year No.	Rolls – End of Year Annual Allowances*	Increase in Annual Allowances	Average Annual Allowances
2011					2,566	$ 33,561		$ 13,079
2012	86	$ 1,340	31	$ 976	2,621	33,926	1.1 %	12,944
2013	90	1,408	58	2,397	2,653	32,938	(2.9)	12,415
2014	80	1,043	79	1,476	2,654	32,504	(1.3)	12,247
2015	72	1,023	60	1,502	2,666	32,025	(1.5)	12,012
2016	89	4,223	64	1,241	2,691	35,007	9.3	13,009
2017	103	4,175	60	1,407	2,734	37,774	7.9	13,817

* In thousands of dollars.

[1] Annual allowance amounts are not available for fiscal years 2011 and prior.

Notes:

No. Refers to the number of retiree health contracts.

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

Pension Benefits
($ in thousands)

	Actuarial Accrued Liability (AAL)							
	(1)	(2)	(3)					
Valuation Date Sept. 30	Active Member Contributions	Retirants and Beneficiaries	Active and Inactive Members (Employer Financed Portion)[3]	Valuation Assets	Portion of AAL Covered by Assets (1)	(2)	(3)	(4)[1]
2008	$ 453	$ 1,010,206	$ 485,638	$ 1,265,725	100.0 %	100.0 %	52.5 %	84.6 %
2009	487	1,010,464	523,028	1,238,089	100.0	100.0	43.4	80.7
2010	485	1,047,318	517,379	1,201,968	100.0	100.0	29.8	76.8
2010 [4]	485	1,052,454	541,361	1,201,968	100.0	100.0	27.5	75.4
2011	451	1,111,282	516,192	1,318,129	100.0	100.0	5.1	69.9
2012 [2]	480	1,145,516	525,042	1,069,179	100.0	93.0	0.0	64.0
2013	1,549	1,173,048	549,362	1,069,106	100.0	91.0	0.0	62.0
2014	3,589	1,187,229	573,236	1,133,323	100.0	95.2	0.0	64.2
2014 [4]	3,589	1,213,209	583,108	1,133,323	100.0	93.1	0.0	63.0
2015	5,971	1,233,879	611,576	1,197,222	100.0	96.6	0.0	64.7
2016	8,762	1,277,584	626,754	1,272,575	100.0	98.9	0.0	66.5
2016 [4]	8,762	1,332,226	666,516	1,272,575	100.0	94.9	0.0	63.4
2017	11,971	1,373,293	668,770	1,342,953	100.0	96.9	0.0	65.4
2017 [4]	11,971	1,427,196	707,655	1,397,866	100.0	97.1	0.0	65.1

[1] Percent funded on a total valuation asset and total actuarial accrued liability basis.
[2] Revised benefit provisions.
[3] Includes DROP members.
[4] Revised actuarial assumptions and/or methods.

Prioritized Solvency Test (Continued)

Other Postemployment Benefits
($ in thousands)

	Actuarial Accrued Liability (AAL)				Portion of AAL Covered by Assets			
Valuation Date Sept. 30	(1) Active Member Contributions	(2) Retirants and Beneficiaries	(3) Active and Inactive Members (Employer Financed Portion) [2]	Valuation Assets	(1)	(2)	(3)	(4) [1]
2008	-	$ 590,311	$ 372,711	-	0.0 %	0.0 %	0.0 %	0.0 %
2009	-	528,354	353,908	-	0.0	0.0	0.0	0.0
2010	-	615,468	440,407	-	0.0	0.0	0.0	0.0
2011	-	596,842	397,839	-	0.0	0.0	0.0	0.0
2012	-	397,041	202,054	$ 32,996	0.0	8.3	0.0	5.5
2013	-	395,655	207,311	52,240	0.0	13.2	0.0	8.7
2014	-	415,077	222,276	77,664	0.0	18.7	0.0	12.2
2015	-	431,891	243,697	94,770	0.0	21.9	0.0	14.0
2016 [3]	-	476,889	276,563	116,709	0.0	24.5	0.0	15.5
2017	-	523,813	195,210	150,670	0.0	28.8	0.0	21.0
2017 [3]	-	528,767	198,261	150,670	0.0	28.5	0.0	20.7

[1] Percent funded on a total valuation asset and total actuarial accrued liability basis.
[2] Includes DROP members.
[3] Revised actuarial assumptions

Analysis of System Experience – Pension

Gains/(Losses) in Accrued Liabilities During Year Ended September 30, 2017 Resulting from Differences Between Assumed Experience & Actual Experience

	Type of Activity	Gain/(Loss)
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.	$ 2,476,311
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.	426,078
3.	**Pay Increases.** If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(4,364,875)
4.	**Investment Income.** If there is greater investment income than assumed, there is a gain. If less income, a loss.	84,136,554
5.	**Death After Retirement**. If retirants live longer than assumed, there is a loss. If not as long, a gain.	(1,834,020)
6.	**New Entrants/Rehires.** New entrants 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.	(4,456,084)
8.	**Composite Gain (or Loss) During Year**	$ 76,383,964

Analysis of System Experience – OPEB

Gains/(Losses) in Accrued Liabilities During Year Ended September 30, 2017
Resulting from Differences Between Assumed Experience & Actual Experience

	Type of Activity	Gain/(Loss)
1.	**Premiums** Gains and losses resulting from actual premiums in valuation year versus that assumed from prior valuation.	$ 63,093,772
2.	**Investment Income.** If there is greater investment income than assumed, there is a gain. If less income, a loss.	6,551,137
3.	**Demographic and Other.** Gains and losses resulting from demographic experience, data adjustments, timing of financial transactions, etc.	2,893,201
4.	**Composite Gain (or Loss) During Year**	$ 72,538,110

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 Police Retirement Act (Public Act 182 of 1986, as amended).

