MERS®

Municipal Employees' Retirement System

COMPREHENSIVE ANNUAL FINANCIAL REPORT

for the fiscal year ending

12.31.2018

1134 Municipal Way
Lansing, Michigan 48917

800.767.MERS (6377)
www.mersofmich.com

COMPREHENSIVE ANNUAL FINANCIAL REPORT

FOR THE YEAR ENDED DECEMBER 31, 2018

PREPARED BY
The Finance Department of the
Municipal Employees' Retirement System of Michigan
1134 Municipal Way
Lansing, MI 48917

Contact MERS of Michigan
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Chris Derose
Chief Executive Officer

Leon Hank, CPA
Chief Financial Officer

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INTRODUCTION

2018 ACHIEVEMENTS

Certificate of Achievement for Excellence in Financial Reporting

The Municipal Employees' Retirement System of Michigan (MERS) received the Certificate of Achievement for Excellence in Financial Reporting from the Government Finance Officers Association for the December 31, 2017, Comprehensive Annual Financial Report. This marks the 30th consecutive year MERS has received this honor.

Public Pension Standards Award

MERS also received the Public Pension Coordinating Council (PPCC), Public Pension Standards Award for 2018, in recognition of meeting the professional standards for plan design and administration as set forth in the Public Pension Standards. This award is presented by the PPCC, a confederation of the National Association of State Retirement Administrators (NASRA), the National Conference on Public Employee Retirement Systems (NCPERS), and the National Council on Teacher Retirement (NCTR).

Municipal Employees' Retirement System MERS

Letter of Transmittal, May 28, 2019

Dear Board Members:

We are pleased to submit the Comprehensive Annual Financial Report (CAFR) for the Municipal Employees' Retirement System of Michigan (MERS) for the fiscal year ending December 31, 2018.

Having completed the second year of our four-year Strategic Plan, MERS has laid a solid groundwork of goals and measurements by which we evaluate and move toward our vision aimed at delivering superior value to our customers by:

- Achieving a deeper understanding of customer needs and connection with them
- Proactively partnering with employers by providing options that help meet their unique needs
- Consistently delivering services through intuitive processes and systems
- Significantly increasing resources and awareness that help participants improve financial wellness to be ready for retirement

To accomplish this, MERS has developed a Balanced Scorecard focusing on four perspectives: Customer, Financial, Process, and Learning & Growth. Specific Projects within each perspective drive business efforts and are measured on an ongoing basis, reported on our Balanced Scorecard and drive team priorities and individual performance company-wide.

In 2018, MERS exceeded overall targets and included highlights such as significant increase in employer satisfaction with their voice being heard, engagement with MERS resources and actions to improve participant financial wellness, solid relative investment performance, holding operational costs in check, and the measurement of key processes. MERS launched two new programs in the year: offering MERS IRA accounts to provide greater saving opportunities at the individual level, and providing Health Care Exchange services to help retiring participants' bridge post-employment healthcare needs. Our customer base continued to expand, as we partnered with 21 new local units of government for the first time, and many continue to enroll in multiple programs – 25% with 1 product, 26% with 2 products, and 49% with 3 products. In addition, participant accounts grew to 145,707.

MERS Profile

MERS is a statutory public corporation that was created to serve members across the state of Michigan on a not-for-profit basis. We are one of the largest, most established and successful shared services stories in Michigan. Our approach to efficiently managing retirement and other post-employment benefit plans allows local governments to focus on their core services. Our comprehensive platform of services includes: plan governance, actuarial services, legal counsel, on-staff auditor, information technology support, administration of benefits, participant education and investment portfolio management. The MERS Retirement Board (Board) provides oversight and serves as the fiduciary of the funds.

Report Structure and Contents

Section 38.1536 of the Michigan Compiled Laws requires the Board to prepare this annual report in accordance with U.S. Generally Accepted Accounting Principles (GAAP). The financial information shown throughout this report meets that requirement. The MERS management team, under the oversight of the Board, is responsible for the preparation, integrity, and fairness of the financial statements and other information presented in this report.

Section 38.1536 also requires the Board to arrange for an annual audit of the MERS financial statements. Plante Moran, PLLC, MERS external auditor, conducted an independent audit of the financial statements in accordance with Generally Accepted Auditing Standards. This audit is described in the Independent Auditor's Report in the Financial Section following this letter. MERS management provides the external auditors with unrestricted access to records and staff. This external audit is conducted annually to ensure the sufficiency of the internal controls and that our financial statements are fairly stated.

As a part of our financial statement process, we have identified necessary internal controls and have them in place to ensure that transactions are authorized, assets are safeguarded, and all supporting records are properly retained and managed. The cost of a control should not exceed the benefits to be derived. The internal control objective is to provide reasonable, rather than absolute, assurance that the financial statements are free of any material misstatements. Our on-staff auditor helps ensure we meet high standards for internal control. As a part of continually strengthening internal controls, MERS conducted an Internal Control Evaluation (ICE) in 2017 for the entire organization. In 2018, MERS also completed a Service Organization Control Audit (SOC 1, Type II audit) that disclosed no deficiencies in MERS internal control.

This CAFR is divided into five sections:

- Introduction – Achievements and structure of MERS
- Financial – Financial statements, notes, required supplemental information, Management's Discussion and Analysis (MD&A), which is the MERS management team's narrative and overview of the financial statements
- Investment – Investment activities and performance information
- Actuarial – Actuarial assumptions and methods as well as the actuary's certification letter
- Statistical – Various schedules on member data and ten-year trends

Financial Summary

Like many investors, MERS has benefited from the long-running economic business cycle upturn since 2009. The calendar years of 2016 and 2017 were especially good, with MERS earning investment returns on our Defined Benefit (DB) Portfolio of 11.1% and 13.2% respectively (net of investment expenses). Despite these good returns, MERS expects a market correction or downturn as has happened in every business cycle since the early 1900s. In 2018, MERS experienced a market downturn with the DB Portfolio recording an investment loss of -3.51% based on a gross rate of return. The DB Portfolio, however, outperformed the policy benchmark by 285 basis points. This means that while the return for the year was negative, the MERS loss in a down market was much less than many of its peers experienced. MERS designs its investment strategy to perform this way, providing more protection against losses when markets are down. More information regarding our investment management performance, policies and processes are found with the Schedule of Fees and Commissions in the Investments Section.

MERS ended the year with a net position of $10.9 billion for all plan types, down $477 million from 2017. The reduction in asset size occurred primarily due to the investment loss for the year. Contributions and transfers in from all plan types exceeded $1 billion for the first time in MERS history. Strong cost control measures helped MERS hold its administrative costs to $19.1 million, close to last year's costs of $19.2 million, and comparable to costs going all the way back to its 2009 spending level. Lower administrative costs also have a positive impact on DB and other plan types.

In 2018, the MERS 457 program grew at the highest rate of any product, increasing in asset size by $26 million to $108.8 million. As an indicator of how municipalities are more aggressively addressing their other post-employment benefit (OPEB) obligations, the MERS Health Care Savings Program and Retiree Health Funding Vehicle net plan assets grew by $25 million in 2018.

One other measure of a defined benefit retirement system's financial health is the percentage of its actuarial liabilities owed that is covered by its available actuarial assets. Using this ratio (calculated from the most recent 2017 calendar year valuation data), nearly 59% of MERS' municipalities were funded at 70% or higher (427 municipalities), which is up from 56% (401 municipalities) in 2016.

We continue to partner with all municipalities in helping them set fiscal goals and discussing options to find the programs and provisions that best fit each municipality's unique needs. There are 746 local units of government within MERS Defined Benefit and Hybrid Plans, which encompasses 2,915 divisions with unique benefit designs. In 2018, 37 divisions adopted a Hybrid Plan or a lower tier Defined Benefit Plan for new employees and 56 divisions adopted a Defined Contribution Plan for new employees. There were also 130 divisions that increased cost sharing to their employees. In 2018, 330 plans made voluntary contributions, contributing an additional $263 million to help increase funding levels. These efforts helped strengthen the financial condition of all these plans. In addition, new local units of government joining the MERS Defined Benefit Plan brought in an extra $2 million.

More detail on these financial metrics is included in the MD&A document. A complete copy of the CAFR is provided to the Governor, the members of both the State House and Senate, and the Office of the State Treasurer, as required by law. The CAFR and Summary Report are available on our website, www.mersofmich.com.

Acknowledgements
We are honored that for the 30th consecutive year, the Government Finance Officers Association (GFOA) awarded MERS its Certificate of Achievement for Excellence in Financial Reporting award for our 2017 CAFR.

We are very grateful to our Board members for their time and dedication which makes it possible for MERS to be successful for our customers. Their conscientious oversight and diligence of our well-run system is greatly appreciated. On behalf of all MERS local units of government and participants, we thank them for their dedication to public service.

We also express our deep gratitude to all staff members for their hard work and dedication to ensure the successful operation of MERS. Our staff applies its energy, innovation, skill, and a commitment to excellent service every day to ensure the security of a retirement plan for all of our participants.

Respectfully submitted,

Chris DeRose
Chief Executive Officer

Leon E. Hank, CPA
Chief Financial Officer

Letter from the Chairperson, May 28, 2019

Dear MERS Members:

On behalf of the MERS Retirement Board, it is my pleasure to present the Municipal Employees' Retirement System of Michigan's (MERS) Comprehensive Annual Financial Report (CAFR). MERS is an independent, professional retirement services company that was created to administer the retirement plans for Michigan's local units of government on a not-for-profit basis. Today we partner with 84% of Michigan's local units of government. Included in this year's report is all of the required financial information for the fiscal year ending December 31, 2018.

MERS is governed by an independent, unpaid board committed to fairness, transparency and accountability. Our board adheres to strong conflict of interest provisions and best fiscal practices making us a reliable fiduciary agent and a go-to expert for retirement security in Michigan. We just completed the second year of our four-year Strategic Plan and are working toward our shared vision of providing superior value.

We continue to grow in the number of local units of government and participants we serve. MERS partners with more than 900 local units of government across the state, from the western Upper Peninsula to the southeastern Lower Peninsula with a combined net position value of nearly $11 billion. MERS proudly serves over 100,000 participants, including police officers and firefighters, road crews, medical staff, librarians, clerks, and countless other roles that protect and serve the many communities across Michigan.

There is no one-size-fits-all approach to providing a secure retirement for Michigan's public servants which is why we offer a broad range of flexible and customizable plans to fit our customers' budgets, needs and goals. MERS responds to feedback and is consistently adding new, updated programs and tools to keep up with dynamic markets and help improve participants' financial wellness. We continue to focus on providing more information and resources to assist our customers with managing their unfunded liabilities, enhancing online account access, and consistently delivering services through intuitive processes and systems.

Readying our participants for retirement is no small feat. However, I know that MERS staff will continue to work diligently to find the appropriate solutions. All of this speaks to the dedication of our leadership, the competency of our staff, and our passion for excellence in all we do for you.

In closing, I would like to take this opportunity to thank the Board members and staff for their expertise and professionalism. It is my pleasure to serve as your MERS Chairperson and, like all of you, I am proud to have played a role in serving all MERS' local units of government and participants in our effort to provide superior value.

Sincerely,

Michael Brown, Chairperson
MERS Retirement Board

MERS RETIREMENT BOARD

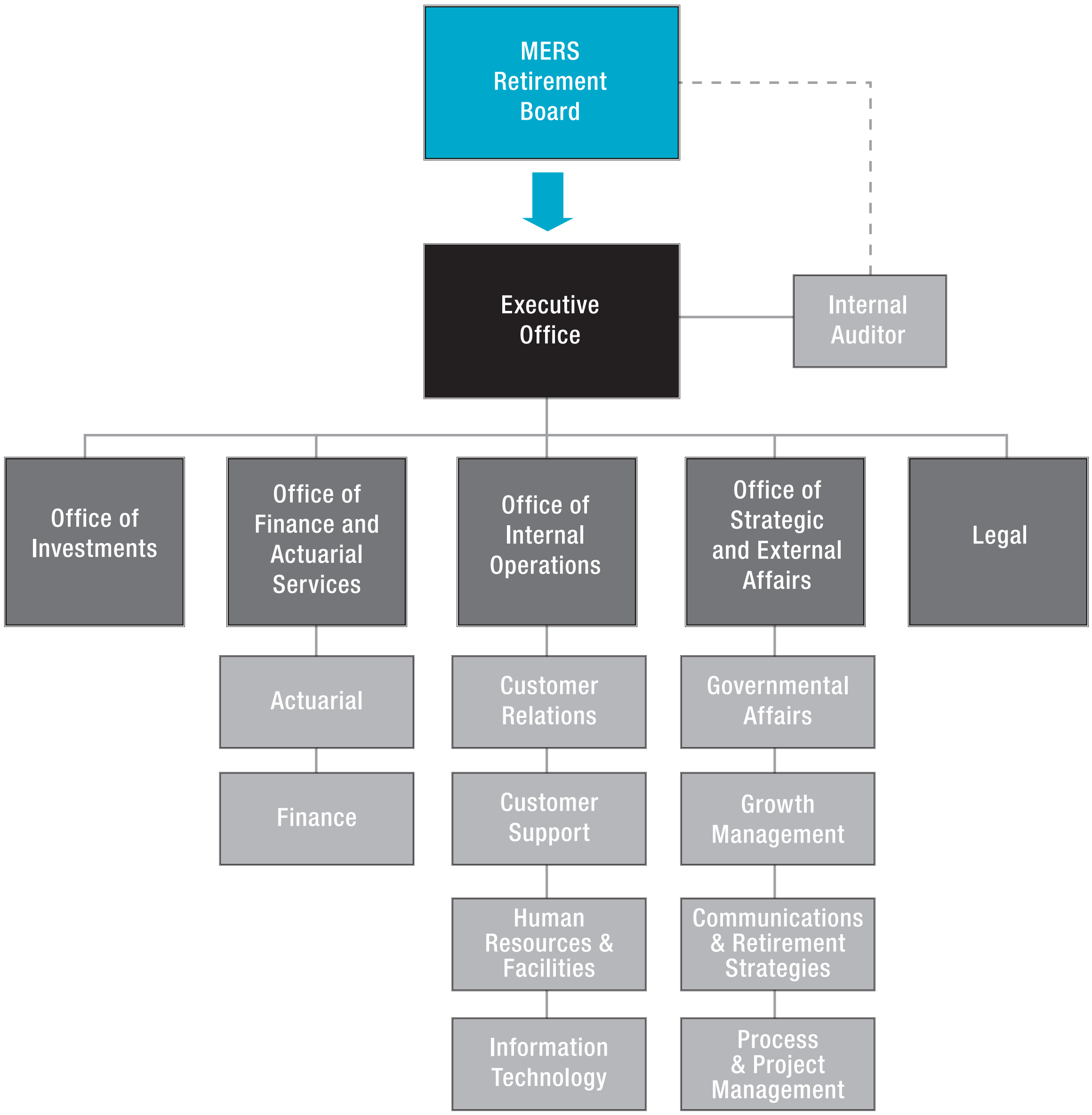
Back row (standing left to right): Dale Feldpausch, James Wiersma, Jason Sarata, Michael Brown, Tina Butler
Front row (sitting): Amy Deford, John Ogden, Michael Gilmore, Randy Girard

Officer Members:	**Michael Brown** (Chairperson), Barry County; **Randy Girard**, Charter Township of Marquette; **Dale Feldpausch**, Capital Region Airport Authority
Employee Members:	**Tina Butler**, Cass County; **Jason Sarata**, Delta Township; **Amy Deford**, Saginaw County
Expert Members:	**Michael Gilmore**, Red Cedar Investment Management, East Lansing; **James R. Wiersma**, Haworth, Holland
Retiree Member:	**John Ogden**, City of Port Huron (Retired)

MERS OFFICERS

From left to right:
Carrie Lombardo, Chief Strategic & External Affairs Officer
Denise Boucke, Chief Operating Officer
Chris DeRose, Chief Executive Officer
Jeb Burns, Chief Investment Officer
Leon Hank, Chief Financial Officer

MUNICIPAL EMPLOYEES' RETIREMENT SYSTEM OF MICHIGAN ORGANIZATIONAL STRUCTURE – 2018



OUTSIDE PROFESSIONAL SERVICES

Actuarial
CBIZ, Inc.
Gabriel, Roeder, Smith & Company

Auditing
Plante & Moran, PLLC

Banking
Commerce
JP Morgan Chase
Northern Trust

Business Consulting
Accurint
Bloomberg BNA
Byrum & Fisk Advocacy
Cammack Retirement
Cobalt Community Research
Gartner, Inc.
Institute for Continuing Legal Education
LexisNexis
Martin Commercial Properties, Inc.
Moore Trosper
Pension Benefit Information
PricewaterhouseCoopers
WoltersKluwer

Human Resource Consulting
Advisa
American Society of Employers
Energage, LLC
Gallagher Benefit Services, Inc.
HR Management Group, Inc.
Right Management

Custodial Banking and Securities Lending
State Street Bank & Trust Company

Investment Consulting and Research
BCA Research
Bloomberg Finance L.P.
Gavekal Capital
Informa Investment Solutions
Ned Davis Research
Stephen Morrow

Legal Consulting
Bernstein, Litowitz, Berger and Grossmann, LLP
Clark Hill, PLC
Dickinson Wright PLLC
Ice Miller, LLP
Jones Day
Miller, Canfield, Paddock and Stone, PLC
Robbins Geller Rudman and Dowd, LLP

Legislative Consulting
Karoub Associates
Michigan Legislative Consultants

Medical Advising
Managed Medical Review Organization

Systems Implementation and Maintenance
Atrio Systems
Cylance, Inc.
Databank IMX LLC
Maner Costerisan Corporation
Optima Consulting LLC
Rapid7 LLC
Tegrit Software Ventures, Inc.
Total Solutions, Inc.
Vertiv
Winklevoss Technologies LLC

Third-Party Administration
Alerus Retirement Solutions

Investment Management
Acadian Asset Management Inc.
Adveq Management US Inc.
Alpine Lake Capital Partners, LLC (Barings LLC)
AlpInvest Partners
Angelo, Gordon & Co.
ARA Asset Management Limited
Blackstone Alternative Asset Management, LP
Brookfield Asset Management
Brookwood Financial Partners, LLC
C.S. McKee, LP
Colony Capital, LLC
Comvest Partners
Connor, Clark, & Lunn Investment Management
Consilium Investment Management
Cromwell Property Group
Domain Capital Advisors, LLC
ElmTree Funds, LLC
Exeter Property Group, LLC
Fortress Investment Group, LLC
Frontier Market Asset Management, LLC
Gerchen Keller Capital, LLC (Burford Capital)
Grantham, Mayo, Van Otterloo & Co. LLC
GreenOak Europe II, LP
Grosvenor Capital Management, LP
H/2 Capital Partners
Hancock Natural Resource Group, Inc.
Harbert Management Corporation
Hemisfério Sul Investimentos SA
IL&FS Capital Advisors Limited
Ionetix
J.P. Morgan Asset Management
Janus Capital Management, LLC
Kennedy Capital Management Inc.
LaSalle Investment Management
LMCG Investments, LLC
MC Credit Partners, LP
Mellon Capital Management Corporation
Merrowie Property Trust
Mesirow Private Equity Advisors, Inc.
Metropolitan Real Estate
Michigan eLab Capital Partners, LP
Miravast Asset Management, LLC
Mountain Pacific Group, LLC
Napier Park Global Capital
Oak Hill Advisors, LP
Oak Street Real Estate Capital, LLC
Oberland Capital Management, LLC
Och-Ziff Real Estate Advisors, LP
Orchard Global Asset Management, LLP
Pioneer Asset Management SA
Polunin Capital Partners Limited
Punch & Associates
Rialto Capital Management, LLC
SPI Strategies, LLC
Square Mile Capital Management, LLC
Starwood Capital Group
Tenacis Systematic Macro Fund, LLC
Terra Partners Asset Management
The Electrum Group, LLC
The Townsend Group
Trice Medical Inc.
Verdantƒ
William Blair & Company

ACKNOWLEDGEMENTS

The Office of Finance and Actuarial Services prepared the MERS Comprehensive Annual Financial Report (CAFR) for the year ended December 31, 2018. Special thanks to the individuals who contributed significant amounts of time and energy to help complete this report.

Office of Finance and Actuarial Services

Betsy Waldofsky, Finance Director
Luke Huelskamp, Senior Finance Manager
Danielle Williams, Accountant
Courtney Allen, Accountant

Office of Investments

Julian Ramirez, Investment Officer and Portfolio Manager
Furat Zomay, Investment Analyst
Peter Wujkowski, Investment and Administrative Officer and Portfolio Manager
Paul Van Gilder, Investment Officer and Portfolio Manager

Office of Strategic and External Affairs

Betsy Schaeffer, Digital Print and Mail Services Supervisor
James Scofield, Design Coordinator
Janie Olivarez, Office Administrator
Jennifer Mausolf, Communications & Retirement Strategies Director
Richard Taylor, Print Production Specialist

Executive Office

Brian LaVictoire, Deputy General Counsel for Investments and Compliance
Valerie Lawver, Office Administrator
Carri Simon, Internal Auditor

Special thanks are also extended to Plante & Moran PLLC, Alerus Retirement Solutions, CBIZ, Inc., Gabriel Roeder Smith & Company, State Street Bank & Trust Company, and Tegrit Software Ventures, Inc.

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FINANCIAL

INDEPENDENT AUDITOR'S REPORT

plante moran

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Independent Auditor's Report

To the Retirement Board
Municipal Employees' Retirement System
of Michigan

Report on the Financial Statements

We have audited the accompanying financial statements of Municipal Employees' Retirement System of Michigan (MERS) as of and for the year ended December 31, 2018 and the related notes to the financial statements, which collectively comprise MERS' 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 basic financial statements referred to above present fairly, in all material respects, the plan net position of Municipal Employees' Retirement System of Michigan as of December 31, 2018 and the changes in plan net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matter

As explained in Note 4, the financial statements include investments valued at approximately $3.8 billion (35 percent of net position) at December 31, 2018, whose fair values have been estimated by management in the absence of readily determinable market values. Management's estimates are based on information provided by fund managers, general partners, etc. Our opinion is not modified with respect to this matter.

To the Retirement Board
Municipal Employees' Retirement System
of Michigan

Required Supplemental Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and the other required supplemental information, 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, which 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 supplemental 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 Municipal Employees' Retirement System of Michigan's basic financial statements. The schedule of administrative expenses, schedule of investment expenses, and schedule of payments to consultants and introductory, investments, actuarial, and statistical sections are presented for the purpose of additional analysis and are not a required part of the basic financial statements.

The schedule of administrative expenses, schedule of investment expenses, and schedule of payments to consultants 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 schedule of administrative expenses, schedule of investment expenses, and schedule of payments to consultants are fairly stated in all material respects in relation to the basic financial statements as a whole.

The introductory, investments, 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.

Report on Summarized Comparative Information

We have previously audited Municipal Employees' Retirement System of Michigan's December 31, 2017 financial statements, and we expressed an unmodified audit opinion on those audited financial statements in our report dated May 15, 2018. In our opinion, the summarized comparative information presented herein as of and for the year ended December 31, 2017 is consistent, in all material respects, with the audited financial statements from which it has been derived.

To the Retirement Board
Municipal Employees' Retirement System
of Michigan

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated May 23, 2019 on our consideration of Municipal Employees' Retirement System of Michigan's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements, and other matters. The purpose of that report is 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 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 Municipal Employees' Retirement System of Michigan's internal control over financial reporting and compliance.

Plante & Moran, PLLC

May 23, 2019

MANAGEMENT'S DISCUSSION AND ANALYSIS

This narrative overview and analysis of Municipal Employees' Retirement System of Michigan's (MERS or System) financial condition for the year ended December 31, 2018 is presented in conjunction with the Chief Executive Officer and Chief Financial Officer's Letter of Transmittal. The Financial Section is comprised of the Independent Auditor's Report, Management's Discussion and Analysis, two basic financial statements with explanatory notes, three required supplementary schedules with explanatory notes, and three supplementary expense schedules.

FINANCIAL HIGHLIGHTS

The following financial highlights occurred during the year ended December 31, 2018:

- Total fiduciary net position for the Defined Benefit Plan, Defined Contribution Plan, Health Care Savings Program, Retiree Health Funding Vehicle, 457 Program, Investment Services Program, and Individual Retirement Account Program decreased by 4%, primarily due to market decline for the year. MERS finished the year with $10.9 billion in net fiduciary position. MERS is proud to announce our newest product in 2018, the Individual Retirement Account that is open to MERS members and their spouses.
- Defined Benefit investment returns saw a loss of -3.64% net of investment expenses for the year. The 10-year return was 8.25% net of investment expenses, which is above the long-term target of MERS' expected investment rate of return of 7.75%.
- Contribution revenue increased by 19% from $858 million in 2017 to $1 billion in 2018, the first time in history MERS' employers exceeded $1 billion in contributions. This increase was largely due to an increase in employer voluntary contributions compared to the previous year.
- Total annual benefits, transfers, and withdrawals increased by $78 million for a total of $987 million up from $909 million in 2017.
- Administrative expenses declined slightly by $157 thousand and ended at $19.1 million while MERS continues to grow, adding new municipal programs. MERS has continued to keep costs down through the growth of our pool and strong ongoing budgeting and cost-control measures.
- Investment expenses also declined slightly by $20 thousand and remained level at $14 million. Most of these expenses are related to investment manager fees. The decrease in investment manager expense was partly due to bringing in additional assets to be managed in-house by MERS Office of Investments at a lower cost.
- The most recent MERS actuarial valuation, dated December 31, 2017, showed 427 of 727 Defined Benefit municipalities are funded 70% or better, with 69 municipalities over 100% funded.
- The difference between the MERS actuarial and fair value assets declined from last year, as the actuarial calculation for 2018 is 109.3% of the fair value of assets as calculated by the actuaries (the ratio was 101.1% as of December 31, 2017). Total Defined Benefit Plan actuarial assets and fair value of assets were valued at $9.8 billion and $9.0 billion respectively at December 31, 2018.
- As part of the MERS 2018 Strategic Plan, MERS invested $5.1 million in capital assets. This includes $4.1 millions for pension administration software and actuarial valuation software. The MERS investment in all capital assets is $18.2 million, net of accumulated depreciation, up from $15.9 million in 2017. MERS expects these software improvements will enhance participant access to retirement services and reduce administrative costs for employers.

BASIC FINANCIAL STATEMENTS

This Management's Discussion and Analysis is an introduction to the MERS basic financial reporting statements:

1. Statement of Fiduciary Net Position
2. Statement of Changes in Fiduciary Net Position
3. Notes to Basic Financial Statements

The "Comparison Statement of Fiduciary Net Position" and "Comparison Statement of Changes in Fiduciary Net Position" provide a comparative summary of the financial condition of the plan as a whole with the prior year results.

The "Statement of Fiduciary Net Position" and "Statement of Changes in Fiduciary Net Position" provide the current financial condition of each MERS product.

Required Supplemental Information

1. Schedule of Annual Money Weighted Rates of Return
2. Schedule of Employer Contributions
3. Schedule of Changes in Employer Net Pension Liability/(Asset) and Related Ratios

Supplementary Expense Schedules

1. Schedule of Administrative Expenses
2. Schedule of Investment Expenses
3. Schedule of Payments to Consultants

The expense schedules summarize all expenses associated with administering all MERS' programs.

