

Annual Comprehensive Financial Report

for the years ended December 31, 2019 and 2018

PENNSYLVANIA MUNICIPAL RETIREMENT SYSTEM



The Pennsylvania Municipal Retirement System

Annual Comprehensive Financial Report
for the years ended December 31, 2019 and 2018

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Pennsylvania Municipal Retirement Board

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Report prepared by the Investment and Financial Management Division
of the Pennsylvania Municipal Retirement System

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Introduction

Vision & Mission

Vision

To be Pennsylvania local governments' pension administrator *of choice*.

Mission

The Pennsylvania Municipal Retirement System seeks to help Pennsylvania's local governments, regardless of size or resources, secure the future retirement of their employees by providing comprehensive, cost-efficient and professional pension administration services through a pension plan tailored to the participants' and sponsors' requirements.

Letter of Transmittal

November 15, 2021
Pennsylvania Municipal Retirement Board
Pennsylvania Municipal Retirement System
P.O. Box 1165
Harrisburg, Pennsylvania 17108-1165

We are pleased to present the Pennsylvania Municipal Retirement System's (PMRS) Annual Comprehensive Financial Report (ACFR) for the years ended December 31, 2019 and 2018. This report is intended to provide financial, investment, actuarial, and statistical information in a single publication. The PMRS' management is solely responsible for the accuracy and completeness of this report. As required by the Pennsylvania Municipal Retirement Law, Act of 1974, P.L. 34, No. 15 (the Act) as amended, PMRS makes available the ACFR to our governing board, the members of the General Assembly of Pennsylvania, each participating municipal employer, and all other interested parties upon request. It is also published at www.pmrs.state.pa.us.

OVERVIEW OF PMRS

PMRS is an agent multiple-employer system headquartered in Harrisburg, Pennsylvania. It is a state retirement agency created by act of the Pennsylvania General Assembly in 1974. Responsibility for the organization and administration of PMRS is vested in the 11-member Pennsylvania Municipal Retirement Board (the board).

PMRS administers sound, cost-effective pension plans on a contracted basis for local government employees throughout the commonwealth. Our services include accounting services, actuarial valuations, employee consultation, record keeping, and asset management. Any Pennsylvania county, city, town, township, borough, municipal authority, or institution supported and maintained by a municipality may participate. The Statistical section of this report lists all participating plans as of January 1, 2019.

PMRS offers two types of retirement plans: defined benefit (traditional pension) and cash balance; either plan can be used alone or in combination with each other. Plan sponsors determine key plan provisions allowable within federal guidelines and commonwealth law. These plan sponsor elections, combined with PMRS' standard plan provisions, determine each plan's unique design tailored to the plan sponsor's specific needs.

The plan design determines the type of plan and benefit options, the general level of plan funding requirements, the cost sharing between the employee and employer along with the employer's administrative complexity. For example, a standard comparative measure of a plan's retirement benefit level is income replacement of the percentage of an employee's final average salary that will be replaced by a plan's annual retirement benefits. Income replacement in PMRS plans ranges from 15% to 80% for employees with 30 years of service. Another comparative measure is total plan costs as a percentage of the total salary of a plan's active employees. PMRS plan costs range from 2% to 30% of total salary. Finally, plan design determines the plan cost sharing of the percentage of total plan costs paid by employers versus those paid by employees. Plan cost sharing for employees ranges from 0% to 60% of the plan's total cost while employer costs range from 40% to 100% of the plan's total cost.

ECONOMIC ENVIRONMENT

The economic expansion continued through 2019, making it the longest on record to date. However, some analysts view 2019 paradoxically. For example, the Federal Reserve cut interest rates despite continued strength from the U.S. economy

while fears of trade wars persisted. On the other hand, Gross Domestic Product (GDP) increased and unemployment remained low, indicating the economy was steady and solid.

Overall, the economy kept chugging along in the first quarter, with strong federal spending, robust exports, and personal consumption, though tempered somewhat by diminishing state and local spending. The ongoing U.S. trade war with China continued to loom, but a resolution seemed more likely. Meanwhile, the first quarter GDP continued a pattern of solid growth with a rate of 3.2%, improving from the 2018 fourth quarter 2.2% growth rate. Job growth averaged more than 180,000 per month during the first quarter, down from the 2018 monthly average of 223,000. Unemployment decreased to 3.8% from 4.1% in December 2018, an historic low. The Consumer Price Index (CPI) remained at 1.9% year-over-year. In monetary policy, the U.S. dollar weakened slightly relative to the euro. The Federal Reserve Bank maintained the federal funds rate at 2.5%. In equity markets, growth stocks continued to outperform value stocks with small cap stocks outperforming large. In the first quarter, the quarterly gross rate of return for PMRS' portfolio was 9.8%.

The second quarter brought some changes to the overall picture. Serious trade issues with China and higher net imports contributed to a slowing growth rate. GDP decreased to 2.1%, slowing markedly from the first quarter. Job growth was a pleasant surprise, with job gains averaging 171,000 hires per month for the quarter. Unemployment decreased slightly from the last quarter to 3.7%. The CPI fell to 1.6% probably reflecting higher income consumers' concerns stemming from the economic impact of the U.S.- China tariffs. The U.S. dollar was slightly stronger against the euro than in the previous quarter. Growth stocks continued to outperform value stocks with small cap stocks outperforming large cap stocks. The Federal Reserve Board announced it would maintain its federal funds rate at a range of 2.25% to 2.50%. In the second quarter, the quarterly gross rate of return for the PMRS' total portfolio was 3.3% and the year-to-date gross rate of return was 13.4%.

In the third quarter, GDP increased at a rate of 2.1%, a decline from the previous quarter rate. Some economists attributed this decline partly to a strike at General Motors which began in mid-September. Unemployment remained at 3.7%. The

CPI increased slightly to 1.7%. The U.S. dollar declined slightly relative to the euro in the third quarter. But the American consumer continued to be a bright spot for the economy. Real personal consumption expenditures rose at a 4.6% annual rate. In addition, real government consumption and gross investment grew robustly at both federal and state levels. Domestic equity markets ended the quarter slightly up with most of the gain attributed to large cap stocks. In monetary policy, the Federal Reserve Board lowered its benchmark interest rate twice in the quarter citing weaker global growth and modest inflation. The federal funds rate remained at 2.50%. In the third quarter, the quarterly gross rate of return for PMRS' portfolio was (.02%) and the year-to-date rate of return was 13.2%.

In the fourth quarter, the U.S. economy showed continued strength and stability as well as a resumption of asset price increases. Fourth quarter GDP declined slightly to 2.1%, but unemployment decreased to 3.5% from the third quarter. The CPI was 2.3% for the quarter. The U.S. dollar continued to strengthen in the fourth quarter. The domestic equity markets ended a strong 2019 with robust gains as trade uncertainty faded. Growth stocks still outpaced their value counterparts for the full year. International stocks also made strong gains during the quarter, with the top 14 weighted countries in the index all registering gains. The Federal Reserve Board cut the federal funds rate to a range of 1.5% to 1.75%. In the fourth quarter, the quarterly gross rate of return for PMRS' total portfolio was 7.0% in the fourth quarter bringing the year-to-date gross rate of return to 21.1%.

FINANCIAL INFORMATION

PMRS financial statements were prepared in accordance with generally accepted accounting principles of the U.S. The financial statements and the required supplementary information in the report have been prepared in accordance with governmental accounting standards. The independent auditor's report is in the Financial section on page 18 and the Management's Discussion and Analysis commences on page 21.

The accrual basis of accounting is used to record all financial transactions including assets, liabilities, revenues, and expenses. Gains and losses on sales and exchanges of investments are recognized on the transaction date. Significant accounting policies are detailed in the Financial section under Notes to Financial Statements.

PMRS' net position was \$2.792 billion at December 31, 2019. PMRS' net position increased by \$442.7 million or 18.8% from \$2.349 billion at December 31, 2018. Net investment gain increased the net position by \$480.3 million. Contributions increased the net position by \$84.8 million. Benefit payments, plan withdrawals, and administrative expenses reduced the net position by \$123.2 million. Additional information is detailed in the Financial section (Statement of Fiduciary Net Position and Statement of changes in Fiduciary Net Position) located on pages 25 and 26.

PMRS has established internal control policies and procedures for the review and verification of all receipts and payments made to and from PMRS. In addition, PMRS' staff prepared a yearly budget which must be adopted by the board. The budget is also presented to and reviewed by the Local Government Committees of the Pennsylvania House and Senate at least two months prior to the beginning of the year. The committees can approve the budget, reject it, or take no action by the end of the year in which case the proposed budget becomes final. Budgetary controls include monthly review and presentation by management with bimonthly board reviews. The 2019 administrative budget was adopted in September 2018 and set at \$9.5 million exclusive of investment fees. Expenses (exclusive of investment fees) in 2019 amounted to \$6.6 million. More information on PMRS expenses is included in the Financial section of this report (Supplementary

Schedule 1 – Administrative Expenses located on page 44.)

ADDITIONS TO FIDUCIARY NET POSITION

PMRS was established by law to pay pension benefits when due. It accumulates sufficient funds to pay benefits through employer contributions, employee contributions, and investment income. The following schedule presents a summary of additions to fiduciary net position for the year ended December 31, 2019 and shows the amount and percentage of increases and decreases in relation to the prior year ended December 31, 2018.

Municipal contributions are based on an actuarial valuation, using the Entry Age Normal Actuarial Cost Method, computed as a percentage of the total employee compensation of all active members during the period for which the amount is determined. Member contributions vary according to the type of pension plan.

Municipal and member contributions also include transfers from other plan administrators for new plans.

Contributions increased by \$1.1 million or 1.3% from \$84.6 million in 2018 to \$85.6 million in 2019. This is due to normal fluctuations in plan contributions.

Net investment income (loss) is a combination of earnings from equities, real estate, fixed income, and a short-term cash management fund less investment expenses. The fair value of PMRS'

SUMMARY OF ADDITIONS TO FIDUCIARY NET POSITION

As of December 31, 2019 and 2018
(amounts in thousands)

ADDITIONS TO FIDUCIARY NET POSITION	2019	PERCENTAGE OF TOTAL	2018	DOLLAR INCREASE (DECREASE)	PERCENTAGE INCREASE (DECREASE)
Contributions ⁽¹⁾	\$ 85,683	15.1%	\$ 84,555	\$ 1,128	1.3%
Net investment income (loss)	480,282	84.9%	(113,220)	593,502	524.2%
Total	\$ 565,965	100%	\$(28,665)	\$ 594,630	2074.4%

⁽¹⁾ Contributions included additional municipal employer contributions towards unfunded liability of \$4.7 million in 2019 and \$8.6 million in 2018 and transfers in lieu of contributions of \$544,153 in 2019.

SUMMARY OF DEDUCTIONS FROM FIDUCIARY NET POSITION

As of December 31, 2019 and 2018
(amounts in thousands)

DEDUCTIONS FROM FIDUCIARY NET POSITION	2019	PERCENTAGE OF TOTAL	2018	DOLLAR INCREASE (DECREASE)	PERCENTAGE INCREASE (DECREASE)
Annuity benefits and terminations	\$ 118,409	96%	\$ 107,644	\$ 10,765	(10%)
Transfers to other plan administrators	-	0%	160	(160)	100%
Administrative expenses	4,867	4%	5,770	(903)	15.6%
Total	\$ 123,276	100%	\$ 113,574	\$ 9,702	(8.5%)

investment portfolio increased from \$2.362 billion at December 31, 2018 to \$2.802 billion at December 31, 2019. Net investment income was \$480.3 million in 2019 compared to (\$113.2) million in 2018. Investment income (loss) is primarily attributable to appreciation (depreciation) in fair values in the equity markets.

Each municipality is charged a \$20 assessment per member to help cover administrative expenses incurred by PMRS. Any fluctuation in assessment is caused by the number of members per municipality and can be affected by employee turnover or new plans being added or plans withdrawing from PMRS.

A breakdown of PMRS' additions to fiduciary net position including 10-year historical trend information is presented in Part I of the Statistical section of this report.

DEDUCTIONS FROM FIDUCIARY NET POSITION

PMRS' primary deductions from fiduciary net position represent the purpose for which it was created: payment of plan benefits. The schedule on page 74 presents a summary of PMRS' deductions from fiduciary net position for the year ended December 31, 2019 and shows the amount and percentage of increases and decreases in relation to the prior year ended December 31, 2018. The major deduction for 2019 was annuity benefits and terminations. Transfers to other plan administrators decreased from \$159,701 in 2018 to \$0 due to no plan withdrawals in 2019.

A breakdown of PMRS' deductions from fiduciary net position including 10-year historical trend information is presented in Part I of the Statistical section of this report.

INVESTMENT HIGHLIGHTS

For the year ended December 31, 2019, the gross rate of return for PMRS' total portfolio was 21.1%, ranking in the top 15th percentile of the Investment Metrics (IM) Public Fund Universe. For the five years ended December 31, 2019, the gross rate of return was 8.4%, ranking in the top 5th percentile. Since inception in December 1985, the gross rate of return for PMRS' total portfolio was 8.9%.

The gross rate of return by asset class for the year ended December 31, 2019 and the allocation of assets in the portfolio as of December 31, 2019 are as follows: large cap equity returned 35.4% (26.6% of the portfolio); small cap equity returned 28.7% (14.3%); developed international equity returned 29.3% (15.4%); emerging markets equity returned 18.4% (9.9%); real estate returned 5.3% (17.8%);

and fixed income returned 8.8% (14.4%). At December 31, 2019, the allocation of assets in the portfolio for cash equivalents was 1.6%.