REGULAR RETIREMENT (NO REDUCTION FACTOR FOR AGE)

Eligibility – 25 years of credited service with no age requirement; or age 50 with 10 years credited service.

Mandatory Retirement Age – None.

Annual Amount – If member has 25 or more years of credited service, 60% of final average compensation; if member has less than 25 years of credited service, total credited service times 2% of final average compensation.

Final Average Compensation – Average of 2 final years.

EARLY RETIREMENT

Eligibility – None.

DEFERRED RETIREMENT (VESTED BENEFIT)

Eligibility – 10 years of credited service. Benefit commences at age 50.

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; in receipt of workers' disability compensation.

Annual Amount – 60% of final average compensation. Disability benefit plus workers' compensation benefit, if any, shall not exceed 100% of final average compensation.

NONDUTY DISABILITY RETIREMENT

Eligibility – 10 years of credited service.

Annual Amount – 2.4% of final average compensation times years of credited service, to a maximum of 60% of final average compensation.

DUTY DEATH BEFORE RETIREMENT

Eligibility – No age or service requirement.

Annual Amount – 60% of final average compensation is payable to surviving spouse; additional $1,200 per year for each child under 18 is also payable. If no surviving spouse, children under 18 share in 60% benefit until attainment of age 18. If no spouse or children, dependent parents are eligible for 60% benefit (plus $1,200 per dependent sibling under 18). Retirement benefit plus workers' compensation, if any, shall not exceed 100% of final average compensation.

Lump Sum Payment – A $1,500 funeral benefit is also payable.

NONDUTY DEATH BEFORE RETIREMENT

Eligibility – 10 years of credited service.

Annual Amount – 2.4% of final average compensation times years of credited service, to a maximum of 60% of final average compensation, payable to surviving spouse. If no surviving spouse, children under 18 share in benefit until attainment of age 18.

Summary of Plan Provisions (Continued)

DEATH AFTER RETIREMENT

The retired member's benefit continues to the surviving spouse. If no surviving spouse, children under 18 share in the continued benefit until attainment of age 18.

DROP PROGRAM PROVISIONS

DROP Eligibility – Any age with 25 years of service.

Maximum Years of DROP – 6 years.

Retirement Benefit – Monthly benefit frozen at date of DROP election.

DROP Account - Amount credited – 100% of the participant's Retirement Benefit if stay full six years (for all 6 years); 90% if stay 5 years; 80% if stay 4 years; 70% if stay 3 years; 60% if stay 2 years; 50% if stay 1 year; 30% if stay less than 1 year.

Interest Credit Rate – 3% annually.

COLA – No COLA adjustment on Retirement Benefit until the end of the DROP period.

Benefit Options – At termination of DROP participation and commencement of retirement, options are lump sum of DROP account, partial lump sum, or maintain funds in account.

POSTRETIREMENT COST-OF-LIVING ADJUSTMENTS

All members retiring (or leaving employment with vested benefits), and their survivors, are eligible for automatic 2% annual (non-compounded) benefit increases, with a maximum annual increase of $500.

POSTRETIREMENT HEALTHCARE BENEFITS

Persons in receipt of retirement allowances (including members who did not retire directly from the System, but come from a vested deferred status), and their dependents, are eligible for 95% State-paid health insurance coverage and 90% State-paid dental and vision insurance.

MEMBER CONTRIBUTIONS BEFORE TRANSITION DATE (FEBRUARY 1, 2013)

Basic Participants – None.

MIP Participants hired before January 1, 1990 – 3.9% of pay.

MIP Participants hired on or after January 1, 1990 and before July 1, 2008 – 3.0% of first $5,000 of pay, plus 3.6% of next $10,000 of pay, plus 4.3% pay in excess of $15,000.

MIP and PENSION PLUS Participants hired on or after July 1, 2008 – 3.0% of first $5,000 of pay, plus 3.6% of next $10,000 of pay, plus 6.4% pay in excess of $15,000.

MEMBER CONTRIBUTIONS

Non Pension Plus Members – Command Officers currently participate on a noncontributory basis. Effective October 1, 2012, troopers and sergeants hired before June 10, 2012 began contributing 1% of their compensation. Effective October 1, 2013 troopers and sergeants hired before June 10, 2012 began contributing 2% of their compensation.

Pension Plus Members – Troopers hired on or after June 10, 2012 contribute 4% of their compensation.

These contributions are for the pension component of their plan.

STATISTICAL SECTION

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 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

Schedules of Additions by Source

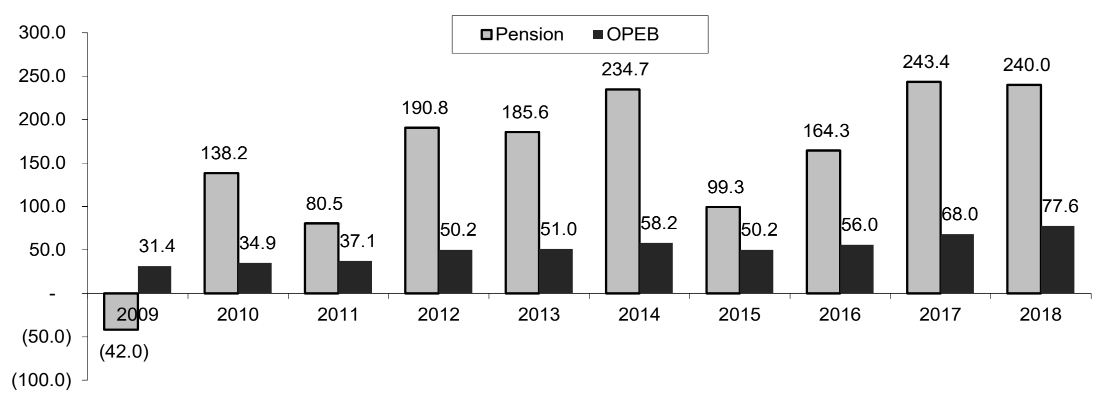
Schedule of Pension Plan Additions by Source
Last Ten Years