Comparison Statement of Fiduciary Net Position (Dollars in Thousands)

	December 31, 2018	December 31, 2017	$ Increase (Decrease)	% Increase (Decrease)
Assets				
Cash and Short-Term Investments	$17,538	$12,766	$4,772	37%
Receivables	478,177	367,227	110,950	30%
Interfund Receivables	127	136	(9)	-7%
Loans	6,161	5,774	387	7%
Investments, at fair value	10,833,075	11,315,059	(481,984)	-4%
Invested Securities Lending Collateral	573,927	528,514	45,413	9%
Other Assets/Prepaids	4,320	695	3,625	522%
Net Capital Assets	18,246	15,913	2,333	15%
Total Assets	**11,931,570**	**12,246,084**	**(314,514)**	**-3%**
Deferred Outflow of Resources				
Outflows Related to Pension	3,571	4,288	(717)	-17%
Liabilities				
Purchase of Investments	438,629	324,919	113,710	35%
Securities Lending Collateral	573,997	528,610	45,387	9%
Administrative/Investment Costs/Reserves	10,359	8,633	1,726	20%
Interfund Payables	127	136	(9)	-7%
Total Liabilities	**1,023,112**	**862,298**	**160,814**	**19%**
Deferred Inflow of Resources				
Inflows Related to Pension	717		717	
Net Position Restricted for Pension and Health Benefits and Investment Accounts Held for Others	**$10,911,312**	**$11,388,074**	**$(476,762)**	**-4%**

Comparison Statement of Changes in Fiduciary Net Position (Dollars in Thousands)

	December 31, 2018	December 31, 2017	$ Increase (Decrease)	% Increase/ Decrease
Additions				
Contributions/Transfers in	$1,024,586	$858,228	$166,358	19%
Investment Net Income (Loss) Investing Activities	(498,201)	1,404,789	(1,902,990)	-135%
Investment Net Income-Securities Lending	3,152	3,663	(511)	-14%
Miscellaneous Income	221	55	166	302%
Total Additions	**529,758**	**2,266,735**	**(1,736,977)**	**-77%**
Deductions				
Benefits/Transfers and Withdrawals	987,449	909,116	78,333	9%
Forfeitures, Miscellaneous	6	15	(9)	100%
Special Litigation Expense		4,250	(4,250)	100%
Administrative Expense	19,065	19,222	(157)	-1%
Total Distributions	**1,006,520**	**932,603**	**73,917**	**8%**
Net Increase/Decrease	**(476,762)**	**1,334,132**	**(1,810,894)**	**-136%**
Net Position-Restricted for Pension and Health Benefits and Investment Accounts Held for Others				
Balance Beginning of Year	11,388,074	10,053,942	1,334,132	13%
Balance End of Year	**$10,911,312**	**$11,388,074**	**$(476,762)**	**-4%**

Analysis of Fiduciary Net Position

The fiduciary net position decreased by $477 million over the previous fiscal year primarily due to investment losses of $484 million before investment expenses.

The MERS receivables consist chiefly of investment and employer contribution billings that settled in early 2019. Investment receivables are the bulk of the receivables for securities that were purchased in late 2018 and then cleared in 2019.

Combined employer and employee contributions increased by $166 million in 2018 due to an increase in extra voluntary employer contributions and an increase in the actuarial required employer contributions.

MERS had capital assets, net of accumulated depreciation, of $18.2 million. Of the total, $10.4 million is software needed to run the pension administration and financial programs; $840,000 is office furniture and equipment; and $7 million is buildings, leasehold improvements, and land.

MERS has no long-term liabilities. The bulk of MERS' liabilities at year-end are related to investment purchases that did not settle until early 2019, accrued administrative and investment expenses, and securities' lending collateral.

Investment Activities

The performance of the Defined Benefit Portfolio was down for the year but favorable when compared to the investment benchmark. The return (net of investment expenses) of -3.64% was below the 7.75% actuarial return assumption target for the year. By comparison for 3, 5, 10, and 20-year periods, the net returns were 6.51%, 4.94%, 8.25%, and 7.99%, respectively. Net investment income (net appreciation in fair value less investment expenses plus securities lending income) decreased by $1.9 billion compared to the previous year. A further detailed analysis of investment returns is in the Investments Section.

The investments are managed to control downside risk while maximizing long-term gain potential. This strategy positions MERS to limit the impact of adverse market conditions. Portfolio diversification by asset class and style is an important element of investment risk control.

MERS is an investment fiduciary under the Public Employee Retirement System Investment Act, PA 314 of 1965, MCL 38.1132 et seq., as amended, and, as such, is subject to the "prudent person" standard of care with respect to the management and investment of the System's assets. This standard requires that MERS discharge its duties solely in the interest of the System's participants and beneficiaries with the diligence, care, and skill that a prudent person would ordinarily exercise under similar circumstances.

In accordance with its fiduciary duties, the Board has adopted an investment policy that outlines the investment goals, objectives, and policies of the System's pension fund. The purpose of the policy is to ensure that the investment activities are carried out within the framework established by the MERS policy and administrative documents. The investment policy assists the Board, Investment Committee, and Office of Investments in effectively and prudently monitoring and administering the MERS investments. A summary of the total assets are found in the Investment section of the CAFR.

Funding Status

A pension plan is well funded when it has sufficient assets invested to meet all expected future obligations to participants. The greater the level of funding — the larger the ratio of assets to actuarial accrued liability. While some municipalities are not fully funded, annual contributions are made at an actuarially determined rate to reach full funding over a fixed period of years. There is no single all-encompassing test for measuring a retirement system's funding progress and current funded status. However, some common indicators that a retirement system has achieved progress in funding its obligations include: observing the changes over time of the ratio of valuation assets to actuarial accrued liabilities and the pattern of the unfunded actuarial accrued liability as a percentage of active payroll.

The Board has adopted a funding policy for MERS to achieve the following major objectives:

- Adequacy
- Inter-Period Equity (in particular intergenerational equity) and Transparency
- Contribution Stability and Governance

The actuarial method for calculating the accrued liability for all plans is entry age normal with the objective of maintaining employer contributions approximately level as a percentage of member payroll. A detailed discussion of the funding method is in the Actuarial Section.

MERS is an agent multiple-employer retirement system that pools assets of the participating employers for investment purposes, but maintains separate trusts for each individual employer. For this reason, MERS does not have a "funded status;" rather, each municipality has its own funded level. Each municipality is responsible for its own plan liabilities; a municipality cannot borrow from another municipality's account to pay for pension expenses. A measure of a municipality's funding progress is the ratio of its actuarial assets to actuarial accrued liabilities.

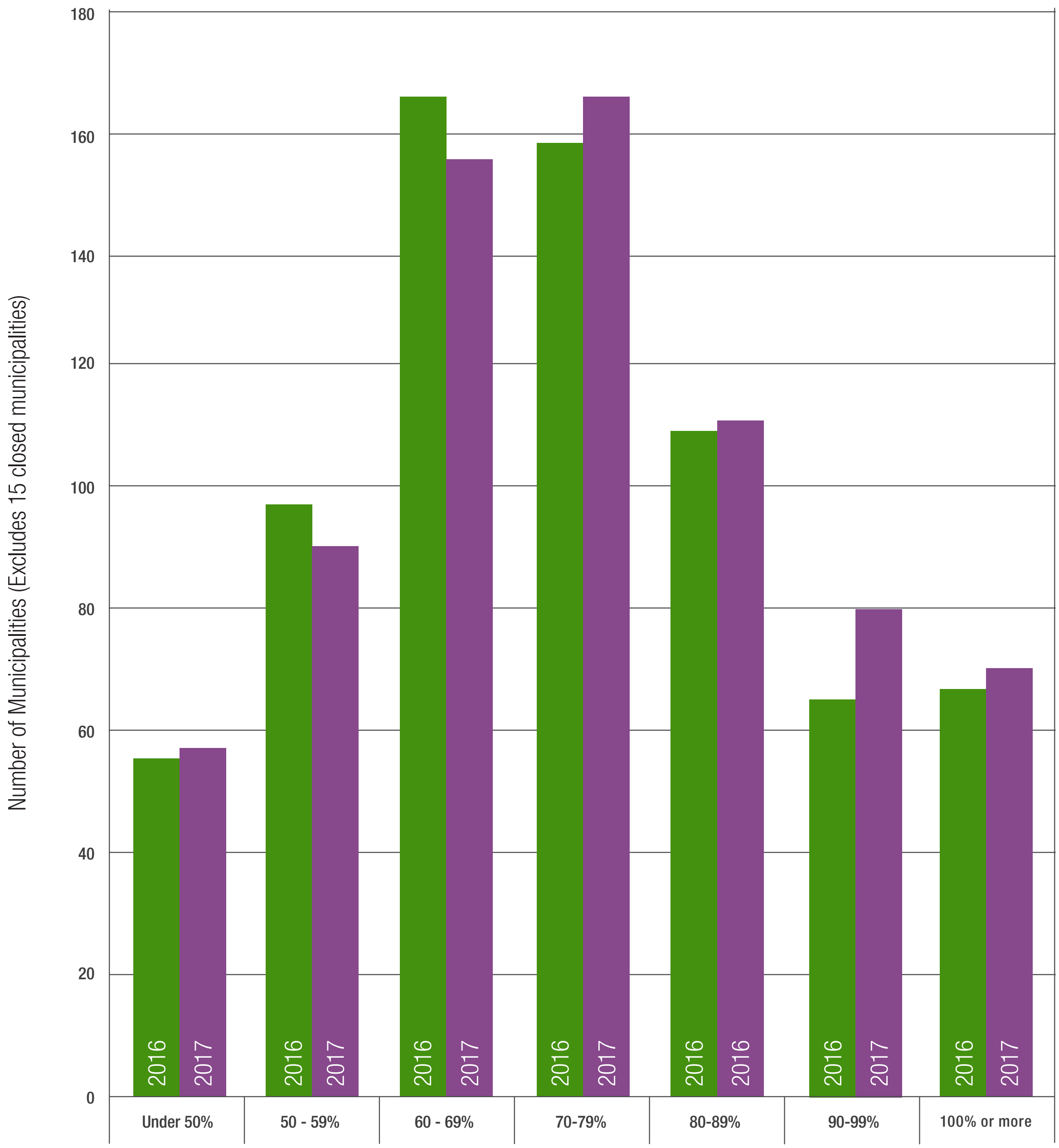
The most recent MERS actuarial valuation is as of December 31, 2017. On that date, of all 727 Defined Benefit and Hybrid municipalities, 427 municipalities in MERS are funded at 70% or higher (58.7% of all Defined Benefit and Hybrid municipalities) and 69 municipalities (9.5% of all Defined Benefit and Hybrid municipalities) are funded at 100% or more. The average funded percentage was 76% in 2017, up 2% from 2016.

MERS partners with our local governments to achieve the following:

- Determine the best retirement fit for each municipality
- Offer cost-reducing strategies
- Provide fiscal best practices

The difference between MERS' actuarial and fair value of assets widened in 2018. The 2018 end of the year actuarial calculation of assets is 109.3% of the fair value of assets compared to 101.1% as of December 31, 2017. Ideally, the differences between actuarial value and fair value of assets should be small. The higher actuarial value of assets reflects smoothing losses of the 2008 downturn, and lower investment returns than the MERS expected rate of return of 7.75%. If investment returns are higher in the next few years than the MERS expected rate of return, the difference will continue to narrow between the actuarial and fair values.

Distribution of Funded Percentage of Actuarial Accrued Liability among the 727 participating municipalities as of December 31, 2017, and the 720 participating municipalities as of December 31, 2016



Statement of Fiduciary Net Position as of December 31, 2018 (Dollars in Thousands)

	Defined Benefit	Defined Contribution	Health Care Savings Plan
Assets			
Cash and Short-Term Investments	$17,913		
Receivables			
Employer and Member Contributions	38,846	$262	$131
Sale of Investments	366,920	8,413	7,499
Investment Income	12,609	288	257
Loans		5,824	
Interfund Receivables	127		
Other	3,809		
Total Receivables/Loans/Other	**422,311**	**14,787**	**7,887**
Global Equities	4,393,363	100,728	89,793
Global Fixed Income	2,560,455	58,706	52,332
Real Assets	1,013,514	23,237	20,714
Diversifying Strategies	924,609	21,199	18,897
Land	1,402		
Mutual Funds		447,073	15,675
Self Directed Accounts		3,614	
Investments, at Fair Value	8,893,343	654,557	197,411
Invested Securities Lending Collateral	496,376	11,381	10,145
Prepaid Expenses	513		
Capital Assets, at cost, net of accumulated depreciation	18,246		
Total Assets	**9,848,702**	**680,725**	**215,443**
Deferred Outflow of Resources			
Outflows related to pension	3,571		
Liabilities			
Purchase of Investments	379,685	8,705	7,760
Securities Lending Collateral	496,437	11,382	10,146
Reserves and Forfeitures			
Administrative and Investment Costs	8,129		
Interfund Payables		47	42
Total Liabilities	**884,251**	**20,134**	**17,948**
Deferred Inflow of Resources			
Inflows related to pension	717		
Net Position-Restricted for Pension and Health Benefits and Investment Accounts Held for Others	**$8,967,305**	**$660,591**	**$197,495**

The accompanying notes are an integral part of these Financial Statements.

457 Program	Individual Retirement Account	Retiree Health Funding Vehicle	Investment Services Program	As of December 31, 2018	As of December 31, 2017
				$17,913	$12,766
$39		$75		39,353	42,631
1,097		37,833	$2,483	424,245	310,601
38		1,300	85	14,577	13,285
337				6,161	5,774
				127	136
				3,809	710
1,511	**0**	**39,208**	**2,568**	**488,272**	**373,137**
13,129	6	453,002	29,733	5,079,754	6,199,488
7,652	3	264,009	17,329	2,960,486	2,581,320
3,029	1	104,504	6,859	1,171,858	1,026,048
2,763	1	95,337	6,258	1,069,064	993,646
				1,402	
83,697	35			546,480	510,905
417				4,031	3,652
110,687	46	916,852	60,179	10,833,075	11,315,059
1,483	1	51,182	3,359	573,927	528,514
				513	695
				18,246	15,913
113,681	**47**	**1,007,242**	**66,106**	**11,931,945**	**12,246,084**
				3,571	4,288
1,135		39,149	2,569	439,004	324,919
1,484	1	51,188	3,360	573,997	528,610
2,230				2,230	2,629
				8,129	6,004
6		30	2	127	136
4,855	**1**	**90,367**	**5,931**	**1,023,487**	**862,298**
				717	
$108,826	**$46**	**$916,874**	**$60,175**	**$10,911,312**	**$11,388,074**

Statement of Changes in Fiduciary Net Position for the Year Ended December 31, 2018 (Dollars in Thousands)

	Defined Benefit	Defined Contribution	Health Care Savings Plan
Additions			
Contributions and Transfers In			
Employer Contributions and Other	$707,958	$49,077	$27,846
Plan Member Contributions	87,739	25,412	
Total Contributions and Transfers In	795,697	74,489	27,846
Net Appreciation/Depreciation in Fair Value	(504,838)	(43,777)	(9,144)
Interest and Dividend Income	120,021	2,752	2,453
Subtotal of Investment Income/(Loss)	(384,817)	(41,025)	(6,691)
Less Investment Expense	12,648	204	182
Net Investment Income/(Loss) Before Securities Lending Activities	(397,465)	(41,229)	(6,873)
Security Lending Activities			
Security Lending Income	15,606	358	319
Security Lending Expenses			
Borrower Rebates	12,197	280	249
Management Fees	682	16	14
Total Securities Lending Expenses	12,879	296	263
Net Income from Security Lending Activities	2,727	62	56
Total Net Investment Income/(Loss)	(394,738)	(41,167)	(6,817)
Miscellaneous Income	221		
Total Additions	**401,180**	**33,322**	**21,029**
Deductions			
Benefits/Transfers and Withdrawals	892,530	39,015	5,954
Forfeitures, and Other Miscellaneous	6		
Special Litigation Expense			
Administrative Expenses	17,463	555	168
Total Deductions	**909,999**	**39,570**	**6,123**
Net Increase/Decrease	(508,819)	(6,248)	14,906
Net Position-Restricted for Pension and Health Benefits and Investment Accounts Held for Others			
Balance Beginning of Fiscal Period	9,476,123	666,839	182,589
Balance End of Fiscal Period	**$8,967,305**	**$660,591**	**$197,495**

The accompanying notes are an integral part of these Financial Statements.

457 Program	Individual Retirement Account	Retiree Health Funding Vehicle	Investment Services Program	December 31, 2018	December 31, 2017
$1,048		$88,650		$874,579	$725,211
36,803	$53			150,007	133,017
37,851	53	88,650		1,024,586	858,228
(8,070)	(2)	(54,298)	$(2,806)	(622,934)	1,297,259
359		12,375	812	138,772	121,589
(7,711)	(2)	(41,923)	(1,994)	(484,162)	1,418,848
27		918	60	14,039	14,059
(7,737)	(2)	(42,841)	(2,054)	(498,202)	1,404,789
47		1,609	106	18,044	10,749
37		1,258	83	14,103	6,170
2		70	5	788	916
39		1,328	87	14,892	7,086
8		281	19	3,152	3,663
(7,729)	(2)	(42,560)	(2,036)	(495,049)	1,408,452
				221	55
30,121	**51**	**46,090**	**(2,036)**	**529,758**	**2,266,735**
4,386	5	35,004	10,554	987,448	909,116
				6	15
					4,250
93		731	55	19,065	19,222
4,479	**5**	**35,735**	**10,609**	**1,006,519**	**932,603**
25,642	46	10,355	(12,644)	(476,761)	1,334,132
83,184		906,519	72,819	11,388,074	10,053,942
$108,826	**$46**	**$916,874**	**$60,175**	**$10,911,312**	**$11,388,074**

NOTES TO BASIC FINANCIAL STATEMENTS

Year ended December 31, 2018

1. REPORTING ENTITY AND PLAN DESCRIPTION

MERS is a statutory public corporation and governmental pension plan qualified under Section 401(a) of the Internal Revenue Code, independent from the State of Michigan, which was established to provide a pooled program for retirement, survivor and disability benefits on a voluntary basis to the State of Michigan's municipal employees. MERS has helped provide retirement plans for municipal employees for over 70 years.

MERS was established by the Michigan Legislature under Public Act 135 of 1945. This act was repealed and replaced by the successor Municipal Employees' Retirement Act of 1984 (PA 427), as last amended by 2004 PA 490 (MERS Act). On August 15, 1996, pursuant to 1996 PA 220, MERS became independent from the State of Michigan.

Since 1996, MERS is solely administered by a nine-member retirement board (Board). The Board consists of the following members, each of whom, except for the retiree member and the Board appointees, shall be from a different county at the time of election:

- Two members, appointed by the Board, who have knowledge or experience in retirement systems, administration of retirement systems, investment management, or advisory services
- One member, a retiree of the System, is appointed by the Board
- Three members of the System, officers of a participating municipality or of a participating court, who are elected as Officer Board members by the delegates at the MERS Annual Conference
- Three employee members of the System, who are not officers of a participating municipality or of a participating court, who are elected as Employee Board members by the delegates at the MERS Annual Conference

The regular term of office for members of the Board is three years. Members of the Board serve without compensation with respect to their duties, but are reimbursed by the System for their actual and necessary expenses incurred in the performance of their duties.

The Board establishes in its Plan Document the benefit plans and provisions that are available for adoption. The local municipality's governing body adopts all benefits of the plan. The various plans are discussed in the Actuarial Section. Pursuant to Article 9, Section 24 of the Constitution of the State of Michigan: "The accrued financial benefits of each pension plan and retirement system of the state and its political subdivisions shall be a contractual obligation thereof which shall not be diminished or impaired thereby. Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities."

MERS is an agent multiple-employer retirement system that pools assets of the participating employers for investment purposes, but maintains separate accounts for each individual employer.

Employee contribution rates vary depending on the benefit plan adopted by the local government. If an employee leaves employment or dies before becoming eligible for retirement benefits, accumulated employee contributions (plus interest) are refunded to the employee or designated beneficiary upon application.

The Internal Revenue Service (IRS) has determined that MERS' Defined Benefit, Defined Contribution and Hybrid Plans are governmental plans that are tax-qualified trusts under Internal Revenue Code (the Code or IRC) Section 401(a) and tax exempt under Section 501(a). The IRS issued the most recent Letter of Favorable Determination for MERS on October 18, 2016. The benefits of tax-qualified status include the preferential deferred taxability of contributions, accumulated earnings, pensions, rollovers, annual compensation limits, and benefit limitations.

Under the Code, the retiree's pension becomes subject to taxation upon periodic distribution unless the distribution is "rolled over" if permitted by law. Pursuant to IRC Section 72(d), any "after tax contributions" are recovered tax-free over the life expectancy of the retiree (or beneficiary, if applicable).

IRC Section 401(a)(17) limits the amount of compensation that can be taken into account for benefit calculation purposes and, correspondingly, limits the amount of employer and employee contributions. Compensation in excess of the limit ($275,000 and $280,000 for 2018 and 2019 respectively) will not be included by MERS in any benefit determination. Employee contributions in excess of the limit will not be collected or accepted, nor included in final average compensation for benefit purposes.

In addition, IRC Section 415(b)(1)(A) imposes certain limitations on pension benefit payments from the MERS qualified trust. Any amounts that exceed the limitations shall be paid from a Qualified Excess Benefit Arrangement (QEBA), as authorized by IRC Section 415(m) and the Michigan Public Employee Benefit Protection Act, MCL 38.1686 (2002 PA 100). The QEBA is a separate plan, and is annually cash funded by the affected participating municipality or court. The Board established the MERS QEBA in 2003 solely for the purpose of providing retirees and beneficiaries that portion of the retirement allowance exceeding the Section 415 limits, which is otherwise not payable by the trust under the terms of the MERS qualified plan. The IRS approval of the QEBA was pursuant to Private Letter Ruling issued December 15, 2003. Retirees and beneficiaries do not have an election, directly or indirectly, to defer compensation to the QEBA.

The MERS Defined Contribution Plan became operative July 8, 1997, under Section 401(a) of the IRC. On this date, the MERS Plan Document of 1996 was first determined by the IRS Letter of Favorable Determination to meet qualifications as a "governmental plan" trust under Code Section 401(a), and tax exempt under Section 501(a). MERS has contracted with a third party administrator for recordkeeping and administrative functions. The plan is available to all MERS participating municipalities and may be adopted on a division-by-division basis. Plan provisions and requirements are specified in the MERS Plan Document. MERS Defined Contribution Plan provides participants with an account they manage. At retirement, benefits are based solely on the amount contributed by the participant and employer and the performance of investments. IRC Section 415(c) imposes certain limitations on the annual additions that can be accepted by the MERS qualified trust (for 2018, the limit was the lesser of $55,000 or 100% of compensation). The plan has several strategic investment categories designed to help participants meet their retirement goals. All participants have access to the MERS streamlined investment menu that allows for simple and strategic investing.

The MERS Hybrid Plan is an option for municipalities that includes both a defined benefit and a defined contribution component. The defined benefit component (Part I) is employer funded, with benefit multipliers of 1.0, 1.25, and 1.5%. The defined contribution component (Part II) is a combination of employer and participant contributions that are invested in mutual funds selected by the individual participant. On the financial statements, the Hybrid Plan is reflected in both Defined Benefit and Defined Contribution columns.

MERS received a Private Letter Ruling dated January 13, 2004, allowing the establishment of an IRC Section 115 Integral Governmental Trust, giving MERS the ability to create two programs – the Health Care Savings Program and the Retiree Health Funding Vehicle.

The MERS Health Care Savings Program became operational in June 2004 and was made available to all municipalities in Michigan. The employer-sponsored program provides medical reimbursement accounts to participants. Medical expenses are reimbursed, as defined in Code Section 213, once participants terminate employment, are on medical leave for six months or longer, or are on disability from any public pension plan.

There are four types of contributions that may be used in the program: 1) Basic Employer (tax-favored); 2) Mandatory Salary Reductions (tax-favored); 3) Mandatory Leave Conversions (tax-favored); and 4) Voluntary Employee Contributions (post-tax).

As a result of the Private Letter Ruling and Code Sections 106 and 213, reimbursements for medical expenses are tax-exempt for the participant, their spouse, and/or Code Section 152 dependent(s). The Health Care Savings Program accounts are invested in the MERS Investment Menu, and earnings are tax exempt as a result of the MERS Private Letter Ruling. Plan provisions and requirements are specified in the MERS Health Care Savings Program and Retiree Health Funding Vehicle Plan Document and Trust.

The MERS Retiree Health Funding Vehicle became operational in the fall of 2004, and was made available to all municipalities in Michigan. Participating municipalities can contribute monies to the Trust as desired and no contribution method is imposed. These funds constitute a health care fund, which enable municipalities to accumulate monies to provide or subsidize health benefits for retirees and beneficiaries. MERS does not provide benefits, only the funding vehicle for local governments. The Retiree Health Funding Vehicle accounts are invested in the MERS portfolio choices and earnings are tax exempt as a result of the MERS Private Letter Ruling. Plan provisions and requirements are specified in the MERS Health Care Savings Program and Retiree Health Funding Vehicle Plan Document and Trust.

The MERS 457(b) Deferred Compensation Program was established as a deferred compensation plan and trust and became operational November 8, 2011. Its purpose is to provide benefits under the Program to participants and beneficiaries upon retirement, termination, disability, or death, upon the terms and conditions, and subject to the limitations contained in the Program. The Program was created for the exclusive benefit of eligible participants and their beneficiaries of any employer electing to participate in the Program. The Program is intended to comply with Code Section 457(b). All assets held in connection with the Program, including all contributions and amounts of compensation deferred pursuant to the Program, all property and rights acquired or purchased with such amounts, and all income attributable to such amounts, property, or rights shall be held in trust for the exclusive benefit of participants and their beneficiaries under the Program. No part of the assets and income shall be used for, or diverted to, purposes other than for the exclusive benefit of participants and their beneficiaries and for defraying reasonable expenses of the Program.

The Investment Services Program is an investment trust fund that is available to all municipalities in Michigan to invest funds through the MERS portfolio while maintaining administrative functions at the municipal level. The program was established by the Board in March 2006 and began operations in June 2006. The Investment Services Program trust fund complies with all the requirements imposed by the Public Employee Retirement System Investment Act, 1965 PA 314. Like the other non-retirement plans, participation in the Investment Services Program alone does not qualify as membership in MERS, and the participating employer that does not otherwise participate in MERS' 401(a) plan does not have a vote at the MERS Annual Conference.

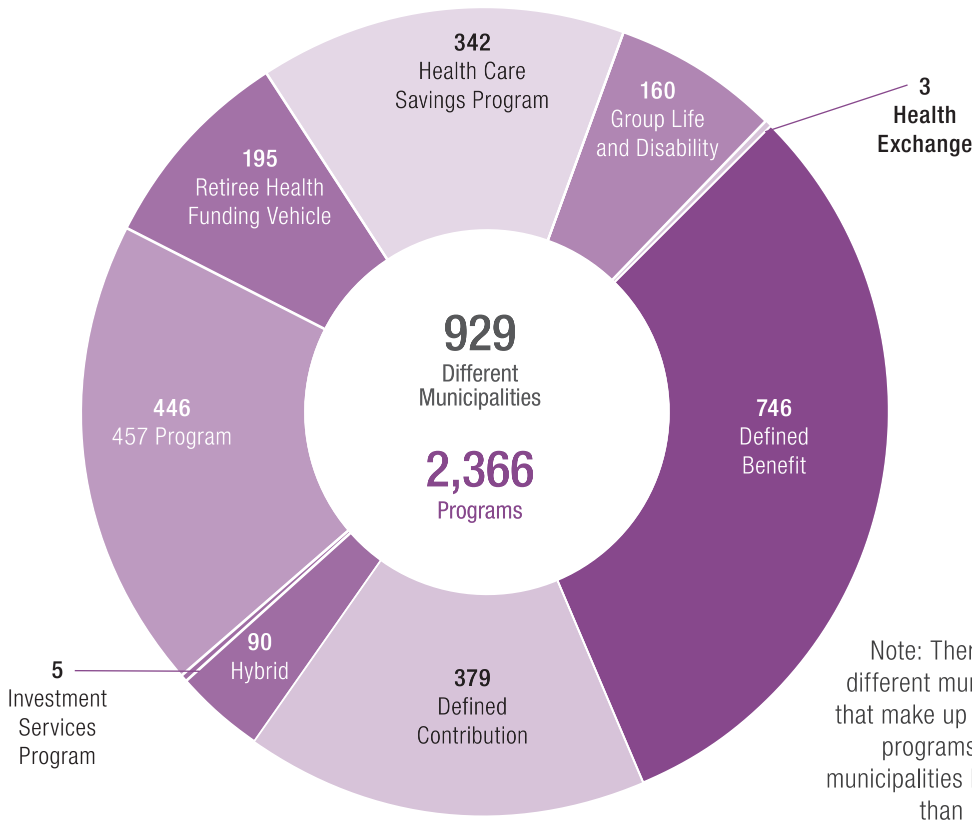
The MERS deemed Individual Retirement Account (IRA) was established in 2018 and is a tax-advantaged retirement account for the exclusive benefit of current and former employees of MERS-partnered municipalities and their spouses. MERS offers two types of IRAs: A Roth IRA that provides tax-free income in retirement and a traditional IRA that allows tax-deductible contributions now. Both allow the participant to withdraw money at any time, without penalty, for qualified expenses including education expenses, buying a first home, and some medical expenses.