FUNDING

PMRS' level of funding is based on the actuarial reserve method. Funds are derived from the excess of revenues over expenses and are accumulated by PMRS to meet current and future benefit obligations to retirees and beneficiaries. As the funding level increases, the assets accumulate and strengthen the investment income potential. PMRS' net position increased by \$442.7 million or 18.8% from \$2.349 billion at December 31, 2018 to \$2.792 billion at December 31, 2019. The "Funded Status of Actuarial Liabilities" was calculated based on the most recent actuarial valuation dated January 1, 2019. The actuarial value of assets funded ratio increased from 100.2% at January 1, 2018 to 100.4% as of the last valuation date of January 1, 2019. As a result, PMRS went from a \$3.6 million surplus as of January 1, 2018 to a surplus of \$8.8 million as of January 1, 2019. The surplus is primarily due to favorable investment gains during 2019. Additional information on PMRS' actuarial value, liabilities, and funding progress can be found in the Actuarial and Financial sections of this report. As an agent multiple-employer public employee retirement system, PMRS reports to each of the plans it administers, providing the governing authority of plans with complete actuarial, accounting, and funding data. Detailed information of PMRS' aggregate plan funding can be found in the Actuarial section of this report beginning on page 57.

MAJOR INITIATIVES

CPAS Plan Administration Software Project

When this software enhancement began in early 2016, it was estimated to be an 18-24-month project. It has now become a seven-year project. The first phase in January 2020 started the use of the enhanced software for the daily administration of PMRS retirement plan program.

The second phase occurs into 2021, improving the administrative functionality of the enhanced software. This phase includes correcting conversion issues, expanding plans' provision options, improving calculation functions, creating a case management workflow and developing automated communications for members.

Phase three is scheduled to begin in 2022 to implement the plan sponsor employer portal and

automate the transfer of financial data to the accounting system. This phase will begin onboarding employers with online access and training to upload most information that is now submitted by paper.

This includes employee salary, contribution data, and new enrollments. Automation of financial data will improve the accuracy and timeliness of accounting and eliminate manual downloads and uploads between the systems and manipulation of the data.

The final phase will implement the member portal and is on the project schedule for 2023. This will enable members to change personal information, such as address, banking information and beneficiaries online. Also included will be the ability to create-on-demand retirement estimates.

Accounting Software Project

The accounting software project was planned in two phases, implementation of Microsoft Dynamics 365 core accounting functions and implementation of additional modules such as procurement, budgeting, and fixed assets. Reconciliation issues between the pension administration and the accounting systems delayed this implementation however, the core accounting functions, fixed assets and procurement modules went live in 2021. The final phase of this project will be completed in 2022 with the automated transfer of general ledger data between the pension administration system and the accounting systems as well as the implementation of a budgeting module.

Electronic Content Management (ECM) System Project

The ECM system will provide enhanced document search and retrieval for converted electronic files, online access to new and existing stored information by plan sponsors and plan members within the pension administration system, and secure integration of PMRS financial records with Microsoft Dynamics 365 accounting system. The software will be installed and configured for use with the pension administration system and the accounting system. The production environment was completed in early 2021 and the disaster recovery environment will be completed in late 2021.

Disaster Recovery

As of the time PMRS started using the updated pension software and financial system in January 2020, PMRS had all critical technology systems hosted off-site, with a secure facility providing PMRS with expert database management. All PMRS' staff have been provided with laptop devices enabling

PMRS to operate in any internet available location for an unlimited period.

IRS Compliant Plan Documents

During 2019, PMRS continued to implement a comprehensive overhaul of plan documents to become fully IRS compliant. The goal is to convert all existing plan documents to comply with IRS requirements by the second quarter of 2020.

PROFESSIONAL SERVICES

Professional consultants are appointed by the board to perform services essential to the efficient operations of PMRS. An annual audit by an independent certified public accounting firm and an annual valuation by an actuarial consultant attest to the financial and actuarial soundness of PMRS. The investment performance of PMRS is reviewed by the investment consultant on a quarterly basis. The consultants providing services to PMRS are listed in the Financial Section and Investment section of this report.

PMRS AWARDS

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to PMRS for its Annual Comprehensive Financial Report for the year ended December 31, 2018. The Certificate of Achievement is a prestigious national award recognizing conformance with the highest standards for preparation of state and local government financial reports. To be awarded a Certificate of Achievement, a government unit must publish an easily readable and efficiently organized annual comprehensive financial report whose contents conform to program standards. Such an annual comprehensive financial report must satisfy both generally accepted accounting principles and applicable legal requirements.

Its attainment represents a significant accomplishment by PMRS, whose Investment and Financial Division holds general responsibility for the compilation and validity of the financial data presented in the Annual Comprehensive Financial Report.

PMRS believes the current report continues to conform to the Certificate of Achievement program requirements, however the extended software implementation issues exceeded the usefulness of the GFOA input to improve the next report. We will not be submitting this report to the GFOA for the

2019 award.

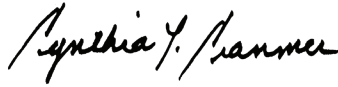
ACKNOWLEDGMENTS

The preparation of this report reflects the combined efforts of PMRS' staff under the direction of the board. It is intended to provide complete and reliable information in conformance with accepted standards and to document responsible stewardship of PMRS' assets.

Respectfully submitted,



Doug Baker,
PMRS Assistant Secretary
of Operations



Cynthia T. Crammer, CPA
PMRS Chief Financial
Officer

Certificate of Achievement



Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Pennsylvania Municipal Retirement System

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

December 31, 2018

Christopher P. Morill

Executive Director/CEO

Administrative Organization

Pennsylvania Municipal Retirement Board

As of December 31, 2019



Barry L. Sherman, Chair
*Represents retired members
enrolled in PMRS*



Cory S. Adams, Vice Chair
*Represents Pennsylvania
State Association of
Township Commissioners*



Joe Torsella
State Treasurer (ex-officio)



Kathy Boockvar
*Secretary of the Commonwealth
(ex-officio)*



Robert McCarron
*Represents active police
officers enrolled in PMRS*



Mike Stender Jr.
*Represents active firefighters
enrolled in PMRS*



Salvatore J. Panto Jr.
*Represents Pennsylvania
Municipal League*



Tom Deitzler
*Represents Pennsylvania
Municipal Authorities Association*



Jeff Pisarcik
*Represents Pennsylvania
State Association of County
Commissioners*



Jody Rebarchak
*Represents Pennsylvania
State Association of
Township Commissioners*



John Cappawana
*Represents Pennsylvania State
Association of Boroughs*

Staff, Consultants, and Managers

As of December 31, 2019

ADMINISTRATIVE STAFF

Secretary

Stephen W. Vaughn

Chief Financial Officer

Charity D. Rosenberry

Assistant Secretary of Programs

Vacant

Assistant Secretary of Operations

Doug E. Baker

PROFESSIONAL CONSULTANTS

Actuary

Cheiron | McLean, VA

Kenneth Kent, FSA, FCA, MAAA, EA

Auditor

Zelenkofske Axelrod LLC | Harrisburg, PA

Cory Johnson, CPA, Partner

Comptroller

Commonwealth of Pennsylvania | Harrisburg, PA

Brian Lyman, Chief Accounting Officer

Legal Counsel

Commonwealth of Pennsylvania | Harrisburg, PA

Brian Zweischer, Chief Counsel

Investment Consultant

Dahab Associates, Inc. | Bay Shore, NY

Richard E. Dahab, CFA, Chairman

Custodian

State Treasurer | Harrisburg, PA

Joe Torsella, State Treasurer

Sub-Custodian

BNY Mellon | Pittsburgh, PA

Matthew J. Coburn, Relationship Manager

INVESTMENT MANAGERS

AMI Asset Management

Los Angeles, CA

Chris Sessing, CFA, Chief Investment Officer

Copeland Asset Management

Conshohocken, PA

Mark Giovanniello, CFA, Chief Investment Officer

Eagle Capital Management, LLC

New York, NY

John Johnson, Managing Director

Emerald Advisors, Inc.

Leola, PA

Kenneth Mertz II, CFA, President/Chief Investment Officer

Federated Investors, Inc.

Pittsburgh, PA

Amy Michaliszyn, Senior Vice President

Forest Investment Associates

Atlanta, GA

Michael L. Clutter, Vice President

Hardman Johnston Global Advisors

Stamford, CT

James Pontone, Director and Portfolio Manager

HGK Asset Management, Inc.

Jersey City, NJ

Matthew Kosara, CFA, Client Portfolio Manager

Jarislowsky, Fraser Limited

Montreal, QC

Dario Mazzarello, Managing Director

LSV Asset Management

Chicago, IL

Keith W. Bruch, CFA, Director of Client Portfolio Services

Nuveen Real Estate

New York, NY

Cindy Chen, Senior Director, Portfolio Management

Polen Capital Management

Boca Raton, FL

Jim Haymes, CFA, Director of Institutional Relations

Prudential Financial, Inc.

Madison, NJ

Jackie Brady, Executive Director

Smith, Graham & Co.

New York, NY

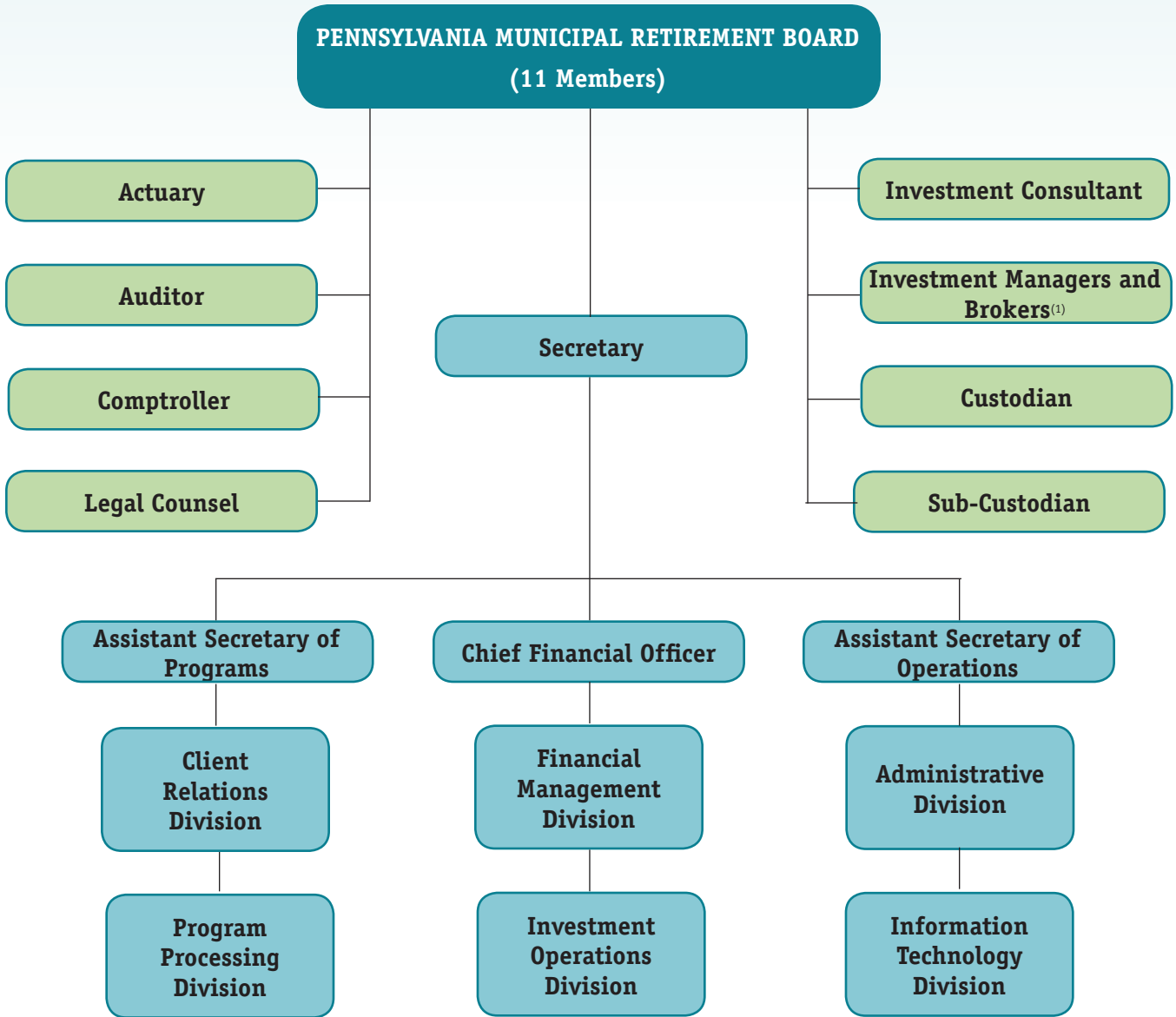
Lynda Leslie, Senior Vice President

State Street Global Advisors

Boston, MA

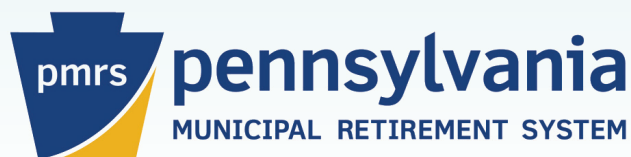
Emiliano Rabinovich, Vice President

Organizational Chart



(1) Investment managers, summary of investment expenses, brokers, and summary of commissions paid are provided in the Investments section of this ACFR.

Chairman's Report



November 15, 2021

Dear Members,

On behalf of the Pennsylvania Municipal Retirement Board, the staff of PMRS, and the citizens of the Commonwealth of Pennsylvania, thank you for dedicating your career to public service in Pennsylvania's communities. We have been living in uncertain times and your work provides stability, continuity, and safety for our families and neighbors.

I am pleased to share PMRS' Annual Comprehensive Financial Report for the years ended December 31, 2018 and 2019. The contents of this report re-affirm the system's strong financial position and unprecedented efforts to modernize operations to better serve you. I encourage you to read it in full.

When you do, I believe that you will realize that you are in excellent company. You are one of nearly 17,000 PMRS members who is working or has worked for one of more than 1,000 units of government to provide direct support to citizens. The average annual salary of all PMRS' active members is just about \$53,400 and, of PMRS' more than 9,000 active members, roughly 20% have earned 20 or more years of service. In 2019, 429 members retired and received average payments of more than \$1,500 per month.