Fiscal Year Ended Sept. 30	Member Contributions	Employer Contributions Dollars	Employer Contributions % of Annual Covered Payroll	Net Investment & Other Income	Total
2009	$ 139,924	$ 35,434,912	28.8 %	$ (77,524,873)	$ (41,950,037)
2010	172,387	37,897,934	32.0	100,179,113	138,249,434
2011	207,384	38,573,946	35.0	41,746,238	80,527,568
2012	229,085	40,686,857	38.8	149,844,852	190,760,794
2013	1,336,081	49,004,314	44.5	135,230,258	185,570,653
2014	2,174,031	58,391,310	51.9	174,085,069	234,650,410
2015	2,677,458	70,351,036	62.7	26,239,211	99,267,706
2016	3,009,482	70,505,268	59.2	90,820,874	164,335,623
2017	3,141,638	74,813,976	57.6	165,410,872	243,366,486
2018	3,488,721	84,929,848	N/A	151,532,099	239,950,668

Schedule of OPEB Plan Additions by Source
Last Ten Years

Fiscal Year Ended Sept. 30	Member Contributions	Employer Contributions Dollars	Employer Contributions % of Annual Covered Payroll	Net Investment & Other Income	Total
2009	$ 1,244,169	$ 29,841,207	24.2 %	$ 276,098	$ 31,361,474
2010	1,157,358	32,890,501	27.7	813,870	34,861,729
2011	1,333,174	31,627,140	28.7	4,178,390	37,138,704
2012	1,337,205	46,190,655	44.0	2,671,348	50,199,208
2013	1,272,232	42,858,381	38.9	6,891,305	51,021,918
2014	1,198,890	46,614,502	41.5	10,394,057	58,207,449
2015	1,129,645	45,848,019	40.9	3,208,549	50,186,214
2016	1,160,562	45,156,857	37.9	9,691,585	56,009,004
2017	237	49,416,721	38.0	18,547,599	67,964,558
2018	-	56,779,248	N/A	20,777,421	77,556,669

Total Additions
Year Ended September 30
(in millions)



Schedules of Deductions by Type

Schedule of Pension Plan Deductions by Type

Last Ten Years

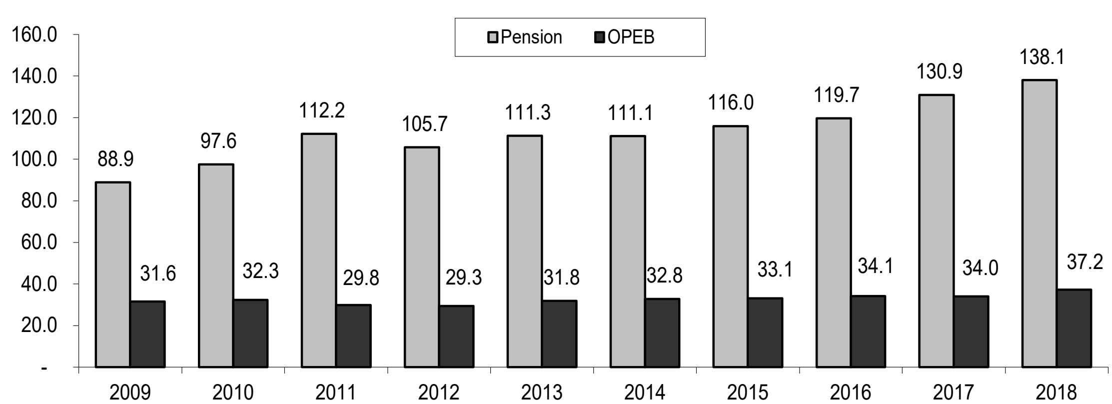
Fiscal Year Ended Sept. 30	Benefit Payments	Refunds and Transfers	Administrative and Other Expenses	Total
2009	$ 88,492,159		$ 386,146	$ 88,878,305
2010	97,194,529	$ 7,166	372,728	97,574,423
2011	111,809,981	5,177	361,611	112,176,769
2012	104,962,793		756,602	105,719,395
2013	110,782,367	19,489	508,118	111,309,974
2014	110,542,930	7,977	575,108	111,126,016
2015	115,466,146	2,935	561,121	116,030,202
2016	119,081,074	13,299	575,135	119,669,508
2017	130,203,073	5,196	665,820	130,874,089
2018	137,366,603	-	749,004	138,115,607

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	$ 30,007,135		$ 1,624,795	$ 31,631,930
2010	31,378,928		876,797	32,255,725
2011	28,954,352		875,530	29,829,882
2012	28,421,260		875,883	29,297,144
2013	30,571,508		1,205,738	31,777,247
2014	31,373,483		1,409,863	32,783,346
2015	31,696,743		1,383,518	33,080,261
2016	32,667,947		1,402,293	34,070,241
2017	32,657,938		1,345,546	34,003,484
2018	35,803,966	$ 62	1,412,564	37,216,592

Total Deductions
Year Ended September 30
(in millions)



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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	$ 140	$ 172	$ 207	$ 229
Employer contributions	35,435	37,898	38,574	40,687
Net investment income	(77,536)	100,144	41,731	149,832
Miscellaneous income	11	35	15	13
Total Additions	(41,950)	138,249	80,528	190,761
Pension benefits	88,492	97,194	111,810	104,963
Refunds of contributions		7	5	
Administrative and Other Expenses	386	373	362	757
Total Deductions	88,878	97,574	112,177	105,719
Changes in net position	$ (130,828)	$ 40,675	$ (31,649)	$ 85,041

Schedule of Changes in Fiduciary Net Position – OPEB Plan
Last Ten Years (in thousands)