Through The Standard Insurance Company, MERS offers quality group life and disability insurance to Michigan municipalities. This group buying program offers comprehensive benefit features, a variety of plan designs, and family-friendly provisions at an affordable cost. The Standard Insurance Company fully administers the plan and MERS does not have any financial liability for the arrangement. In exchange for offering the group buying, MERS receives a small reimbursement that is reported in the service fee line item of the Defined Benefit administrative expenses.

MERS partners with the Mercer Marketplace 365 to offer a private health care exchange for eligible members. A private exchange is a marketplace where retirees can purchase benefits from the carrier of their choice with a wide variety of coverage options for pre-65 and Medicare-eligible retirees. Participants may use their MERS Health Care Savings Program funds for insurance premiums, co-payments, deductibles, etc., paid to providers available on the Exchange. The individual HCSP account would reflect any reimbursement for eligible expenses from HCSP as a distribution. As part of its collaboration agreement, MERS receives a quarterly reimbursement from Mercer to promote this partnership that is reported in the service fee line item of the Defined Benefit administrative expenses. Employers who partner with Mercer to manage their retiree group health plan receive a reimbursement for their retiree member list.

Any "municipality" (a term defined by Section 2b (2) of the MERS Act, MCL 38.1502b(2)) within the state may elect to become a participating member of MERS by a majority vote of the municipality's governing body or by an affirmative vote of the qualified electors. Changes in retirement plan coverage are subject to approval by a majority vote of the municipality's governing body.

MERS Participating Municipalities as of December 31, 2018



Note: There are 929 different municipalities that make up the 2,366 programs, as many municipalities have more than 1 product.

MERS Participants as of December 31, 2018

	Defined Benefit	Defined Contribution	Hybrid	Health Care Savings Program	457	Health Exchange	IRA
Active	31,010	13,195	3,199	16,971	4,962	104	6
Deferred	9,223	NA	233	NA	NA	NA	NA
Retired	40,972	NA	95	NA	NA	NA	NA
Contributions not Vested	12,884	NA	8	NA	NA	NA	NA
Terminated	NA	6,021	NA	6,091	733	NA	NA
Product Totals	94,089	19,216	3,535	23,062	5,695	104	6
Total MERS Accounts*							145,707

** Total MERS Accounts represents the total number of accounts within MERS; individuals may be represented multiple times across categories.*

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Reporting Entity

The Board is responsible for the administration of the System, has fiduciary responsibility for the investment of assets, and oversees all funds included in these financial statements. The Board appoints the Chief Executive Officer who manages and administers the System under the supervision and direction of the Board.

MERS financial statements are not included in the financial statements of any other organization.

Blended Component Units

MERS Real Estate Corporation (MREC) is governed by a three-member board appointed by MERS as the sole member. Although it is legally separate from MERS, MREC is reported as if it were part of MERS because it is solely owned by MERS to function as a real estate holding company for the properties occupied by MERS.

Cost Allocation

The costs of administering the MERS Defined Benefit Plan are allocated proportionally based on the average daily balance asset size to the municipalities along with investment gains/losses on a quarterly basis.

The costs of administering the MERS Defined Contribution Plan, Health Care Savings Program, Retiree Health Funding Vehicle, Investment Services Program, and IRAs are allocated out to the employers and participants based on an administrative expense percentage for each employer and participant as well as their investment expenses based on fund choices.

Basis of Accounting

The financial statements for MERS are prepared on an accrual basis in accordance with Generally Accepted Accounting Principles (GAAP) as applicable to government organizations in the U.S. The preparation of financial statements, in conformity with GAAP, requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates.

MERS Defined Benefit Plan employer and employee contributions are recognized when due pursuant to legal, statutory, and contractual requirements. Benefits and refunds are recognized when due and payable in accordance with the terms of the Plan. Expenses and the associated liabilities for those expenses are also recorded using the accrual method when the liability is incurred.

The Defined Contribution Plan, 457 Program, Health Care Savings Program, Retiree Health Funding Vehicle, Investment Services Program, and IRA financial statements are prepared using the accrual accounting method for revenues which are recorded when either payroll reports and/or funds are received. Expenses and the associated liabilities for those expenses are also recorded using the accrual method when the liability is incurred.

Plan investments are presented at fair value using the accrual method for those investments which are invested in the MERS portfolio. Investment purchases, sales, and associated payables and receivables are recorded on their trade date. Investments invested outside of the MERS portfolio (primarily mutual funds) are recorded at fair value.

Post-Employment Benefits

MERS does not provide other post-employment benefits to its employees and accordingly does not have any expense or liabilities for these benefits.

Fair Value of Investments

Plan investments are presented at fair value. Short-term investments are valued at cost plus accrued interest, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. Corporate bonds not traded on a national or international exchange are based upon equivalent values of comparable securities with similar yield and risk. Independent appraisals are the basis for valuing the fair value of real estate. Other investments that do not have established markets are recorded at an estimated fair value. Real estate and private equity investments typically have a quarter lag in reporting, but the values as of December 31 are estimated based on the third quarter capital statements plus fourth quarter cash flows, adjusted for any other known events.

Investment Act Disclosures

The Public Employee Retirement System Investment Act, MCL 38.1132, et seq., 1965 PA 314 requires MERS to follow certain financial management practices and provide related disclosures, and to provide a summary annual report, as defined by Act 314. Compliance with these requirements is achieved in this CAFR, in our Summary Report, and Consolidated Annual Actuarial Valuation found at www.mersofmich.com. MERS limits board member professional training, education, and travel expenses in compliance with MCL 38.1133(6) and is reported in the Schedule of Administrative Expenses.

Capital Assets

Capital assets represent land, buildings, office furniture, equipment, and software with a value of $5,000 or more. Assets are carried at cost, less accumulated depreciation. Depreciation expense is calculated by allocating the net cost of assets over their estimated useful lives using the straight-line method. Useful lives of the related assets vary from 3 to 30 years.

Capital Assets

Capital Assets	Buildings	Land	Leasehold Improvements	Office Furniture and Equipment	Software	Total Capital Assets
Balances Dec 31, 2017	$6,504,700	$1,266,516	$155,811	$3,271,708	$16,737,712	$27,936,447
Additions	112,515		201,904	399,578	4,399,589	5,113,587
Deletions and Transfers				(6,207)		(6,207)
Balances Dec 31, 2018	**6,617,215**	**1,266,516**	**357,715**	**3,665,080**	**21,137,301**	**33,043,827**
Accumulated Depreciation						
Balances Dec 31, 2017	810,503		87,954	2,466,153	8,658,783	12,023,393
Depreciation Expense	259,770		44,905	363,821	2,112,349	2,780,845
Deletions and Transfers				(6,207)		(6,207)
Balances Dec 31, 2018	**1,070,274**		**132,859**	**2,823,767**	**10,771,132**	**14,798,031**
Net Capital Assets Dec 31, 2018	**$5,546,941**	**$1,266,516**	**$224,857**	**$841,313**	**$10,366,169**	**$18,245,796**

Total Columns on Statements

The “Total” columns on the “Statement of Plan Net Position” and “Statement of Changes in Plan Net Position” are presented to facilitate financial analysis. Amounts in these columns do not present the plan net position and changes in plan net position in conformity with GAAP, nor is such data comparable to a consolidation. Transactions between the Defined Benefit Plan, Defined Contribution Plan, Health Care Savings Program, 457 Program, Retiree Health Funding Vehicle, Investment Services Program, and IRAs have not been eliminated from the “Total” columns.

The basic financial statements include certain prior-year summarized comparative information in total but not at the level of detail required for a presentation in conformity with generally accepted accounting principles. Accordingly, such information should be read in conjunction with the government’s financial statements for the year ended December 31, 2017, from which the summarized information was derived.

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

New Accounting Pronouncements

In January 2017, the Governmental Accounting Standards Board issued GASB Statement No. 84, Fiduciary Activities, which improves guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how these activities should be reported. This Statement establishes criteria for identifying fiduciary activities of all state and local governments. The focus of the criteria generally is on (1) whether a government is controlling the assets of the fiduciary activity and (2) the beneficiaries with whom a fiduciary relationship exists. An activity meeting the criteria should be reported in a fiduciary fund in the basic financial statements. The requirements of this Statement are effective for reporting periods beginning after December 15, 2018. Although the applicability of this standard to MERS itself is limited, employers who are in the MERS Retiree Health Funding Vehicle and Investment Services Program will need to report under the standard. MERS will be providing information to assist employers with the necessary reporting.

In June 2017, the Governmental Accounting Standards Board issued GASB Statement No. 87, Leases, which improves accounting and financial reporting for leases by governments. This statement requires recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset, and a lessor is required to recognize a lease receivable and a deferred inflow of resources. The provisions of this statement are effective for the MERS financial statements for the year ending December 31, 2020. MERS has evaluated the standard and found that the impact would be insignificant. As such, MERS will not be implementing the standard in 2020, but will continue to evaluate this annually.

3. CONTRIBUTIONS AND RESERVES

Contributions

The Defined Benefit Plan contribution funding requirements are actuarially determined using the entry age normal actuarial cost method and are based upon the benefit plan adopted by the municipality. Some municipalities fund their entire pension obligations solely from employer contributions. Most municipalities jointly fund pension obligations from employee and employer contributions. Monthly employee contributions are based upon a percentage of actual compensation as determined by the employer. Employer contributions are based upon projected or accrued compensation as determined by an annual actuarial valuation. For details about normal cost and total employer contributions by employer, please see the MERS Summary Actuarial Report found on our website at www.mersofmich.com. Employee contributions are held in individual member accounts that are credited with interest annually. Pursuant to Board resolution adopted November 9, 2005, the interest rate for each year beginning in 2005 is the 1-year T-bill rate as of December 31 each year for the ensuing December 31 employee interest calculation. It is also used for interest calculations the subsequent year for those employees requesting a refund of their contributions.

Contributions to the Defined Contribution Plan are reported directly to the MERS third-party administrator by the participating municipalities and are separate from contributions made to the MERS Defined Benefit Plan. Both employer contributions and employee voluntary and mandatory contributions are governed by the contribution limits under the IRC. Municipalities may elect to have mandatory employee contributions where the participant pays a fixed dollar or percentage. If the municipality has a match contribution type, the participant will elect the amount of contribution at the time of enrollment and will not be allowed to make any changes to that contribution amount. Municipalities may also choose to allow additional voluntary after-tax contributions through payroll deduction. Municipalities may also choose to offer matching contributions into the Defined Contribution Plan based on elective deferrals made by participants to the MERS 457(b) Program.

Participating municipalities may, upon adoption of a Defined Contribution Plan resolution for new hires, offer current Defined Benefit employees an opportunity to opt into the Defined Contribution Plan. MERS transfers the actuarial present value of the employee's accrued benefit in the Defined Benefit Plan into the employee's Defined Contribution Plan account (at a stipulated funded ratio between 80%-100%). Employees direct their contributions to various investment options offered by the MERS Office of Investments, and may transfer their account balances between investment categories or make changes to the percentage allocation on a daily basis.

Contributions to the 457(b) Program are made pre-tax and can be either a flat dollar amount or a percentage of payroll. An employer may also adopt a Roth provision allowing for after-tax contributions. Participation in the program is voluntary, so contributions can start and stop at any time, as well as increase or decrease.

Participants can make contributions to the MERS IRAs at any frequency and work directly with MERS third-party administrator to set this up. It is the participant's responsibility to ensure they do not exceed the IRA limits. Contributions are made post-tax to the Roth IRA, and participants may be able to deduct the contributions on their federal income tax returns for the traditional IRA.

Contributions to the Health Care Savings Program can come in many different forms based on the election of the employer. Mandatory pre-tax salary reductions can be elected based on a fixed dollar or required percentage that is mandatory for the entire group of participant or through a leave conversion election where vacation, personal time, sick time, or severance can be deposited into a Health Care Savings Program upon termination. In addition, post-tax voluntary employee contributions can be elected and can start or stop at any time.

Contributions to the Retiree Health Funding Vehicle and Investment Services Program can be made at any frequency for any amounts the employer wishes.

Defined Benefit Plan Reserves

Pursuant to the MERS Plan Document, 3 reserves have been established. See “Schedule of Changes in Reserves” in the Statistical Section.

- **Reserve for Employee Contributions**

  All additions to and deductions from this reserve are for the Defined Benefit Plan. Employee contributions and interest are credited to this reserve. Also credited are monies received from the purchase of service credit and monies received in repayment of previously refunded contributions. The reserve is reduced by amounts paid to employees who terminate employment and request refunds, and by amounts transferred into the “Reserve for Employer Contributions and Benefit Payments” upon an employee’s retirement. Interest is credited to each employee’s account, as provided in the Board’s November 9, 2005 resolution. The December 31, 2018 balance was $883 million.

- **Reserve for Employer Contributions and Benefit Payments**

  All additions to and deductions from this reserve are for the Defined Benefit Plan. All employer contributions are credited to this reserve. Net income is allocated to this reserve from the “Reserve for Expenses and Undistributed Investment Income”. At retirement, the employee’s accumulated contributions, if any, and interest are transferred into this reserve from the “Reserve for Employee Contributions.” Monthly benefits paid to retirees reduce this reserve. The December 31, 2018 balance was $8.1 billion.

- **Reserve for Expenses and Undistributed Investment Income**

  All additions to and deductions from this reserve are for the Defined Benefit Plan and Defined Benefit portion of the Hybrid Plan. All investment earnings and other monies received that are not dedicated to other areas are credited to this reserve. All administrative and investment expenses are paid from this reserve. Transfers from this reserve to the “Reserve for Employer Contributions and Benefit Payments” are at allocation rates determined by the Board. The unallocated reserve at the end of December 31, 2018 was $10 million.

Other Reserves

Each of the products outside of the Defined Benefit Plan has its own reserve for additions and deductions to be recorded. MERS maintains separate employer account records for each municipality within the products. The December 31, 2018 reserve balances were as follows: Defined Contribution Plan $661 million, Health Care Savings Program $197 million, Retiree Health Funding Vehicle $917 million, Investment Services Program $60 million, 457(b) Program $109 million, and IRAs $46 thousand.

A more detailed analysis of the reserves can be found in the Statistical Section.

4. INVESTMENTS AND DEPOSITS

The Board has the fiduciary responsibility and authority to oversee the investment portfolio. Various professional investment managers are contracted to manage the System's assets. All investment decisions are subject to the Michigan Public Employee Retirement System Investment Act (PERSIA), 1965 PA 314, MCL 38.1132, et seq., and the investment policy established by the Board. Michigan law allows diverse investment in stocks, corporate and government bonds, mortgages, real estate, and other investments. PERSIA requires that the System invest its assets prudently and solely in the interest of the participants and beneficiaries. Under Plan Document Section 87(6), PERSIA, and Internal Revenue Code Section 401(a)(2), the investments shall be made for the exclusive purpose of providing benefits to the participants and their beneficiaries, and defraying reasonable expenses of the System.

The investment policy requires independent performance measurement of investment managers and establishes total return objectives for the total portfolio and major categories of investments. As of December 31, 2018, all securities held met the required statutory provisions and Board policy. As of the same dates, no investments were in default or subject to bankruptcy proceedings that had not been previously recorded.

MERS asset allocation policy is an important determinant of achieving the investment goals of the Plan. An asset allocation study is conducted every three years to assess portfolio construction and design. The study is presented to the Board for adoption. Factors influencing the allocation policy include projecting actuarial liabilities, historical and expected long-term market returns and risk, future economic conditions, inflation and interest rate risks, and liquidity requirements.

The investment policy provides for periodic rebalancing of the portfolio to reflect asset reallocation and ensuring investments remain within the Board approved parameters.

Investment manager selection is an important decision involving complex due diligence. Managers are selected after a lengthy and time consuming process involving a review of quantitative and qualitative components. Policy objectives include focusing on stable, long-term, financially secure, experienced, and disciplined investment managers in the selection decision. Once selected, managers are monitored and reviewed for investment returns, asset allocation compliance, and market related factors.

Other investment processes and procedures include capital calls, cash flow reconciliations, trade settlements, regular portfolio review, monthly account reconciliation, performance reporting and review, periodic manager conference calls, and asset allocation reviews.

The annual money weighted rate of return on pension plan investments is calculated as the internal rate of return on pension plan investments, net of investment expenses. This expresses investment performance adjusted for the changing amounts actually invested throughout the year, measured on monthly inputs with expenses measured on an accrual basis. For the year 2018, the annual money weighted rate of return net of investment expenses measured on monthly inputs was -3.59%. (See Required Supplemental Information)

The MERS Investment Policy is adopted by the Board with the Chief Executive Officer (CEO) being responsible for all activities and duties of the System. The CEO has delegated to the Office of Investments authority to manage MERS pension funds, other trust funds, and direct all investment management activities not reserved by the Board. The Board is the System's sole fiduciary and sets general investment policy, including the Plan's asset allocation, Investment Guidelines, and Investment Policy Statements. The Board's investment authority and fiduciary responsibility is found in 1945 PA 135 and 1965 PA 314.

The Board has appointed an Investment Committee (IC) delegated with authority to make certain investment decisions and assist in investment policy development. The IC monitors investment management activity and policy recommendations developed by the MERS Office of Investments. The IC is composed of three voting Board members, including two public members with investment experience. The CEO and Chief Investment Officer (CIO) also serve on the committee as non-voting members. The IC approves recommendations to hire and terminate managers. The IC also appoints one additional non-voting Board member to observe meetings.

The Office of Investments carries out investment activity for the System, provides a monthly report on investment activities and performance, monitoring external investment managers, and reporting any material changes to the IC and the Board.

The 2018 allocation is as follows:

Global Equity	55.5%
Global Fixed Income	18.5
Real Assets	13.5
Diversifying Strategies	12.5

There is one investment manager who exceeds 5% of the pension plan's net position: Janus Henderson Investors. This firm, however, has many individual diversified investments under the firm's control, so that no one specific position exceeds the investment guideline or PERSIA limits.

MERS offers a variety of investment choices to participants and municipalities:

- The Defined Benefit plan invests in the whole portfolio of MERS including global equities, global bonds, diversified strategies, and real assets.
- The Defined Contribution Plan, Health Care Savings Program, 457 Program and IRAs have several investment options. One is a Retirement Strategies option whereby a participant can choose a target date fund that adjusts their investment allocation automatically over time as they approach retirement. Another choice is the Premium Select Option whereby a participant can select from various pre-built select funds. A third option for only the Defined Contribution and 457 participants is the Self Directed Brokerage account for those investors who understand the risks of selecting their own investment choices.
- The Retirement Health Funding Vehicle and Investment Services Program have several investment options available under the Premium Select Options of various pre-built select funds of which employers may choose. The Net Asset Value (NAV) per unit for each investment option as of 12/31/2018 is as follows:

Name	Net Asset Value Price per Unit
MERS TOTAL MARKET PORTFOLIO	19.673536
EMERGING MARKET STOCK	9.892769
INTERNATIONAL STOCK INDEX	8.939881
LARGE CAP STOCK INDEX	13.126638
MERS BALANCED INC PORT (40/60)	11.274818
MERS CAPITAL APPR PORT (80/20)	12.190345
MERS CAPITAL PRES PORT (20/80)	11.202176
MERS DIVERS BOND PORT (0/100)	15.25596
MERS EST MARKET PORT (60/40)	24.195257
MERS GLOBAL STOCK PORT (100/0)	9.533776
MID CAP STOCK INDEX	11.906078
SHORT-TERM INCOME	11.267035
SMALL CAP STOCK INDEX	10.342689

Cash Deposits

Custodial credit risk for cash deposits is the risk that, in the event of a failure of a depository financial institution, the system may not be able to recover its deposits. Balances on deposits are insured by the Federal Deposit Insurance Corporation (FDIC) up to specified limits. Balances in excess of FDIC limits are uninsured. MERS has not experienced any losses in its accounts and believes it is not exposed to a significant credit risk on its cash.

Credit Risk

Credit risk is the financial risk that an issuer, or other counterparty, will not fulfill its obligations to MERS. Credit risk exposure is dictated by each investment manager's agreement. Other criteria based on the Board's investment policy, includes that if a security is downgraded below investment grade after purchase, a review with a written explanation shall be forwarded to the Investments staff. Board policy also allows that when calculating the average rating of the portfolio, the manager may use the highest rating of the major rating agencies to calculate the average. Board policy, with regard to global fixed income securities, is that no more than 10% of the portfolio may be invested in corporate bonds or sovereign bonds rated below investment grade, as defined by Moody's and Standard & Poor's rating agencies. Board policy for global fixed income securities is that the average weighted credit of the portfolio will be a minimum of A-. When calculating the average rating of the global portfolio, the manager may use the highest rating of the major agencies to calculate the average. Board policy with regard to global, non-investment grade fixed income securities includes criteria that credit quality must maintain a minimum of 10% of the portfolio in investment grade fixed income with at least two ratings of BBB-/Baa3 or higher at the time of purchase (as assigned by Standard & Poor's or Moody's). Each portfolio is managed in accordance with investment guidelines that are specific as to permissible credit quality ranges, exposure levels within individual security quality rating tiers, and/or the average credit quality of the overall portfolio.

As of December 31, 2018, the domestic fixed income portfolio consisted of fixed income investments with respective quality ratings, excluding those obligations of the U.S. government. Investments issued by or explicitly guaranteed by the U.S. government are not considered to have credit risk. The Plan's exposure to credit risk, as of December 31, 2018, is presented on the following pages by investment category as rated by Standard & Poor's, Moody's, and Fitch credit ratings.

Credit Ratings Summary – December 31, 2018

Quality Rating	Agencies	Asset Backed	Loan	Corporate Bonds	Foreign Currency	LMTD Part Units
AAA/Aaa		$18,565,089		$6,418,866	$4,119,684	
AA+/Aa1	$75,038,232			4,110,840		
AA/Aa2		2,041,755		7,081,186		
AA-/Aa3				15,486,108		
A+/A1	776,236	115,412		27,669,914		
A/A2		989,750		29,265,868		$893,103
A-/A3		3,063,244		51,198,146		
BBB+/Baa1		660,356		46,674,596		
BBB/Baa2		3,035,846		66,184,294		133,786,837
BBB-/Baa3	875,623			49,322,401		
BB+/Ba1				12,122,359		
BB/Ba2				15,917,692		7,164,671
BB-/Ba3				5,131,144		
B+/B1				632,620		
B/B2						18,993,325
B-/B3						
CCC+/Caa1						
CCC/Caa2						734,329
CCC-/Caa3						
CC/Ca						436,628
C						
D/C						3,711,339
NA						
Cash with no ratings						
NR*	3,225,109	23,057,762	15,416,517	45,855,094	(28,258,142)	129,913,693
Totals	**$79,915,199**	**$51,529,213**	**$15,416,517**	**$383,071,127**	**$(24,138,458)**	**$295,633,925**

**The Not Rated classification includes $129 million in commingled funds and limited partnerships without credit ratings. There is also $212 million in mortgage backed securities most of which are believed to be AAA or AA+. Removing those classifications leaves the overall portfolio at 2.8% Not Rated.*

Reconciliation of Investments

Fixed income	$2,960,761,077
Difference from Investments	(483,545,034)
Payables settling in 2019	(19,625,073)
Currency difference	(607)
Receivables settling in 2019	24,594,020
Cash in Fixed Income Portfolio	478,576,688
Small Difference	6
Total	**$483,545,034**

Mortgage Backed Securities	Municipals	Non Security Assets	Short-Term Cash	U.S. Treasuries	Total	% of Portfolio
$9,233,312					$38,336,951	1.55%
9,358			$525,000	$1,413,651,232	1,493,334,662	60.28%
	$2,638,279				11,761,220	0.47%
					15,486,108	0.63%
					28,561,562	1.15%
					31,148,721	1.26%
970,166					55,231,555	2.23%
20,563					47,355,515	1.91%
					203,006,976	8.19%
1,027,663					51,225,686	2.07%
192,904					12,315,263	0.50%
					23,082,363	0.93%
1,512,064					6,643,208	0.27%
					632,620	0.03%
					18,993,325	0.77%
75,338					75,338	0.00%
					0	0.00%
					734,329	0.03%
					0	0.00%
					436,628	0.02%
					0	0.00%
					3,711,339	0.15%
					0	0.00%
			$33,223,983		33,223,983	1.34%
212,690,116		$18,542			401,918,691	16.22%
$225,731,484	**$2,638,279**	**$18,542**	**$33,748,983**	**$1,413,651,232**	**$2,477,216,043**	**100.00%**

Concentration of Credit Risk Debt Securities

Concentration of credit risk is the risk of loss attributed to the magnitude of an entity's exposure in a single issuer. The MERS investment policy states securities representing debt and equity of any one company shall not exceed 5% of the fair value of the portfolio. MERS did not hold any organization's securities that exceeded 5% of the investment portfolio other than those issued or explicitly guaranteed by the U.S. government as of December 31, 2018.

Interest Rate Risk

Interest rate risk is the risk that an investment's value will change due to a change in the absolute level of interest rates. Interest rate risk is controlled through diversification of portfolio management styles. Duration is a measure of interest rate risk. The greater the duration of a bond or a portfolio of bonds, the greater its price volatility will be in response to a change in interest rates and vice-versa. Sensitivity to changing interest rates may derive from prepayment options embedded in an investment. The Board policy, in regard to interest rate risk, is that the effective duration of the domestic portfolio shall be (+/-) 20% of the Bloomberg Barclays Capital Aggregate Index or the Bloomberg Barclays Universal Bond Index. Board policy in regard to global non-investment grade fixed income securities is that the portfolio's duration is (+/-) 2 years of the benchmark duration. The benchmark for global non-investment grade fixed income securities is 1/3 Bloomberg Barclays Capital U.S. Treasury Inflation Protected Securities Index, 1/3 Citigroup High Yield Market Index, and 1/3 JP Morgan Emerging Markets Global Bond Index. As of December 31, 2018, the System's exposure to interest rate risk (as measured by the effective duration method summary) is listed below by investment type.

The term duration has a special meaning in the context of bonds. It is a measurement of how long, in years, it takes for the price of a bond to be repaid by its internal cash flows. It is an important measure for investors to consider, as bonds with higher durations carry more risk and have higher price volatility than bonds with lower durations.

Effective Duration – December 31, 2018

Investment Type	Fair Value	Weighted Effective Duration
Agency	$80,534,237	2.06
Asset Backed	51,499,855	0.99
Bank Loan	15,416,517	0.59
CMBS	3,735,384	2.63
CMO	34,083,554	3.41
Corporate	354,961,879	4.81
Mortgage Pass-Through	184,586,359	3.72
Commingled Fund	198,467,344	6.50
US Treasury	1,413,651,226	2.88
Yankee (Intl bonds in U.S. dollars)	32,324,123	5.91
Total Fair Value of Effective Duration	**$2,369,260,478**	

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment. MERS currency risk exposure, or exchange rate risk, is primarily derived from its holdings in foreign currency denominated equities and fixed income investments. The Board investment policy for the global non-investment grade fixed income portfolio, allows currency hedging to mitigate currency exposure.

Hedging the non-U.S. dollar currency exposure of the portfolio is permitted. The portfolio will be limited to the maximum net currency exposure of 25% at any given time.

The MERS exposure to foreign currency risk in U.S. dollars is summarized below as of December 31, 2018.

Foreign Currency Risk in U.S. Dollar Denominations – December 31, 2018

Currency	Equities	Currency	Private Equity	Real Estate	Total
Australian dollar	$18,894,922	$629,441	$86,188,135	$294,555	$106,007,052
Brazilian real	1,574,501	102,437			1,676,938
British pound sterling	37,921,937	(281,792)		238,265	37,878,410
Canadian dollar	17,171,996	1,106,649	2,846,688	(5,370,226)	15,755,106
Danish krone	4,790,541				4,790,541
Euro	83,549,722	4,147,162	90,985,496	1,017,062	179,699,442
Hong Kong dollar	11,180,544	102,107		359,782	11,642,433
Indonesian rupiah	291,885	15,709			307,594
Japanese yen	96,951,778	19,488		1,908,523	98,879,788
Malaysian ringgit	470,283	15,107			485,390
Mexican peso		104,277		453,589	557,866
New Israeli shekel	12,279,570	3,265	1,426,559	218,631	13,928,025
New Taiwan dollar	4,997,971	163,812			5,161,782
New Zealand dollar	1,882,730	23,175		56,930	1,962,835
Norwegian krone	5,881,842	68,623			5,950,466
Philippine peso	39,978	16,929			56,907
Polish zloty	478,791	32,454			511,245
Singapore dollar	4,392,424	412,543		331,646	5,136,614
South African rand	206,718	(3,906)		22,566	225,378
South Korean won	3,439,036	61,400			3,500,436
Swedish krona	13,201,411	4,838			13,206,249
Swiss franc	11,748,388				11,748,388
Thailand baht	4,145,196	(429)			4,144,767
Turkish lira	236,564	35,177		15,585	287,326
Total Investment Securities	**$335,728,727**	**$6,778,465**	**$181,446,878**	**$(453,093)**	**$523,500,977**

Custodial Credit Risk

Custodial credit risk is the risk that deposits may not be recovered in the event of failure of a depository financial institution. As of December 31, 2018, the $17.9 million carrying amount of the System's cash and short term investments was comprised of $17.9 million in deposits, $17.65 million which was subject to custodial credit risk because it was uninsured and uncollateralized.