PMRS remains one of the best funded, most stable municipal systems in the country with a total assets-to-liabilities ratio of 100.4%. On your behalf, PMRS managed an investment pool of \$2.8 billion in 2019. This sum reflects your contributions, your employers' contributions, and investment growth over time, among other funds. Net of fees, this report reveals that the fund earned a 20.5% rate of return at year end. It is reassuring to know that we have a strong foundation on which to weather current events.

Modernization efforts did pose challenges to PMRS' operations in 2019. We underestimated the disruption and delay of PMRS far-reaching digital infrastructure. Thank you for your patience.

I am always grateful for the support and dedication of my fellow Municipal Retirement Board members. Without compensation, each invests substantial skill, energy, and time throughout the year to oversee and guide the system. Our position would not be nearly as strong without their commitment to each of you.

Finally, I thank the PMRS staff and the transparency and openness with which they approach their work. The more you know about the agency, the more I believe you will appreciate it.

As always, please contact us if you have any questions, comments, concerns, or suggestions. We welcome your involvement and appreciate your support.

Thank you for allowing us to serve you.

Respectfully submitted,

A handwritten signature in black ink that reads "Barry L. Sherman".

Barry L. Sherman

Chairman

Summary of Plan Provisions

INTRODUCTION

PMRS offers a variety of alternative pension plans. Municipalities may design their own pension benefit structures. Most municipalities select this option and work with PMRS to create a combination of benefits that meet the individual needs of the municipality and its employees.

SUPERANNUATION AND EARLY ANNUITY ELIGIBILITY BENEFITS

Under an optional plan design, a municipality may choose any age or service requirement permitted under its particular municipal code. Early retirement under the optional plan may also be designed to meet the needs of the municipality.

There are two approaches to accumulating retirement benefits. Under the cash balance approach, the benefit accrues based on the level of contributions and the investment earnings credited to the fund. The defined benefit approach depends upon the individual's age, years of credited service, and an actual benefit formula which usually includes a salary factor.

DISABILITY ANNUITY ELIGIBILITY BENEFITS

The majority of plans have a disability benefit that allows a member who is unable to work because of serious injury or illness to apply for a disability annuity. The application and required medical documentation will be reviewed by the board and PMRS medical examiners to determine whether the member is eligible for the disability benefit.

A disability caused directly from a job related activity is classified as a service-connected disability. A disability that is not caused by job activity is termed a non-service disability.

Conditions for disability benefits are defined in the municipality's contract. PMRS basic plans provide for (1) a service-connected disability annuity of 50% of the disabled individual's final average salary offset by worker's compensation, and (2) a non-service disability with a minimum of 10 years service and a 30% final average salary annuity.

VESTING ANNUITY ELIGIBILITY BENEFITS

Conditions for vesting are defined in the municipality's contract.

A member who terminates service before retirement and is eligible to vest may elect to leave their accumulated contributions in PMRS and defer receipt

of benefits until normal retirement age. Then, when the member receives the vested benefits, the payment will include the member contributions and the municipal contributions.

BENEFIT PAYMENT OPTIONS

Depending on the municipality's contractual agreement, employees may elect to receive their monthly retirement allowance from a list of options. Typical options are as follows:

- **Single Life Annuity:** Provides a continual income throughout the annuitant's lifetime with no beneficiary benefit
- **Option 1:** Reduced lifetime benefit with remaining lump sum value of account to beneficiary
- **Option 2:** Joint and 100% survivorship annuity
- **Option 3:** Joint and 50% survivorship annuity

DEATH BENEFIT ELIGIBILITY

A death benefit provides some continuation of payment or presentation of benefits to a beneficiary given certain eligibility requirements of the covered individual. If an active member or vestee with minimum years of service dies, the death benefit goes into effect provided the municipality has included this feature in its plan.

TERMINATION OF SERVICE

A member always receives the accumulated deductions and interest earned at the regular interest rate which is currently 5.25%. Depending upon the municipality's contract structure, the member might also receive excess investment monies upon withdrawal.

If a member terminates employment and goes to work for another municipality which is a member of PMRS, the employee may transfer the service credits unimpaired to the new municipal employer.



Financial

Independent Auditors' Report



Zelenkofske Axlerod LLC

CERTIFIED PUBLIC ACCOUNTANTS

EXPERIENCE | EXPERTISE | ACCOUNTABILITY

Pennsylvania Municipal Retirement Board
Pennsylvania Municipal Retirement System
Harrisburg, Pennsylvania

INDEPENDENT AUDITOR'S REPORT

Report on the Financial Statements

We have audited the accompanying financial statements of the Pennsylvania Municipal Retirement System (the System), as of and for the year ended December 31, 2019, and the related notes to the financial statements, which collectively comprise the System's financial statements as listed in the table of contents.

The comparative information presented herein as of and for the year ended December 31, 2018, was audited by another auditor, and accordingly we express no opinion and provide no assurance on it.

Management's Responsibility for the Financial Statements

The System's 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. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of System, as of December 31, 2019, and the respective changes in financial position, for the year then ended in accordance with accounting principles generally accepted in the United States of America.

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3800 McKnight East Drive, Suite 3805, Pittsburgh, PA 15237
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Pennsylvania Municipal Retirement Board
Pennsylvania Municipal Retirement System

Adoption of Governmental Accounting Standards Board Pronouncements

As described in notes to the financial statements, in 2019 the System adopted the provisions of Governmental Accounting Standards Board's ("GASB") Statement No. 95, "*Postponement of the Effective Dates of Certain Authoritative Guidance*". Our opinion is not modified with respect to this matter.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, schedules of investment returns, allocated share of the net pension liability, allocated share of the net OPEB liability, and pension and OPEB contribution schedules, as listed in the table of contents, be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the 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 System's financial statements. The Schedule 1 – Administrative Expenses, Schedule 2 – Investment Expenses, and Schedule 3 – Payments to Consultants ("supplementary schedules") and the introduction, investments, actuarial and statistical sections, as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the financial statements.

The supplementary schedules are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the financial statements. Such information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the supplementary schedules are fairly stated, in all material respects, in relation to the financial statements as a whole.

The introduction, investments, actuarial and statistical sections, as listed in the table of contents, have not been subjected to auditing procedures applied in the audit of the financial statements, and accordingly we do not express an opinion or provide any assurance on them.

Zelenkofske Axlerod LLC
ZELENKOFKSKE AXELROD LLC

Harrisburg, Pennsylvania
November 15, 2021

Management's Discussion and Analysis

This section presents management's discussion and analysis of PMRS' financial performance for the years ended December 31, 2019, 2018 and 2017. It is presented as required supplementary information to the financial statements.

OVERVIEW OF FINANCIAL STATEMENTS

PMRS administers sound, cost-effective pension plans on a contracted basis for local government. Our services include accounting, actuarial valuations, employee consultation and record keeping, and asset management. Any Pennsylvania county, city, town, township, borough, municipal authority, or institution supported and maintained by a municipality may participate. The Statistical section of this report lists all participating plans as of January 1, 2019.

The **Statement of Fiduciary Net Position** provides a snapshot of the financial position of PMRS at December 31, 2019, including comparative amounts for the prior year.

The **Statement of Changes in Fiduciary Net Position** summarizes PMRS' financial activities that occurred for the year ended December 31, 2019, including comparative amounts for the prior year.

The **Notes to Financial Statements** provide additional information that is essential for a full understanding of financial statements. The notes are an integral part of the financial statements and include detailed information not readily evident in the financial statements.

The **Required Supplementary Information** following the Notes to the Financial Statements provides a schedule of investment returns and a schedule of net other post-employment benefit (OPEB) liability.

The remaining supplementary schedules provide additional detailed information concerning the administrative expenses, investment expenses and payments to consultants. Supplementary information is considered useful in understanding

and evaluating the financial activities of PMRS.

FINANCIAL HIGHLIGHTS

- PMRS' net position increased by \$442.7 million or by 18.8% from \$2.349 billion at December 31, 2018 to \$2.792 billion at December 31, 2019. PMRS' net positions decreased by \$142.2 million or by 5.7% from \$2.491 billion at December 31, 2017 to \$2.349 billion at December 31, 2018. Changes in fair value are recognized as part of the net appreciation/depreciation in the fair value of investments.
- The actuarial value of assets funded ratio increased from 100.2% at January 1, 2018 to 100.4% as of the last valuation date of January 1, 2019. PMRS went from a \$3.6 million surplus on an actuarial value of assets basis as of January 1, 2018 to a surplus of \$8.8 million as of January 1, 2019.
- The market value of assets funded ratio decreased from 103.8% at January 1, 2018 to 93.2% as of the last valuation date of January 1, 2019. The deficit increased from \$90.7 million as of January 1, 2018 to a deficit of \$107.8 million as of January 1, 2019. This change was primarily due to the negative (-4.6%) money-weighted investment return during 2018.
- The market value of assets did not exceed the reserves as of January 1, 2019. As of January 1, 2020, the market value of assets exceeded the reserves. Upon publication of the 2019 Annual Comprehensive Financial Report, the actuary will present to the board the calculations defined in Board Policy Statement 05-2 related to excess interest.
- The portfolio gross rate of return for the year ended December 31, 2019 was 21.1% compared to (4.1%) and 18.4% for the years ended December 31, 2018 and 2017, respectively.
- Contributions increased by \$1.1 million or 1.3% from \$84.5 million in 2018 to \$85.6 million in

2019 representing relatively flat growth for the year. Contributions increased by \$9.1 million or 12.1% from \$75.4 million in 2017 to \$84.5 million in 2018 attributed to three plans contributing \$8.6 million to reduce their unfunded liability.

- Annuity benefits and terminations increased \$10.8 million or 10.0% from \$107.6 million in 2018 to \$118.4 million in 2019. Annuity benefits and terminations increased by \$5.3 million or 5.2% from \$102.3 million in 2017 to \$107.6 million in 2018. The fluctuations in annuity benefits and terminations from 2017 to 2019 were primarily due to an increased number of retirees and annuity benefits as well as annuity increases (cost-of-living adjustments) that may be applied each year.
- Transfers to other plan administrators decreased from \$159,701 in 2018 to \$0 in 2019 due to decreased plan withdrawals. Transfers from other plan administrators increased from \$0 in 2018 to \$544,153 in 2019 due to an increase in plan admissions.
- Administrative expenses decreased by \$903,542 or 15.7% in 2019 from \$5.8 million in 2018 to \$4.9 million in 2019 primarily due to a decrease in personnel in 2019. Administrative expenses increased by \$272,026 or 4.9% from \$5.5 million in 2017 to \$5.8 million due to increases in IT consulting expenses. Administrative expenses were within PMRS' budgeted amounts for all three years.

GASB STANDARDS

PMRS adopted the provision of GASB Statement No. 95, "Postponement of the Effective Dates of Certain Authoritative Guidance." The adoption of this statement resulted in PMRS postponing the effective dates of certain authoritative guidance.

FUNDED STATUS

PMRS uses an actuarial reserve method of funding that is financed by member contributions, employer contributions and earnings from invested assets. Actuarial valuations are performed bi-annually for PMRS' member municipalities as prescribed by Act 205 (Act 293 for County Plans).

The January 1, 2019 actuarial liabilities for municipal defined benefit and cash balance pension plans are based on the actuarial valuation as of that date. This actuarial valuation includes the calculation of the actuarially determined contributions for calendar years 2021 and 2022 for the 723 defined benefit municipal plans. The

actuarial liabilities for the county plans were rolled forward one year using accepted actuarial methods from January 1, 2018 to January 1, 2019. Rolled forward liabilities reflect expected accruals, material plan changes, interest, and benefit payments during the year.

The January 1, 2020 actuarial liabilities for the county defined benefit pension plans are based on the actuarial valuation as of that date. This actuarial valuation includes the calculation of the actuarially determined contributions for 2022 and 2023. The actuarial liabilities for the municipal plans were rolled forward from January 1, 2019 to January 1, 2020 using similar techniques as described above.

As part of a valuation, the progress toward funding pension obligations of the retirement system is measured by comparing the actuarial value of assets to the actuarial accrued liability. This measurement is referred to as the funded ratio or funded status. The most recent actuarial valuation reports PMRS is 100.4% funded as of January 1, 2019.

INVESTMENTS

PMRS is a long-term investor and the board manages the assets with long-term objectives in mind. A primary element of PMRS' investment philosophy is that diversification among various asset classes is the best way to achieve its goals. PMRS makes estimates of future long-term market returns and establishes an asset allocation plan considering the risk associated with each asset class as well as the financial objectives of the fund.

For the year ended December 31, 2019, the PMRS' gross rate of return was 21.1%. The gross rate of return over the past three and five years ended December 31, 2019 was 11.2% and 8.4%, respectively.

SHORT TERM

Short-term investments decreased by \$25.3 million or 36.8% from \$68.9 million at December 31, 2018 to \$43.6 million at December 31, 2019. Short-term investments increased by \$7.8 million or 12.8% from \$61.1 million at December 31, 2017 to \$68.9 million at December 31, 2018. The annual fluctuations represent the normal cash flow necessary to meet operating expenses.

FIXED INCOME

Fixed income increased by \$55.8 million or 16.1% from \$347.2 million at December 31, 2018 to \$403.0 million at December 31, 2019. Fixed income increased by \$149,827 from \$347.1 million at

December 31, 2017 to \$347.2 million at December 31, 2018. The increase is primarily due to favorable market appreciation.

COMMON AND PREFERRED STOCK

Common and preferred stock including international stock increased by \$396 million or 27.2% from \$1.460 billion at December 31, 2018 to \$1.856 billion at December 31, 2019 primarily due to changes in fair value. Common and preferred stock including international stock decreased by \$198.9 million or 12.0% from \$1.659 billion at December 31, 2017 to \$1.460 billion at December 31, 2018 primarily due to changes in fair value.