	Fiscal Year			
	2009	**2010**	**2011**	**2012**
Member contributions	$ 1,244	$ 1,157	$ 1,333	$ 1,337
Employer contributions	29,841	32,891	31,627	46,191
Other governmental contributions	372	322	3,644	1,061
Net investment income	(158)	480	527	1,594
Transfers from other systems				
Miscellaneous income	62	12	8	17
Total Additions	31,361	34,862	37,139	50,199
Health care benefits	30,007	31,379	28,954	28,421
Refunds of contributions				
Transfers to other systems				
Administrative and Other Expenses	1,625	877	876	876
Total Deductions	31,632	32,256	29,830	29,297
Changes in net position	$ (271)	$ 2,606	$ 7,309	$ 20,902

Schedules of Changes in Fiduciary Net Position (Continued)

Fiscal Year (continued)					
2013	2014	2015	2016	2017	2018
$ 1,336	$ 2,174	$ 2,677	$ 3,009	$ 3,142	$ 3,489
49,004	58,391	70,351	70,505	74,814	84,930
135,202	174,085	26,236	90,811	165,384	151,529
28		3	10	27	4
185,571	234,650	99,268	164,336	243,366	239,951
110,782	110,543	115,466	119,081	130,203	137,367
19	8	3	13	5	-
508	575	561	575	666	749
111,310	111,126	116,030	119,670	130,875	138,116
$ 74,261	$ 123,524	$ (16,762)	$ 44,666	$ 112,492	$ 101,835

Fiscal Year (continued)					
2013	2014	2015	2016	2017	2018
$ 1,272	$ 1,199	$ 1,130	$ 1,161		
42,858	46,615	45,848	45,157	$ 49,417	$ 56,779
2,801	1,758	1,874	2,191	2,469	3,546
4,073	8,637	1,326	7,396	16,063	17,222
17		9	104	15	10
51,022	58,207	50,186	56,009	67,965	77,557
30,572	31,373	31,697	32,668	32,658	35,804
1,206	1,410	1,384	1,402	1,346	1,413
31,777	32,783	33,081	34,070	34,003	37,217
$ 19,245	$ 25,424	$ 17,106	$ 21,939	$ 33,961	$ 40,340

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	Funeral Benefits	Refunds		Total
					Employee Contribution	Employer Contribution	
2009	$ 74,051,305	$ 4,452,564	$ 9,988,290				$ 88,492,159
2010	81,958,482	4,814,513	10,421,533		$ 4,353	$ 2,813	97,201,695
2011	95,613,346	5,226,631	10,968,504	$ 1,500		5,177	111,815,158
2012	87,999,851	5,370,427	11,592,515				104,962,793
2013	93,031,493	5,675,801	12,073,573	1,500	19,489		110,801,855
2014	91,805,601	5,804,476	12,932,853			7,977	110,550,907
2015	95,679,585	6,132,395	13,654,166		2,935		115,469,081
2016	98,437,622	6,344,022	14,299,429		13,299		119,094,373
2017	108,922,599	6,588,327	14,692,147			5,196	130,208,269
2018	115,195,841	6,923,210	15,247,552		21	(21)	137,366,603

Schedule of OPEB Benefits and Refunds by Type

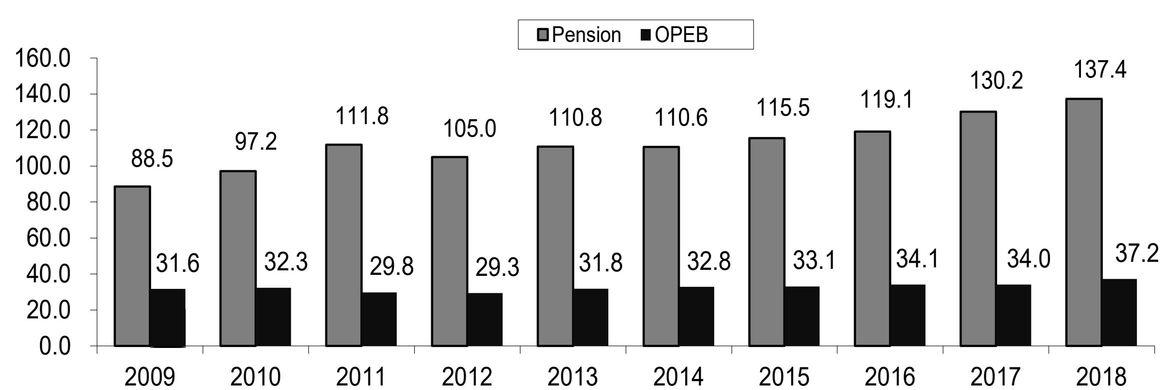
Last Ten Years

Fiscal Year Ended Sept. 30	Health Benefits	Dental Benefits	Vision Benefits	Administrative Expenses	Health Refunds	Total
2009	$ 27,404,439	$ 2,345,481	$ 257,216	$ 1,624,795		$ 31,631,930
2010	28,398,257	2,568,972	411,698	876,797		32,255,725
2011	26,456,992	2,272,568	224,792	875,530		29,829,882
2012	26,071,869	2,282,682	66,709	875,883		29,297,144
2013	27,881,426	2,314,422	375,661	1,205,738		31,777,247
2014	28,748,890	2,440,060	184,533	1,409,863		32,783,346
2015	29,110,087	2,380,425	206,231	1,383,518		33,080,261
2016	30,057,236	2,401,978	208,734	1,402,293		34,070,241
2017	30,215,360	2,190,542	252,037	1,345,546		34,003,484
2018	33,328,845	2,301,342	173,779	1,412,564	$ 62	37,216,592

Total Benefit Deductions

Year Ended September 30

(in millions)