Securities Lending

The MERS policy and statute authorizes participation in a securities lending program administered by its global custodian, State Street Bank and Trust Company. MERS receives income as the owner of securities and income from the lending of those securities. There are no dividends or coupon payments owing on the securities on loan. Securities lending earnings are credited to MERS and other participating clients on approximately the 15th day of the following month. The securities are open contracts and, therefore, could be terminated at any time by either party.

The borrower collateralizes the loan with cash at 102% of fair value plus accrued interest on domestic securities, and 105% of fair value plus accrued interest on international securities loaned. Due to the nature of the program's collateralization of U.S. fixed income securities on loans at 102% plus accrued interest, MERS' management believes that there is no credit risk per GASB 40 because the lender owes the borrower more than the borrower owes the lender. Cash collateral is invested for MERS in a dedicated short-term investment fund consisting of investment grade fixed income securities. The custodian provides for full indemnification to MERS for any losses that might occur in the event of borrower default resulting from negligence or intentional misconduct. Securities on loan are marked to fair value daily to ensure the adequacy of the collateral. There are no restrictions on the amount of securities that can be loaned at one time. MERS security lending is also in compliance with PERSIA 38.1140e.

MERS has never experienced a loss on securities lending transactions resulting from the default of a borrower or lending agent since it commenced lending securities in March 1995. As of December 31, 2018, the fair value of fixed income securities invested in the cash collateral pool was below the original cost, resulting in a cumulative unrealized loss of $70 thousand that is reflected in the financial statements. Securities lending produced a net income of $3.2 million excluding unrealized gains and losses.

Collateral Held and Fair Value of Securities on Loan

Fair Value of Securities on Loan	Nature of Collateral	Collateral Held
$573,661,642	Cash	$573,997,167
	Calculated Mark	666,978
	Non-Cash	11,971,413
$573,661,642		**$586,635,557**

Securities Lending Collateral

	S & P Rating	Percentage	Amount
Short-Term Credit Ratings	A-1+/P-1 *	12.86%	$73,793,879
	A-1/P-1 *	50.20%	288,139,357
	A-2	0.00%	
Long-Term Credit Ratings	AAA	0.00%	
	AA	7.49%	42,988,244
	A	22.08%	126,765,300
	BBB+	0.00%	
	BBB	0.00%	
	BBB-	0.00%	
	BB+	0.00%	
	BB	0.00%	
	BB-	0.00%	
	Other	7.37%	42,310,387
		100.00%	573,997,167
Net accumulated depreciation in fair value			(70,316)
Invested Securities Lending Collateral			$573,926,851

** A short term obligation rated A-1/P-1 is rated in the highest category by both Standard & Poor's (S&P) and Moody's Investor Services. These Issuers have a superior ability to repay short-term obligations. S&P will designate certain issues with a plus sign (+) to indicate that the obligor's capacity to meet its financial commitment is extremely strong.*

Derivatives

Derivative instruments are financial contracts whose value depends on the values of underlying assets, reference rates, or financial indices. They include futures contracts, swap contracts, credit-linked notes (CLN), and forward foreign currency exchange. While the Board has no formal policy specific to derivatives, MERS holds investments in futures contracts, swap contracts, credit linked notes, and forward foreign currency exchange. MERS enters into these derivative contracts primarily to obtain exposure to different markets to enhance the performance and reduce the volatility of the portfolio. It enters swaps and futures contracts to gain or hedge exposure to certain markets. They also manage interest rate risk and forward foreign exchange contracts primarily to hedge foreign currency exposure.

The following tables summarize the various contracts in the portfolio as of December 31, 2018. The notional value associated with these derivative instruments are generally not recorded on the financial statements; however, the amounts for the exposure (unrealized gains/losses) on these instruments are recorded. Interest rate risks associated with these investments are included in the table. MERS does not anticipate additional significant market risk from the swap arrangements.

Swap Contracts

Name	Maturity Date	Position	Cost	Market Value	Unrealized Gain
None					

Foreign Currency Forward Contracts

Pending Receivable	$6,983,932
Pending Payable	(3)
Foreign Currency Forward Contract Asset (Liability)	**$6,983,929**

Futures and Options Contracts

Futures Contract	Expiration Date	Long/ Short	Cost	Market Value	Unrealized Gain/(Loss)
Russell 2000 E Mini Futures	March 15, 2019	Short	$(196,356,226)	$(187,106,300)	$9,249,926

MERS could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. MERS and its investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, and exposure monitoring procedures. MERS anticipates that counterparties will be able to satisfy their obligations under the contracts. Investments in limited partnerships and combined funds may include derivatives that are not shown in the derivative totals.

Private Equity and Capital Calls

The Board has approved $3 billion available to call for private investments. As of December 31, 2018, $2.151 billion was invested in private investments leaving $849 million available for future investments. Investments in private market values reflect capital returns, income, and gains or losses.

MERS has various investments that can be difficult to value in that there are not readily accessible comparable market values. MERS has level 2 investment values of approximately $3.2 billion, (chiefly in global fixed income). Level 2 investments typically have quoted prices for similar type assets and have pricing models that can be derived principally from observable market data. MERS also has level 3 investments of approximately $4 billion (chiefly in real estate, private equity, timber, commingled funds, and limited partnerships). These investments tend to be illiquid and do not trade frequently. As a result, there may not be readily marketable prices for them.

Management's estimates of these values are based on information provided by investment managers, general partners, real estate advisors, and other means. Because alternative investments are not readily marketable, their estimated value is subject to uncertainty and therefore may differ from the values that would have been used had a ready market for these securities existed. The differences could be material.

Fair Value Measurements

Investments are presented at fair value. The System categorizes their 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 and give the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements).

Level 1 Unadjusted quoted prices for identical instruments in active markets.

Level 2 Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable.

Level 3 Valuations derived from valuation techniques in which significant inputs are unobservable.

Investments that are measured at fair value using the net asset value (or NAV) (or its equivalent) as a practical expedient are not classified in the fair value hierarchy. The tables on page 46 shows the fair value leveling on the investments for MERS.

In instances where inputs used to measure fair value fall into different levels in the fair value higher hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. (An investment having both level 2 and level 3 inputs would be categorized as level 3.) The system's assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset. The tables on page 46 show the fair value leveling of the investments for MERS.

Global equities classified in level 1 are valued using prices quoted in active markets for those securities. Global equities classified in level 3 are values with last trade data having limited trading volume.

Global fixed income classified in level 2 and level 3 are valued using either a bid evaluation or a matrix pricing technique. Bid evaluations may include market quotations, yields, maturities, call features, and ratings. Matrix pricing is used to value securities based on the securities relationship to benchmark quoted prices. Level 2 fixed income securities have non-proprietary information that was readily available to market participants, from multiple independent sources, which are known to be actively involved in the market. Level 3 fixed income securities use proprietary information or single source pricing. Global fixed income classified in level 3 are investments with values in leases, real estate and credit limited partnerships that are not readily traded and are valued using a pricing model.

Real assets and Diversifying Strategies in level 1 are valued using prices quoted in active markets. Real assets classified in level 3 are primarily investments in real estate, infrastructure and timber generally valued using the income approach by internal manager reviews or independent external appraisers. Level 2 securities for real assets and Diversifying Strategies have non-proprietary information that was readily available to market participants, from multiple independent sources, which are actively involved in the market. Level 3 Diversifying Strategies are valued using appraisals, cash-flow analysis, and sales of similar investments. MERS policy is to obtain an external appraisal a minimum of every 3 years for properties that MERS has some degree of control or discretion. In practice, some investments are appraised annually. Appraisals are performed by an independent appraiser with preference for Member Appraisal Institute designated appraisers. The appraisals are performed using generally accepted valuation approaches applicable to the investment type.

Mutual funds and self-directed accounts are valued at quoted prices for those securities in active markets. Mutual funds that are not publicly traded are recorded as level 3 investments.

Certain alternative investments such as private equity, real assets, and diversifying strategies do not have readily ascertainable market values. Management, in consultation with their investment managers, value these investments in good faith based upon audited financials, cash-flow analysis, purchase and sales of comparable investments, other practices used within the industry, or other information provided by the underlying investment managers. The estimated fair value of these investments may differ significantly from values that would have been used had a ready market existed. These investments are classified as level 3.

The valuation method for investments measured at the net asset value (NAV) per share is presented in the table on page 46. The System holds shares or interests in investment companies where the fair value of the investments are measured on a recurring basis using net asset value per share (or its equivalent) of the investment companies as a practical expedient. Global equity, real assets and diversifying strategy investments at NAV are generally long term private market investments that are illiquid with redemptions restricted over the life of the partnership. During the life of the partnerships, distributions are received as underlying partnership investments are realized. As of December 31, 2018, it is probable that all of the investments in this type will be sold at an amount different from the NAV per share of MERS ownership interest in partners' capital.

GASB 72 Disclosures for MERS

Fair Value Investments		Quoted Prices in Active Markets Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3	Totals
Global Equities		$1,930,073,028		$2,121,985,677	$4,052,058,706
Global Fixed Income			$2,540,369,930	96,551,279	2,636,921,210
Real Assets		134,803,188	3,365,268	868,071,923	1,006,240,379
Diversifying Strategies		42,410,615	129,797,889	682,663,970	854,872,474
Mutual Funds (DC, 457, HCSP, IRA)		21,446,630			21,446,630
Self Directed accounts (DC and 457)		4,030,838			4,030,838
Total investments by fair value		**2,132,764,299**	**2,673,533,088**	**3,769,272,849**	**8,575,570,236**
Investments at Net Asset Value (NAV)	**NAV**				**Totals**
Global Equities	$962,368,680				962,368,680
Fixed Income	198,033,105				198,033,105
Real Assets	186,136,510				186,136,510
Diversifying Strategies	191,660,050				191,660,050
Mutual Funds (DC, 457, HCSP, IRA)	525,033,208				525,033,208
Total Investments at NAV	**2,063,231,554**				**2,063,231,554**
Total Fair Value and NAV Investments	**2,063,231,554**	**2,132,764,299**	**2,673,533,088**	**3,769,272,849**	**10,638,801,789**
Securities Lending Collateral			**573,926,851**		**573,926,851**
Total Fair Value and NAV Investments with Securities Lending	**$2,063,231,554**	**$2,132,764,299**	**$3,247,459,939**	**$3,769,272,849**	**$11,212,728,640**

Reconciliation to Investments on Financial Statements	
Investments at fair value and NAV from above	$10,638,801,789
Cash included in GASB 72	(12,547)
Investment in land	1,402,094
Foreign Exchange Receivables/Payables	5,145,142
Rounding	2,173
Future Index Russell 2000 Portfolio Hedge	187,736,791
Adjusted investments	10,833,075,442
Investments from financial statements	$10,833,075,442

MERS holds shares or interests in investment companies where the fair value of the investments are measured on a recurring basis, using net asset value (NAV) per share (or its equivalent) of the investment companies as a practical expedient.

As of December 31, 2018, the fair value, unfunded commitments, redemption frequency, and redemption notice periods of those investments are as follows:

Investment Type	Fair Value	Unfunded Commitments	Redemption Frequency (if Eligible)	Redemption Notice Period
Global Equities	$962,368,680		Monthly, quarterly, semi-annually, annually	30 days
Real Assets	186,136,510		Monthly, quarterly, semi-annually, annually	N/A
Diversifying Strategies	191,660,050	$22,276,897	Monthly, quarterly, semi-annually, annually	N/A
Total Investments at NAV	**$1,340,165,240**	**$22,276,897**		

Investments at NAV

The Global Equities' portfolios are diversified by geographic region, styles, sectors, and market capitalizations. Active management is used to take advantage of less efficient areas of the market. This strategy is expected to perform well in periods of low to falling inflation and rising economic growth. It is also projected to provide ongoing income as well as downside protection in volatile markets. The fair value of the investments have been estimated using the net asset value of the investments.

The Real Assets portfolio includes investments in real estate, timber, infrastructure, commodities, and agriculture and farmland strategies. The real assets strategy is designed to provide a hedge against unexpected spikes in inflation as well as capitalize on long-term themes such as an emerging middle class in developing markets and global population growth. The majority of the investments within this portfolio will be private investments making the portfolio relatively illiquid and longer duration. The fair value of the investments have been estimated using the net asset value of the investments.

Diversifying strategies in middle market direct lending, litigation finance, healthcare royalties, bank regulatory capital, and opportunistic credit, among others. The strategy is designed to provide downside protection and uncorrelated returns with traditional asset classes – specifically equities. Core fixed income has traditionally been one of the most diversifying asset classes, but the low return expectations for the asset class make it less attractive on a risk-adjusted basis. Consequently, non-traditional asset classes must be considered as an alternative. The fair value of the investments have been estimated using the net asset value of the investments.

Mutual fund investments at NAV are not publicly traded, with a strategy designed to provide participants access to target date funds based on their expected retirement date. The funds automatically adjust based on the participant's age with investments in global equities, fixed income, and other diversified investments with an appropriate level of risk that is consistent with its asset mix. The fair value of the investments have been estimated using the net asset value of the investments.

5. RISK MANAGEMENT AND INSURANCE

MERS maintains a complete portfolio of insurance coverage including, but not limited to, fiduciary liability, workers' compensation, auto, property, and general commercial liability.

6. SELF INSURANCE

MERS self-insured for its dental insurance in 2018 with a third party administrator to assist with coverage.

7. COMMITMENTS AND CONTINGENCIES

In the normal course of business, MERS is involved in a number of disputes over benefits or other claims. MERS does not anticipate any material loss as a result of these claims. Furthermore, the cost of a successful benefit claim is ultimately the responsibility of the affected municipality, in most cases, as it becomes a funding obligation of that municipality.

In 1998, MERS entered into a contractual agreement with a municipality and its bargaining units to pay for a certain portion of the municipality's and employees' benefit costs to settle a legal dispute over an alleged actuarial error. MERS took the position that its legal obligations under this agreement ended on December 31, 2015. The municipality and its bargaining units disagreed with MERS, resulting in litigation. The parties settled the matter in 2017. The settlement amount is reported as a special, one-time payment item in the Statement of Changes in Fiduciary Net Position for the year ended December 31, 2017.

8. FUNDED STATUS AND FUNDING PROGRESS

The MERS funded status is summarized in the Management's Discussion and Analysis.

Actuarial valuations are prepared annually as of December 31 for each participating municipality. To facilitate budgetary planning needs, employer contribution requirements are provided for each municipality's unique fiscal year that commences after the following calendar year end. For example, the contribution requirements for fiscal years that began in 2018 were determined by actuarial valuations as of December 31, 2016. Approximately 78% of the participating municipalities have fiscal years that begin January 1 or July 1.

9. RELATED PARTIES

Cobalt Community Research is a 501(c)(3) nonprofit, non-partisan coalition that helps local governments, schools and membership organizations measure, benchmark, and manage their efforts through shared data, high-quality affordable surveys, focus groups and meetings that use instant audience feedback technology. MERS facilitated the creation of Cobalt and MERS employees performed the regular work required to run Cobalt through August 31, 2017, after which time Cobalt Community Research took over all operations and MERS employees no longer performed these duties. Cobalt maintained separate financial reporting and was responsible for repaying MERS for all administrative costs including staff time. In 2017, Cobalt paid MERS $76,807.35 to cover the year's pro-rated expenses.

10. INTERFUND BALANCES

The general purpose of the interfund receivables and payables in the financial statements relates to transactions that occurred between the various product positions within MERS that did not settle until 2019.

11. GASB 68

The Governmental Accounting Standards Board (GASB) Statement No. 68, "Accounting and Financial Reporting for Pensions", requires certain disclosures for employers who provide pensions. MERS employees participate in the MERS Defined Benefit Plan. The sections below are required and pertain to MERS staff only.

Pensions

For purposes of measuring the Net Pension Liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

Plan Description

The employer's defined benefit pension plan provides certain retirement benefits to plan members and beneficiaries. MERS is an agent multiple employer, statewide public employee pension plan established by the Michigan Legislature under Public Act 135 of 1945 and administered by a nine member Board. MERS issues a publicly available financial report that includes financial statements and required supplementary information. This report is available on the MERS website at www.mersofmich.com.

Benefits Provided

Benefit Multiplier: 2.25% Multiplier (80% max)
Normal Retirement Age: 60
Vesting: 6 years
Early Retirement (Unreduced): 55/30
Early Retirement (Reduced): 50/25, 55/15
Final Average Compensation: 3 years
COLA for Future Retirees: 2.50% (Non-Compounded)
Employee Contributions: 4%
Act 88: Yes (Adopted 9/24/1996)

At the December 31, 2017, valuation date, the following employees were covered by the benefit terms:

Inactive Employees or Beneficiaries Currently Receiving Benefits: 38
Inactive Employees Entitled to but Not Yet Receiving Benefits: 39
Active Employees: 128
Total Employees: 205

Contributions

The employer is required to contribute amounts at least equal to the actuarially determined rate, as established by the Board. The actuarially determined rate is the estimated amount necessary to finance the cost of benefits earned by employees during the year, with an additional amount to finance any unfunded accrued liability. The actuarial determined contribution rate for 2018 was 14.27% of payroll. MERS total employer contributions totaled $2,612,795.84. MERS employees are required to contribute 4% of their salaries to help fund the pension.

Article 9, Section 24 of the State of Michigan constitution requires that financial benefits arising on account of employee service rendered in each year be funded during that year.

Net Pension Liability/Asset

MERS Net Pension Asset, measured as of December 31, 2017 was $3,185,095.59 and the total pension liability used to calculate the Net Pension liability was determined by an annual valuation for that date.

Actuarial Assumptions

The total pension liability in the December 31, 2017 annual actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation: 2.5%
Salary Increases: 3.75% in the long term
Investment Rate of Return: 8.00% net of investment expenses, including inflation

The mortality table used to project the mortality experience of non-disabled plan members is a 50% male, 50% female blend of the following tables:

- The RP-2014 Healthy Annuitant Mortality Tables, with rates multiplied by 105%
- The RP-2014 Employee Mortality Tables
- The RP-2014 Juvenile Mortality Tables

The mortality table used to project the mortality experience of disabled plan members is 50% Male, 50% Female blend of RP-2014 Disabled Retiree Mortality Tables.

The actuarial assumptions used in the valuation were based on the results of the actuarial experience study of 2009-2013.

The long-term expected rate of return on pension plan investments was determined using a model method in which the best-estimate ranges of expected future real rates of return (expected returns net of investment and administrative expenses 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. The target allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Target Allocation Gross Rate of Return	Long-Term Expected Gross Rate of Return	Inflation Assumption	Long-Term Expected Real Rate of Return
Global Equity	55.50%	8.65%	4.80%	2.50%	3.41%
Global Fixed Income	18.50%	3.76%	0.70%	2.50%	0.23%
Real Assets	13.50%	9.72%	1.31%	2.50%	0.97%
Diversifying Strategies	12.50%	7.50%	0.94%	2.50%	0.63%
Total	**100.00%**		**7.75%**		**5.25%**

Discount Rate

The discount rate used to measure the total pension liability was 8.00% for 2017. The projection of cash flows used to determine the discount rate assumes that employer and employee contributions will be made at the rates agreed upon for employees and the actuarially determined rates for employers. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to pay all projected future benefit payments of current active and inactive employees. 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.

Changes in Net Pension Liability/(Asset)

	Total Pension Liability/(Asset) (a)	Plan Fiduciary Net Position (b)	Net Pension Liability/(Asset) (a) - (b)
Balances at December 31, 2016	$27,044,227	$27,387,571	$(343,344)
Changes for the Year			
Service Cost	1,457,033		1,457,033
Interest on Total Pension Liability	2,192,266		2,192,266
Changes in benefits			-
Difference Between Expected and Actual Experience	95,943		95,943
Changes in Assumptions			-
Employer Contributions		2,367,084	(2,367,084)
Employee Contributions		525,320	(525,320)
Net Investment Income		3,753,767	(3,753,767)
Benefit Payments, Including Employee Refunds	(738,847)	(738,847)	-
Administrative Expenses		(59,178)	59,178
Other Changes	1		1
Net changes	3,006,395	5,848,147	(2,841,752)
Balances as of December 31, 2017	**$30,050,622**	**$33,235,718**	**$(3,185,096)**

Sensitivity of the Net Pension Liability/(Asset) to Changes in the Discount Rate

The following presents the Net Pension Liability of MERS, calculated using the discount rate of 8.00%, as well as what the employer's Net Pension Asset would be using a discount rate that is 1% lower (7.00%) or 1% higher (9.00%) than the current rate.

Sensitivity of Net Pension Liability/(Asset)

	1% Decrease (7%)	Current Discount Rate (8%)	1% Increase (9%)
Net Pension Liability (Asset)		$(3,185,096)	
Change in Net Pension Liability	$4,780,233		$(3,909,839)
Adjusted Net Pension Liability	**$1,595,137**	**$(3,185,096)**	**$(7,094,935)**

Note: the current discount rate shown for GASB 68 purposes is higher than the MERS assumed rate of return. This is because GASB 68 requires that the discount rate must be gross of administrative expenses, whereas for funding purposes, it is net of administrative expenses. MERS has a net position asset due to the Plan Fiduciary Net Position exceeding the total Pension Liability.

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

For the year ended December 31, 2018, MERS recognized defined benefit pension expense of $1,205,408. MERS also reported deferred outflows and inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences in Experience	$165,788	$-
Differences in Assumptions	792,395	
Excess (Deficit) Investment Returns		717,429
Contributions Subsequent to the Measurement Date*	2,612,796	
Total	**$3,570,980**	**$717,429**

**The amount reported as deferred outflows of resources resulting from contributions subsequent to the measurement date will be recognized as a reduction in the Net Pension Liability for the measurement date of December 31, 2018, which is recorded in 2019.*

Amounts reported as deferred outflows and inflows of resources related to pensions will be recognized in pension expense as follows:

Year Ended	Deferred Outflow
2019	$297,032
2020	216,775
2021	(222,983)
2022	(58,312)
2023	(5,462)
2024	13,706

There were changes in the actuarial assumptions or methods affecting the 2015 valuation for smoothing, price and wage inflation, discount rate, and mortality tables based on the experience study.
This calculation was done with an effective date of December 31, 2015.

12. SUMMARY INFORMATION – ACTUARIAL FUNDING METHODS AND ASSUMPTIONS

Valuation Date	December 31, 2017
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percent of Payroll, Closed
Remaining Amortization Period	For open divisions (new hires are included in the division) the amortization period is 22 years. The 22 year period will decline by one each year until the initial unfunded accrued liability is paid off. For divisions that closed to new hires prior to 2016 (new hires are not covered by the MERS Defined Benefit Plan or Hybrid Plan (Part I) provisions in a linked division) of active municipalities, the employer had two amortization options. Under Accelerated to 5 Year Option, the amortization period is decreased annually by two years until the period reaches six or five years. Each year thereafter, It decreases by one each year until the unfunded liability is paid off. Under the Accelerated to 15 year Option, the amortization period is decreased annually by two years until the period reaches 16 or 15 years. Each year thereafter, the amortization period is decreased annually by one year until the unfunded accrued liability is paid off. Negative unfunded accrued liabilities are amortized over 10 years, with the 10 year period reestablished with each annual actuarial valuation.
Asset Valuation Method	A 5-year smoothed fair value asset valuation method was adopted December 31, 2015.
Actuarial Assumptions	Investment Rate of Return – 8.00% net of investment expenses
Projected Salary Increases	A 3.75% for base inflation, plus a percentage based on an age-related scale to reflect merit, longevity and promotional pay increases.
Post-Retirement Benefit	A 2.5% annual post-retirement benefit adjustment – if adopted by individual municipalities.

Deferred Retirement Option Program (DROP+) Partial Lump Sum

If participants are covered by the Benefit Program DROP+, and retires at least 12 months after first becoming eligible for unreduced benefits, they have the option to receive a partial lump sum and a reduced monthly benefit:

- The participant can elect a lump sum equal to 12, 24, 36, 48, or 60 times their monthly straight life accrued benefit.
- For each 12 months included in the lump sum, the participant's lifetime benefit is reduced by the DROP+ percentage adopted by the employer. The employer can adopt any of the following DROP+ reduction percentages: 4, 5, 6, 7, or 8%.

Benefit Program DROP+ may not be adopted after June 30, 2013. Two employers adopted this benefit prior to it ending.

Deferred Retirement Option Program (DROP): Traditional

If a member is covered by the Benefit Program DROP and is eligible for retirement, they have the option to elect a specified DROP period in which they will cease to accrue any additional retirement benefits, but remain employed by the participating municipality or court. The member must elect a DROP end date at least six months after the beginning date, but no more than sixty months after the beginning date, in one-month increments.

Upon the member's election of DROP and the receipt of an application to enroll in DROP, MERS will calculate the member's service retirement and benefit payment as of the beginning date. The System also shall calculate any age differential between the member and the member's beneficiary as of the calendar year of the DROP exit date in accordance with Treasury Regulation § 1.401(a)(9)-6. Upon the beginning date of the DROP period, the member shall be responsible to continue employee contributions, if any.

On the next available benefit payment date after processing is complete, and monthly thereafter, an amount equal to 100% of the monthly service retirement benefit payment the member would have received if he or she had retired as of the DROP beginning date will be credited to a notional account for the benefit of the member. Funds in the DROP account are credited with interest in the amount of 3% annually, or prorated in the event of a DROP period that is less than twelve months.

Upon the end date, the member shall receive a lump-sum distribution of the member's DROP account and on the first day of the calendar month following end date, the member will begin receiving monthly service retirement benefit payments.

REQUIRED SUPPLEMENTARY INFORMATION

The following schedules are presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, information is presented for those years where information is available.

Annual Money Weighted Return

The annual money weighted rate of return on pension plan investments is calculated as the internal rate of return on pension plan investments, net of investment expenses. This expresses investment performance adjusted for the changing amounts actually invested throughout the year, measured on monthly inputs with expenses measured on an accrual basis.

Schedule of Investment Returns

	2013	2014	2015	2016	2017	2018
Annual money-weighted rate of return, net of investment expenses	14.97%	7.32%	-0.99%	10.78%	13.38%	-3.59%

This schedule is presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, information is presented for those years where information is available.

The following schedules refer to MERS' staff only. A measurement date of December 31, 2016, was used. Note that while the measurement date for calculation of the net pension liability and pension expense is December 31, 2016, the schedule of employer contributions show the actuarial contributions that have been remitted through December 31, 2017, and the preceding nine years.

Schedule of Employer Contributions

The Schedule of Employer Contributions shows the employer's required annual contributions from the annual actuarial valuation, compared with the actual contributions remitted over the past ten years.

Schedule of Employer Contributions

	2018	2017	2016	2015	2014
Actuarial Determined Contributions	$1,612,796	$1,367,084	$1,172,934	$1,088,267	$1,089,079
Contributions in Relation to the Actuarially Determined Contribution	2,612,796	2,367,084	1,672,934	2,099,146	2,089,079
Contribution Deficiency (Excess)	$(1,000,000)	$(1,000,000)	$(500,000)	$(1,010,879)	$(1,000,000)
Covered Payroll	$10,643,044	$10,080,837	$9,694,637	$9,184,670	$9,184,670
Contributions as a Percentage of Covered Payroll	15%	14%	12%	12%	12%

	2013	2012	2011	2010	2009
Actuarial Determined Contributions	$1,006,942	$1,276,266	$1,194,741	$1,136,057	$1,070,451
Contributions in Relation to the Actuarially Determined Contribution	2,506,942	1,276,266	1,194,741	1,136,057	1,070,451
Contribution Deficiency (Excess)	$(1,500,000)	$-	$-	$-	$-
Covered Payroll	$9,741,710	$9,400,436	$10,195,504	$9,113,922	$8,198,952
Contributions as a Percentage of Covered Payroll	10%	14%	12%	12%	13%

Notes to Schedule of Employer Contributions:

Actuarial Cost Method: Entry Age Normal
Amortization Method: Level percentage of payroll, open
Remaining Amortization Period: 15 years
Asset Valuation Method: 5 year smoothed
Inflation: 2.50% long-term wage inflation
Salary Increases: 3.75%
Investment Rate of Return: 7.75% net of investment and administrative expenses
Normal Retirement Age: 60
Mortality: 50% Female/50% Male blend of the RP-2014 Healthy Annuitant Mortality Tables with rates multiplied by 105%, the RP-2014 Employee Mortality Tables, and the RP-2014 Juvenile Mortality Tables

Schedule of Changes in Employer's Net Pension Liability/(Asset) and Related Ratios

The Schedule of Changes in Employer's Net Pension Liability and Related Ratios shows the changes in the total pension liability less the statement of changes in fiduciary net position resulting in the net Pension Liability calculation for the employer.