REAL ESTATE

Real estate increased by \$13.7 million or 2.8% from \$486.3 million at December 31, 2018 to \$500.0 million at December 31, 2019 primarily due to changes in fair value. Real estate increased by \$47.7 million or 10.9% from \$438.6 at December 31, 2017 to \$486.3 million at December 31, 2018 primarily due to changes in fair value.

CONTRIBUTIONS AND INVESTMENT INCOME

Contributions increased by \$1.1 million or 1.3% from \$84.5 million at December 31, 2018 to \$85.6 million at December 31, 2019. Municipal contributions decreased in 2019 by \$838,594 reflecting increasing municipal contributions despite the decline in contributions toward unfunded liabilities decreasing from \$8.6 million in 2018 to \$4.7 million in 2019. Additional contributions in 2019 include increase member contributions of \$1.3 million and transfers from other plans of \$554,153. Contributions increased by \$9.1 million or 12.1% from \$75.4 million in 2017 to \$84.5 million in 2018. This was due to municipalities contributing an additional \$8.6 million toward unfunded liabilities in 2018.

Net investment gain was \$480.3 million in 2019 compared to net investment loss of (\$113.2) million in 2018 and net investment income of \$379.9 million in 2017. Investment income (loss) is primarily attributable to appreciation (depreciation) in fair values in the equity markets.

Investment expenses increased by \$13,000 or 0.11% from \$12.305 million in 2018 to \$12.318 million in 2019. Fluctuations in the fair market value of assets account for annual differences in the investment

expenses. Investment expenses were \$11 million in 2017. The investment expenses are based on the fair value of the quarterly average balance of investments under management.

PENSION PLAN BENEFITS AND EXPENSES

Annuity benefits and terminations were \$118.4 million in 2019 compared to \$107.6 million in 2018 and \$102.3 in 2017. Annuity benefits and terminations increased in all three years primarily due to an increased number of retirees and annuity benefits as well as annuity increases (cost-of-living adjustments) that may be applied each year. Annuity benefits excluding death payments were \$105.6 million in 2019 compared to \$97.1 million in 2018 and \$91.0 in 2017.

Transfers to other plan administrators decreased from \$159,701 in 2018 to \$0 in 2019 due to decreased plan withdrawals. Transfers to other plan administrators decreased from \$759,844 in 2017 to \$159,701 in 2018 to \$0 in 2019 due to decreased plan withdrawals.

Administrative expenses were \$4.9 million in 2019 compared to \$5.8 million in 2018 and \$5.5 million in 2017.

FINANCIAL CONTACT

PMRS' financial statements are designed to present users with a general overview of the PMRS' finances and to demonstrate the trustee's accountability. If there are questions about the report or additional information is required, contact the Chief Financial Officer, Pennsylvania Municipal Retirement System at P.O. 1165, Harrisburg, PA 17108-1165.

SUMMARY OF FIDUCIARY NET POSITION

As of December 31, 2019, 2018, and 2017
(amounts in thousands)

ANALYSIS OF FIDUCIARY NET POSITION	2019	2018	2017
Assets			
Receivables	\$ 6,946	\$ 4,244	\$ 5,599
Investments	2,802,642	2,362,136	2,505,464
Capital assets	330	383	442
Prepaid assets	58		
Total assets	\$ 2,809,976	\$ 2,366,763	\$ 2,511,505
Deferred outflows of resources	1,721	1,245	1,375
Liabilities			
Deferred inflows of resources	3,806	2,823	1,047
Fiduciary net position	\$ 2,792,069	\$ 2,349,380	\$ 2,491,620

SUMMARY OF CHANGES IN FIDUCIARY NET POSITION

Years Ended December 31, 2019, 2018, and 2017
(amounts in thousands)

ANALYSIS OF CHANGES IN FIDUCIARY NET POSITION	2019	2018	2017
Additions			
Contributions ⁽¹⁾	\$ 85,683	\$ 84,555	\$ 75,412
Net investment income (loss)	480,263	(113,221)	379,934
Miscellaneous income	19	-	-
Total additions	\$ 565,965	\$ (28,666)	\$ 455,346
Deductions			
Annuity benefits and terminations ⁽²⁾	118,409	107,644	102,318
Transfers to other plan administrators ⁽³⁾	-	159	760
Administrative expenses	4,867	5,771	5,499
Total deductions	\$ 123,276	\$ 113,574	\$ 108,577
Changes in fiduciary net position	\$ 442,689	\$ (142,240)	\$ 346,769

INVESTMENT BALANCES BY ASSET CLASS

As of December 31, 2019, 2018 and 2017
(amounts in thousands)

Asset class	2019	PERCENTAGE OF PORTFOLIO	2018	PERCENTAGE OF PORTFOLIO	2017	PERCENTAGE OF PORTFOLIO
Short term and other investments ⁽⁴⁾	\$ 43,558	1.6%	\$ 68,881	2.9%	\$ 61,150	2.4%
Fixed income	403,053	14.4%	347,219	14.7%	347,068	13.9%
Common and preferred stock	1,147,093	40.9%	936,426	39.6%	1,033,458	41.2%
International stock	708,911	25.3%	523,297	22.2%	625,205	25.0%
Real estate	500,027	17.8%	486,313	20.6%	438,583	17.5%
Total investments	\$ 2,802,642	100.0%	\$ 2,362,136	100.0%	\$ 2,505,464	100.0%

⁽¹⁾ Contributions include additional municipal employer contributions towards unfunded liability of \$4.7 million in 2019 and \$8.6 million in 2018 and transfers from other plan administration of \$544,153 in 2019 and \$612,199 in 2017.

⁽²⁾ Annuity payment increased by \$10.7 million, \$6.1 million and \$6.9 million in 2019, 2018, and 2017, respectively. Average number of annuitants receiving benefits increased by 238 in 2019 (3.9% increase), 235 in 2018 (4.1% increase) and 269 in 2017 (4.9% increase).

⁽³⁾ Three plans withdrew with total assets of \$159,701. Two plans withdrew with total assets of \$759,844 in 2017.

⁽⁴⁾ Short-term and other investments includes cash and cash equivalents held by investment managers and the Pennsylvania Treasury Department

Financial Statements

Statements of Fiduciary Net Position

As of December 31, 2019 and 2018

	2019	2018
Assets		
Receivables		
Plan members	\$ 2,307,066	\$ 1,721,603
Municipal employers	970,033	237,602
Accrued investment income	2,140,899	1,889,657
Investment sales receivable	1,510,858	394,456
Other receivable	16,720	--
Total receivables	6,945,576	4,243,318
Investments, at fair value		
Short-term and other investments	43,557,561	68,881,421
U.S. government fixed income pooled funds	283,709,057	240,483,537
Corporate bond pooled funds	119,344,015	106,734,968
Equity index funds, common and preferred stocks	1,147,093,058	936,426,340
Real estate	500,027,435	486,313,268
International equities	708,911,164	523,296,628
Total investments	2,802,642,290	2,362,136,162
Capital assets (net of accumulated depreciation of \$241,247 and \$119,887 at 2019 and 2018 respectively)	330,021	383,015
Prepaid asset	58,306	--
Total assets	2,809,976,193	2,366,762,495
Deferred outflows of resources	1,721,099	1,245,082
Liabilities		
Accounts payable and accrued expenses	5,299,472	4,809,630
Net pension liability	4,781,405	3,937,967
Net other postemployment benefit obligation liability	3,332,000	5,197,000
Investment purchases payable	2,409,175	1,860,444
Total liabilities	15,822,052	15,805,041
Deferred inflows of resources	3,806,101	2,822,761
Net position restricted for pensions	\$ 2,792,069,139	\$ 2,349,379,775

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

Statements of Changes in Fiduciary Net Position

Years Ended December 31, 2019 and 2018

	2019	2018
Additions		
Contributions		
Municipal employers	\$ 60,450,153	\$ 61,288,746
Plan members	24,332,531	23,008,066
Transfers from other plan administrators	544,153	--
Assessments	356,500	257,908
Total contributions	\$ 85,683,337	\$ 84,554,720
Investment income		
From investing activities:		
Net appreciation (depreciation) in fair value of investments	454,527,190	(142,496,038)
Short-term and other investments	1,197,670	1,038,239
Equity index funds Common and preferred stocks	13,030,157	13,642,126
Real estate	17,921,921	19,926,594
International equities	5,905,355	6,974,223
Total investment income (loss)	\$ 492,582,292	(\$ 100,914,856)
Investment expenses	(12,318,985)	(12,305,637)
Total net investment income (loss)	\$ 480,263,307	(\$ 113,220,493)
Miscellaneous income	19,023	8
Total additions	\$ 565,965,667	(\$ 28,665,765)
Deductions		
Annuity benefits and terminations	118,409,245	107,643,886
Transfers to other plan administrators	-	159,701
Administrative expenses	4,867,058	5,770,601
Total deductions	\$ 123,276,303	\$ 113,574,188
Net increase (decrease)	442,689,364	(142,239,953)
Net position restricted for pensions		
Balance, beginning of year	2,349,379,775	2,491,619,728
Balance, end of year	\$ 2,792,069,139	\$ 2,349,379,775

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

Notes to Financial Statements

(1) ORGANIZATION AND DESCRIPTION OF PMRS

Organization

PMRS was created by the Pennsylvania General Assembly in 1974 with the passage of the Pennsylvania Municipal Retirement Law, Act of 1974, P.L. 34, No. 16 (the Act). PMRS acts as an agent multiple-employer system, and its designated purpose is to administer sound, cost-effective pensions for local government employees. Responsibility for the organization and administration of PMRS is vested in the 11-member Pennsylvania Municipal Retirement Board. Under the Act, each individual municipality has authority to establish or amend its respective benefits and employee contribution rates, subject to board approval. Employer contributions are actuarially determined by PMRS' actuary.

Membership in PMRS is optional for Pennsylvania's local governments. When a municipality joins PMRS, its full-time employees contractually become members. Part-time, seasonal and temporary employees as well as elected officials may also become members through contractual agreement. The following tables reflect municipal membership and individual membership as of January 1, 2019 and 2018.

INDIVIDUAL MEMBERSHIP

	2019	2018
ACTIVE MEMBERS		
Defined benefit plans		
Municipal	7,005	6,946
Police	813	797
Firefighters	131	125
Total	7,949	7,728
Cash balance plans		
Municipal	1,416	1,365
Police	22	22
Firefighters	8	0
Total	1,446	1,387
Total active members	9,395	9,255
RETIREES AND BENEFICIARIES		
Retirees	5,550	5,307
Beneficiaries	639	599
Total retirees and beneficiaries	6,189	5,906
INACTIVE PARTICIPANTS WITH RIGHTS TO DEFERRED PENSION (VESTED)		
Defined benefit	853	797
Cash balance	315	293
Total vested	1,168	1,090
Defined benefit	32	35
Cash balance	8	0
Total non-vested	40	35
Total individual memberships	16,792	16,286

PARTICIPATING LOCAL GOVERNMENT EMPLOYERS

	2019		2018	
	DEFINED BENEFITS	CASH BALANCE	DEFINED BENEFITS	CASH BALANCE
Counties	4	0	4	0
Cities	18	0	18	0
Boroughs	146	62	148	58
Townships of the first class	19	4	19	3
Townships of the second class	166	156	166	154
Authorities and other units	169	81	174	80
Police	191	18	192	18
Firefighters	10	2	9	1
Total*	723	323	730	314

* Total includes plans with no active members.

Pension Benefits

PMRS has the broad authority to allow a municipality to design its own retirement benefit structure. Alternatively, PMRS has two basic benefit structures: one for municipal employees (Article II of the Act) and one for uniformed employees - police and firefighters (Article III of the Act). Certain elected officials are not permitted to become PMRS members, as outlined in individual municipal ordinances. Under these two structures, members are eligible for monthly retirement benefits upon reaching the age of 65 and 55, under Articles II and III, respectively, or upon accumulating 24 years of service. Under Articles II and III of the Act, vesting occurs after 12 years of service. Such benefits under Articles II and III are generally equal to (a) the actuarial value of the members' contributions and (b) a municipal annuity that is based on a percentage of a member's salary or compensation. The benefit structures also provide death, disability, and early retirement benefits. These benefit provisions and all other requirements are established under Articles II and III of the Act. Under Article IV of the Act, municipalities may provide for benefits different from those available under Articles II and III. Vesting provisions, if any, under Article IV may vary.

Automatic post-retirement benefit increases are optional in plan contracts. Some member municipalities include the automatic increase; others occasionally grant an ad hoc cost-of-living increase. A post-retirement benefit increase may also be granted through PMRS' excess interest award (see Note 3 for an explanation of excess interest).

Member municipalities wishing to amend benefits, contact PMRS staff to discuss desired amendments and to obtain a cost study. Amendments are drafted by PMRS staff, reviewed by the chief counsel office, adopted by the municipality, and submitted to the board for formal approval.

(2) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting

PMRS' financial statements are prepared on the accrual basis of accounting. Employee and employer contributions are recognized in the period in which the contributions are due. Benefits and refunds are recognized when due and payable in accordance with the terms of each plan. Expenses are recorded when the corresponding liabilities are incurred.

Use of Estimates in Preparing Financial Statements

The preparation of financial statements in conformity

with accounting principles generally accepted in the U.S. 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 additions and deductions during the reported period. Actual results could differ from those estimates.

Investments

Investments are reported at fair value. Fair value is the amount that a plan can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller, that is, other than in a forced or liquidation sale. Short-term investments are reported at amortized cost, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. Equity index funds are valued at the net asset value of units held based on the value of the underlying investments as determined by quoted market prices. Fixed income index funds are valued at the net asset value of units held based on yields currently available on comparable securities of issuers with similar credit ratings of the underlying investments. Real estate investments are valued at the net asset value. Purchases and sales of investments are recorded on a trade-date basis. Interest income is recorded on the accrual basis and dividends are recorded on the ex-dividend date.

Capital Assets

Capital assets consist of office furniture and equipment, software, and leasehold improvements. Capital assets are recorded at cost and depreciated using the straight-line method over the following useful lives.