Schedules of Retired Members by Type of Benefit

Schedule of Retired Members by Type of Pension Benefits

September 30, 2017

Amount of Monthly Pension Benefit	Number of Retirees	Type of Retirement * 1	2	3	4	5	6	Option** Life
$ 1 - 400	29	21	-	2	1	5	-	29
401 - 800	102	94	4	1	-	-	3	102
801 - 1,200	100	77	8	4	4	-	7	100
1,201 - 1,600	171	68	58	24	5	14	2	171
1,601 - 2,000	206	90	62	28	15	5	6	206
2,001 - 2,400	164	94	47	7	10	3	3	164
2,401 - 2,800	140	90	27	9	8	2	4	140
2,801 - 3,200	240	156	50	20	10	-	4	240
3,201 - 3,600	498	391	67	21	11	2	6	498
3,601 - 4,000	569	490	36	37	2	3	1	569
Over 4,000	843	799	24	15	3	-	2	843
Totals	3,062	2,370	383	168	69	34	38	3,062

* Type of Retirement
1 - Normal retirement for age & service
2 - Survivor payment - normal 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

**Selected Option
Life - 100% joint and survivor

Schedule of Retired Members by Type of Other Postemployment Benefits

September 30, 2017

Amount of Monthly Pension Benefit	Number of Retirees	Type of Other Postemployment Benefits Health	Dental	Vision
$ 1 – 400	29	1	1	1
401 – 800	102	38	37	37
801 – 1,200	100	36	36	36
1,201 – 1,600	171	122	120	118
1,601 – 2,000	206	166	164	163
2,001 – 2,400	164	149	143	143
2,401 – 2,800	140	133	133	133
2,801 – 3,200	240	234	233	234
3,201 – 3,600	498	485	486	486
3,601 – 4,000	569	550	551	553
Over 4,000	843	810	809	813
Totals	3,062	2,724	2,713	2,717

Source: Gabriel Roeder Smith & Co.

Schedules of Funding Progress

Last Ten Years

Pension Benefits ($ in millions)

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	$ 1,265.7	$ 1,496.3	$ 230.6	84.6 %	$ 120.7	191.0 %
2009	1,238.1	1,534.0	295.9	80.7	123.2	240.1
2010	1,202.0	1,565.2	363.2	76.8	118.6	306.3
2010 [1]	1,202.0	1,594.3	392.3	75.4	118.6	330.9
2011	1,138.1	1,627.9	489.8	69.9	110.3	444.1
2012 [2]	1,069.2	1,671.0	601.9	64.0	104.9	573.9
2013	1,069.1	1,724.0	654.9	62.0	110.2	594.0
2014	1,133.3	1,764.1	630.7	64.2	112.5	560.9
2014 [1]	1,133.3	1,799.9	666.6	63.0	112.5	592.8
2015	1,197.2	1,851.4	654.2	64.7	112.1	583.5
2016	1,272.6	1,913.1	640.5	66.5	119.0	538.1
2016 [1]	1,272.6	2,007.5	734.9	63.4	119.0	617.4
2017	1,343.0	2,054.0	711.1	65.4	129.9	547.5
2017 [1]	1,397.9	2,146.8	749.0	65.1	129.9	576.7

[1] Revised actuarial assumptions and/or methods.

[2] Revised benefit provisions.

Source: Gabriel Roeder Smith & Co.

Other Postemployment Benefits ($ in millions)

Valuation Date Sept 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded (Overfunded) Accrued Liabili (UAAL) (b-a)	Funded Ratio (a/b)	Covered Employee Payroll (c)	UAAL as a % of Covered Employee Payroll ((b-a)/c)
2008		$ 963.0	$ 963.0	0.0 %	$ 120.7	797.7 %
2009		882.3	882.3	0.0	123.2	715.9
2010		1,055.9	1,055.9	0.0	118.6	890.5
2011		994.7	994.7	0.0	110.3	902.0
2012 [2]	$ 33.0	599.1	566.1	5.5	104.9	539.8
2013	52.2	603.0	550.8	8.7	110.2	499.6
2014	77.7	637.4	559.7	12.2	112.5	497.7
2015	94.8	675.6	580.8	14.0	112.1	518.0
2016 [1]	116.7	735.5	636.7	15.5	119.0	534.8
2017	150.7	719.0	568.3	21.0	129.9	437.6
2017 [1]	150.7	727.0	576.4	20.7	129.9	443.8

[1] Revised actuarial assumptions and/or methods.

[2] Revised valuation method.

Source: Gabriel Roeder Smith & Co.

Schedule of Other Postemployment Benefits

For Year Ended September 30, 2018

(in thousands)

Claims		
Health insurance	$	31,595
Vision insurance		166
Dental insurance		2,259
Total Claims		34,020
Estimated Claims Liability		
Health insurance		1,733
Vision insurance		8
Dental insurance		42
Total Estimated Claims Liability		1,784
Administrative Fees		
Staff Salaries		50
Staff Retirement and Social Security		28
Staff Other Fringe Benefits		10
Printing		-
Postage, Telephone, and Other		-
Health insurance		1,223
Vision insurance		14
Dental insurance		88
Total Administrative Fees		1,413
Subtotal		37,217
Refunds		-
Grand Total	$	37,217