Schedule of Changes in the Net Pension Liability/(Asset)

Total Pension Liability/(Asset)	2015	2016	2017	2018
Service Cost	$1,203,192	$1,269,997	$1,379,059	$1,457,033
Interest	1,523,654	1,706,312	1,985,384	2,192,266
Changes of Benefit Terms				
Difference Between Expected and Actual Experience		313,939	(134,179)	95,943
Changes of Assumptions		1,386,692		
Benefit Payments Including Employee Refunds	(526,561)	(565,862)	(627,619)	(738,847)
Other		1	(1)	(1)
Net Change in Total Pension Liability/(Asset)	2,200,285	4,111,079	2,602,645	3,006,394
Total Pension Liability/(Asset) Beginning Balance	18,130,219	20,330,504	24,441,583	27,044,228
Total Pension/(Asset) Liability Ending Balance	**$20,330,504**	**$24,441,583**	**$27,044,228**	**$30,050,622**
Plan Fiduciary Net Position				
Contributions-Employer	$2,089,079	$2,099,146	$1,672,934	$2,367,084
Contributions-Employee	398,940	520,710	514,304	525,320
Net Investment Income	1,193,652	(343,573)	2,735,307	3,753,767
Benefit Payments Including Employee Refunds	(526,561)	(565,862)	(627,619)	(738,847)
Administrative Expense	(44,244)	(48,754)	(53,870)	(59,178)
Net Change in Plan Fiduciary Net Position	3,110,866	1,661,667	4,241,055	5,848,147
Plan Fiduciary Net Position Beginning Balance	18,373,983	21,484,849	23,146,516	27,387,571
Plan Fiduciary Net Position Ending Balance	**$21,484,849**	**$23,146,516**	**$27,387,571**	**$33,235,718**
Employer Net Pension Liability/(Asset)	**$(1,154,345)**	**$1,295,067**	**$(343,343)**	**$(3,185,096)**
Plan Fiduciary Net Position as a percentage of the Total Pension Liability/(Asset)	106%	95%	101%	111%
Covered Payroll (from GASB 68 actuarial page)	$9,184,670	$9,694,637	$10,080,837	$10,643,044
Employer's Net Pension Liability/(Asset) as a percentage of covered payroll	-13%	13%	-3%	-30%

There were changes in the actuarial assumptions or methods affecting the 2015 valuation for smoothing, price and wage inflation, discount rate, and mortality tables based on the experience study. This calculation was done with an effective date of December 31, 2015.

OTHER SUPPLEMENTARY INFORMATION

Schedule of Administrative Expenses for the Year Ended December 31, 2018

	Budget (Unaudited)	Actual	Variance	Percentage of Budget
Personnel Services				
Salaries	$11,140,450	$11,160,999	$(20,549)	100%
Social Security	795,000	778,478	16,522	98%
Retirement	1,684,660	1,335,211	349,449	79%
Insurance	2,088,500	2,001,732	86,768	96%
Total Personnel Services	**15,708,610**	**15,276,420**	**432,190**	**97%**
Professional Services				
Third Party Administrator	1,920,096	1,602,539	317,557	83%
Actuarial Services	1,512,900	1,680,129	(167,229)	111%
Audit Services	190,000	154,513	35,487	81%
Commercial Banking	100,000	95,686	4,314	96%
Temporary Personnel	10,000	0	10,000	0%
IT Services/Continuity/Records	214,995	277,429	(62,434)	129%
Business Consultants	612,380	440,017	172,363	72%
Legal Services	50,000	34,581	15,419	69%
Medical Services	170,000	126,225	43,775	74%
Total Professional Services	**4,780,371**	**4,411,119**	**369,252**	**92%**
Communication				
Annual Conference	125,000	109,395	15,605	88%
Board Travel, Education and Meetings[1]	44,000	31,355	12,645	71%
Outreach	255,000	215,464	39,536	84%
Postage / Shipping	234,560	214,423	20,137	91%
Printing and Copying Services	87,000	82,632	4,368	95%
Telephone / Communications	230,660	207,239	23,421	90%
Travel and Meetings	195,664	178,536	17,128	91%
Total Communication	**1,171,884**	**1,039,044**	**132,840**	**89%**
Miscellaneous				
Depreciation	2,968,200	2,780,844	187,356	94%
Equipment Purchases & Rental	44,590	60,896	(16,306)	137%
Insurance	395,000	388,471	6,529	98%
Building / Maintenance / Utilities	246,528	221,043	25,485	90%
Office Supplies/Subscriptions	99,321	100,088	(767)	101%
Operating Expenses	557,810	57,657	500,153	10%
Personnel Support	136,500	103,493	33,007	76%
Professional Development	208,352	179,015	29,337	86%
Software Support	1,587,314	1,150,721	436,593	72%
Service Fees[2]	(5,802,473)	(6,703,595)	901,122	116%
Total Miscellaneous	**441,142**	**(1,661,367)**	**2,102,509**	**-377%**
Total Administrative Expenses	**$22,102,007**	**$19,065,216**	**$3,036,791**	**86%**

[1] Board Travel, Education, and Meetings includes $11,946 for board members training and educations, including related travel expenditures. These expenditures comply with the requirements of Section 38.1133 of the Michigan Compiled Laws.

[2] Service fees come primarily from fees paid on participant directed accounts to cover administrative expenses. They are treated as expenditure credit, not revenue.

Note: See accompanying Independent Auditor's Report

Schedule of Investment Expenses for the Year Ended December 31, 2018

	Budget (Unaudited)	Actual	Variance	Percentage of Budget
Personnel Services				
Salaries	$1,837,900	$1,824,366	$13,534	99%
Social Security	93,300	94,303	(1,003)	101%
Retirement	210,500	172,057	38,443	82%
Insurance	181,500	183,223	(1,723)	101%
Total Personnel Services	**2,323,200**	**2,273,949**	**49,251**	**98%**
Professional Services				
Commercial Banking	1,000,000	1,052,329	(52,329)	105%
Investment Managers	14,000,000	10,298,951	3,701,049	74%
Business Consultants	125,000	71,954	53,046	58%
Total Professional Services	**15,125,000**	**11,423,234**	**3,701,766**	**76%**
Miscellaneous				
Travel	143,000	82,072	60,928	57%
Office Supplies	5,000	1,386	3,614	28%
Professional Development	16,000	12,378	3,622	77%
Operating Expenses	10,000	3,866	6,134	39%
Research and Portfolio Management	400,000	243,060	156,940	61%
Total Miscellaneous	**574,000**	**342,762**	**231,238**	**60%**
Total Investment Expenses	**$18,022,200**	**$14,039,945**	**$3,982,255**	**78%**

Note: See accompanying Independent Auditor's Report

Schedule of Payments to Consultants – December 31, 2018

Firm	Nature of Services	Amount
Tegrit Software Ventures, Inc.	Software Consulting and Configuration Services	$3,123,936
Gabriel, Roeder, Smith & Company	Actuarial Consultant	1,861,720
Alerus Retirement Solutions	Third Party Administration	1,603,440
CBIZ, Inc.	Actuarial Consultant	1,181,694
Plante & Moran, PLLC	Auditing Services	180,963
Gartner, Inc.	Software Consulting and Configuration Services	150,000
Jones Day	Investment Consultant	149,281
Bloomberg Finance L.P.	Investment Data Services	134,555
Managed Medical Review Organization	Medical Advisors	126,225
Ice Miller, LLP	Legal Services	107,419
Moore Trosper	Construction and Building Modification	102,928
Miller, Canfield, Paddock, and Stone, PLC	Legal Services	76,360
Rapid7 LLC	Software Consulting and Configuration Services	65,043
Byrum & Fisk Advocacy	Marketing and Public Relations Services	57,000
Winklevoss Technologies LLC	Software Consulting and Configuration Services	52,000
Stephen Morrow	Investment Consultant	51,159
Michigan Legislative Consultants	Legislative Consultant	42,840
BCA Research	Investment Consultant	41,754
Martin Commercial Properties, Inc.	Real Estate Consultant	40,240
L.P. Gavekal Capital	Investment Consultant	40,000
Cylance, Inc.	Software Consulting and Configuration Services	34,600
Gallagher Benefit Services, Inc.	Benefit Consultant	30,000
Ned Davis Research	Investment Consultant	30,000
Karoub Associates	Legislative Consultant	24,720
Informa Investment Solutions	Investment Consultant	22,251
Total Solutions, Inc.	Software Consulting and Configuration Services	22,023

This schedule only includes firms whose annual payment amount was $20,000 or above.

Fees paid to investment managers are included in the Investment Section.

Payments to consultants are already included in the Administrative and Investments Expenses reported in the Statement of Changes in Fiduciary Net Position.

See accompanying Independent Auditor's Report.

INVESTMENTS

CHIEF INVESTMENT OFFICER REPORT

Dear Members and MERS Retirement Board:

I respectfully submit the investment activity for the Municipal Employees' Retirement System (MERS) of Michigan's Comprehensive Annual Financial Report for the year ending December 31, 2018.

As always, our goal is to invest fund assets to achieve the long-term objectives of our member municipalities established by the Board, within prudent risk parameters. Our investment returns consistently outperform various benchmarks and market averages, through a long-term approach designed to provide downside protection and upside market participation.

Economic Overview

Global markets exhibited elevated levels of volatility as the year progressed, culminating in a significant fourth quarter correction across financial markets. Equity markets finished the year in negative territory across all segments and geographies. U.S. markets fared better than international markets with the S&P 500 down -4.38% versus the MSCI ACWI IMI returning -10.08%. Smaller capitalized equities experienced significant draw downs, particularly in international and emerging markets. International small cap equities where down -17.89% and emerging market equities -14.58%. Fixed income provided needed diversification and exhibited positive returns, with the Barclays U.S. Aggregate positive in the fourth quarter and flat at year-end. U.S. GDP grew at 2.9% in 2018 up from 2.6% in 2017. Job growth was strong throughout the year, but is expected to slow going forward. The unemployment rate continued to fall, finishing the year at 3.7%. The economy remains near full employment and wage pressure trended upward as the higher job numbers are likely a result in tighter job market for employers and increase cost for business expansions.

While interest rates remain at historic lows, the U.S. has entered into a new interest rate regime. Fed Chair, Jerome Powell signaled early in the year that rate hikes would continue and in fact initiated two, but signaled that they would be data dependent going forward, indicating that a pause in 2019 was possible. Despite economic strength, the U.S. Treasury yield curve flattened. The Eurozone's cyclical recovery stalled with a year-over-year growth rate falling 2.1%, a rate below the U.S. However, the banking sector remains a concern in southern Europe. Populist sentiment once again increased across Europe after declining across the continent in 2017. Broad based economic acceleration is beginning to occur in the emerging markets which is reflected in expectations for 2018 global GDP growth to finish at 3.7%.

While global markets moved into negative territory in 2018, economic data remained broadly positive. Several themes articulated last year continue to hold. The backdrop of increasing market volatility and a shift toward increased nationalistic economic policies are likely to persist, and increase global volatility going forward. Geopolitical instability in Asia and the Middle East will continue to influence market perceptions, largely to the negative. In addition, U.S. economic and foreign policy shifts are expected to potentially contribute to elevated levels of geopolitical instability. Developed markets will continue to grapple with aging populations and high legacy costs.

Low interest rates may compress returns across all asset classes. The U.S. has signaled that it will pause its monetary tightening policy and expand fiscal policy through simulative public policy. This will eventually put upward pressure on both interest rates and inflation. However, interest rate levels remain artificially depressed from a historic perspective. This coupled with the increasing likelihood that we are nearing the top of the business cycle will make it difficult to meet return objectives in the near term, placing additional stress on financial systems.

MERS Total Portfolio

The MERS Total Portfolio performed returned -3.51% gross of fees for the year, outperforming its policy benchmark which returned -5.36%. The portfolio continued to outperform consistently for longer time periods through 10 years. Global equities drove the Total Portfolio's performance to the negative for the year with international and emerging market equities experiencing significant drawdowns. Diversifying strategies, real assets and fixed income asset classes provide much needed diversification and positive returns in 2018. MERS' decision to reduce risk was rewarded with strong relative returns. The global fixed income market remained a challenging area due to persistently low interest rates. The fixed income portfolio continued to exhibit a strategically lower duration, which paid off as interest rates increased throughout the year causing bond prices to fall.

MERS 2018 highlights:

- MERS Total Portfolio returned -3.51% gross of fees for the year, outperforming its policy benchmark by 1.85%. The five year return of 5.16% outperformed the policy benchmark by 1.82% on an annualized basis. The portfolio returned 8.51% at the 10-year mark and has outperformed the policy benchmark in all time periods (1, 3, 5, 7, and 10 year).
- The Office of Investments completed work on a Valuation Based Allocation approach to its investment program.
- The target asset allocation breakdown is shown below:

Global Equity	55.5%
Global Fixed Income	18.5%
Real Assets	13.5%
Diversifying Strategies	12.5%

- At the broad asset class level, absolute returns gross of investment fees for the year were as follows:

Global Equity	-8.38%
Global Fixed Income	0.69%
Real Assets	3.50%
Diversifying Strategies	1.98%

In conclusion, I would like to thank the MERS Retirement Board for their continued support of the Office of Investments in their roles as the fiduciaries of the MERS Plan. The clarity of MERS' governance structure and the functional checks and balances has allowed the investment program to be successful for our members. This relationship makes for a more efficient decision-making process, benefiting our membership through stronger risk-adjusted returns.

Respectfully,

Jeb Burns
Chief Investment Officer

REPORT ON INVESTMENT ACTIVITY

The Board, as "investment fiduciary" under the Public Employee Retirement System Investment Act (PERSIA), MCL 38.1132 et seq., has the fiduciary responsibility and authority to direct the investments of MERS' trust assets. Board Members must discharge their duties for the exclusive benefit of plan participants and beneficiaries. PERSIA requires that the Board "act with the same care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a similar capacity and familiar with those matters would use in the conduct of a similar enterprise with similar aims." MCL 38.1133(3). MERS offers a Defined Benefit Plan (DB), Defined Contribution Plan (DC), Hybrid Plan, Health Care Savings Program (HCSP), 457 Program (457), Deemed Individual Retirement Account (IRA), Retiree Health Funding Vehicle (RHFV), and Investment Services Program (ISP) (the "Plans"). The Board has delegated all investment management operations and activities to the Chief Executive Officer and the Board's Investment Committee, except those specifically reserved for the Board. The CEO is directly responsible for all day-to-day activities of MERS. The CEO has delegated management of MERS' trust assets to the Office of Investments, including all investment management activities. All transactions undertaken on behalf of the Plans shall be for the sole interest of the Plans' participants and beneficiaries.

The MERS Investment Policy Statement (IPS) outlines the investment goals, objectives, and policies of the MERS Total Portfolio (the Portfolio). The purpose of the IPS is to ensure that the investment activities are carried out within the framework established by MERS' policy and administrative documents. The IPS assists the Board, Investment Committee, and the Office of Investments in effectively and prudently monitoring and administering MERS' investment. The IPS addresses the following:

- The goals of MERS' investment program
- Investment policies
- Performance objectives and evaluation
- Major investment programs
- Investment processes and procedures

The IPS is designed to provide sufficient flexibility in the management and oversight process to reflect the dynamic nature of the capital markets. It is a working document and may be modified as needed or as market conditions change. At a minimum, the IPS will be reviewed and approved annually by the Board.

Plan investments are presented at fair value. Short-term investments are valued at cost plus accrued interest, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. Corporate bonds not traded on a national or international exchange are based upon equivalent values of comparable securities with similar yield and risk. Independent appraisals are the basis for valuing the fair value of real estate. Other investments that do not have established markets are recorded at an estimated fair value. Real estate, private equity, and certain alternative investments typically have a quarter lag in reporting, which is the industry standard. Periodic and independent appraisals of these assets are carried out to ensure an accurate valuation to assist in properly assessing the value of the Portfolio.

MERS uses a time-weighted rate of return calculation methodology based on the market rate of return for the schedule of investment results in this report.

The annual money weighted rate of return on pension plan investments is calculated as the internal rate of return on pension plan investments, net of investment expenses. This expresses investment performance adjusted for the changing amounts actually invested throughout the year, measured on monthly inputs with expenses measured on an accrual basis. The annual money weighted rate of return net of investment expenses measured on monthly inputs was -3.59%.

DEFINED BENEFIT PLAN

INVESTMENT OBJECTIVES AND ACTIVITY

In conformity with PERSIA, the primary goal of the MERS investment program is to grow assets at a rate which, when coupled with employer and employee contributions, satisfies promised benefits to MERS members. To achieve this objective, the Investment Committee allocates MERS assets with a strategic, long-term perspective and a high degree of prudence to reduce risk by:

- Exceeding the actuarial investment assumption on a long-term basis, which is currently 7.75% annually
- Maintaining adequate liquidity to pay promised benefits
- Adopting a strategic asset allocation plan that reflects current and future liabilities, minimizes volatility, and maximizes the long-term total rate of return
- Minimizing the costs associated with the implementation of the asset allocation through the efficient use of internal and external resources
- Maintaining above median peer rankings for the 10-year time period
- Exceeding the return of the Portfolio's Policy Benchmark. The Policy Benchmark currently consists of 45% Russell 3000, 25% Bloomberg Barclays Global Aggregate Bond Index, 20% MSCI ACWI IMIex-US, and 10% Bloomberg Barclays Global Aggregate ex US

PORTFOLIO HIGHLIGHTS

Asset Allocation

The Portfolio's asset allocation is the single most important determinant of achieving the stated investment goals. The Office of Investments conducts an asset allocation study every 3 years to assess portfolio construction and strategy. The MERS Board adopts and implements an asset allocation policy that is predicated on a number of factors, including:

- A projection of actuarial assets, liabilities, and benefit payments
- Historical and expected long-term capital market risks and returns for each asset class
- Expected correlations of returns among various asset classes
- An assessment of future economic conditions, including inflation and interest rate levels
- Various risk/return scenarios
- Liquidity requirements

Criteria for Inclusion of Asset Classes

The following criteria will be used in assessing an asset class for inclusion in the Portfolio:

- Sufficient size and liquidity to permit an investment by the Portfolio
- Staff, external managers, or consultant expertise to ensure proper due diligence and cost-effective implementation
- The incorporation of the asset class contributes to the return enhancement and/or further diversification of the Portfolio's assets
- Ability to readily measure performance and risk against appropriate benchmarks

The Board sets target allocations to various asset classes that are designed to meet MERS' long-term objectives and establishes minimum and maximum allowable allocations for each asset class. The bands allow flexibility to pursue tactical shifts or investment strategies over shorter time periods.

Current Targeted Allocations and Allocation Bands

Asset Class	Target Weight	Min/ Max Bands	Minimum Allocation	Maximum Allocation
Global Equity	55.5%	+/- 10.0%	45.5%	65.5%
Global Fixed Income	18.5%	+/- 7.5%	11.0%	26.0%
Real Assets	13.5%	+/- 5.0%	8.5%	18.5%
Diversifying Strategies	12.5%	+/- 5.0%	7.5%	17.5%

Portfolio Rebalance Policy

In conducting rebalancing activities, the Office of Investments operates in accordance with the following:

- Reviews the asset allocation at least monthly to ensure conformance with the asset allocation set by the Board
- Initiates rebalancing transactions to bring all percentages to values inside the bands or promptly seek Board approval to remain outside the bands in the event that an asset class falls out of the said bands
- Deviates from an asset class' target allocation, but stay within the allowable bands when implementing a tactical shift or investment strategy
- Implements rebalancing activities at a reasonable cost using either index futures via an external derivatives manager or using hard dollars
- Approves all rebalancing transactions

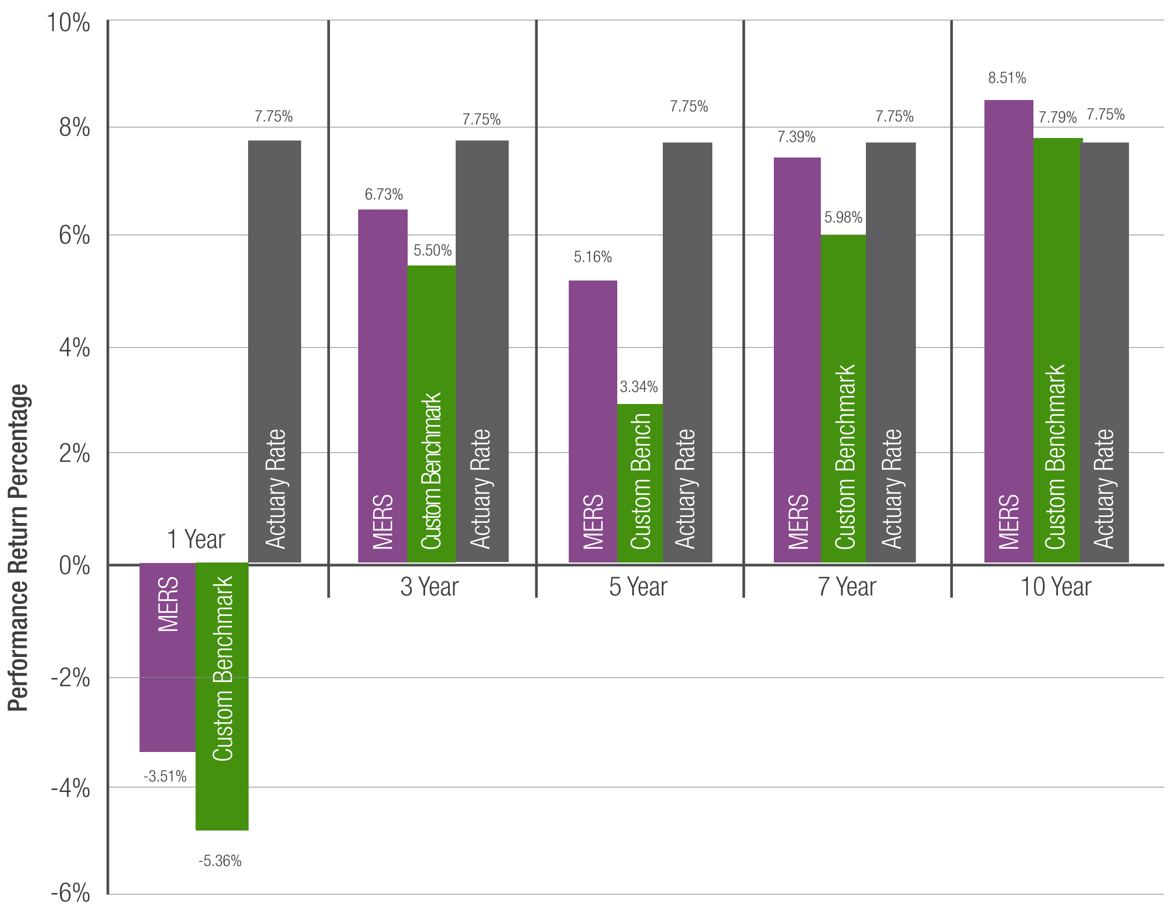
Sub-Asset Class/ Manager Rebalancing

The use of sub-asset class/manager level rebalancing is meant to exploit mean reversion at a more granular level. It is recognized that sub-asset classes/managers are poised to perform well at different times and in different market environments. Thus, by incorporating market information, rebalance rules or triggers can be established to guide the desired asset allocation tilts within the portfolio. A variety of factors will be included in the decision making process such as:

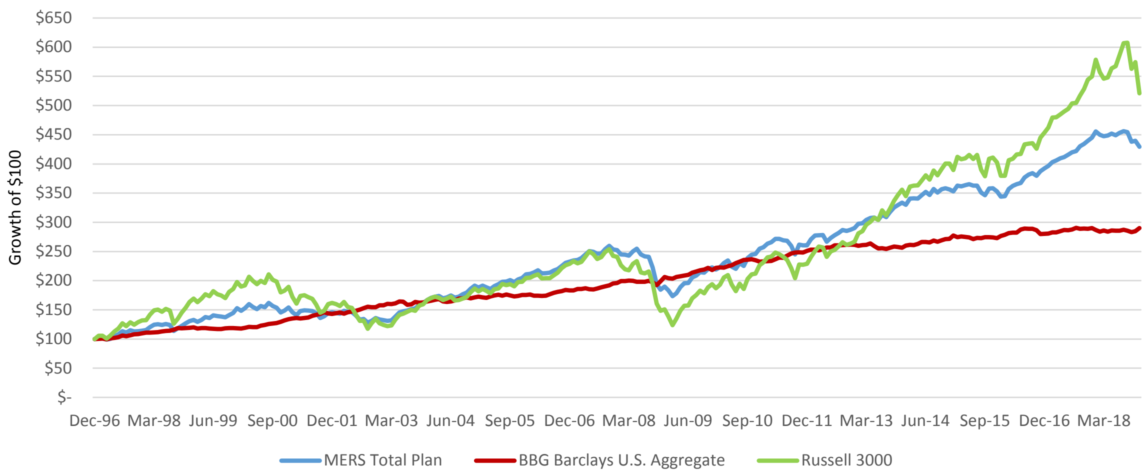
- Allocation level relative to target
- Recent relative performance
- Market correlation
- Valuation — whether an asset class is overvalued or undervalued
- Economic activity — different economic conditions favor different asset classes
- Market sentiment — volume, volatility, risk aversion, fund flows, etc.

The ultimate goal is overweighting a sub-asset class/manager when outperformance is likely and underweighting a sub-asset class/manager when it is likely to underperform. Doing so, systematically helps eliminate emotional decision making which leads to a better risk/return profile for the Portfolio. Allocations to external investment managers are limited to 15% of the total fund each; however, this excludes passive index strategies.

Performance Versus Custom Benchmarks as of December 31, 2018 (gross of fees)

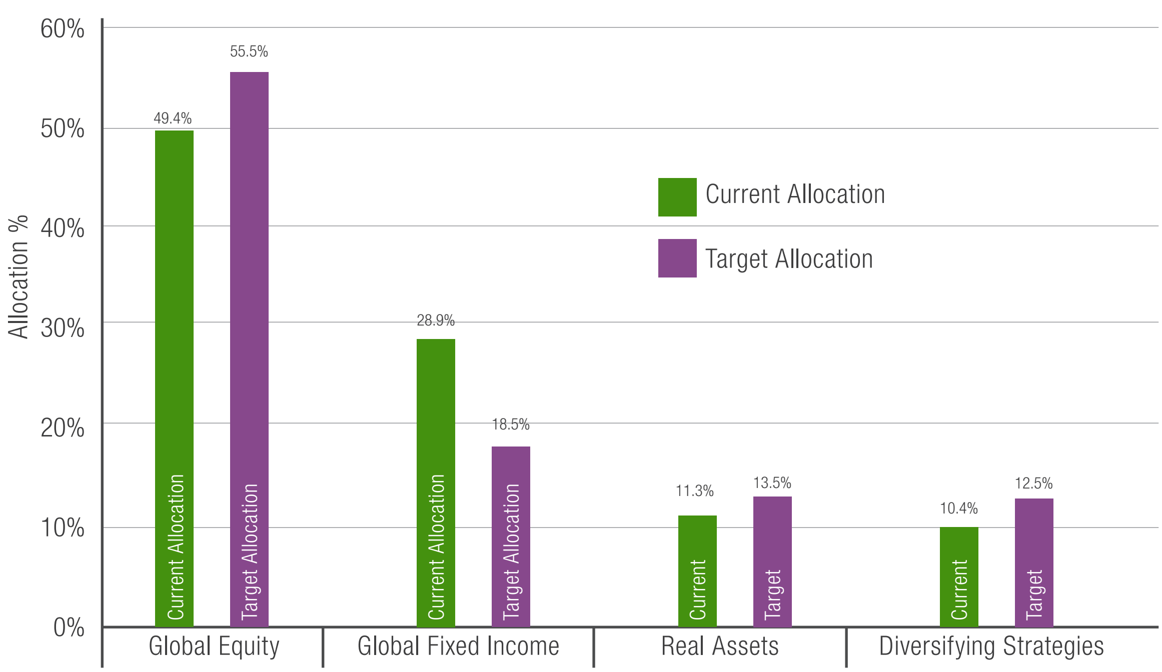


Downside Protection, Upside Participation as of December 31, 2018



Diversification is a portfolio strategy designed to reduce exposure to the volatility of returns by combining a variety of investments (such as stocks, bonds, real estate, and commodities) which are unlikely to all move in the same direction. The goal of diversification is to reduce the risk in a portfolio. While it is impossible to foresee all market risks, the strategic goal of the MERS asset allocation policy and the portfolio is to create a well-diversified portfolio that provides downside market protection with upside market participation.