Office Furniture	7 years
Office Equipment	4 years
Software	3 years
Leasehold Improvements	10 years

Pensions for Employees of PMRS

Employees of PMRS are members of the Pennsylvania State Employees' Retirement System (SERS).

For purposes of measuring the net pension liability, deferred outflows of resources, deferred inflows of resources, and pension expense information about the fiduciary net position of SERS and additions to/deductions from SERS' fiduciary net position have been determined on the same basis as they are reported by SERS (please refer to Note 6 for additional information regarding SERS). PMRS' net

pension liability, deferred outflows of resources, and deferred inflows of resources are reported on the Statement of Fiduciary Net Position. The pension expense is reported in administrative expenses on the Statement of Changes in Fiduciary Net Position and is detailed on the Schedule of Administrative Expenses Supplementary Schedule.

Postemployment Benefits Other Than Pensions

PMRS participates in the commonwealth's Retired Employee Health Program. For purposes of measuring the Other Postemployment Benefits (OPEB) liability, deferred outflows of resources, deferred inflows of resources, and OPEB expense, information about the fiduciary net position of the commonwealth and additions to/deductions from the commonwealth's fiduciary net position have been determined on the same basis as they are reported by the commonwealth (please refer to Note 7 for additional information). PMRS' net OPEB liability, deferred outflows of resources, and deferred inflows of resources are reported on the Statement of Fiduciary Net Position. The OPEB expense is reported in administrative expenses on the Statement of Changes in Fiduciary Net Position and is detailed on the Schedule of Administrative Expenses Supplementary Schedule.

Compensated Absences

PMRS uses the accrual basis of accounting for measuring vacation leave, sick leave, and other compensated absences liabilities. Employees of PMRS are paid for accumulated vacation leave upon termination or retirement. Retiring employees of PMRS that meet service, age, or disability requirements are paid between 30% and 100% of sick days available at retirement, up to 161 maximum days paid. As of December 31, 2019 and 2018, \$392,152 and \$236,812, respectively, were accrued for unused vacation and sick leave for PMRS employees and included in accounts payable and accrued expenses on the Statement of Fiduciary Net Position.

Federal Income Taxes

PMRS is a qualified trust fund under Section 401(a) of the Internal Revenue Code (IRC). As a result of the qualified status, the trust fund is entitled to an exemption, under Section 501 (a) of the IRC, from federal income taxation on its investment earnings. Additionally, the trust fund and any benefits accruing to the members of PMRS are exempt from Pennsylvania state and municipal taxes.

It should be noted that the Internal Revenue Service (IRS) announced and initiated a renewed focus on the tax qualification of public pension funds in 2008. PMRS continues to work proactively to address this IRS initiative.

New Accounting Pronouncements Adopted

During the year ended December 31, 2020 PMRS adopted GASB issued Statement No. 95, "Postponement of the Effective Dates of Certain Authoritative Guidance." The primary objective of this statement is to provide temporary relief to governments and other stakeholders in light of the COVID-19 pandemic. That objective is accomplished by postponing the effective dates of certain provisions in Statements and Implementation Guides that first became effective or are scheduled to become effective for periods beginning after June 15, 2018, and later. The application of Statement No. 95 delays the effective date of GASB Statement No. 84, "Fiduciary Activities" by one year.

During the year ended December 31, 2018, PMRS adopted GASB issued Statement No. 85, "Omnibus 2017." The objective of this statement is to address practice issues that have been identified during implementation and application of certain GASB Statements. This statement addresses a variety of topics including issues related to blending component units, goodwill, fair value measurement and application and postemployment benefits (pensions and other postemployment benefits). Upon examination, it was determined that PMRS is currently presenting information in accordance with the requirements.

New Accounting Pronouncements to Be Adopted

The GASB issued Statement No. 84 "Fiduciary Activities" in January 2017. The objective of this statement is to improve guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how those activities should be reported. The requirements of this statement are effective for financial statements for fiscal years beginning after December 15, 2019 as amended by GASB Statement No. 95 "Postponement of the Effective Dates of Certain Authoritative Guidance."

The GASB issued Statement No. 87 "Leases" in June 2017. This statement 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 requirements of this statement are effective for financial statements for fiscal years beginning after June 15, 2021.

PMRS is evaluating these pronouncements and their potential impact to the financial statements, if any, and plans to adopt them as applicable by their effective date.

(3) CONTRIBUTIONS AND RESERVES

Contributions

Contributions to PMRS are made by members and municipalities. Under Articles II and III of the Act, members are required to contribute 3% to 8% of their salaries. The amount a member contributed under Article IV of the Act is based upon a contracted plan provision and is principally expressed as a percent of compensation or salary. The contributions required of municipalities are based upon an actuarial valuation, using the Entry Age Normal Actuarial Cost Method, computed as a percentage of the total compensation of all active members during the period for which the amount is determined. The required contributions from municipalities for the years ended December 31, 2019 and 2018 consisted of the following:

	2019	2018
Municipality normal cost ⁽¹⁾	\$ 60,450,152	\$ 61,288,746
Amortization of unfunded actuarial accrued liability	(9,203,187)	(13,760,621)
Total⁽²⁾	\$ 51,246,965	\$ 47,528,125

¹Municipality normal cost includes additional municipal employer contributions towards unfunded liability of \$4.6 million and \$8.6 million in 2019 and 2018 retrospectively.

² Total does not include \$20 per member assessment fee to municipalities.

The actual contributions were 118.7% of the required contributions in 2019 and 129.0% of the required contributions in 2018.

The total contributions to PMRS in 2019 were \$85.7 million of which \$60.5 million and \$24.3 million were made by municipal employers and plan members, respectively. Included in the municipal normal cost are \$544,153 transfers from other plan administrators and \$356,500 from assessments.

Total contributions to PMRS in 2018 were \$84.6 million of which \$61.3 million and \$23.0 million were made by municipal employers and plan members, respectively, and \$257,908 was from assessments.

The difference between the municipalities' required

and actual contributions is generally due to various factors including additional contributions towards unfunded liability, plan takeovers and the municipalities transferring state aid money to PMRS as required under the Municipal Pension Plan Funding Standard and Recovery Act of 1984 (Act 205).

Each municipality is also charged a \$20 assessment fee per member to help cover administrative expenses incurred by PMRS. The remaining costs of administering the plan are financed by investment income.

Contributions Required and Contributions Made

PMRS' funding policy requires actuarially determined annual required contributions of plan member municipalities at rates that accumulate sufficient assets to pay benefits when due. PMRS' actuary used the Entry Age Normal Cost Actuarial Method to determine plan liabilities and normal cost. Under this method, a normal cost is calculated that would fund each employee's benefits during the employee's career as a level percentage of pay.

At each valuation date, the unfunded actuarial accrued liability is calculated as the present value of all plan benefits, less the present value of future normal cost accruals, less current assets (actuarial value).

The normal cost rate is applied to the projected payroll, and projected employee contributions are deducted. Actuarial gains (or losses) are reflected by decreases (or increases) in the unfunded actuarial accrued liability. Under Act 205, and amended under Act 44¹, the unfunded accrued liability is amortized as a level dollar amount over the lesser of:

1. a. 30 years with respect to the initial liability as of 1/1/1985 (or first valuation);
- b. 20 years with respect to actuarial gains and losses;
- c. 15 years with respect to changes due to actuarial assumptions;
- d. 20 years with respect to changes due to plan provisions (if state mandated);
- e. 10 years with respect to changes in benefits for currently active members and one year of retired members (if local benefit changes), or;
2. the average assumed working lifetime of active employees as of the date the liability was established. If there are no active employees, the unfunded liability is amortized one year after the liability was established.

¹ Act 44 of 2009 made amendments to Act 205 which changes certain amortization periods. These changes affect the cost calculations for PMRS' plans as of January 1, 2011.

Significant actuarial assumptions used to compute the actuarially determined contribution requirement include (a) an investment rate of return of 5.25% per year (net of investment expenses and certain administrative expenses) compounded annually; (b) projected salary increases ranging from 2.8% to 7.05% with an average increase of 4.3%, including 2.8% per year compounded annually for inflation, with an additional age-based component to reflect merit/seniority; (c) post-retirement cost-of-living increases of 2.8% per year until the maximum is reached (optional in contracts); (d) pre-retirement mortality based on RP2000 Non-Annuitant Mortality Table projected 15 years with Scale AA for males and females and an additional setback of 5 years for females; (e) healthy post-retirement mortality based on RP2000 Annuitant Combined Mortality Table projected 5 years with Scale AA for males and projected 10 years with Scale AA for females; and (f) disabled post-retirement mortality based on the RP2000 Combined Mortality Table with a set forward of 10 years. These actuarial assumptions were first adopted for the January 1, 2016 actuarial valuation based on the most recent experience study for the period covering January 1, 2009 through December 31, 2013 and, as such, will be reflected in the Actuarially Determined Contributions for calendar year 2019. The January 1, 2017 and 2018 valuations results are based on actuarial assumptions used for the January 1, 2016 valuation and the updated investment rate of return assumption. The January 1, 2016 valuation results reflect a 5.5% interest rate of return assumption while the January 1, 2017 and 2018 valuation results reflect the 5.25% interest rate of return assumption adopted by the board in November 2016.

The amortization method uses level dollar for plan bases and average for Aggregate Gain/Loss, 10% of surplus is credited against aggregate cost where applicable, based on an open amortization period. The remaining amortization period at December 31, 2019 and 2018 was 10-30 years.

Reserve Accounts

As of December 31, 2019 and 2018, the reserve account balances were as follows:

	2019	2018
Members' Reserve Account	\$ 485,374,472	\$ 474,930,885
Municipal Reserve Account	942,893,353	911,884,310
Retired Members' Reserve Account	1,190,972,778	1,134,708,899
DROP Participant Reserve Account	873,195	1,544,143
Disability Reserve Account	687,614	358,812
Undistributed Earnings Reserve Account	171,267,727	(174,047,274)
Total	\$ 2,792,069,139	\$ 2,349,379,775

The act defines the following funds to be maintained by PMRS.

Members' Reserve Account

The Members' Reserve Account is credited with all contributions made by active members of PMRS. Interest is credited to each member's individual account at an annual rate determined by the board. PMRS' regular interest rate for the years ended December 31, 2019 and 2018 was 5.25%. In addition to regular interest, PMRS may also award excess interest. PMRS awarded excess interest of \$4.1 million in 2018 to the Members' Reserve account as directed by the municipalities. To date, PMRS has not awarded excess interest for 2019.

Upon retirement or disability of an active member, the member's accumulated contributions plus interest are transferred to the Retired Members' Reserve for subsequent benefit payments. Withdrawals of the contributions of members not eligible for benefits are paid from this reserve. The account was fully funded as of December 31, 2019.

Municipal Reserve Accounts

Separate municipal accounts are maintained for each municipality. The Municipal Reserve Account is credited with each municipality's contributions toward the superannuation retirement and death benefits of its members. Interest is credited to each separate municipal account at an annual rate determined by the board. PMRS' regular interest rate for the years ended December 31, 2019 and 2018 was 5.25%. In addition to regular interest, PMRS may also award excess interest. PMRS awarded excess interest of \$18.2 million to the Municipal Reserve Account in 2018 as directed by the municipalities. To date, PMRS has not awarded excess interest for 2019. The account was fully funded as of December

31, 2019.

Retired Members' Reserve Account

The Retired Members' Reserve Account represents the amounts transferred from the Members' Reserve Account, the Municipal Accounts, and the Disability Reserve Account. All retirement benefits and retirees' death benefits are paid from this reserve. Interest is credited to the Retired Members' Account at an annual rate determined by the Board. PMRS' regular interest for the years ended December 31, 2019 and 2018 was 5.25%. In addition to regular interest, PMRS may also award excess interest. PMRS awarded excess interest of \$3.6 million in 2018 to the Retired Members' Reserve Account as directed by the municipalities. To date, PMRS has not awarded excess interest for 2019. The account was fully funded as of December 31, 2019.

DROP Participant Reserve Account

Deferred Retirement Option Program (DROP) is an optional form of payment upon a member's retirement. The DROP Participant Reserve Account is credited with all monthly annuity payments payable to a DROP participant. The monthly DROP interest is dependent on the monthly rate of return credited to the Liquid Asset Pool as determined by the Pennsylvania Treasurer. The DROP interest credited each month shall not be less than 0% nor more than 0.367% per month and shall not exceed the statutory limit of 4.5% annually. The average monthly yield for 2019 ranged from 1.83% to 2.56% with 2.36% as the average for the 12-month period. The average monthly yield for 2018 ranged from 1.02% to 2.38% with 1.95% as the average for the 12-month period. The first DROP participant enrolled on July 31, 2012. The account was fully funded as of December 31, 2019.

Disability Reserve Account

The Disability Reserve Account is credited with the contributions made by municipalities toward the disability retirement of member employees. The disability reserves are limited to 150% of the largest value of transfers to the Retired Members' Reserve Account over the most recent three years. Interest is credited to the disability account at an annual rate determined by the board. PMRS' regular interest rate for the years ended December 31, 2019 and 2018 was 5.25%. The account was fully funded as of December 31, 2019.

Undistributed Earnings Reserve Account

In addition to regular interest, PMRS may also

award excess interest. Excess interest is investment earnings on PMRS' assets in excess of that required for allocation to regular interest and administrative expenses. Rates for excess interest are determined annually by the board with advice from PMRS' actuary. The excess interest is distributed to the Members' Reserve Accounts, the Municipal Reserve Accounts, and the Retired Members' Reserve Account as directed by the municipalities.

To date, PMRS has not awarded excess interest for 2019. In 2018, PMRS awarded excess interest in the amount of \$25.9 million from the Undistributed Earnings Reserve Account of which \$18.2 million was distributed to the Municipal Reserve Accounts, \$4.1 million was distributed to the Members' Reserve Accounts, and \$3.6 million was distributed to the Retired Members' Reserve Accounts as directed by the municipalities.