Schedules of Average Benefit Payments

Schedule of Average Benefit Payments - Pension*

Last Ten Years

Payment Periods	Credited Service (Years) as of September 30							
	0-5	5-10	10-15	15-20	20-25	25-30	30+	Total
Period 10/1/07 to 9/30/08:								
Average Monthly Benefit	$ 1,409	$ 1,958	$ 1,133	$ 1,618	$ 1,881	$ 2,801	$ 3,094	$ 2,652
Average Final Average Salary	25,371	36,598	33,124	33,774	34,889	49,530	54,550	47,774
Number of Active Retirants	32	33	127	88	116	2,046	294	2,736
Period 10/1/08 to 9/30/09:								
Average Monthly Benefit	$ 1,577	$ 1,988	$ 1,164	$ 1,677	$ 2,004	$ 2,857	$ 3,146	$ 2,704
Average Final Average Salary	46,745	38,004	33,515	36,187	37,184	50,070	55,329	48,649
Number of Active Retirants	41	35	127	88	117	2,023	290	2,721
Period 10/1/09 to 9/30/10:								
Average Monthly Benefit	$ 1,934	$ 2,139	$ 1,221	$ 1,704	$ 2,182	$ 2,936	$ 3,226	$ 2,784
Average Final Average Salary	48,354	37,160	34,502	36,152	40,307	51,475	56,908	50,021
Number of Active Retirants	50	33	132	88	125	2,040	294	2,762
Period 10/1/10 to 9/30/11:								
Average Monthly Benefit	$ 1,946	$ 2,169	$ 1,307	$ 1,801	$ 2,525	$ 3,018	$ 3,293	$ 2,862
Average Final Average Salary	42,720	37,160	35,669	39,170	47,658	53,194	58,578	51,716
Number of Active Retirants	79	33	135	93	143	2,078	296	2,857
Period 10/1/11 to 9/30/12:								
Average Monthly Benefit	$ 2,232	$ 2,181	$ 1,362	$ 1,851	$ 2,779	$ 3,111	$ 3,340	$ 2,925
Average Final Average Salary	40,154	37,217	38,697	40,877	53,981	54,808	59,266	52,867
Number of Active Retirants	178	31	145	94	148	2,033	284	2,913
Period 10/1/12 to 9/30/13:								
Average Monthly Benefit	$ 1,949	$ 2,197	$ 1,389	$ 1,846	$ 2,803	$ 3,147	$ 3,383	$ 2,984
Average Final Average Salary	57,421	36,625	39,204	41,154	54,177	54,952	59,512	53,953
Number of Active Retirants	58	32	150	99	165	2,153	296	2,953
Period 10/1/13 to 9/30/14:								
Average Monthly Benefit	$ 1,487	$ 2,258	$ 1,423	$ 1,989	$ 2,311	$ 3,211	$ 3,444	$ 3,043
Average Final Average Salary	12,794	37,160	39,452	45,375	43,523	57,079	60,468	55,126
Number of Active Retirants	12	33	150	109	122	2,249	288	2,963
Period 10/1/14 to 9/30/15:								
Average Monthly Benefit	$ 1,555	$ 2,220	$ 1,467	$ 2,057	$ 2,374	$ 3,276	$ 3,520	$ 3,105
Average Final Average Salary	16,277	38,261	40,035	47,567	45,227	58,215	61,447	56,247
Number of Active Retirants	13	34	153	108	125	2,275	279	2,987
Period 10/1/15 to 9/30/16:								
Average Monthly Benefit	$ 1,636	$ 2,175	$ 1,466	$ 2,158	$ 2,442	$ 3,354	$ 3,560	$ 3,168
Average Final Average Salary	16,277	41,678	40,371	50,193	46,503	59,402	61,608	57,317
Number of Active Retirants	13	37	157	116	126	2,295	274	3,018
Period 10/1/16 to 9/30/17:								
Average Monthly Benefit	$ 1,659	$ 2,229	$ 1,496	$ 2,235	$ 2,571	$ 3,424	$ 3,627	$ 3,240
Average Final Average Salary	16,277	42,625	40,370	51,448	49,672	60,635	62,457	58,538
Number of Active Retirants	13	36	157	116	131	2,342	267	3,062

* Average monthly benefits shown are pension benefits

Source: Gabriel Roeder Smith & Co.

Schedules of Average Benefit Payments (Continued)

Schedule of Average Benefit Payments - Health*

Last Ten Years

Payment Periods	Credited Service (Years) as of September 30							
	0-5	5-10	10-15	15-20	20-25	25-30	30 +	Total
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	$ 2,109	$ 2,173	$ 1,256	$ 1,666	$ 2,668	$ 2,974	$ 3,216	$ 2,792
Average Final Average Salary	35,474	35,421	32,171	34,365	44,369	50,596	53,934	47,706
Number of Active Retirants	14	27	94	73	703	1,253	267	2,431
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	$ 2,148	$ 2,229	$ 1,276	$ 1,729	$ 2,733	$ 3,029	$ 3,277	$ 2,845
Average Final Average Salary	41,318	35,421	32,572	35,861	45,021	51,038	54,550	48,236
Number of Active Retirants	17	27	97	74	697	1,248	260	2,420
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	$ 2,774	$ 2,266	$ 1,334	$ 1,756	$ 2,800	$ 3,120	$ 3,364	$ 2,927
Average Final Average Salary	52,130	35,421	33,845	35,819	45,993	52,808	56,040	49,727
Number of Active Retirants	24	27	103	74	694	1,276	262	2,460
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	$ 2,342	$ 2,298	$ 1,406	$ 1,863	$ 2,906	$ 3,212	$ 3,458	$ 3,011
Average Final Average Salary	36,454	35,421	34,597	39,393	47,821	54,685	58,042	51,289
Number of Active Retirants	51	27	105	79	696	1,328	264	2,550
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	$ 2,423	$ 2,319	$ 1,495	$ 1,940	$ 3,011	$ 3,316	$ 3,519	$ 3,076
Average Final Average Salary	35,943	35,352	37,432	41,389	49,669	56,573	58,839	52,335
Number of Active Retirants	148	25	111	80	678	1,305	255	2,602
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	$ 2,813	$ 2,328	$ 1,521	$ 1,918	$ 3,040	$ 3,355	$ 3,571	$ 3,147
Average Final Average Salary	52,704	34,695	38,003	41,001	49,624	56,859	59,281	53,496
Number of Active Retirants	28	26	116	85	731	1,388	265	2,639
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	$ 1,454	$ 2,393	$ 1,550	$ 2,077	$ 3,001	$ 3,474	$ 3,645	$ 3,217
Average Final Average Salary	14,124	35,421	38,186	45,084	47,839	59,214	60,250	54,560
Number of Active Retirants	8	27	115	94	686	1,454	256	2,640
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	$ 1,546	$ 2,424	$ 1,592	$ 2,153	$ 3,047	$ 3,555	$ 3,728	$ 3,286
Average Final Average Salary	19,007	35,421	38,841	46,892	48,148	60,432	61,174	55,517
Number of Active Retirants	9	27	117	93	683	1,476	248	2,653
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	$ 1,653	$ 2,501	$ 1,591	$ 2,234	$ 3,107	$ 3,636	$ 3,775	$ 3,353
Average Final Average Salary	19,007	36,820	39,558	49,068	48,779	61,782	61,350	56,611
Number of Active Retirants	9	28	122	99	669	1,510	243	2,680
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	$ 1,676	$ 2,580	$ 1,617	$ 2,295	$ 3,170	$ 3,711	$ 3,854	$ 3,426
Average Final Average Salary	19,007	37,902	39,682	50,621	49,644	63,152	62,303	57,844
Number of Active Retirants	9	27	122	99	672	1,559	236	2,724