Current Asset Allocation versus Target Allocation as of December 31, 2018



Statistical Performance

Portfolio Characteristics	1 Year	3 Year	5 Year	7 Year	10 Year
Annualized Return (gross of fees)	-3.51%	6.73%	5.16%	7.39%	8.51%
Annualized Standard Deviation	5.61%	5.01%	5.39%	5.62%	7.48%
Sharpe Ratio	(0.96)	1.14	0.84	1.24	1.09
Excess Return	1.85%	1.23%	1.82%	1.41%	0.72%
Correlation to Policy Benchmark	0.98	0.92	0.92	0.93	0.96
	1 Year	3 Year	5 Year	7 Year	10 Year
MERS Total Portfolio (Gross of Fees)	-3.51%	6.73%	5.16%	7.39%	8.51%
MERS Total Portfolio (Net of Fees)	-3.64%	6.51%	4.94%	7.16%	8.25%
MTP Custom Benchmark*	-5.36%	5.50%	3.34%	5.98%	7.79%
Excess (Gross)	1.85%	1.23%	1.82%	1.41%	0.72%

**45% Russell 3000, 20% MSCI ACWI ex USA IMI (Net), 25% Bloomberg Barclays Aggregate, 10% BBG BARC Global Aggregate ex US*

Securities Lending

The System participates in the securities lending program at the custodian as permitted under Section 20e of PERSIA. MCL 38.1140e. The securities lending program is managed in a prudent manner for the sole benefit of its participants and beneficiaries in accordance with PERSIA. MERS uses existing assets to generate an additional and steady source of income through conservative securities lending practices.

Securities Lending 2018 Rebates and Fees

	Gross Earnings	Rebates	Agent/Mgr fees	Net earnings
First Quarter	$3,707,263	$2,628,215	$215,803	$863,244
Second Quarter	4,614,267	3,461,286	230,588	922,393
Third Quarter	5,064,572	4,083,437	196,223	784,912
Fourth Quarter	4,657,541	3,929,756	145,555	582,230
Totals	**$18,043,642**	**$14,102,695**	**$788,169**	**$3,152,778**

Investment Summary for Defined Benefit Plan, Defined Contribution Plan, Hybrid Plan, Health Care Savings Program, Retiree Health Funding Vehicle, 457 Program, IRA, and Investment Services Program as of December 31, 2018

Type of Investment	Market Value	Percentage
Global Fixed Income	$2,960,761,077	28.9%
Global Equities	5,068,543,472	49.4%
Diversifying Strategies	1,063,959,520	10.4%
Real Assets	1,166,438,562	11.4%
Sub Total Investments	**10,259,702,631**	

Reconciliation of Investments to Financial Statements	
Total Investments from above	**10,259,702,631**
Receivables - Sale of Investments, Interest & Dividends	(438,824,838)
Alternative asset adjustment not on State Street portfolio	21,278,692
Investment in Land	1,402,094
Investments not in Mutual Funds and Self Directed Accounts	550,510,675
Investments in cash	30,769,779
Rounding	2,173
Payables - Purchases of Investments	408,234,235
Investments on Financial Statements	**$10,833,075,442**

Note: Includes receivables and payables for sales and purchases of securities with settlement dates after December 31, 2019.

GLOBAL EQUITY ASSET CLASS SUMMARY

As of December 31, 2018, the Global Equity portfolio had a fair value of $5.1 billion, representing 49.4% of the Fund. Performance for this portfolio was -8.38% gross of fees for the year.

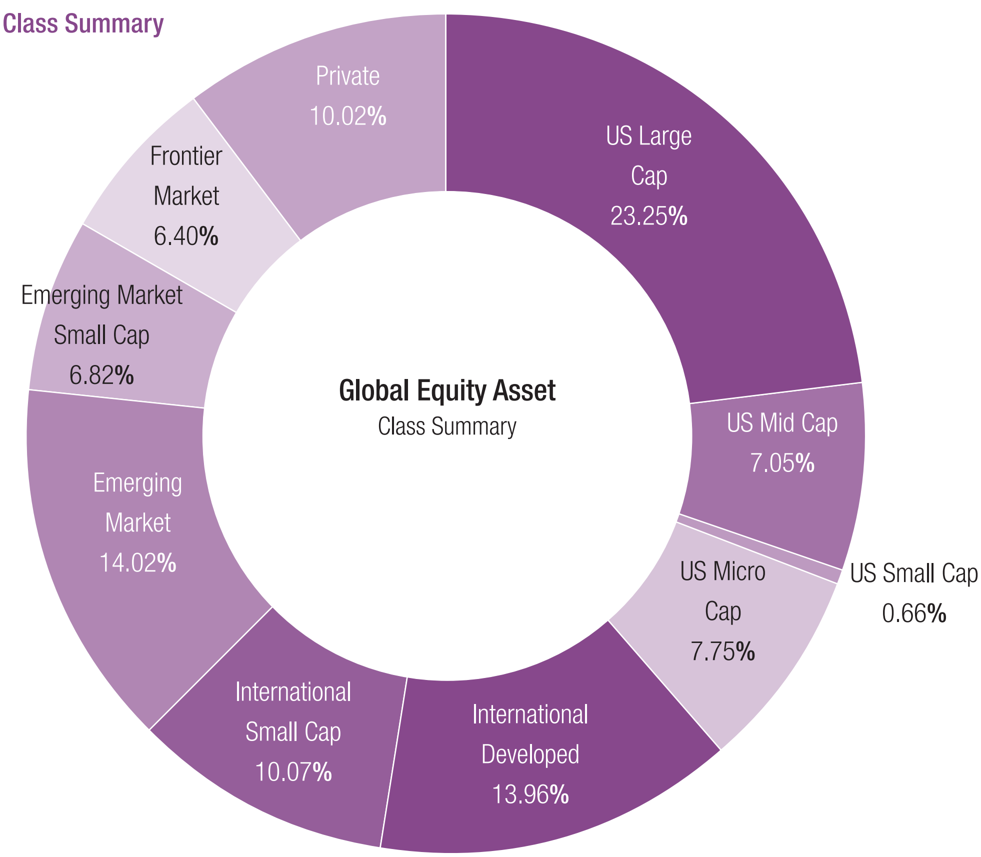
The Global Equity portfolio as of December 31, 2018, had a target allocation of 55.5% of the Portfolio, representing the largest portion of MERS' Defined Benefit Portfolio. The portfolio is designed to provide long-term capital appreciation, generate current income, and provide a hedge against inflation. To manage risk the global equity assets are diversified across geographic regions, styles, and the market capitalization spectrum.

A core portion of the global equity portfolio is invested in highly liquid equity securities including, but not limited to, U.S. large cap equities, U.S. mid cap equities, and developed ex U.S. large and mid cap equities. The portfolio may also include higher risk investments such as small cap equities, micro cap equities, private equity, emerging market equities, and frontier market equities.

Both internal and external managers are used within the Global Equity portfolio. The use of a passive investment approach versus active management will vary based on the composition of the asset class. In efficient markets, such as U.S. large cap equities, passive exposure will be favored in order to reduce of management fees. In inefficient markets, such as emerging markets, active management will be favored in order to reduce risk and add value over a passive approach.

MERS uses a time-weighted rate of return calculation methodology based on the market rate of return for the schedule of investment results in this report.

Equity Asset Class Summary



Global Equity Performance as of December 31, 2018

	1 Year	3 Years	5 Years	10 Years
Global Equity	-8.38%	7.26%	5.24%	10.43%
Global Equity Blend[1]	-12.49%	7.45%	5.79%	11.79%
Excess	**4.11%**	**-0.19%**	**-0.55%**	**-1.36%**
U.S. Large Cap Equity	-5.52%	9.68%	9.16%	14.02%
S&P 500 Index	-4.38%	9.26%	8.49%	13.12%
Excess	**-1.14%**	**0.42%**	**0.67%**	**0.90%**
U.S. Mid Cap Equity	-10.82%	5.59%	5.11%	12.69%
S&P 400 Index	-11.08%	7.66%	6.03%	13.68%
Excess	**0.26%**	**-2.07%**	**-0.92%**	**-0.99%**
U.S. Small Cap Equity	-9.12%	8.90%	4.71%	12.44%
S&P 600 Index	-8.48%	9.46%	6.34%	13.60%
Excess	**-0.64%**	**-0.56%**	**-1.63%**	**-1.16%**
U.S. Micro Cap Index	-11.12%	6.84%	3.58%	
Russell Micro Cap Index	-13.08%	5.79%	3.08%	
Excess	**1.96%**	**1.05%**	**0.50%**	
International Developed Equity	-8.91%	2.13%		
MSCI EAFE	-13.79%	2.87%		
Excess	**4.88%**	**-0.74%**		
International Small Cap Equity	-17.02%	6.92%	5.41%	13.12%
MSCI EAFE Small Cap (Net)	-17.89%	3.73%	3.06%	10.51%
Excess	**0.87%**	**3.19%**	**2.35%**	**2.61%**
Emerging Market Equity	-15.67%	8.44%	0.93%	
MSCI Emerging Markets	-14.58%	9.25%	1.65%	
Excess	**-1.09%**	**-0.81%**	**-0.72%**	
Emerging Market Small Cap Equity	-17.24%	7.23%		
MSCI EM Small Cap Equity	-18.59%	3.68%		
Excess	**1.35%**	**3.55%**		
Frontier Market Equity	-10.44%	6.27%	1.28%	5.58%
MSCI Frontier Market Index	-16.41%	4.21%	0.67%	4.75%
Excess	**5.97%**	**2.06%**	**0.61%**	**0.83%**
Private Equity	17.25%	10.61%	11.33%	9.02%
Private Equity Blend[2]	-14.37%	5.73%	3.92%	11.45%
Excess	**31.62%**	**4.88%**	**7.41%**	**-2.43%**

[1] 19.82% S&P 500 Index, 4.5% S&P 400 Index, 4.5% S&P 600 Index, 11.71% Russell Microcap Index, 11.71% MSCI EAFE Index (Net), 10.81% MSCI EAFE Small Cap Index (Net), 13.51% MSCI Emerging Markets Index (Net), 9.01% MSCI Emerging Markets Small Cap Index (Net), 5.41% MSCI Frontier Markets Index (Net), 9.01% Private Equity Blend

[2] 50% Russell 2000, 50% MSCI EAFE Small Cap Net

Top 10 Public Equity Holdings as of December 31, 2018

Asset Description	Fair Value	Percentage of Total Fair Value
Microsoft	$29,232,557	0.28%
Apple	24,173,813	0.24%
Amazon	22,676,743	0.22%
JPMorgan Chase	16,369,507	0.16%
Johnson + Johnson	15,893,927	0.15%
Exxon Mobil	13,588,426	0.13%
Coca Cola	13,194,693	0.13%
Enbridge	12,484,183	0.12%
Berkshire Hathaway Class B	12,079,289	0.12%
Walt Disney	11,668,076	0.11%

A complete list of portfolio holdings is available upon request.

Global Equity Investment Strategies

External Management	Portfolio Fair Value
U.S. Large Cap	$316,479,022
U.S. Micro Cap	277,973,429
International Developed	707,646,177
International Small Cap	510,640,871
Emerging Markets	710,560,854
Emerging Markets Small Cap	345,560,327
Frontier Markets	324,492,016
Global Private Equity	327,401,392
Total	**3,520,754,088**
Internal Management	Portfolio Fair Value
U.S. Large Cap	861,866,920
U.S. Mid Cap	357,371,888
U.S. Small Cap	33,576,068
U.S. Micro Cap	114,781,782
Private Equity Funds and Direct Deals	180,192,726
Total	**1,547,789,384**
Grand Total	**$5,068,543,472**

GLOBAL FIXED INCOME ASSET CLASS SUMMARY

As of December 31, 2018, the Global Fixed Income portfolio had a fair value of $2.5 billion, representing 24.2% of the Fund. Performance for fixed income was 0.69% gross of fees for the year.

The Global Fixed Income allocation (18.5% targeted) plays a vital role in the MERS Defined Benefit Portfolio. The core of the portfolio includes investment grade securities such as U.S. Treasury bonds, corporate bonds, and global investment grade debt. This portfolio is designed to provide downside protection, diversification, stable income, and liquidity. The core fixed income portfolio is expected to preserve capital and provide liquidity that may be used for portfolio rebalancing in stressed market environments.

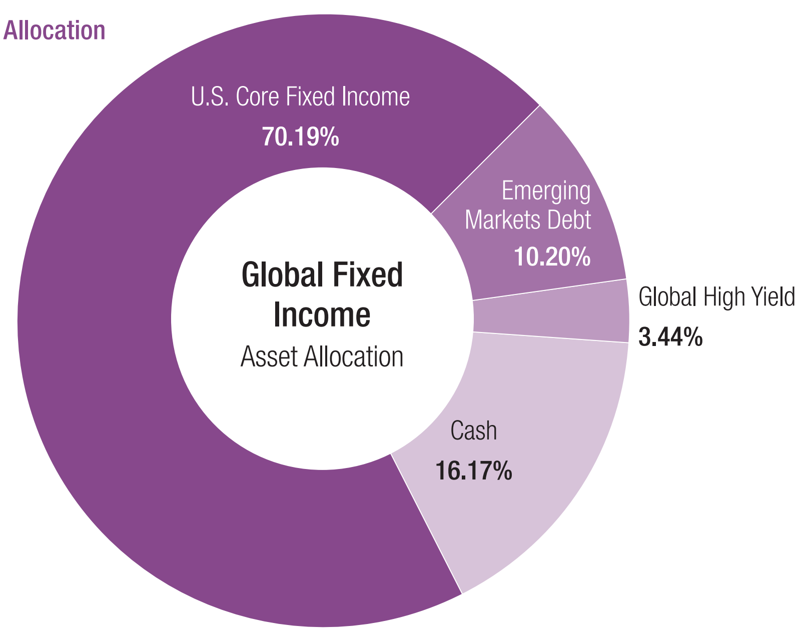
The Global Fixed Income portfolio may also include higher risk investments such as high yield bonds, emerging market debt, structured credit investments, and other below investment grade securities. These below investment grade securities entail higher risk, including the potential impairment of capital and low liquidity. However, these securities tend to exhibit equity-like risk/return profiles combined with higher cash yields and will only be purchased when risk premiums are high.

Both internal and external management will be utilized within the Global Fixed Income portfolio.

Internal management will be focused on investment grade core fixed income and will entail active decisions regarding duration, sector allocation, and security selection within U.S. Treasuries, corporate bonds, and other sectors. External managers may also be used within Core Fixed Income. Risk characteristics (such as duration) will be monitored on an aggregate basis including both internal and external portfolios. External managers will be used in the management of sub-investment grade securities. The Office of Investments will utilize specialized managers to opportunistically invest in certain portions of the sub-investment grade fixed income market. Exchange Traded Funds (ETFs) and other index-linked products may also be used to cost-effectively implement bond strategies in lieu of using active managers.

MERS uses a time-weighted rate of return calculation methodology based on the market rate of return for the schedule of investment results in this report.

Global Fixed Income Asset Allocation



Global Fixed Income Performance as of December 31, 2018 (gross of fees)

	1 Year	3 Years	5 Years	10 Years
Global Fixed Income	0.69%	4.01%	3.55%	4.43%
Global Fixed Income Blend*	-1.34%	3.14%	2.50%	5.04%
Excess	**2.03%**	**0.87%**	**1.05%**	**-0.61%**
U.S. Core Fixed Income	0.73%	2.09%	2.57%	5.16%
Bloomberg Barclays Aggragate Bond Index	0.01%	2.06%	2.52%	3.48%
Excess	**0.72%**	**0.03%**	**0.05%**	**1.68%**
Emerging Markets Debt	-2.06%	7.18%	4.17%	
JPMorgan EMBI Global Diversified Index	-4.26%	5.15%	4.80%	
Excess	**2.20%**	**2.03%**	**-0.63%**	
Global High Yield	1.90%			
Bank of America Merrill Lynch Global High Yield Index	-3.35%			
Excess	**5.25%**			
Cash	0.84%	1.26%	1.04%	-1.56%
91 Day Treasury Bill	1.87%	1.02%	0.63%	0.37%
Excess	**-1.03%**	**0.24%**	**0.41%**	**-1.93%**

**54.05% BBG Barclays US Agg, 27.03% JP Morgan EMBI Global Diversified, 10.81% BofA Merrill Lynch Global High Yield Index, 8.11% US 91-Day Treasury Bills*

Top 10 Global Fixed Income Holdings as of December 31, 2018

Asset Description	Fair Value	Percentage of Total Fair Value
US TREASURY N/B	$120,539,063	1.17%
TREASURY BILL	67,625,020	0.66%
US TREASURY N/B	59,674,219	0.58%
US TREASURY N/B	59,423,437	0.58%
US TREASURY N/B	59,322,656	0.58%
US TREASURY N/B	53,047,070	0.52%
US TREASURY N/B	50,091,797	0.49%
US TREASURY N/B	49,675,781	0.48%
US TREASURY N/B	49,625,000	0.48%
US TREASURY N/B	49,533,203	0.48%

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

Global Fixed Income – Investment Strategies

External Management	Portfolio Fair Value
U.S. Core Fixed Income	$952,737,592
Emerging Markets Debt	198,467,344
Global High Yield	101,907,333
Total	**1,253,112,269**
Internal Management	Portfolio Fair Value
U.S. Core Fixed Income	1,125,404,550
Emerging Markets Debt	103,667,564
Total	**1,229,072,114**
Grand Total	**$2,482,184,383**

REAL ASSETS CLASS SUMMARY

As of December 31, 2018, the Real Assets portfolio had a fair value of $1.2 billion, representing 11.4% of the Fund's portfolio. The target allocation is 13.5% of the total portfolio. Performance for Real Assets was 3.5% gross of fees for the year.

The primary objective of the Real Assets allocation is to provide some degree of protection for the Portfolio against inflation. Secondary objectives are capital growth and if possible, current yield through cash dividends. Examples of potential real asset categories include:

- Real Estate
- Commodities
- Infrastructure
- Agriculture/Farmland

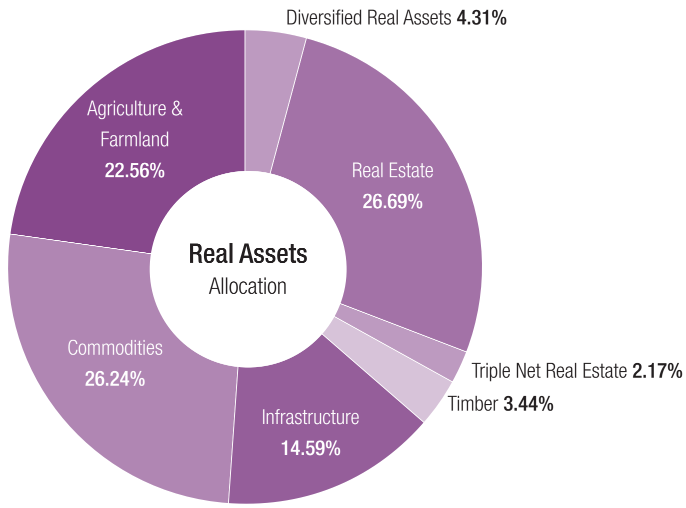
The Real Assets portfolio is constructed in a diversified manner, with no single investment comprising more than 20% of the total allocation to Real Assets. Investments in real assets may be either liquid (those that could be liquidated within 30 days) or illiquid (investments where capital is committed for multi-year periods of time). Illiquid strategies are defined as strategies with contractual lockups that would take greater than one year to liquidate. Examples of liquid real assets investments include commodities futures, sector specific equities, or sector specific publicly traded debt. Examples of illiquid investments include commingled funds, limited partnerships, co-investments, or private placements.

MERS uses a time-weighted rate of return calculation methodology based on the market rate of return for the schedule of investment results in this report.

Real Assets – Investment Strategies

Strategy	Portfolio Fair Value
Diversified Real Assets	$50,313,904
Real Estate	311,197,855
Triple Net Real Estate	25,369,352
Timber	40,161,007
Infrastructure	170,160,719
Commodities	306,071,629
Agriculture & Farmland	263,164,096
Grand Total	**$1,166,438,562**

Real Assets Allocation



Real Assets Performance as of December 31, 2018 (gross of fees)

	1 Year	3 Years	5 Years	10 Years
Real Assets	3.50%	8.01%	6.14%	4.07%
Real Assets Blend[1]	-7.25%	2.12%	1.45%	2.64%
Excess	**10.75%**	**5.89%**	**4.69%**	**1.43%**
Diversified Real Assets	2.61%			
Real Assets Blend	-7.25%			
Excess	**9.86%**			
Real Estate	10.48%	13.07%	13.67%	6.19%
Real Estate Blend[2]	-2.07%	4.84%	7.73%	13.01%
Excess	**12.54%**	**8.23%**	**5.95%**	**-6.82%**
Triple Net Real Estate	29.69%	15.19%	15.10%	
BBG BARC CMBS Inv Grd (Bbb) Idx	5.46%	6.71%	4.81%	
Excess	**24.23%**	**8.49%**	**10.29%**	
Timber	14.14%	13.45%	8.13%	5.16%
S&P Global Timber & Forestry Index Net	-17.69%	7.72%	3.39%	8.70%
Excess	**31.83%**	**5.73%**	**4.74%**	**-3.54%**
Infrastructure	3.29%	4.45%	4.76%	3.89%
Private Infrastructure Blend[3]	-4.53%	1.97%	2.88%	4.26%
Excess	**7.82%**	**2.49%**	**1.88%**	**-0.37%**
Commodities	-12.95%	10.88%	0.57%	2.85%
Bloomberg Commodity Index Total Return	-11.25%	0.30%	-8.80%	-3.78%
Excess	**-1.70%**	**10.59%**	**9.37%**	**6.63%**
Agriculture & Farmland	19.74%	7.67%	8.74%	
S&P Global Agribusiness Equity Index	-13.71%	4.73%	1.77%	
Excess	**33.45%**	**2.93%**	**6.97%**	

[1] 18.52% Real Estate Blend, 7.41% BBG Barclays Inv Grade CMBS BBB Index, 22.22% Private Infrastructure Blend, 33.33% Bloomberg Commodities Index, 18.52% S&P Global Agribusiness Equity Index
[2] 80% FTSE NAREIT All Equity REITS, 20% Barclays Investment Grade CMBS BBB Index
[3] 50% DJ Brookfield Global Infrastructure Index, 50% BBG Barclays Global Inflation-Linked

DIVERSIFYING STRATEGIES CLASS SUMMARY

As of December 31, 2018, the Diversifying Strategies portfolio had a fair value of $1.1 billion, representing 10.4% of the total portfolio. Performance for the strategy was 1.98% gross of fees for the year, making it the second highest asset class return for MERS.

The Diversifying Strategies allocation (12.5% targeted) is expected to provide the Fund with downside protection and uncorrelated returns with traditional asset classes, specifically equities.

The following criteria are used to classify a diversifying strategy

- Correlation or Beta of 0.40 or less with equity markets
- Superior risk-adjusted returns (as measured by Sharpe ratio and other appropriate statistical measures)
- Returns resulting from idiosyncratic (non-market) risks

Illiquid and liquid strategies are both considered when funding the Diversifying Strategies portfolio. As a result illiquid Diversifying Strategies are expected to deliver higher returns with higher levels of risk. Liquid strategies are defined as strategies that can be liquidated within thirty days. These strategies will have lower expected returns and lower levels of risk.

The MERS Office of Investments adheres to the following portfolio construction guidelines for the Diversifying Strategies portfolio:

- The portfolio is diversified across a minimum of four different strategies at any one time
- Each strategy targets a minimum of $100M and positions will be initiated at a minimum size of $50M when possible
- The Asset Allocation Study determines the target allocation between illiquid strategies and liquid strategies

MERS uses a time-weighted rate of return calculation methodology based on the market rate of return for the schedule of investment results in this report.

Diversifying Strategies Performance as of December 31, 2018 (gross of fees)

	1 Year	3 Years	5 Years	10 Years[2]
Diversifying Strategies	1.59%	4.53%	4.55%	
Diversifying Strategies Blend[1]	-3.03%	2.50%	2.52%	
Excess	**4.62%**	**2.03%**	**2.03%**	
Liquid Diversifying Strategies	-7.94%	-6.40%		
Diversifying Strategies Blend[1]	-3.03%	2.50%		
Excess	**-4.91%**	**-8.90%**		
Private Diversifying Strategies	7.72%	8.96%	6.85%	
Diversifying Strategies Blend[1]	-3.03%	2.50%	2.52%	
Excess	**10.75%**	**6.46%**	**4.33%**	

[1] 25% Russell 3000, 10% MSCI ACWI ex US IMI Net, 45% BBG Barclays US Agg, 20% BBG Barclays Global Agg ex US
[2] The Diversifying Strategies Allocation started in June 2012 and therefore does not possess 10 year returns.

Diversifying Strategies – Investment Strategies

Liquid Diversifying Strategies	Portfolio Fair Value
Canadian Small/Mid Cap Market Neutral Equity	$77,968,643
Long/Short Equity	205,610,864
Global Macro	82,349,400
Total	**365,928,907**
Private Diversifying Strategies	**Portfolio Fair Value**
Bank Regulatory Capital	35,390,179
Litigation Financing	17,598,125
Middle Market Direct Lending	58,229,220
Global Opportunistic Credit	289,462,205
Intangible/Tangible Assets	91,641,736
Global Structured Lending	55,251,697
Lower Middle Market Direct Lending	29,905,032
Healthcare Royalties	2,056,284
Insurance Linked Securities	63,373,326
Life Settlements	55,122,809
Total	**698,030,613**
Grand Total	**$1,063,959,520**

Investment Management Fees

Since management fees directly affect the returns of a manager, a best effort is made to achieve the best fee agreement possible. MERS leverages the scale of investments to negotiate deals that are at the lower end of industry standards and more than competitive with peers. While it is understood that superior managers often have higher fee structures, performance expectations and costs are carefully balanced. Fees are the only factor that one can be certain of ex-ante; thus it is critical to minimize them to the extent possible. All else being equal, managers with lower fees will be favored.

Schedule of Investment Fees as of December 31, 2018

Investment Managers	Average Assets Under Management	Annual Fee	Average Basis Points
Global Equity	$5,068,543,472	$7,398,999	14.60
Global Fixed Income	2,482,184,383	1,759,858	7.09
Diversifying Strategies	1,063,959,520	1,025,909	9.64
Real Assets	1,166,438,562	114,185	0.98
Total	**$9,781,125,937**	**$10,298,951**	**10.53**

Investment Custodian	
State Street Bank and Trust	1,052,329
Securities Lending Agent	
State Street Bank and Trust	788,168
Total Investment Fees	**$12,139,448**

The above table presents the 2018 investment manager fees MERS incurred, excluding alternative investments and comingled funds. The alternative investments and comingled fund portfolios results are reported to MERS net of fees, therefore the management fees paid for these investments are not reported in the above table.