(4) INVESTMENTS

Members of the board are trustees of PMRS' assets. They have exclusive responsibility for the management of such assets and have full power to invest PMRS' assets, subject to the terms, conditions, limitations, and restrictions imposed by the commonwealth law upon fiduciaries. The board is governed by the "prudent investor" rule in establishing investment policy. The "prudent investor" rule requires the exercise of that degree of judgment, skill, and care under the circumstances then prevailing which investors of prudence, discretion, and intelligence, who are familiar with such matters, exercise in the management of their own affairs not in regard to speculation, but in regard to permanent disposition of the funds, considering the probable income to be derived therefrom, as well as safety of their capital.

The board has adopted its Statement of Investment Policy to formally document investment objectives and responsibilities. This policy, as well as applicable state law, establishes guidelines for permissible investments of PMRS. The pension plan's policy regarding the allocation of invested plan assets is established and may be amended by the board. The board established its allocation goals as follows:

Domestic equities (large capitalized firms)	25 %
Domestic equities (small capitalized firms)	15 %
International equities (developed markets)	15 %
International equities (emerging markets)	10 %
Fixed income	15 %
Real estate	12.5 %
Timberland	7.5 %

The board prohibits: (1) purchasing of commodities, mineral rights except those mineral rights that come with the purchase of timberland, and warrants except those previously authorized; (2) short selling and the purchasing of securities on margin; and (3) selling or buying options or futures contracts on either fixed income or equity instruments. Unleveraged derivatives used to dampen risk, execute an unleveraged strategy, or reallocate assets within a portfolio quickly may be used by a manager provided the exposure to derivatives does not exceed 5% of the manager's portfolio at market value. Leveraged derivatives of any nature or the use of derivatives to create leverage are strictly prohibited. Notwithstanding the above, warrants received in corporate restructuring may be retained at the manager's discretion.

The board achieves day-to-day management of the investment portfolio through investment managers. Restrictions concerning diversification within each manager and among managers are provided by the adopted Investment Policy.

Money-Weighted Rate of Return

For the years ended December 31, 2019 and 2018, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 20.9% and (4.57%), respectively. The money-weight of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Fair Value of Investments

PMRS measures and records its investments using fair value measurement guidelines established by generally accepted accounting principles. These guidelines recognize a three-tiered fair value hierarchy as follows:

- Level 1 inputs: Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets. A quoted price for an identical asset or liability in an active market (e.g. an equity security traded on a major exchange) provides the most reliable fair value measurement and, if available, should be used to measure the fair value in that particular market.
- Level 2 inputs: The categorization of an asset/liability as Level 1 requires that it be traded in an active market. If an instrument is not traded in an active market, it may fall to Level 2. Level 2 inputs are inputs that are observable, either directly or indirectly, but do not qualify as Level 1.

- Level 3 inputs: Reporting entities may use unobservable inputs to measure fair value if relevant observable inputs are not available, thereby allowing for situations in which there is little, if any market activity for the asset or liability at the measurement date. These unobservable inputs are considered Level 3.

Equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities.

Investments valued at the net asset value (NAV) per share (or its equivalent) include investments considered to be alternative investments defined by the Association of International Certified Professional Accountants. The definition includes investments for which a readily determinable fair value does not exist (that is, investments not listed on national exchanges or over-the-counter markets, or for which quoted market prices are not available from sources such as financial publications, exchanges, or NASDAQ). These types of investments include real estate and commingled index funds and can be held within any of the asset classes used by PMRS based on underlying portfolio holdings and analysis of risk and return relationships. The commingled index funds are open-ended funds and may be used in equity or fixed income asset classes. They are funds made up of underlying securities that have readily available fair values (publicly traded stocks and bonds). PMRS owns units of these funds rather than the individual securities. Contributions or withdrawals from these funds can be made as needed, generally with daily or monthly liquidity, with a notice period of one to fifteen days. PMRS has short-term and other investments that are not measured at fair value or NAV. PMRS invests in the Pennsylvania Treasury Pool 99 and Pool 124 short-term investment pools. These pools consist exclusively of fixed income securities, primarily of short duration, which are held either directly or through the Consolidated Cash Pool, an investment instrument used to invest short-term monies. PMRS' portion is valued at cost plus accrued interest, which approximates fair value.

The chart depicting fair value levels is on page 34.

Deposit and Investment Risks

PMRS's deposits and investments may be subject to various risks. Among these risks are concentration of credit risk, custodial credit risk, credit risk, interest rate risk, and foreign currency risk. Due to the level of risk associated with certain investments, it is possible that changes in the values of investments may occur in the near term and that such changes could materially affect the amounts reported in the Statement of

INVESTMENTS

As of December 31, 2019

INVESTMENTS BY FAIR VALUE LEVEL	2018	FAIR VALUE MEASUREMENTS USING		
		LEVEL 1	LEVEL 2	LEVEL 3
Common and preferred stock	\$ 1,252,286,282	\$ 1,252,286,282	-	-
Total investments by fair value level	\$ 1,252,286,282	\$ 1,252,286,282	-	-
INVESTMENTS MEASURED AT NET ASSET VALUE (NAV)		UNFUNDED COMMITMENTS	REDEMPTION FREQUENCY	REDEMPTION NOTICE PERIOD
Commingled funds - debt	403,053,072	-	Daily, monthly	1-15 days
Commingled funds - equity	603,717,940	-	Daily, monthly	1-15 days
Real estate	500,027,435	40,000,000	Not eligible	Not eligible
Total investments measured at NAV	\$ 1,506,798,447	\$ 40,000,000		
INVESTMENTS AT OTHER THAN FAIR VALUE				
Short-term and other investments	43,557,561			
Total investments at other than fair value	\$ 43,557,561			
Total investments	\$2,802,642,290			

INVESTMENTS

As of December 31, 2018

INVESTMENTS BY FAIR VALUE LEVEL	2019	FAIR VALUE MEASUREMENTS USING		
		LEVEL 1	LEVEL 2	LEVEL 3
Common and preferred stock	\$ 1,152,315,812	\$ 1,152,315,812	-	-
Total investments by fair value level	\$ 1,152,315,812	\$ 1,152,315,812	-	-
INVESTMENTS MEASURED AT NET ASSET VALUE (NAV)		UNFUNDED COMMITMENTS	REDEMPTION FREQUENCY	REDEMPTION NOTICE PERIOD
Commingled funds - debt	347,218,505	-	Daily, monthly	1-15 days
Commingled funds - equity	307,407,156	-	Daily, monthly	1-15 days
Real estate	486,313,268	40,000,000	Not eligible	Not eligible
Total investments measured at NAV	\$ 1,140,938,929	\$ 40,000,000		
INVESTMENTS AT OTHER THAN FAIR VALUE				
Short-term and other investments	68,881,421			
Total investments at other than fair value	\$ 68,881,421			
Total investments	\$2,362,136,162			

Fiduciary Net Position.

Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of PMRS' investments in a single issuer. As of December 31, 2019 and 2018, PMRS had no single issuer that exceeded 5% of total investments. Investments issued or explicitly guaranteed by the U.S. government and investments in mutual funds, external investment pools, and other pooled investments were excluded.

Custodial Credit Risk - Deposits

Custodial credit risk for deposits is the risk that, in the event of a financial institution failure, PMRS would not be able to recover the value of the deposits. The Pennsylvania Treasury is the custodian of PMRS' funds. The Pennsylvania Treasury deposits

must be held in insured depositories approved by the Commonwealth's Board of Finance and Revenue and must be fully collateralized.

Custodial Credit Risk - Investments

Custodial credit risk for investments is the risk that, in the event of the failure of the counterparty to a transaction, PMRS would not be able to recover the value of investments or collateral securities that are in the possession of an outside party. In accordance with a contractual relationship between the Pennsylvania Treasury and its custodial agent, substantially all investments, where securities are used as evidence of the investment, are held by the custodian in book-entry form in PMRS' name. Those investments are defined as insured or registered investments for which the securities are held by PMRS or its agent and, therefore, have a very

minimal level of custodial credit risk. The remaining investments, which do not have securities that are used as evidence of the investment, are primarily in commingled funds, which include real estate.

Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The credit risk of a debt instrument is measured by nationally recognized statistical rating organizations (NRSRO) such as Moody's Investors Service (Moody's), Standard and Poor's (S&P), and Fitch Ratings (Fitch).

Only those bonds issued by the federal government and its agencies or foreign government bonds denominated in U.S. dollars rated "AA" or higher, and only those corporate bonds which are rated and which ratings are no lower the "A" by at least two of the three NRSRO listed above shall be purchased in accordance with PMRS' investment guidelines. Should any bond drop below investment quality (BA or lower), the manager shall divest the holding or report in writing to PMRS within thirty (30) days from the day the security's rating has fallen below the acceptable rating as to why the security remains a safe investment for the portfolio. When an index fund is utilized to meet PMRS' commitment to the fixed income allocation, the underlying securities of the index shall not have to comply with the specific requirements of this paragraph.

For securities exposed to credit risk in the fixed income portfolio, the following table discloses aggregate fair value by credit quality rating category at December 31, 2019 and 2018.

CREDIT RISK

QUALITY RATING	2019	2018
	FAIR VALUE	FAIR VALUE
AAA ⁽¹⁾	\$ 290,883,402	\$ 253,157,011
AA ⁽¹⁾	13,220,141	12,326,257
A ⁽¹⁾	43,489,426	34,721,851
Baa ⁽¹⁾	55,460,103	46,978,664
Below Baa ⁽¹⁾	0	34,722
NR ⁽²⁾	43,557,561	68,881,421
Total	\$ 446,610,633	\$ 416,099,926

1 The fixed income portfolio is currently 100% passive. The Fair Value distributed among the credit ratings is calculated based on percentages reported by the index fund provider.

2 Not Rated securities include short-term and other investments.

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of a fixed income investment. PMRS measures interest rate

risk using duration. Duration is a measure of the sensitivity of the price (the value of principal) of a fixed income investment to a change in interest rates and is expressed as a number of years. The higher the duration, the greater the changes in fair value when interest rates change.

At December 31, 2019 and 2018, PMRS' fixed income portfolio had the following effective duration:

2019 INTEREST RATE RISK

	FAIR VALUE	EFFECTIVE DURATION IN YEARS
Commingled funds - debt	\$ 403,053,072	5.88
Short-term and other investments	43,557,561	0.1
Total	\$ 446,610,633	

2018 INTEREST RATE RISK

	FAIR VALUE	EFFECTIVE DURATION IN YEARS
Commingled funds - debt	\$ 347,218,505	5.88
Short-term and other investments	68,881,421	0.1
Total	\$ 416,099,926	

Foreign Currency Risk

Foreign currency risk is the risk that fluctuations in the exchange rates will adversely affect the fair value of an investment. As part of PMRS' program to manage risk and enhance returns, PMRS invests in non-U.S. markets.

At December 31, 2019 and 2018, PMRS had the following non-U.S. currency exposure:

2019 FOREIGN CURRENCY RISK

CURRENCY	EQUITY	SHORT-TERM	TOTAL
European Euro	\$ 75,398,492	\$ 27	\$ 75,398,518
Japanese Yen	53,451,567	-	53,451,567
Hong Kong Dollar	27,620,519	-	27,620,519
British Pound Sterling	26,316,821	2	26,316,823
Norwegian Krone	8,065,086	-	8,065,086
South Korean Won	7,617,836	-	7,617,836
Swedish Krona	6,604,996	-	6,604,996
Swiss Franc	6,233,277	-	6,233,277
Australian Dollar	5,719,480	-	5,719,480
Canadian Dollar	-	720	720
Total	\$ 217,028,074	\$ 749	\$ 217,028,823

2018 FOREIGN CURRENCY RISK

CURRENCY	EQUITY	TOTAL
European Euro	\$ 73,792,326	\$ 73,792,326
Japanese Yen	48,143,760	48,143,760
British Pound Sterling	30,429,698	30,429,698
Hong Kong Dollar	22,283,232	22,283,232
Swiss Franc	14,905,526	14,905,526
Norwegian Krone	7,082,928	7,082,928
Swedish Krona	5,371,574	5,371,574
Canadian Dollar	3,530,410	3,530,410
South Korean Won	3,199,865	3,199,865
Australian Dollar	2,791,628	2,791,628
Singapore Dollar	1,360,915	1,360,915
Danish Krone	1,125,196	1,125,196
Total	\$ 214,017,058	\$ 214,017,058

(5) SECURITIES LENDING

In accordance with a contract between the Pennsylvania Treasury and its custodian, PMRS may participate in a securities lending program. Under this program, the custodian, acting as the lending agent, lends securities (equities, fixed income, and money market instruments) to independent brokers, dealers, and banks, acting as borrowers in exchange for collateral. Collateral is required at 102% of the fair value of the securities lent except for equity securities of non-U.S. corporations, for which collateral of 105% is required. Collateral is marked-to-market daily. If the fair value of collateral held falls below the minimum guidelines for securities loaned, additional collateral is obtained. The lending agent invests the cash collateral in accordance with reinvestment guidelines approved by the Pennsylvania Treasury. The lending agency cannot pledge or sell collateral securities received unless the borrower defaults.

As of December 31, 2019 and 2018, PMRS had no credit risk exposure to borrowers because participation in the securities lending program was halted in 2008.

(6) PENSION PLAN FOR EMPLOYEES OF THE PMRS

SERS' Plan Description

PMRS contributes to the State Employees' Retirement System (SERS), a cost-sharing multiple-employer defined benefit pension plan established by the commonwealth to provide pension benefits for employees of the state government and certain independent agencies. SERS is a component unit of the

commonwealth and is included in the commonwealth's financial report as a pension trust fund.

Membership in SERS is mandatory for most state employees. Article II of the commonwealth's constitution assigns the authority to establish and amend the benefit provision of the plan to the Pennsylvania General Assembly.