* Average monthly benefits shown are pension benefits
Source: Gabriel Roeder Smith & Co.

Schedules of Average Benefit Payments (Continued)

Schedule of Average Benefit Payments - Dental*

Last Ten Years

Payment Periods	Credited Service (Years) as of September 30							
	0 - 5	**5 - 10**	**10 - 15**	**15 - 20**	**20 - 25**	**25 - 30**	**30+**	**Total**
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	$ 2,109	$ 2,173	$ 1,274	$ 1,659	$ 2,689	$ 2,987	$ 3,224	$ 2,810
Average Final Average Salary	35,474	35,421	32,475	33,454	44,915	50,915	54,126	48,072
Number of Active Retirants	14	27	92	71	692	1,252	267	2,415
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	$ 2,148	$ 2,229	$ 1,293	$ 1,728	$ 2,747	$ 3,039	$ 3,284	$ 2,858
Average Final Average Salary	41,318	35,421	32,875	35,532	45,400	51,261	54,685	48,504
Number of Active Retirants	17	27	95	73	688	1,246	260	2,406
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	$ 2,774	$ 2,266	$ 1,352	$ 1,755	$ 2,815	$ 3,124	$ 3,379	$ 2,938
Average Final Average Salary	52,130	35,421	34,155	35,490	46,395	52,910	56,366	49,958
Number of Active Retirants	24	27	101	73	687	1,272	263	2,447
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	$ 2,342	$ 2,298	$ 1,446	$ 1,863	$ 2,921	$ 3,220	$ 3,472	$ 3,023
Average Final Average Salary	36,454	35,421	35,530	39,131	48,187	54,871	58,357	51,562
Number of Active Retirants	51	27	105	78	690	1,326	265	2,542
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	$ 2,435	$ 2,319	$ 1,534	$ 1,940	$ 3,026	$ 3,327	$ 3,527	$ 3,089
Average Final Average Salary	36,182	35,352	38,315	41,155	50,071	56,833	59,026	52,642
Number of Active Retirants	148	25	111	79	674	1,304	256	2,597
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	$ 2,813	$ 2,328	$ 1,549	$ 1,918	$ 3,048	$ 3,364	$ 3,578	$ 3,156
Average Final Average Salary	52,704	34,695	38,683	40,777	49,851	57,062	59,413	53,705
Number of Active Retirants	28	26	117	84	725	1,384	265	2,629
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	$ 1,454	$ 2,393	$ 1,578	$ 2,078	$ 3,010	$ 3,480	$ 3,653	$ 3,224
Average Final Average Salary	14,124	35,421	38,870	44,925	48,067	59,324	60,387	54,710
Number of Active Retirants	8	27	116	93	683	1,447	256	2,630
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	$ 1,546	$ 2,424	$ 1,620	$ 2,155	$ 3,053	$ 3,561	$ 3,736	$ 3,293
Average Final Average Salary	19,007	35,421	39,508	46,752	48,316	60,581	61,315	55,675
Number of Active Retirants	9	27	118	92	680	1,470	248	2,644
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	$ 1,653	$ 2,501	$ 1,622	$ 2,236	$ 3,114	$ 3,642	$ 3,783	$ 3,361
Average Final Average Salary	19,007	36,820	40,063	48,958	48,953	61,928	61,494	56,771
Number of Active Retirants	9	28	122	98	666	1,505	243	2,671
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	$ 1,676	$ 2,580	$ 1,648	$ 2,297	$ 3,176	$ 3,716	$ 3,862	$ 3,433
Average Final Average Salary	19,007	37,902	40,186	50,527	49,822	63,270	62,452	57,985
Number of Active Retirants	9	27	122	98	669	1,552	236	2,713

*Average monthly benefits shown are pension benefits
Source: Gabriel Roeder Smith & Co.

Schedules of Average Benefit Payments (Continued)