Schedule of Investment Commissions as of December 31, 2018

Brokerage Firm	Shares Traded	Total Dollars	Commission/ Share
Merrill, Lynch,Pierce,Fenner & Smith Inc.	23,365,423	$229,366	0.01
Instinet U.K. Ltd	26,958,937	202,072	0.01
RBC Dominion Securities Inc.	10,877,511	135,624	0.01
BTIG, LLC	2,843,487	91,417	0.03
CIBC World Markets Inc.	10,466,203	80,183	0.01
Weeden + Co.	7,374,750	72,081	0.01
Capital Institutional Services Inc.	4,958,890	71,855	0.01
Toronto Dominion Securities Inc.	3,819,913	71,500	0.02
Nesbit Burns	5,798,308	70,403	0.01
Raymond James Ltd	5,156,333	68,199	0.01
Scotia McLeod Inc.	3,934,337	62,897	0.02
Cormack Securities Inc.	6,231,872	62,885	0.01
GMP Securities Inc.	4,578,919	59,774	0.01
Goldman Sachs International	18,050,607	58,685	0.00
Canaccord Genuity Corporation	4,589,144	49,164	0.01
Bloomberg Tradebook LLC	2,671,401	46,063	0.02
Pershing Securities Limited	3,317,161	44,235	0.01
NBC Clearing Services Inc.	2,644,881	42,441	0.02
Fidelity Clearing Canada	4,201,899	37,705	0.01
B.Riley & Co., LLC	1,127,579	33,480	0.03
Virtu Americas LLC	4,848,562	28,686	0.01
Peters and Co Limited	2,595,928	27,809	0.01
SG Securities Hong Kong	26,096,513	25,070	0.00
Credit Suisse Securities (USA) LLC	16,829,750	24,209	0.00
JonesTrading Institutional Services, LLC	845,153	22,951	0.03
Subtotal (25 Largest)	204,183,461	1,718,754	0.01
Remaining Total	71,499,455	198,345	0.00
Total Commissions	**275,682,916**	**$1,917,099**	**0.01**

MERS INVESTMENT MENU SUMMARY *(PARTICIPANT DIRECTED ACCOUNTS AND INSTITUTIONAL FUNDS)*

The Board is the sole fiduciary for MERS' institutional funds and participant directed retirement accounts with respect to establishing, monitoring, and amending the Plans' investment menu and executes its duties solely in the interest of the Plans and their participants and beneficiaries.

The MERS Investment Menu is divided into three categories that PDA participants can use to address his/her investment needs: Retirement Strategies, Premium Select Options, and a Self-Directed Brokerage Account. The availability of the investment options in these categories is dependent on the plan of which a participant or municipality partakes.

Retirement Strategies

The Retirement Strategies offer participants a simple way to invest. Each fund is named for a "target date"—the approximate year in which the participant is expected to retire and start withdrawing from their account. Funds farthest from the target dates emphasize growth potential by allocating a higher percentage of the portfolio to equities. As investors move closer to—and into—retirement, the funds automatically adjust to a more conservative asset mix. The Retirement Strategies are expected to meet the general needs of the average participant in different age groups by utilizing a glide path. A glide path represents the changes made to the asset allocation over time as the target date approaches.

The Retirement Strategies glide path shall be based on industry accepted investment theory and investment methodology as well as reasonable capital market assumptions. Plan demographics shall be taken into consideration when developing the glide path. The glide path will be monitored by the MERS Office of Investment and Investment Committee.

Premium Select Options

Premium Select - Asset Allocation Portfolios

The Premium Select Asset Allocation Portfolios are multi-manager investment options built to offer participants the ability to benefit from economies of scale, by utilizing investments MERS' Defined Benefit portfolio. The options are designed so a participant can select the option that best matches his/her risk tolerance and offer attractive risk-adjusted returns at a below-market fee.

Premium Select - Asset Specific Funds

The Premium Select Asset Specific Funds provide a participant the ability to structure his/her own unique portfolio by allocating his/her investments to a single asset class. These options give a participant the ability to build his/her own portfolio. The funds can either be components of the MERS Defined Benefit portfolio or outside investment fund options with a preference for index based investments. Whenever an outside investment is offered, the lowest share class available to MERS will be utilized.

Self-Directed Brokerage Account

Participants who desire additional investment options and are willing to accept all risks and costs related to such alternatives can make his/her own investment decisions through the Self-Directed Brokerage Account (SDBA). The SDBA is available to participants through MERS DC, or 457 programs as long as they maintain a pre- determined account balance.

Participant Directed Accounts

1 Retirement Strategies[1]

2005 Retirement Strategy
2010 Retirement Strategy
2015 Retirement Strategy
2020 Retirement Strategy
2025 Retirement Strategy
2030 Retirement Strategy
2035 Retirement Strategy
2040 Retirement Strategy
2045 Retirement Strategy
2050 Retirement Strategy
2055 Retirement Strategy
2060 Retirement Strategy

2 Premium Select Options

Portfolios Built for You

MERS Total Market Portfolio
MERS Global Stock Portfolio (100/0)
MERS Capital Appreciation Portfolio (80/20)
MERS Established Market Portfolio (60/40)[2]
MERS Balanced Income Portfolio (40/60)
MERS Capital Preservation Portfolio (20/80)
MERS Diversified Bond Portfolio (0/100)

Funds to Build Your Own Portfolio

Large Cap Stock Index
Mid Cap Stock Index
Small Cap Stock Index
Emerging Market Stock
International Stock Index
Real Estate Stock
Bond Index
High-Yield Bond
Short-Term Income
Stable Value (DC &457 Only)

3 Self-Directed Brokerage Account

TD Ameritrade (DC & 457 Only)

Institutional Funds

Portfolios Built for You

MERS Total Market Portfolio[3]
MERS Global Stock Portfolio (100/0)
MERS Capital Appreciation Portfolio (80/20)
MERS Established Market Portfolio (60/40)
MERS Balanced Income Portfolio (40/60)
MERS Capital Preservation Portfolio (20/80)
MERS Diversified Bond Portfolio (0/100)

Funds to Build Your Own Portfolio

Large Cap Stock Index
Mid Cap Stock Index
Small Cap Stock Index
Emerging Market Stock
International Stock Index
Short-Term Income

Note:
1 Default investment option for DC and 457
2 Default investment option for HCSP
3 Default investment option for RHFV and ISP

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ACTUARIAL

CBIZ Retirement Plan Services
CBIZ Benefits & Insurance Services, Inc.
17199 Laurel Park North, Ste. 405
Livonia, MI 48152
http://retirement.cbiz.com

September 18, 2018

The Retirement Board
Municipal Employees' Retirement System of Michigan
1134 Municipal Way
Lansing, Michigan 48917

Dear Board Members:

The basic financial objective of the Municipal Employees' Retirement System of Michigan (MERS) is to establish and receive contributions for each municipality and court which:

(1) fully cover the cost of benefits that members earn during the coming fiscal year, and

(2) amortize the unfunded costs of benefits earned based on past service, and which

(3) when combined with present assets and future investment return will be sufficient to meet the financial obligations, of each municipality and court under MERS, to present and future retirees and beneficiaries.

In order to measure progress toward this fundamental objective, MERS has annual actuarial valuations completed. Separate actuarial valuations are prepared for each participating municipality and court. The purpose of the December 31, 2017 annual actuarial valuations was to (i) measure MERS' funding progress, (ii) establish contribution requirements for fiscal years beginning in 2019 that provide for the normal cost (i.e. the costs assigned by the valuation method to the year of service about to be rendered) and amortization of unfunded actuarial accrued liabilities over a reasonable period (see the Appendix on the MERS website for a description of the amortization policy), and (iii) provide actuarial information in connection with applicable Governmental Accounting Standards Board statements. The valuations should not be relied upon for any other purpose. The valuations were completed based upon population data, asset data, and plan provision data as of December 31, 2017.

The actuarial valuations are based upon financial data, plan provision data, and participant data which are prepared by MERS' administrative staff. We checked the data for internal and year-to-year consistency as well as general reasonableness, but did not otherwise audit the data. As a result, we do not assume responsibility for the accuracy or completeness of the data provided by MERS' administrative staff. The actuary summarizes and tabulates population data in order to analyze long term trends. MERS' external auditor audits the actuarial data annually.

This letter was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This letter may be provided to parties other than the System only in its entirety and only with the permission of the System.

Retirement Board
September 18, 2018
Page 2 of 2

Actuarial valuations are based on assumptions regarding future rates of investment return and inflation, rates of retirement, withdrawal, death, disability, and pay increase among MERS members and their beneficiaries. These assumptions are adopted by the Board after considering the advice of the actuary and other professionals. The assumptions and methods used for funding purposes were developed based on the parameters set by the Actuarial Standards of Practice. The assumptions and methods comply with the requirements of Governmental Accounting Standards Board Statement No. 68. The demographic assumptions adopted by the Retirement Board were based upon the actual experience of MERS during the years 2009 to 2013 and were first reflected in the December 31, 2015 annual valuations.

The economic assumptions were last revised by the Board for the December 31, 2015 annual valuations. Future actuarial valuation results may differ significantly from those presented in the annual valuations due to such factors as experience differing from that anticipated by the actuarial assumptions, or changes in plan provisions, actuarial assumptions/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.

Assets are valued on a market related basis that fully recognizes expected investment return and averages unanticipated market return over a 5 year period. Prior to 2016, future unanticipated market returns were reflected in the valuation assets over a 10 year period.

Based on the actuarial valuations, MERS' staff prepared various supporting schedules in the Comprehensive Annual Financial Report.

To the best of our knowledge, the actuarial valuations are complete and accurate and are made in accordance with generally recognized actuarial methods, in compliance with Act No. 220 of the Public Acts of 1996, as amended, and the MERS plan document, as revised. All of the undersigned are members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The actuarial assumptions used in the December 31, 2017 annual actuarial valuation reports produce results that we believe are reasonable.

Respectfully submitted,

W. James Koss, MAAA, ASA

Cathy Nagy, MAAA, FSA

Curtis Powell, MAAA, EA

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

An actuarial valuation is the mathematical process that estimates plan liabilities and employer contribution requirements for the purpose of financing the Retirement System (System). This process is repeated annually to update the liabilities and contribution requirements for changes in participant census and plan features, and to reflect actual plan experience in the process. The valuation complies with the Municipal Employees' Retirement Act, MCL 38.1501, et seq., as amended (MERS Act) and as embodied in the MERS Plan Document (as revised), the MERS Actuarial Policy, and other applicable laws.

In addition to using current membership and financial data, an actuarial valuation requires the use of a series of assumptions regarding uncertain future events. The assumptions and methods used in the December 31, 2017 actuarial valuations are those adopted by the MERS Retirement Board (Board). The actuarial assumptions are unchanged from those used in the December 31, 2016 valuations. The most recent experience study for the System was completed in 2015, and covered the period from January 1, 2009 through December 31, 2013.

There have been no changes in the funding method that was adopted by the Board commencing with the December 31, 1993 valuations. The basic funding method is entry age normal and employer contribution amounts are developed as a level percentage of payroll.

Valuation assets were valued for each municipality by taking the difference in investment income between expected return and market return and recognizing it over a 5-year period. This asset valuation method was first adopted for the December 31, 2016 valuation. For purposes of transition from the 10-year to the 5-year smoothing method, the entirety of prior unrecognized gains and losses at December 31, 2016 was combined into a single item and will be recognized over the next 4 years.

The employer contribution rate has been determined for each municipality based on the entry age normal funding method (adopted 1994). Under the entry age normal cost funding method, the total employer contribution is comprised of the normal cost plus the amortization payment required to fund the unfunded actuarial accrued liability over a period of years. For open divisions (new hires are included in the division) the amortization period is 21 years. The 21-year period will decline by 1 each year until the initial unfunded accrued liability is paid off. For divisions that closed to new hires prior to 2016 (new hires are not covered by the MERS Defined Benefit Plan or Hybrid Plan (Part I) provisions in a linked division) of active municipalities, the employer had 2 amortization options. Under the Accelerated to 5-Year Option, the amortization period decreases annually by 2 years until the period reaches 6 or 5 years. Each year thereafter it decreases by 1 each year until the unfunded liability is paid off. Under the Accelerated to 15-Year Option, the amortization period decreases annually by 2 years until the period reaches 16 or 15 years. Each year thereafter the amortization period decreases annually by 1 year until the unfunded accrued liability is paid off. Negative unfunded accrued liabilities are amortized over 10 years, with the 10-year period reestablished with each annual actuarial valuation. As of December 31, 2017, there were 1,520 closed divisions.

The total normal cost is, for each active participant, the level percentage of payroll contribution (from entry age to retirement) required to accumulate sufficient assets at the participant's retirement to pay for his or her projected benefit. The employer normal cost is the total normal cost reduced by the participant contribution rate. Closed municipalities (no longer actively participating in MERS) are covered by special funding. Employer's computed normal cost of benefits expressed as a percentage of valuation payroll is 6.94% and the total required contribution rate expressed as a percentage of valuation payroll is 25.73%.

For employers that adopt E-1 or E-2 post-retirement benefit increases, retirement benefits are assumed to increase by an annual, non-compounded rate of 2.5%. (Board adopted in 1981.)

There have been no recent changes that have had an impact on the System. Municipalities have the ability to modify provisions that apply to their individual plan. The individual municipality contribution rates are modified to account for changes in provisions of the plan selected by the municipality.

MERS' staff has provided the data about participants and present assets. Although examined for general reasonableness, the actuary has not audited the data. The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA). The Board adopted the assumptions used in the actuarial valuations after consulting with the actuary.

Note: the Annual Actuarial Valuation addresses assets and liabilities for participation under the MERS Defined Benefit Plan, including the defined benefit portion (Part I) of the Hybrid Plan. The defined contribution portion of the Hybrid Plan (Part II) is not addressed in the valuation results as it is not a defined benefit plan.

ASSUMPTIONS AND METHOD CHANGES

Actuarial Assumptions

To calculate MERS' contribution requirements, assumptions are made about future events that could affect the amount and timing of benefits to be paid, and the assets to be accumulated. The economic and demographic assumptions include:

- An assumed rate of investment return used to discount liabilities and project what plan assets will earn
- A mortality table projecting the number of participants who will die before retirement and the duration of benefit payments after retirement
- Assumed retirement rates projecting when participants will retire and commence receiving retirement benefits
- A set of withdrawal and disability rates to estimate the number of participants who will leave the workforce before retirement
- Assumed rate of pay increases to project participant compensation in future years

Interest Rate

Funding plan benefits involves the accumulation of assets to pay future benefits. These assets are invested, and the net rate of investment earnings is a significant factor when determining the contributions required to support the ultimate cost of benefits. For the 2017 actuarial valuation, the long-term investment yield, net of administrative and investment expenses, is assumed to be 7.75%. This assumption was first used for the December 31, 2015 actuarial valuations.

Although the actuarial value of assets for 2017 was 1% higher than the fair value, meeting the actuarial assumption in the next few years will require average annual market returns that exceed the 7.75% investment return assumption.

Pay Increases

Because benefits are based on a participant's final average compensation (FAC), it is necessary to make an assumption with respect to each participant's estimated pay progression. The pay increase assumption used in the actuarial valuation projects annual pay increases of 3.75% in the long term plus a percentage based on an age-related scale to reflect merit, longevity and promotional pay increases.

The pay increase assumption for sample ages is shown on the following page. The 3.75% long-term wage inflation assumption was first used for the December 31, 2015 actuarial valuation. The merit and longevity pay increase assumption was first used for the December 31, 2015 actuarial valuation.

Annual Percentage Increase in Salary

Sample Ages	Base Inflation	Merit and Longevity	Total Percentage Increase in Salary
20	3.75%	11.00%	14.75%
25	3.75%	7.20%	10.95%
30	3.75%	3.10%	6.85%
35	3.75%	1.90%	5.65%
40	3.75%	1.20%	4.95%
45	3.75%	0.81%	4.56%
50	3.75%	0.52%	4.27%
55	3.75%	0.30%	4.05%
60	3.75%	0.00%	3.75%

Inflation

Although no specific price inflation assumption is needed for this valuation, the assumed long-term annual rate of price inflation is 2.5%.

Payroll Growth

For divisions that are open to new hires, the number of active participants is projected to remain constant, and the total payroll is projected to increase 3.75% annually. This assumption was first used for the December 31, 2015 actuarial valuations.

Increase in Final Average Compensation

The last three experience studies determined that for some retirees of some municipalities, the actual final average compensation (FAC) at retirement was larger than would be expected based on reported annual pays and FACs for the years just before retirement. Some possible sources for the differences are:

- Lump sum payments for unused paid time off. Unused sick leave payouts have been excluded from FAC since the mid-1970s. However, since that time it has become popular to combine sick and vacation time into paid time off, which is included in the FAC. Consequently, the lump sums that are includible in FAC have grown over the years.
- Extra overtime pay during the final year of employment. Our studies only reflect any increase in overtime during the final year, not any increase that occurs during the full three or more year averaging period.

The amount of unexpected FAC increase varies quite a bit between municipalities. Some municipalities show no sign of FAC loading, while other municipalities show increases above the average increase. This is presumably the result of different personnel policies and collective bargaining agreements among municipalities.

The Board adopted new FAC assumptions to be first used for the December 31, 2015 annual actuarial valuations. These assumptions reflect an FAC load of 0% to 12% for each municipality, based on the municipality's experience in the 2009-2013 and earlier experience studies (it is anticipated that these assumptions will be updated after every 5-year experience study). The FAC increase assumption(s) for each municipality are shown in individual annual actuarial valuation reports. Note that for divisions that adopted Sick Leave in FAC (SLIF), the assumption is developed individually for each division based on the specific SLIF provision and/or past experience.

Retirement Rates

A schedule of retirement rates is used to measure the probability of eligible participants retiring during the next year.

The retirement rates for Normal Retirement are determined by each participant's replacement index at the time of retirement. The replacement index is defined as the approximate percentage of the participant's pay (after reducing participant contributions) that will be replaced by the participant's benefit at retirement. The index is calculated as:

Replacement Index = 100 x Accrued Benefit ÷ by [Pay - Participant Contributions].

Retirement rates for early reduced retirement are determined by the participant's age at early retirement.

The revised normal retirement rates and early retirement rates below were first used for the December 31, 2015 actuarial valuations.

Normal Retirement – Service Based Benefit F(N) Adopted

Sample Replacement Index	Percent of Eligible Active Participants Retiring Within the Next Year
5	8.0%
10	12.0%
15	16.0%
20	19.0%
25	19.5%
30	19.5%
35	19.5%
40	20.0%
45	21.0%
50	21.0%
55	21.0%
60	24.0%
65	24.0%
70	25.0%
75	28.0%
80	33.0%
85	36.0%
90	41.0%
95	46.0%
100+	50.0%

Early Retirement – Reduced Benefit

Retirement Ages	Percent of Eligible Active Participants Retiring Within Next Year
50	2.00%
51	2.00%
52	3.30%
53	3.80%
54	5.60%
55	4.30%
56	4.20%
57	4.10%
58	5.00%
59	6.20%

Withdrawal Rates

The withdrawal rates are used to estimate the number of participants at each age that are expected to terminate employment before qualifying for retirement benefits. The withdrawal rates do not apply to participants eligible to retire, and do not include separation on account of death or disability. The assumed rates of withdrawal applied in the current valuation are based on years of service and scaled up or down according to each division's experience.

Sample rates of withdrawal from active employment, prior to the scaling factor, are shown. These rates were first used for the December 31, 2015 actuarial valuations.

The base withdrawal rates are multiplied by a scaling factor to obtain the assumed withdrawal rates. The scaling factor for each division is shown in each municipality's annual actuarial report.

Rates of Withdrawal (Excluding Death or Disability) from Active Employment Before Retirement

Sample Years of Service	% of Active Participants Withdrawing Within the Next Year
0	19.6%
1	16.3%
2	13.3%
3	10.5%
4	8.6%
5	6.9%
10	4.6%
15	3.4%
20	2.6%
25	2.2%
30 and over	2.2%

Disability Rates

Disability rates are used in the valuation to estimate the incidence of participant disability in future years. The assumed rates of disablement at various ages are shown. These rates were first used for the December 31, 2015 actuarial valuations.

** 80% of the disabilities are assumed to be non-duty, and 20% of the disabilities are assumed to be duty related. For those plans that have adopted disability provision D-2, 40% of the disabilities are assumed to be non-duty, and 60% are assumed to be duty related*

Rates of Withdrawal Due To Disability*

Sample Ages	Percent of Active Participants Becoming Disabled Within Next Year
20	0.02%
25	0.02%
30	0.02%
35	0.05%
40	0.08%
45	0.20%
50	0.29%
55	0.38%
60	0.39%
65	0.39%

Mortality Tables

In estimating the amount of reserves required at retirement to pay a participant's benefit for the remainder of their lifetime, it is necessary to make an assumption with respect to the probability of surviving to retirement, and the life expectancy after retirement.

The mortality table used to project the mortality experience of non-disabled plan participants is a 50% male, 50% female blend of the following tables:

- The RP-2014 Healthy Annuitant Mortality Tables, with rates multiplied by 105%
- The RP-2014 Employee Mortality Tables
- The RP-2014 Juvenile Mortality Tables

For ages 0-17 we use the rates in Table 3; for ages 18-49 we use the rates in Table 2; for ages 50-69 we blend Table 1 and Table 2, and for ages 70 and older we use the rates in Table 1.

The mortality table used to project the mortality experience of disabled plan participants is a 50% Male, 50% Female blend of RP-2014 Disabled Retiree Mortality Tables.

These mortality tables were first used for the December 31, 2015 actuarial valuations.

It is assumed that 90% of active participants' deaths are non-duty and 10% of deaths are assumed to be duty-related.

Possible future mortality improvements are reflected in the mortality assumption. The mortality assumptions include a 10% margin for future mortality improvements, relative to the actual mortality experience seen in the 2009-2013 Experience Study.

Mortality Tables (Non – Disabled)

Age	Expected Years of Life Remaining	Mortality Rates
20	63.06	0.03%
25	58.15	0.03%
30	53.24	0.03%
35	48.33	0.04%
40	43.43	0.05%
45	38.56	0.08%
50	33.74	0.23%
55	29.18	0.37%
60	24.79	0.58%
65	20.59	0.94%
70	16.66	1.56%
75	13.07	2.51%
80	9.85	4.18%

Mortality Tables (Disabled)

Age	Expected Years of Life Remaining	Mortality Rates
20	46.95	0.47%
25	43.14	0.54%
30	39.24	0.55%
35	35.33	0.65%
40	31.52	0.82%
45	27.98	1.30%
50	24.87	1.62%
55	21.91	1.89%
60	18.97	2.18%
65	16.04	2.63%
70	13.19	3.43%
75	10.54	4.77%
80	8.18	6.88%

Schedule of Active Member Valuation Data

Valuation Dec 31	Participating Municipalities	Active Participants	Active Participants Annual Payroll	Annual Average Pay	Percent Increase in Average Pay	Participants on Deferred Status
2008	692	36,092	$1,624,855,145	$45,020	3.9%	6,662
2009	699	35,598	1,636,501,282	45,972	2.1%	6,726
2010	715	35,816	1,683,983,258	47,018	2.3%	6,961
2011	721	35,111	1,669,676,476	47,554	1.1%	7,160
2012	726	34,187	1,640,390,877	47,983	0.9%	7,262
2013	728	34,809	1,687,391,045	48,476	1.0%	7,620
2014	728	35,302	1,743,799,124	49,397	1.9%	7,690
2015	732	35,274	1,786,825,334	50,656	2.5%	8,340
2016	735	34,843	1,779,919,980	51,084	0.8%	8,252
2017	743	34,787	1,812,477,401	52,102	2.0%	8,361

Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

	Added to Rolls		Removed from Rolls	
Valuation Dec 31	Retirees/ Beneficiaries Number	Annual Allowance	Retirees/ Beneficiaries Number	Annual Allowance
2008	2,015	$43,573,642	783	$5,156,426
2009	1,871	36,164,024	773	4,545,379
2010	2,809	67,149,443	809	9,250,641
2011	2,212	50,594,419	940	11,072,125
2012	2,348	53,957,105	811	9,477,177
2013	3,578	73,762,997	857	11,138,379
2014	4,242	107,064,445	948	12,090,122
2015	2,714	68,984,180	1,001	13,947,540
2016	2,847	70,269,768	1,540	25,743,252
2017	2,479	60,140,628	1,105	16,084,776

	End-of-Year Rolls			
Valuation Dec 31	Retirees/ Beneficiaries Number	Annual Allowance	% Increase in Annual Allowance	Average Annual Allowance
2008	23,832	$391,959,046	10.9%	$16,447
2009	24,930	423,577,691	8.1%	16,991
2010	26,930	481,476,493	13.7%	17,879
2011	28,202	520,998,787	8.2%	18,474
2012	29,739	565,478,715	8.5%	19,015
2013	32,460	628,103,333	11.1%	19,350
2014	35,754	723,077,656	15.1%	20,224
2015	37,467	778,114,296	7.6%	20,768
2016	38,774	822,640,812	5.7%	21,216
2017	40,148	866,696,664	5.4%	21,588

SUMMARY OF PLAN DOCUMENT PROVISIONS

There were no recent changes in the nature of the Defined Benefit Plan that would have a material impact on the actuarial valuations for December 31, 2017. Pursuant to a collective bargaining agreement, a participating municipality may provide for retirement benefits that are modifications of some of the MERS standard retirement benefits otherwise included, although the Hybrid Plan is not modifiable. The actuary took the known modifications into consideration when determining the municipality contribution rates in the December 31, 2017 actuarial valuation.

The benefits summarized in this section are intended only as general information regarding MERS. The CAFR and valuation are not a substitute for the language of the MERS Act and the MERS Plan Document, as revised. If any conflict occurs between the information in this summary and the MERS Act or the MERS Plan Document, as revised, the provision of the Act and the MERS Plan Document govern.

The December 31, 2017 actuarial valuation was based on the provisions of the MERS Plan Document as of that date.

Defined Benefit Plan

Eligibility for Retirement

Monthly retirement payments are made over the lifetime of the retiree and/or over the lifetime of the beneficiary. Payments are based on the choice of benefits adopted by each municipality and the final payment option elected by the retiring participant.

Vesting occurs after 10 years of credited service unless the municipality selects a lesser number of years.

Members are eligible to retire after vesting and between the ages of 60 and 70. The municipality may choose other combinations of age and service such as age 55 and 15 years of service, age 50 and 25 years of service, etc.

Early retirement benefits are available if the vested member meets either the age 55 with 15 years of service or age 50 with 25 years of service eligibility requirements. The monthly payment is reduced (unless waived by the municipality) for each month the participant is younger than the age the unreduced retirement benefits are available.

Benefit Formula

The annual benefit equals a specified percentage of the participant's final average compensation, multiplied by the number of years and months of credited service. The plan has several benefit multipliers available. The benefit multipliers vary and are adopted by a participating municipality.

Mandatory Retirement

There is no mandatory retirement age; however, participants must take a required minimum distribution as required by law.

Deferred Retirement (Vesting)

Deferred retirement occurs when a participant leaves MERS covered employment after vesting, but before reaching the minimum retirement age. The participant or beneficiary will become eligible for the deferred allowance once eligibility requirements for retirement are met. However, the participant's contributions must remain on deposit with MERS.

Maximum Benefit Payable by MERS

The maximum benefit that may be paid by MERS is governed by Section 415 of the Internal Revenue Code (IRC). Benefits in excess of the maximum benefit will be paid by the MERS Excess Benefit Plan under Plan Section 88.

Act 88 (Reciprocal Retirement Act)

If a municipality elects to come under the provision of Act 88, service with former and future public employers in Michigan may be used to satisfy the eligibility requirements for that municipality.

Final Average Compensation

Final average compensation (FAC) is the highest monthly average of a participant's compensation over a consecutive period of months of credited service. The municipality selects the number of months. A FAC-3 is over a 36-month period, and a FAC-5 is over a 60-month period. The compensation used in calculating the final average compensation cannot exceed the limit set by IRC Section 401(a)(17).

Disability Retirement Allowance – Duty or Non-Duty

Duty disability retirement is available to a participant who becomes totally and permanently disabled while employed by a participating municipality after meeting the vesting requirement of the benefit program. The service requirement is waived if the disability is the natural and proximate result of a personal injury or disease arising out of and in the course of the participant's actual performance of duty with a municipality.

The allowance is computed in the same manner as a service retirement allowance, except that the reduction for retirement before age 60 is not applied.

If disability is duty-related, the amount of the retirement allowance shall not be less than 25% of the member's final average compensation.

Death Allowance – Duty or Non-Duty

If a participant or vested former participant with the minimum years of service required to be vested dies before retirement, a monthly survivor allowance may be made payable. If the participant is married, the spouse is the automatic beneficiary unless the spouse, in writing, declines a benefit in favor of another named beneficiary.

A survivor beneficiary will receive a retirement allowance computed in the same manner as a service retirement allowance, based on service and final average compensation at death, but reduced to reflect an Option II election. The reduction for retirement before age 60 is not applied. Payment to the survivor beneficiary of a deceased participant commences immediately. Payment to the survivor beneficiary of a deceased vested former participant commences on the date the participant would have first satisfied eligibility for retirement with an unreduced service retirement allowance.