SERS' Benefits Provided to Employees of PMRS

SERS provides a pension defined benefit plan, including retirement, death, and disability benefits, for employees of state government and certain independent agencies. SERS member retirement benefits are determined by taking years of credited service multiplied by final average salary multiplied by 2% multiplied by class of service multiplier.

SERS also provides a hybrid plan which is a mix of defined benefit pension plan and defined contribution investment plan. The defined benefit plan provides member benefits based on years of service and salary. The defined contribution plan allows the member to pick the investment vehicle and assume the associated risk. The amount of retirement depends on the accumulated contributions and investment returns.

According to the State Employees' Retirement Code (SERC), all obligations of SERS will be assumed by the commonwealth should SERS terminate.

Contributions to SERS

Section 5507 of the SERC (71 Pa C.S. §5507) requires the commonwealth and other employers whose employees are SERS members to make contributions to the fund on behalf of all active members and annuitants necessary to fund the liabilities and provide the annuity reserves required to pay benefits. SERS funding policy, as set by the board, provides for periodic active member contributions at statutory rates. The SERS funding policy also provides for periodic employer contributions at actuarially determined rates based on SERS funding valuation, expressed as a percentage of annual retirement covered payroll, such that they, along with employee contributions and an actuarially determined rate of investment are adequate to accumulate assets to pay benefits. However, Act 2010-120 imposes rate increase collars (limits on annual rate increases) on employer contributions. The collar for commonwealth fiscal year 15/16 was 4.5% and no longer applied effective July 1, 2017.

SERS' Pension Plan Investments

The long-term expected real rate of return on

pension plan investments is determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of manager fees and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighing the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in SERS current and target asset allocation as of December 31, 2018 and 2017 are summarized in the following tables:

2018 LONG-TERM EXPECTED REAL RATE OF RETURN

ASSET CLASS	TARGET ALLOCATION	LONG-TERM EXPECTED REAL RATE OF RETURN
Private equity	16%	7.25%
Global public equity	48%	5.15%
Real estate	12%	5.26%
Multi-Strategy	10%	4.44%
Fixed income	11%	1.26%
Cash	3%	-
Total	100%	

2017 LONG-TERM EXPECTED REAL RATE OF RETURN

ASSET CLASS	TARGET ALLOCATION	LONG-TERM EXPECTED REAL RATE OF RETURN
Private equity	16%	8.00%
Global public equity	43%	5.30%
Real estate	12%	5.44%
Hedge funds	12%	5.10%
Fixed income	14%	1.63%
Cash	3%	(0.25%)
Total	100%	

Proportionate Share of SERS' Net Pension Liability, Pension Expense, Deferred Outflows of Resources, and Deferred Inflows of Resources

PMRS' proportion of the net pension liability was calculated using a projected-contribution method. PMRS' proportionate share of the SERS' net pension liability was measured as of December 31, 2018 and 2017, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation at December 31, 2018 and 2017.

The following methods and assumptions were used

in the actuarial valuation at December 31, 2018 and 2017:

ACTUARIAL ASSUMPTIONS	
Investment rate of return/discount rate	7.25% net of manager fees including inflation
Projected salary increases	Average of 5.60% with range of 3.70% – 8.90% including inflation
Inflation	2.6%
Mortality rate	Projected RP-2000 Mortality Tables adjusted for actual plan experience and future improvement
Cost-of-living adjustments	None (ad hoc)
Asset valuation method	Fair (market) value

On December 31, 2019, PMRS reported a net pension liability of \$4.8 million and \$3.9 million at December 31, 2018 for its proportionate share of the net pension liability for the SERS plan on the Statement of Fiduciary Net Position. The net pension liability was measured as of December 31, 2018 and 2017, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that measurement date. On December 31, 2018, PMRS' proportion was 0.02295329% and .02277373% at December 31, 2017.

For the years ended December 31, 2019 and 2018, PMRS recognized pension expenses of \$615,492 and \$484,129, respectively, in administrative expenses on the Statement of Changes in Fiduciary Net Position. On December 31, 2019 and 2018, PMRS reported deferred outflows of resources and deferred inflows of resources from the following sources:

2019 SCHEDULE OF DEFERRED OUTFLOWS AND INFLOWS

	DEFERRED OUTFLOWS OF RESOURCES	DEFERRED INFLOWS OF RESOURCES
Differences between expected and actual experience	\$ 71,753	\$ 51,812
Changes of assumptions	127,388	-
Differences between projected and actual investment earnings on pension plan investments	465,201	-
Differences between employer contributions and proportionate share of contributions	8,611	1,145
Changes in proportion	39,776	215,144
Contributions subsequent to measurement date	514,987	-
Total	\$ 1,227,716	\$ 268,101

2018 SCHEDULE OF DEFERRED OUTFLOWS AND INFLOWS

	DEFERRED OUTFLOWS OF RESOURCES	DEFERRED INFLOWS OF RESOURCES
Differences between expected and actual experience	\$ 66,581	\$ 74,771
Differences between projected and actual investment earnings on pension plan investments	197,158	-
Changes of assumptions	-	156,571
Differences between employer contributions and proportionate share of contributions	11,291	2,198
Changes in proportion	28,805	306,221
Contributions subsequent to measurement date	476,919	-
Total	\$ 780,754	\$ 539,761

The amount reported as deferred outflows of resources at December 31, 2019 and 2018 includes contributions subsequent to the measurement date of \$514,987 and \$476,919, respectively, which are recognized as a reduction of the net pension liability in the years ended December 31, 2020 and 2019. The amounts reported as deferred outflows of resources and deferred inflows of resources at December 31, 2019 will be recognized in pension expense as follows:

YEAR ENDING DECEMBER 31	
2020	\$ 173,370
2021	36,322
2022	56,866
2023	174,161
2024	3,910
Total	\$ 444,629

Sensitivity of PMRS' Proportionate Share of SERS' Net Pension Liability to Changes in the Discount Rate

The following presents PMRS' proportionate share of the SERS' net pension liability as well as what PMRS' proportional share of the SERS' net pension liability would be if it were calculated using a discount rate that is one percentage point lower (6.25%) or one percentage point higher (8.25%) than the current discount rate:

2019 SENSITIVITY OF THE NET PENSION LIABILITY TO CHANGE IN THE DISCOUNT RATE

	1% DECREASE (6.25%)	DISCOUNT RATE (7.25%)	1% INCREASE (8.25%)
Net pension liability	\$ 5,871,175	\$ 4,781,405	\$ 3,847,532

2018 SENSITIVITY OF THE NET PENSION LIABILITY TO CHANGE IN THE DISCOUNT RATE

	1% DECREASE (6.25%)	DISCOUNT RATE (7.25%)	1% INCREASE (8.25%)
Net pension liability	\$ 4,998,508	\$ 3,937,967	\$ 3,029,491

SERS' Pension Plan Fiduciary Net Position

Detailed information about SERS' fiduciary net position is available in the SERS' Annual Comprehensive Financial Report which can be found on the SERS' website at www.SERS.pa.gov.

(7) POSTEMPLOYMENT HEALTHCARE PLAN FOR EMPLOYEES OF PMRS

Commonwealth's Plan Description and Administration

PMRS participates in the commonwealth's Retired Employees Health Program (REHP). The REHP is a single-employer defined benefit Other Postemployment Benefit (OPEB) plan that includes commonwealth agencies and some component units. The REHP is established as a trust equivalent arrangement. The REHP is administered by the Pennsylvania Employees Benefit Trust Fund (PEBTF), which acts as a third-party administrator under an administrative agreement with the commonwealth. The REHP is provided as part of collective bargaining agreements with most commonwealth labor unions. All policy decisions and types and levels of benefits for the REHP fall under the purview of the commonwealth's Executive Board, and the Secretary of Administration. The REHP does not have a governing board.

Benefits Provided

The commonwealth sponsors the REHP for eligible retirees and their dependents to receive subsidized health coverage for the retiree's lifetime.

Contributions to Commonwealth

REHP employer contribution requirements are established by the commonwealth's Office of Administration and the Office of the Budget. All employing agencies and certain plan members contributed \$300 per bi-weekly pay period for each current REHP eligible active employee during the fiscal year ended June 30, 2019. Plan members who retired after June 30, 2005 contribute to the plan based on a percentage of their final gross base salary at the time of retirement. Plan member contribution rates vary based on their REHP enrollment date.

Commonwealth's REHP Investments

The assets of the REHP are managed by the Pennsylvania Treasury in an investment pool. The REHP investments are made based upon an interagency agreement, dated June 17, 2008, and the "prudent investor" standard set forth in the Commonwealth of Pennsylvania's fiscal code 72P.S. §30.1, amendment to the fiscal code, the principles of Prudent Investors Standards.

The long-term expected rate of return on REHP plan investment is determined using a risk premium review. This review compares the current relationship between fixed income and equity and their relationship over long periods of time to come up with an expected rate of return. Other variables considered in the expected rates of return are a reversion to the mean for each asset class. Best estimates of arithmetic real rates of return for each asset class included in the target asset allocation as of June 30, 2019 and 2018 are summarized in the following table:

2019 LONG-TERM EXPECTED REAL RATE OF RETURN

ASSET CLASS	TARGET ALLOCATION	LONG-TERM EXPECTED REAL RATE OF RETURN
US equity	47%	5.60%
International equity	20%	5.80%
Fixed income	25%	1.70%
Real Estate	8%	4.60%
Cash	0%	0.90%
Total	100%	

2018 LONG-TERM EXPECTED REAL RATE OF RETURN

ASSET CLASS	TARGET ALLOCATION	LONG-TERM EXPECTED REAL RATE OF RETURN
US equity	47%	6.60%
International equity	20%	8.60%
Fixed income	25%	3.00%
Real Estate	8%	6.90%
Cash	0%	1.00%
Total	100%	

Change of Assumption

At December 31, 2019, PMRS reported a net OPEB liability of \$3.3 million and \$5.2 million at December 31, 2018 for its proportionate share of the net OPEB liability on the Statement of Fiduciary Net Position. The net OPEB liability was measured as of June 30, 2019 and 2018, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of that measurement date. At June 30, 2019, PMRS

proportion of the net OPEB liability was 0.032% and 0.035% at June 30, 2018.

The discount rate changed from 3.87% as of June 30, 2018 to 3.50% as of June 30, 2019.

Proportionate Share of Commonwealth's Net OPEB Liability, OPEB Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources

PMRS' proportionate share of the commonwealth's net OPEB liability was measured as of June 30, 2019 and 2018, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation dated September 2019 and October 2018, respectively.

The total OPEB liability in the June 30, 2019 and 2018 actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

	JUNE 30, 2019	JUNE 30, 2018
Discount rate	3.50%	3.87%
Investment rate of return	5.00%	5.00%
Inflation	2.60%	2.60%
Initial medical trend rate	6.00%/	6.20%/
	5.90%	5.90%
Ultimate medical trend rate	4.10%	4.10%
Year ultimate trend rate reached	2075	2075

For the years ended December 31, 2019 and 2018, PMRS recognized OPEB expenses of \$472,000 and \$108,342, respectively, in administrative expenses on the Statement of Changes in Fiduciary Net Position. At December 31, 2019 and 2018, PMRS reported deferred outflows of resources and deferred inflows of resources from the following sources:

2019 SCHEDULE OF DEFERRED OUTFLOWS AND INFLOWS

	DEFERRED OUTFLOWS OF RESOURCES	DEFERRED INFLOWS OF RESOURCES
Differences between expected and actual experience	\$ -	\$ 2,478,000
Changes of assumptions	107,000	462,000
Differences between projected and actual earnings on plan investments	-	6,000
Change in proportionate share and differences between actual and proportionate share of employer contributions	240,000	592,000
Contributions subsequent to measurement date	146,383	-
Total	\$ 493,383	\$ 3,538,000

2018 SCHEDULE OF DEFERRED OUTFLOWS AND INFLOWS

	DEFERRED OUTFLOWS OF RESOURCES	DEFERRED INFLOWS OF RESOURCES
Differences between expected and actual experience	\$ -	\$ 1,592,000
Changes of assumptions	-	683,000
Differences between projected and actual earnings on plan investments	-	8,000
Change in proportionate share and differences between actual and proportionate share of employer contributions	304,000	-
Contributions subsequent to measurement date	160,328	-
Total	\$ 464,328	\$ 2,283,000

The amount reported as deferred outflows of resources at December 31, 2019 and 2018 includes contributions subsequent to the measurement date of \$146,383 and \$160,328, respectively, which are recognized as a reduction of the net OPEB liability in the years ended December 31, 2020 and 2019. The amounts reported as deferred outflows of resources at December 31, 2019 will be recognized in OPEB expense as follows:

YEAR ENDING DECEMBER 31	
2020	\$(784,000)
2021	\$(784,000)
2022	\$(747,000)
2023	\$(588,000)
2024	\$(287,000)
Thereafter	\$(1,000)

Sensitivity of PMRS’ Proportionate Share of the Commonwealth’s Net OPEB Liability to Changes in the Discount Rate and Healthcare Cost Trend Rates

The following presents PMRS’ proportionate share of the commonwealth’s net OPEB liability as well as what PMRS’ proportionate share of the commonwealth’s net OPEB liability would be if it were calculated using a discount rate that is one percentage point lower or one percentage point higher than the current discount rate:

2019 SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGE IN THE DISCOUNT RATE

	1% DECREASE (2.50%)	DISCOUNT RATE (3.50%)	1% INCREASE (4.50%)
Net OPEB liability	\$ 3,780,000	\$ 3,332,000	\$ 2,957,000

2018 SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGE IN THE DISCOUNT RATE

	1% DECREASE (2.87%)	DISCOUNT RATE (3.87%)	1% INCREASE (4.87%)
Net OPEB liability	\$ 5,954,000	\$ 5,197,000	\$ 4,573,000

The following presents PMRS’ proportionate share of the commonwealth’s net OPEB liability as well as what PMRS’ proportionate share of the commonwealth’s net OPEB liability would be if it were calculated using a healthcare cost trend rate that is a one percentage point lower or one percentage point higher than the current healthcare cost trend rate:

2019 SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGE IN THE HEALTHCARE COST TREND RATE

	1% DECREASE (5.0%/4.9% DECREASING TO 3.1%)	HEALTHCARE COST TREND RATES (6.0%/5.9% DECREASING TO 4.1%)	1% INCREASE (7.0%/6.9% DECREASING TO 5.1%)
Net OPEB liability	\$ 2,895,000	\$ 3,332,000	\$ 3,871,000

2018 SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGE IN THE HEALTHCARE COST TREND RATE

	1% DECREASE (5.2%/4.9% DECREASING TO 3.1%)	HEALTHCARE COST TREND RATES (6.2%/5.9% DECREASING TO 4.1%)	1% INCREASE (7.2%/6.9% DECREASING TO 5.1%)
Net OPEB liability	\$ 4,461,000	\$ 5,197,000	\$ 6,112,000

Commonwealth’s Annual Comprehensive Financial Report (ACFR)

The REHP is reported in the commonwealth’s Annual Comprehensive Financial Report (ACFR) as a Pension (and Other Employee Benefit) Trust. The REHP is reported using the economic resources measurement focus and the accrual basis of accounting. The ACFR is an audited financial statement and is available at www.budget.pa.us.