Schedule of Average Benefit Payments - Vision *

Last Ten Years

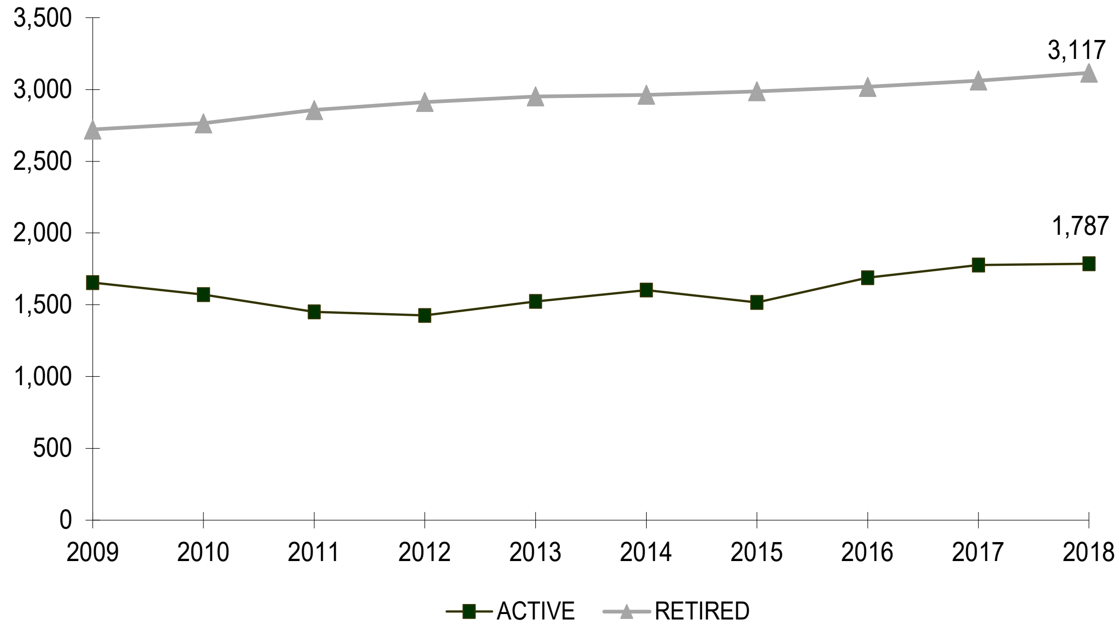
Payment Periods	**Credited Service (Years) as of September 30**							
	0-5	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30 +**	**Total**
Period 10/1/07 to 9/30/08								
Average Monthly Benefit	$ 2,109	$ 2,173	$ 1,265	$ 1,645	$ 2,686	$ 2,987	$ 3,224	$ 2,807
Average Final Average Salary	35,474	35,421	32,576	33,025	44,813	50,914	54,126	48,027
Number of Active Retirants	14	27	92	72	694	1,254	267	2,420
Period 10/1/08 to 9/30/09								
Average Monthly Benefit	$ 2,148	$ 2,229	$ 1,284	$ 1,713	$ 2,746	$ 3,039	$ 3,284	$ 2,857
Average Final Average Salary	41,318	35,421	32,973	35,087	45,327	51,258	54,685	48,469
Number of Active Retirants	17	27	95	74	689	1,249	260	2,411
Period 10/1/09 to 9/30/10								
Average Monthly Benefit	$ 2,774	$ 2,266	$ 1,343	$ 1,740	$ 2,813	$ 3,125	$ 3,379	$ 2,937
Average Final Average Salary	52,130	35,421	34,248	35,045	46,321	52,929	56,366	49,936
Number of Active Retirants	24	27	101	74	688	1,277	263	2,454
Period 10/1/10 to 9/30/11								
Average Monthly Benefit	$ 2,342	$ 2,298	$ 1,438	$ 1,848	$ 2,919	$ 3,220	$ 3,472	$ 3,021
Average Final Average Salary	36,454	35,421	35,619	38,668	48,110	54,882	58,357	51,537
Number of Active Retirants	51	27	105	79	691	1,331	265	2,549
Period 10/1/11 to 9/30/12								
Average Monthly Benefit	$ 2,435	$ 2,319	$ 1,525	$ 1,924	$ 3,026	$ 3,328	$ 3,527	$ 3,089
Average Final Average Salary	36,182	35,352	38,399	40,673	50,036	56,857	59,026	52,637
Number of Active Retirants	148	25	111	80	676	1,310	256	2,606
Period 10/1/12 to 9/30/13								
Average Monthly Benefit	$ 2,813	$ 2,328	$ 1,550	$ 1,918	$ 3,048	$ 3,365	$ 3,578	$ 3,157
Average Final Average Salary	52,704	34,695	38,928	40,777	49,820	57,084	59,413	53,729
Number of Active Retirants	28	26	116	84	727	1,390	265	2,636
Period 10/1/13 to 9/30/14								
Average Monthly Benefit	$ 1,454	$ 2,393	$ 1,580	$ 2,078	$ 3,010	$ 3,483	$ 3,653	$ 3,227
Average Final Average Salary	14,124	35,421	39,119	44,925	48,043	59,417	60,387	54,786
Number of Active Retirants	8	27	115	93	683	1,455	256	2,637
Period 10/1/14 to 9/30/15								
Average Monthly Benefit	$ 1,546	$ 2,424	$ 1,621	$ 2,155	$ 3,055	$ 3,564	$ 3,736	$ 3,296
Average Final Average Salary	19,007	35,421	39,758	46,752	48,347	60,650	61,315	55,754
Number of Active Retirants	9	27	117	92	679	1,477	248	2,649
Period 10/1/15 to 9/30/16								
Average Monthly Benefit	$ 1,653	$ 2,501	$ 1,623	$ 2,236	$ 3,116	$ 3,645	$ 3,783	$ 3,364
Average Final Average Salary	19,007	36,820	40,309	48,958	48,986	62,000	61,494	56,852
Number of Active Retirants	9	28	121	98	665	1,511	243	2,675
Period 10/1/16 to 9/30/17								
Average Monthly Benefit	$ 1,676	$ 2,580	$ 1,650	$ 2,297	$ 3,178	$ 3,719	$ 3,862	$ 3,437
Average Final Average Salary	19,007	37,902	40,434	50,527	49,856	63,335	62,452	58,063
Number of Active Retirants	9	27	121	98	668	1,558	236	2,717

* Average monthly benefits shown are pension benefits

Source: Gabriel Roeder Smith & Co.

Ten Year History of Membership

Fiscal Year Ended September 30



ACKNOWLEDGMENTS

The *Michigan State Police 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

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Rick Legal
Cindy Molzan
Hope Richardson
Paula Webb
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