If there is no named beneficiary and the participant leaves a spouse, the spouse will receive an Option II survivor allowance. The amount shall be 85% of the deceased participant's or the deceased former vested participant's accrued retirement allowance computed in the same manner as a service retirement allowance, based on service and final average compensation at the time of death.

Payment to the surviving spouse of a deceased participant commences immediately. Payment to the surviving spouse of a deceased former vested participant commences on the date the member would have first satisfied eligibility for retirement with an unreduced service retirement allowance. The amount of a surviving spouse's benefit is always the larger of (1) the benefit computed as a survivor beneficiary, and (2) the 85% of accrued retirement allowance benefit described above. If there is no named beneficiary and no retirement allowance being paid to a surviving spouse, unmarried children under 21 will be paid an equal share of 50% of the deceased participant's or the deceased former vested participant's accrued retirement allowance. The reduction for retirement before age 60 is not applied.

If no retirement benefits are payable on death, the beneficiary or, if none, the decedent's estate would receive a refund of any remaining participant's contributions.

A duty death allowance, computed in the same manner as a non-duty death allowance, may be payable to a spouse or child(ren) if death occurs as the natural and proximate result of a personal injury or disease arising out of and in the course of the participant's actual performance of duty with a municipality. The vesting requirement is waived, and the minimum benefit is 25% of the deceased participant's final average compensation.

Participant Contributions

Each participant may contribute a percentage of their annual compensation, if selected by the municipality, up to the compensation limit under Section 401(a)(17) of the Internal Revenue Code. The weighted average of participant contributions in 2017 was 4.29%. Interest is credited to accumulated participant contributions each December 31 at a rate determined by MERS. Currently MERS is using the 1-year U.S. Treasury bill rate determined as of December 31.

If a participant dies without a retirement allowance or other benefit payable on their account, the participant's accumulated contributions plus interest are refunded to the participant, if living, or to the participant's surviving spouse or a beneficiary named by the participant (with spousal consent). If a participant terminates employment, the participant may take a refund of participant contributions, while waiving any attributable service credit.

Post-Retirement Adjustments

Each municipality may elect to provide post-retirement adjustments to retirees and their beneficiaries. The municipality can choose a one-time adjustment, an annual adjustment for all retirees, or an adjustment for future retirees only. This cost-of-living adjustment (COLA) increase is effective in January of each year.

Forms of Benefit Payment

The participant elects a payment option as part of the retirement application process. Once the election is made, the selection is irrevocable after receipt of first payment. The payment options include:

- Straight Life paid over the retiree's life only
- A reduced benefit paid over the joint lives of the retiree and beneficiary, and continuing to the beneficiary if s/he survives the retiree. If the retiree survives the beneficiary, the retiree's benefit is prospectively converted to a straight life benefit.
- A reduced benefit paid over the life of the retirement, continuing as 75% or 50% of the original reduced amount for the life of the beneficiary if s/he survives the retiree. If the retiree survives the beneficiary, the retiree's benefit is prospectively converted to a straight life benefit.
- A reduced benefit paid to the retiree for life, and if the retiree dies before the number of monthly benefits elected at retirement (60, 120, 180, or 240) is reached, the reduced benefit continues to the beneficiary until the sum of the number of the monthly benefits paid to the retiree and to the beneficiary reaches the number elected at retirement.

Deferred Retirement Option Program (DROP): Traditional

If a participant is covered by the Benefit Program DROP and is eligible for retirement, they have the option to elect a specified DROP period in which they will cease to accrue any additional retirement benefits, but remain employed by the participating municipality or court. The member must elect a DROP end date at least six months after the beginning date, but no more than 60 months after the beginning date, in 1-month increments.

Upon the participant's election of DROP and the receipt of an application to enroll in DROP, MERS will calculate the participant's service retirement and benefit payment as of the beginning date. The System shall also calculate any age differential between the participant and the participant's beneficiary as of the calendar year of the DROP exit date in accordance with Treasury Regulation § 1.401(a)(9)-6. Upon the beginning date of the DROP period, the participant shall be responsible to continue paying participant contributions, if any.

On the next available benefit payment date after processing is complete, and monthly thereafter, an amount equal to 100% of the monthly service retirement benefit payment the participant would have received if he or she had retired as of the DROP beginning date will be credited to a notional account for the benefit of the participant. Funds in the DROP account are credited with interest in the amount of 3% annually, or prorated in the event of a DROP period that is less than 12 months.

Upon the end date, the participant shall receive a lump-sum distribution of the participant's DROP account and on the first day of the calendar month following end date, the participant will begin receiving monthly service retirement benefit payments.

Deferred Retirement Option Program (DROP+) Partial Lump Sum

If a participant is covered by the Benefit Program DROP+ and retires at least 12 months after first becoming eligible for unreduced benefits, they have the option to receive a partial lump sum and a reduced monthly benefit:

- The participant can elect a lump sum equal to 12, 24, 36, 48, or 60 times their monthly accrued benefit.
- For each 12 months included in the lump sum, the participant's lifetime benefit is reduced by the DROP+ percentage adopted by the employer. The employer can adopt any of the following DROP+ reduction percentages: 4, 5, 6, 7, or 8%.

As of June 30, 2013, Benefit Program DROP+ may no longer be adopted; 2 employers adopted the program prior to it ending.

Annuity Withdrawal

Under the Annuity Withdrawal Program, a retiring participant may elect to receive a refund of their accumulated participant contributions with interest in a lump sum at retirement. The participant's monthly pension would then be reduced by the actuarial equivalent of the lump sum payment. The employer has two options for the interest discount rate used to compute the actuarial equivalent reduction: the current investment return assumption used in the annual actuarial valuations or the most recent December 31 interest rate used for crediting interest on participant contributions.

HYBRID PLAN

Part I - Defined Benefit Portion of Hybrid Plan

Eligibility for Retirement
Monthly retirement payments are made over the lifetime of the retiree and/or over the lifetime of the beneficiary. Payments are based on the choice of benefits adopted by each municipality and the final payment option elected by the retiring participant.

Vesting occurs after six years of credited service.

Participants are eligible to retire at an age between 60 and 70, as selected by the participating municipality, or upon accruing 6 years of service, whichever is later.

Benefit Formula
The annual benefit equals a specified percentage of the participant's final average compensation multiplied by the number of years and months of credited service. Percentage options are 1.0, 1.25, and 1.5%, and may be selected by a participating municipality.

Mandatory Retirement
There is no mandatory retirement age; however, all benefits must commence by the required beginning dated determined under IRC Section 401(a)(9).

Deferred Retirement (Vesting)
Deferred retirement occurs when a participant leaves MERS covered employment after vesting, but before reaching the applicable retirement age. The participant or beneficiary will become eligible for the deferred allowance once eligibility requirements are met. However, the participant's contributions must remain on deposit with MERS.

Maximum Benefit Payable by MERS
The maximum benefit that may be paid by MERS is governed by Section 415 of the Internal Revenue Code (IRC). Benefits in excess of the maximum benefit will be paid by the MERS Excess Benefit Plan under Plan Section 88.

Act 88 (Reciprocal Retirement Act)
If the municipality has elected to come under the provision of Act 88, service with former and future public employers in Michigan may be used to satisfy the eligibility requirements for that municipality.

Final Average Compensation
Final average compensation (FAC) is computed using the FAC-3 under the Defined Benefit Plan. The compensation used in calculating final average compensation cannot exceed the limit set by IRC Section 401(a)(17).

Disability Benefit – Duty or Non-Duty
Benefits are the same as are provided in the Defined Benefit Plan, except that optional benefit program D-2 does not apply.

Death Allowance – Duty or Non-Duty
Benefits are the same as are provided in the Defined Benefit Plan, except that the optional benefit program D-2 does not apply.

Participant Contributions
In the event the municipality elects an employer cap under Plan Document section 66(3), each participant may contribute a percentage of their annual compensation, up to the compensation limit under IRC Section 401(a)(17). Interest is credited to accumulated participant contributions each December 31 at a rate determined by MERS.

Currently MERS is using the 1-year U.S. Treasury bill rate determined as of December 31.

If a participant leaves the municipality, or dies without a retirement allowance or other benefit payable on their account, the participant's accumulated contributions plus interest are refunded with spousal consent to the participant, if living, or to the participant's surviving spouse or a named beneficiary.

Post-Retirement Adjustments

There are no post-retirement adjustments within the Hybrid Plan.

Forms of Benefit Payment

The participant elects a payment option as part of the retirement application process. Once the election is made, the selection is irrevocable after receipt of first payment. The payment options include:

- Straight Life paid over the retiree's life only
- A reduced benefit paid over the joint lives of the retiree and beneficiary, and continuing to the beneficiary if s/he survives the retiree. If the retiree survives the beneficiary, the retiree's benefit is prospectively converted to a straight life benefit.
- A reduced benefit paid over the life of the retirement, continuing as 75% or 50% of the original reduced amount for the life of the beneficiary if s/he survives the retiree. If the retiree survives the beneficiary, the retiree's benefit is prospectively converted to a straight life benefit.
- A reduced benefit paid to the retiree for life, and if the retiree dies before the number of monthly benefits elected at retirement (60, 120, 180, or 240) is reached, the reduced benefit continues to the beneficiary until the sum of the number of the monthly benefits paid to the retiree and to the beneficiary reaches the number elected at retirement.

Deferred Retirement Option Program (DROP): Traditional

There is no DROP option in the Hybrid Plan.

Deferred Retirement Option Program (DROP+) Partial Lump Sum

There is no DROP+ option in the Hybrid Plan.

Annuity Withdrawal

There is no Annuity Withdrawal option in the Hybrid Plan.

Part II - Defined Contribution Portion of Hybrid Plan

Contributions — Employer

Any percentage of compensation that is allowed by federal law.
There are three vesting schedules from which an employer may choose to adopt:

- Immediate vesting upon participation
- 100% vesting after stated years (the maximum vesting period is 5 years)
- Graded vesting percentages per year of service (must be 100% vested after 6 years)

Contributions — Participant

Any percentage of compensation that is allowed by federal law and subject to procedures established by the Retirement Board. Participant contributions are vested immediately.

Note: The Annual Actuarial Valuation addresses assets and liabilities for participation under the MERS Defined Benefit Plan and the Defined Benefit portion of the Hybrid Plan. The Defined Contribution portion of the Hybrid Plan is not addressed in the valuation results

STATISTICAL

STATISTICAL SUMMARY

The Statistical Section provides pertinent information to assist readers when viewing the Financial Statements, Notes to the Financial Statements, and Required Supplementary Information to help in understanding and assessing the System's overall financial condition. The information reported here is in compliance with GASB Statement No. 44, Economic Condition Reporting: The Statistical Section. This statement establishes standardized reporting requirements for the supplementary information provided in this section.

The schedules and graphs beginning on the next page show financial trend information about the growth of the MERS assets for the past 10 years. These schedules provide detailed information about the trends of key sources of additions and deductions to the System's assets, and assist in providing a context framing of how MERS' financial position has changed over time. The financial trend schedules presented are:

- Changes in Fiduciary Net Position – Last 10 Years
- Schedule of Changes in Reserves

The next schedules show demographic, economic, operating, and trend information about the MERS environment.

- Schedule of Average Benefit Payments
- Schedule of Benefit Payments by Type
- Schedule of Retired Members by Type of Benefit
- Schedule of Retired Members by Type of Option Selected
- Defined Contribution Plan Participants, Defined Benefit Participants and Total MERS Participants

Changes in Fiduciary Net Position – Last 10 Years Ended December 31, 2018 (Dollars in Thousands)

Year	2009	2010	2011	2012
Defined Benefit Plan				
Additions:				
Plan Member Contributions	$62,677	$83,573	$64,790	$73,133
Employer Contributions	350,737	341,354	298,328	783,292
Net Investment Gain (Loss)	789,800	754,011	130,115	668,303
Total Additions to Plan Net Assets	**1,203,214**	**1,178,938**	**493,233**	**1,524,728**
Deductions:				
Benefits and Employee Refunds	419,576	461,204	505,854	565,695
Special Litigation Expense				
Administrative Expenses	19,254	21,340	22,514	24,483
Total Deductions from Plan Net Assets	**438,830**	**482,544**	**528,368**	**590,178**
Net Increase (Decrease)	764,384	696,394	(35,135)	934,550
Net Assets Held in Trust				
Balance Beginning of Fiscal Period	4,512,787	5,277,171	5,973,565	5,938,430
Balance End of Fiscal Period	**$5,277,171**	**$5,973,565**	**$5,938,430**	**$6,872,980**
Defined Contribution Plan				
Additions:				
Plan Member Contributions	$8,086	$8,694	$10,376	$1,997
Employer Contributions	21,994	26,374	22,079	40,103
Net Investment Gain (Loss)	39,951	28,971	1,862	38,552
Total Additions to Plan Net Assets	**70,031**	**64,039**	**34,317**	**80,652**
Deductions:				
Benefits and Withdrawals	8,868	10,902	19,901	18,532
Administrative Expenses			826	759
Total Deductions from Plan Net Assets	**8,868**	**10,902**	**20,727**	**19,291**
Net Increase (Decrease)	61,163	53,137	13,590	61,361
Net Assets Held in Trust				
Balance Beginning of Fiscal Period	183,613	244,776	297,913	311,503
Balance End of Fiscal Period	**$244,776**	**$297,913**	**$311,503**	**$372,864**
Health Care Savings Program				
Additions:				
Employer Contributions	$16,964	$11,651	$7,307	$10,742
Net Investment Gain (Loss)	2,978	4,055	918	5,406
Miscellaneous Income	263	377		
Total Additions to Plan Net Assets	**20,205**	**16,083**	**8,225**	**16,148**
Deductions:				
Medical Disbursements Paid	512	890	1,474	1,787
Forfeitures and transfers	322	458	16	300
Administrative Expenses	159	(439)	717	144
Total Deductions from Plan Net Assets	**993**	**909**	**2,207**	**2,231**
Net Increase (Decrease)	19,212	15,174	6,018	13,917
Net Assets Held in Trust				
Balance Beginning of Fiscal Period	14,469	33,681	48,855	54,873
Balance End of Fiscal Period	**$33,681**	**$48,855**	**$54,873**	**$68,790**

2013	2014	2015	2016	2017	2018
$88,410	$102,446	$86,553	$87,043	$88,192	$87,739
409,563	523,372	635,581	566,815	609,707	707,958
988,639	501,254	(140,903)	867,584	1,176,099	(394,517)
1,486,612	**1,127,072**	**581,231**	**1,521,442**	**1,873,998**	**401,180**
662,708	707,268	754,978	917,084	849,734	892,536
				4,250	
20,342	17,822	17,665	17,446	17,389	17,463
683,050	**725,090**	**772,643**	**934,530**	**871,373**	**909,999**
803,562	401,982	(191,412)	586,912	1,002,625	(508,818)
6,872,980	7,676,016	8,077,998	7,886,586	8,473,498	9,476,123
$7,676,542	**$8,077,998**	**$7,886,586**	**$8,473,498**	**$9,476,123**	**$8,967,305**
$20,370	$20,805	$23,496	$20,882	$22,259	$25,412
42,706	26,112	38,151	56,696	32,666	49,077
63,614	25,208	(7,482)	45,744	85,984	(41,168)
126,690	**72,125**	**54,165**	**123,322**	**140,909**	**33,321**
26,021	63,304	34,797	61,088	34,722	39,015
812	623	601	619	648	555
26,833	**63,927**	**35,398**	**61,707**	**35,370**	**39,570**
99,857	8,198	18,767	61,615	105,539	(6,249)
372,864	472,721	480,919	499,686	561,301	666,840
$472,721	**$480,919**	**$499,686**	**$561,301**	**$666,840**	**$660,591**
$12,164	$11,649	$20,275	$27,158	$23,477	$27,846
7,979	3,480	(1,779)	11,393	19,926	(6,817)
20,143	**15,129**	**18,496**	**38,551**	**43,403**	**21,029**
2,316	3,011	3,694	4,925	5,645	5,954
723	469	355			
125	163	145	165	187	168
3,164	**3,643**	**4,194**	**5,090**	**5,832**	**6,123**
16,979	11,486	14,302	33,461	37,571	14,906
68,790	85,769	97,255	111,557	145,018	182,589
$85,769	**$97,255**	**$111,557**	**$145,018**	**$182,589**	**$197,495**

Changes in Fiduciary Net Position – Last 10 Years Ended December 31, 2018 (Dollars in Thousands)

Year	2009	2010	2011	2012
Retiree Health Funding Vehicle				
Additions:				
Employer Contributions	$48,029	$52,613	$48,644	$78,809
Net Investment Gain (Loss)	23,525	29,278	6,820	36,770
Total Additions to Plan Net Assets	**71,554**	**81,891**	**55,464**	**115,579**
Deductions:				
Disbursements Paid to Municipalities	6,088	5,564	9,074	13,071
Transfers and Special Expenses	623	859		
Administrative Expenses	54	1,039	1,647	521
Total Deductions from Plan Net Assets	**6,765**	**7,462**	**10,721**	**13,592**
Net Increase (Decrease)	64,789	74,429	44,743	101,987
Net Assets Held in Trust				
Balance Beginning of Fiscal Period	118,415	183,204	257,633	302,376
Balance End of Fiscal Period	**$183,204**	**$257,633**	**$302,376**	**$404,363**
Investment Services Program				
Additions:				
Employer Contributions	$999			$700
Net Investment Gain (Loss)	3,376	$867	$162	791
Total Additions to Plan Net Assets	**4,375**	**867**	**162**	**1,491**
Deductions:				
Disbursements and Transfers	33,593			106
Administrative Expenses	4	250	28	11
Total Deductions from Plan Net Assets	**33,597**	**250**	**28**	**117**
Net Increase (Decrease)	(29,222)	617	134	1,374
Net Assets Held in Trust				
Balance Beginning of Fiscal Period	35,313	6,091	6,708	6,842
Balance End of Fiscal Period	**$6,091**	**$6,708**	**$6,842**	**$8,216**

2013	2014	2015	2016	2017	2018
$58,111	$64,161	$73,764	$71,741	$59,219	$88,650
59,826	32,947	(8,833)	70,585	107,415	(42,560)
117,937	**97,108**	**64,931**	**142,326**	**166,634**	**46,090**
14,341	9,556	22,002	24,893	12,286	35,004
4					
659	692	732	773	841	731
15,004	**10,248**	**22,734**	**25,666**	**13,127**	**35,735**
102,933	86,860	42,197	116,660	153,507	10,355
404,363	507,296	594,156	636,352	753,012	906,519
$507,296	**$594,156**	**$636,352**	**$753,012**	**$906,519**	**$916,874**

	$74,660	$19,721	$289	$142	
$1,148	2,781	138	6,699	7,385	$(2,035)
1,148	**77,441**	**19,859**	**6,988**	**7,527**	**(2,035)**
300	280	40,798	3,309	3,355	10,554
10	81	82	74	71	55
310	**361**	**40,880**	**3,383**	**3,426**	**10,609**
838	77,080	(21,021)	3,605	4,101	(12,644)
8,216	9,054	86,134	65,113	68,718	72,819
$9,054	**$86,134**	**$65,113**	**$68,718**	**$72,819**	**$60,175**

Changes in Fiduciary Net Position – Last 10 Years Ended December 31, 2018 (Dollars in Thousands)

Year	2009	2010	2011	2012
457 Program				
Additions:				
Employee Contributions				$8,170
Employer Contributions				
Net Investment Gain (Loss)				163
Total Additions to Plan Net Assets				**8,333**
Deductions:				
Benefits				21
Administrative Expenses				6
Total Deductions from Plan Net Assets				**27**
Net Increase (Decrease)				8,306
Net Assets Held in Trust				
Balance Beginning of Fiscal Period				
Balance End of Fiscal Period				**$8,306**
IRA Program				
Additions:				
Employee Contributions				
Employer Contributions				
Net Investment Gain (Loss)				
Total Additions to Plan Net Assets				
Deductions:				
Benefits				
Administrative Expenses				
Total Deductions from Plan Net Assets				
Net Increase (Decrease)				
Net Assets Held in Trust				
Balance Beginning of Fiscal Period				
Balance End of Fiscal Period				

The Changes in Fiduciary Net Position over the last 10 years chart shows contributions being received from municipalities, investment gains/losses and disbursements to retirees/municipalities. The 457 and IRA programs have been in existence for less than 10 years.

2013	2014	2015	2016	2017	2018
$4,582	$5,788	$12,442	$20,646	$22,566	$36,803
77	132				1,048
1,558	786	(747)	3,643	11,698	(7,729)
6,217	**6,706**	**11,695**	**24,289**	**34,264**	**30,122**
584	1,230	1,066	1,717	3,389	4,386
34	70	51	66	86	93
618	**1,300**	**1,117**	**1,783**	**3,475**	**4,479**
5,599	5,406	10,578	22,506	30,789	25,642
8,306	13,905	19,311	29,889	52,395	83,184
$13,905	**$19,311**	**$29,889**	**$52,395**	**$83,184**	**$108,826**

					$53
					(2)
					51
					5
					5
					46
					$46

Schedule of Changes in Reserves – Year Ended December 31, 2018 (Dollars in Thousands)

	Reserve for Employee Contributions	Reserve for Employer Contributions and Benefit Payments	Reserve for Expenses and Undistributed Investment Income	Total Reserve for Defined Benefit Plan
Additions				
Member Contributions	$87,739			$87,739
Employer Contributions		$707,958		707,958
Net Investment Income			$(394,743)	(394,743)
Miscellaneous Income			221	221
Total Additions	**87,739**	**707,958**	**(394,522)**	**401,175**
Deductions				
Benefits and Withdrawals	8,633	883,897		892,530
Administrative Expense			17,463	17,463
Total Deductions	**8,633**	**883,897**	**17,463**	**909,993**
Net Increase (Decrease)	79,106	(175,939)	(411,985)	(508,818)
Other Changes in Reserves				
Investment Income Allocations	20,632	(407,156)	386,524	
Retirement and Division Transfers	(64,993)	64,993		
Total Other Changes in Reserves	**(44,361)**	**(342,163)**	**386,524**	
Net Increase in Reserves After Other Changes	**34,745**	**(518,102)**	**(25,461)**	**(508,818)**
Reserve Balance Beginning of Year	848,518	8,591,683	35,922	9,476,123
Reserve Balance End of Year	**$883,263**	**$8,073,581**	**$10,461**	**$8,967,305**

The Schedule of Changes in Reserves shows the balance in each of the reserves and changes to those reserve balances over the year. The Employee Contributions, Employer Contributions and Reserve for Expenses and Undistributed Investment Income are components of the Defined Benefit Plan. A balance in the Reserve for Expenses and Undistributed Investment Income will be allocated at a future date.

Reserve for Defined Contribution	Reserve for Health Care Savings Program	Reserve for Individual Retirement Account	Reserve for Retiree Health Funding Vehicle	Reserve for Investment Services Program	Reserve for 457 Program	Total Reserve for Pension Trust Funds
$25,412		$53	$88,650		$36,803	$238,657
49,077	$27,846				1,048	785,929
(41,167)	(6,818)	(2)	(42,560)	$(2,036)	(7,729)	(495,056)
						221
33,322	**21,028**	**51**	**46,090**	**(2,036)**	**30,122**	**529,751**
39,015	5,954	5	35,004	10,554	4,386	987,449
555	168		731	55	93	19,065
39,570	**6,122**	**5**	**35,735**	**10,608**	**4,479**	**1,006,513**
(6,249)	14,906	46	10,355	(12,644)	25,642	(476,762)
						0
						0
						0
						0
(6,249)	**14,906**	**46**	**10,355**	**(12,644)**	**25,642**	**(476,762)**
666,840	182,589		906,519	72,819	83,184	11,388,074
$660,591	**$197,495**	**$46**	**$916,874**	**$60,175**	**$108,826**	**$10,911,312**

Schedule of Average Benefit Payments – Defined Benefit Plan

Valuation Date December 31	Number of Retirees and Beneficiaries	Average Yearly Benefit
2008	23,832	$16,447
2009	24,930	16,991
2010	26,930	17,879
2011	28,202	18,474
2012	29,739	19,015
2013	32,460	19,350
2014	35,754	20,224
2015	37,467	20,768
2016	38,774	21,216
2017	40,148	21,588

The Schedule of Average Benefit Payments shows the historical record and trends of retirees and the benefits they are drawing.

Schedule of Benefit Payments by Type – Defined Benefit Plan (Dollars in Thousands)

Fiscal Year Ended	Pension Benefits and Employer Withdrawals	Disability Benefits	Employee Refunds and Withdrawals	Total
December 31, 2009	$391,613	$18,254	$9,510	$419,377
December 31, 2010	433,778	19,415	7,006	460,199
December 31, 2011	476,993	20,812	7,915	505,720
December 31, 2012	535,900	21,284	8,052	565,236
December 31, 2013	631,906	20,913	9,889	662,708
December 31, 2014	670,032	27,959	9,277	707,268
December 31, 2015	715,638	31,364	7,976	754,978
December 31, 2016	870,741	35,829	10,514	917,084
December 31, 2017	802,037	37,250	10,432	849,719
December 31, 2018	845,688	38,209	8,633	892,530

The Schedule of Benefit Expenses by Type shows the benefits paid as regular pension benefits, disability benefits and refunds for employees who have been terminated and requested refunds of their employee contributions.

Schedule of Retired Members by Type of Benefit – Defined Benefit Plan
December 31, 2017, Tabulated by Optional Form of Benefit Being Paid, Tabulated by Type of Benefit Being Paid

Type of Benefit	Number of Retirees	Total Monthly Benefits
Normal Retirement for age and service	32,819	$63,667,496
Non-Duty Disability[1]	1,187	1,588,303
Duty Disability[1]	591	1,067,322
Beneficiaries[2]	4,665	4,920,659
Non-Duty Death	829	921,884
Duty Death	57	59,058
Totals	40,148	$72,224,722

[1] At age 60, these benefit types are converted to normal retirement for age and service
[2] Includes EDRO alternate payees

Schedule of Retired Members by Type of Option Selected – Defined Benefit Plan
December 31, 2017, Tabulated by Optional Form of Benefit Being Paid

Type of Benefit	Number of Retirees	Total Monthly Benefits
Beneficiary draws 100% of retiree's benefit	12,373	$23,338,574
Beneficiary draws 67% of retiree's benefit	3	$12,816
Beneficiary draws 75% of retiree's benefit	2,644	6,495,837
Beneficiary draws 60% of retiree's benefit	413	1,481,510
Beneficiary draws 50% of retiree's benefit	5,836	12,300,210
Equated Option (changing at Social Security age)	393	375,034
5 year certain and life	314	490,298
10 year certain and life	827	1,571,634
15 year certain and life	237	364,253
20 year certain and life	498	740,889
Straight life allowance	16,610	25,053,667
Totals	40,148	$72,224,722

The Schedule of Retired Members by Type of Benefit and by Type of Option Selected present distributions of retirees and beneficiaries on the rolls by the types of benefit being paid and option selected.

Defined Contribution Plan Participants and Total MERS Participants

	Number of Participants Total	Defined Benefit	% of Total	Defined Contribution	% of Total	Hybrid	% of Total
December 31, 2009	75,605	67,254	89.0%	8,351	11.0%	N/A	0.0%
December 31, 2010	78,343	69,707	89.0%	8,636	11.0%	N/A	0.0%
December 31, 2011	91,666	81,926	89.4%	9,193	10.0%	547	0.6%
December 31, 2012	93,462	82,331	88.1%	10,210	10.9%	921	1.0%
December 31, 2013	98,072	85,530	87.2%	11,340	11.6%	1,202	1.2%
December 31, 2014	101,589	87,661	86.3%	12,239	12.0%	1,689	1.7%
December 31, 2015	106,735	90,437	84.7%	13,912	13.0%	2,386	2.2%
December 31, 2016	108,412	91,125	84.1%	14,803	13.7%	2,484	2.3%
December 31, 2017	112,664	92,790	82.4%	16,819	14.9%	3,055	2.7%
December 31, 2018	116,840	94,089	80.5%	19,216	16.4%	3,535	3.0%

Although MERS Defined Contribution Plan participants are not included in the annual actuarial valuation of the MERS Defined Benefit Plan, the trend in Defined Contribution participation is of interest. Numerous municipal divisions have established Defined Contribution Plan benefits for future new employees. Existing Defined Benefit Plan active members in those divisions were offered a choice of plans. The table above shows recent participation trends in Defined Contribution and Hybrid Plans, and overall MERS participants.

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