(8) RELATIONSHIPS WITH OTHER COMMONWEALTH AGENCIES

Responsibility for the organization and administration of PMRS is vested in the 11-member Pennsylvania Municipal Retirement Board. The Pennsylvania Treasurer and the secretary of the commonwealth serve on the board by virtue of statute. Eight board members are also appointed by the governor after being nominated by their respective organizations.

One member each represents the Pennsylvania Municipal League, Pennsylvania Municipal

Authorities Association, Pennsylvania State Association of Boroughs, Pennsylvania State Association of County Commissioners, Pennsylvania State Association of Township Commissioners, Pennsylvania State Association of Township Supervisors, the active police officers, and the active firefighters. In addition, one board position is filled by a retired member of PMRS. Interested individuals apply, and then the governor makes an appointment from the list of applicants.

PMRS is not included as a component unit of the commonwealth for financial reporting purposes because PMRS is not financially accountable to the commonwealth as there is no imposition of will, no financial benefit/burden, nor fiscal dependency associated with PMRS toward the commonwealth.

(9) PLAN TERMINATION

Member municipalities may withdraw from PMRS if the conditions for withdrawal under the act have been met. Requirements include a minimum of five years of membership, approval of a minimum of 75% of the plan's active, vested, and retired members, and approval of the board. In the event of withdrawal, a municipality is entitled to receive a net refund of the amount then standing to the credit of the municipality in the municipal account, the member employees' account, and the retired members' reserve account. In no event shall the municipality refund exceed the pro-rata interest of the withdrawing municipality in the net position of the entire fund based on fair value of the fund investments as of the date of receipt of the application for permission to withdraw. Liability for any continuation of retirement or disability benefits being paid from PMRS shall attach to the withdrawing municipality.

(10) RISK MANAGEMENT

Exposure of PMRS through board or staff activity is covered by various means. PMRS acts under the cover of sovereign immunity, participation in the Employee Liability Self-Insurance Program of the Commonwealth of Pennsylvania, the commonwealth's fidelity bond, and the State Insurance Fund. The board also adopted a self-insurance indemnification policy in 2004. There have been no significant reductions in insurance coverage from the prior year. Settlements did not exceed insurance coverage for the past three years.

PMRS' implementation policy is to allow contracted external managers to decide what action to take regarding their respective portfolio's foreign currency exposures. PMRS has no specific policies for

interest rate risk and foreign currency risk.

(11) LITIGATION AND CONTINGENCIES

PMRS is subject to various threatened and pending lawsuits. These lawsuits include issues related to benefit calculations and eligibility. It is the opinion of management that the ultimate liability arising from such threatened and pending litigation will not have a material effect on the financial positions of PMRS. PMRS is exposed to various other liabilities and risks related to fiduciary responsibilities of directors and officers.

(12) COMMITMENTS

At December 31, 2019, PMRS had commitments for the future purchase of investments in real estate of \$40 million.

PMRS entered an operating lease for a new office building effective July 1, 2017 and expiring June 30, 2027 with two five-year renewal options. Annual rent for the first year (including parking) was \$290,718 with annual increases up to a maximum of 5%. Office space rental expense for the years ended December 31, 2019 and 2018 was \$314,729 and \$294,660, respectively.

(13) RISK AND UNCERTAINTIES

Investments are exposed to various risks such as interest rate, market, and credit risks. Due to the level of risk associated with certain investments, it is possible that changes in the values of investment securities may occur in the near term and such changes could materially affect the amounts reported in the financial statements.

(14) SUBSEQUENT EVENTS

PMRS has performed an evaluation of subsequent events through November 15, 2021, the date the financial statements were available to be issued. No material events were identified by PMRS.

As the effects of the coronavirus pandemic continue to evolve and are dependent upon future developments, the impact of the coronavirus on PMRS' operations and financial results are uncertain at this time.

Required Supplementary Schedules

SCHEDULE 1 - INVESTMENT RETURNS

Schedule of Investment Returns
Annual money-weighted rate of return,
net of investment expense

YEAR ENDED DECEMBER 31	ANNUAL RATE
2019	20.9%
2018	(4.57%)
2017	17.84%
2016	8.23%
2015	(0.27%)
2014	5.20%

Note: Money-weighted results for the required 10-year timeframe will be added as available.

SCHEDULE 2 - ALLOCATED SHARE OF NET PENSION LIABILITY

MEASUREMENT YEAR ENDED	ALLOCATION PERCENTAGE	ALLOCATED SHARE OF NET PENSION LIABILITY	COVERED PAYROLL	NET PENSION LIABILITY AS A PERCENTAGE OF COVERED PAYROLL	PLAN FIDUCIARY NET POSITION AS A PERCENTAGE OF TOTAL PENSION LIABILITY
12/31/2018	0.02295329%	\$ 4,781,405	\$ 1,535,688	311.35%	56.4%
12/31/2017	0.02277373%	3,937,967	1,507,109	261.3%	63.0%
12/31/2016	0.02323614%	4,475,356	1,479,180	302.6%	57.8%
12/31/2015	0.02580846%	4,692,967	1,651,026	284.2%	58.9%
12/31/2014	0.02542261%	3,777,141	1,566,464	241.1%	64.8%
12/31/2013	0.02528467%	3,454,742	Not available	Not available	66.7%

Note: Allocated share of net pension liability results for the required 10-year timeframe will be added as available.

SCHEDULE 3 - ALLOCATED SHARE OF NET OPEB LIABILITY

MEASUREMENT YEAR ENDED	ALLOCATION PERCENTAGE	ALLOCATED SHARE OF NET OPEB LIABILITY	COVERED PAYROLL	NET OPEB LIABILITY AS A PERCENTAGE OF COVERED PAYROLL	PLAN FIDUCIARY NET POSITION AS A PERCENTAGE OF TOTAL OPEB LIABILITY
06/30/2019	0.03271800%	\$ 3,332,000	\$ 1,432,000	232.70%	3.8%
06/30/2018	0.03539700%	5,197,000	1,438,000	361.40%	2.2%
06/30/2017	0.03374800%	6,768,000	1,428,000	473.90%	1.4%
06/30/2016	0.03439300%	7,327,000	Not available	Not available	Not available

Note: Allocated share of net pension liability results for the required 10-year timeframe will be added as available.

SCHEDULE 4 – SCHEDULE OF PMRS PENSION CONTRIBUTIONS

	2014	2015	2016	2017	2018	2019
Contractually determined contribution	\$ 282,345	\$ 343,460	\$ 371,833	\$ 452,537	\$ 476,919	\$ 514,987
Contributions in relation to the contractually determined contribution	282,345	\$ 343,460	\$ 371,833	\$ 452,537	\$ 476,919	\$ 514,987
Contribution deficiency (excess)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Covered payroll	\$ 1,620,305	\$ 1,596,464.9	\$ 1,470,254	\$ 1,574,215.0	\$ 1,589,270.1	\$ 1,684,961.9
Contributions as a percentage of covered payroll	17.43%	21.51%	25.29%	28.75%	30.01%	30.56%

In accordance with GASB Statement No. 75, this schedule has been prepared prospectively. This schedule will accumulate each year until sufficient information to present a ten-year trend is available. Changes of assumption: In 2017, the discount rate changed from 7.50% to 7.25%, and annual inflation decreased from 2.75% to 2.60%.

SCHEDULE 5 – SCHEDULE OF PMRS OPEB CONTRIBUTIONS

	2017	2018	2019
Contractually determined contribution	\$ 228,982	\$ 164,355	\$ 172,698
Contributions in relation to the contractually determined contribution	\$ 228,982	\$ 164,355	\$ 172,698
Contribution deficiency (excess)	\$ -	\$ -	\$ -
Covered payroll	\$1,574,215	\$1,589,270	\$1,684,962
Contributions as a percentage of covered payroll	14.55%	10.34%	10.25%

In accordance with GASB Statement No. 75, this schedule has been prepared prospectively. This schedule will accumulate each year until sufficient information to present a ten-year trend is available. Change of assumptions: The discount rate changed from 3.87% as of 6/30/18 to 3.50% as of 6/30/19.

Supplementary Schedules

SCHEDULE 1 – ADMINISTRATIVE EXPENSES

Comparative Two-Year Schedule
Years Ended December 31, 2019 and 2018

	2019	2018
PERSONNEL EXPENSES		
Salaries and wages	\$ 1,942,989	\$ 1,674,683
Social security contributions	126,616	118,424
Pension expense	639,802	484,129
OPEB expense	(322,025)	108,342
Insurance expenses	192,257	187,548
Other employee benefits	17,713	12,528
Total personnel expenses	\$ 2,597,352	\$ 2,585,654
PROFESSIONAL SERVICES		
IT consultants	\$ 375,115	\$ 1,097,312
Actuarial	522,939	826,380
Audit	161,395	136,410
Legal	47,917	104,238
Miscellaneous professional	98,132	93,320
Data processing	40,581	34,655
Total professional costs	\$ 1,246,079	\$2,292,315
COMMUNICATION		
Telephone	\$ 65,385	\$ 52,201
Travel and conferences	31,805	32,713
Postage	25,104	20,800
Printing	596	7,199
Advertising	5,376	3,276
Total communication	\$ 128,266	\$ 116,189
OTHER SERVICES AND CHARGES		
Contracted EDP services	\$ 437,617	\$ 339,529
Office space rental	314,729	294,660
Equipment leasing	27,127	39,821
Dues and subscriptions	15,302	15,436
Supplies	7,601	5,500
Maintenance	436	4,016
Bonding and insurance, net	13,384	468
Total other services and charges	\$ 816,196	\$ 699,430
DEPRECIATION	\$ 79,166	\$ 77,013
Total administrative expenses	\$ 4,867,059	\$ 5,770,601

SCHEDULE 2 – INVESTMENT EXPENSES

Comparative Two-Year Schedule
Years Ended December 31, 2019 and 2018

	2019	2018
Investment management fees	\$ 12,008,813	\$ 11,997,298
Investment consultants	189,878	190,000
Custodial fees	102,645	101,163
Proxy voting services	17,648	17,176
Total investment expenses	\$ 12,318,984	\$ 12,305,637

SCHEDULE 3 – PAYMENTS TO CONSULTANTS

Comparative Two-Year Schedule
Years Ended December 31, 2019 and 2018

FIRM NAME	NATURE OF SERVICE	2019	2018
Dell	IT consultants	\$ (24,320)	\$ 805,752
Cheiron	Actuary	522,939	826,380
OST, Inc.	IT consultants	224,655	215,172
Dehab Associated, Inc.	Investment consultant	189,787	190,000
ZA LLC	Auditor	70,980	136,410
Keymark IMR	IT consultants	90,415	48,333
CPAS Systems	IT consultants	788	15,575
ISS	Proxy voting services	169,832	17,176
Appalachia Technologies	IT consultants	17,648	12,480
IMR	Records management services	4,160	1,899
Windstream	IT consultants	2,756	--
Total		\$ 1,271,659	\$ 2,269,177



Investments

Basis of Presentation

The data presented in the Investment section by PMRS' independent investment consultant has been prepared using a time-weighted rate of return methodology based upon fair values. The Investment section includes only those investments under management of advisors that are under contract with PMRS. These investments are valued in a manner consistent with information present in the Financial section except for the recognition of accrued income and pending sales and purchases. The difference noted above represents the difference between the investment balance of \$2,802,642,290 presented in the Financial section and the balance of \$2,800,814,336 reported in this section as of December 31, 2019. The difference noted above also results in a difference in the investment gain of \$492,582,292 presented in the Financial section and the investment gain of \$490,719,669 reported in this section for the year ended December 31, 2019.

Investments are reported at fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. The fair value of real estate investments is based on independent appraisals every three years. In years when an appraisal is not performed, real estate investments, and investments that do not have an established market value, are reported at estimated fair values. Purchases and sales of investments are recorded on a trade-date basis.

Returns for active and passive funds presented throughout the Investment section are gross of external manager fees.

INVESTMENT RETURN

As of December 31, 2019, the Pennsylvania Municipal Retirement Board's investment portfolio was valued at \$2,800,814,336, which was an increase of \$438,254,506 from the December 31, 2018 ending value of \$2,362,559,830. For the year ended December 31, 2019, PMRS had net withdrawals of \$52,465,163 and an investment gain of \$490,719,669.

For the five years ended December 31, 2019, PMRS had net withdrawals of \$198,000,776 and an investment return of \$950,851,083. PMRS investment portfolio increased from \$2,047,964,029 as of December 31, 2014 to \$2,800,814,366 as of December 31, 2019.

Since inception in December 1985, PMRS had net withdrawals of \$377,417,500 and an investment return of \$3,015,836,455. PMRS investment portfolio increased from \$162,395,431 as of December 31, 1985 to \$2,800,814,336 as of December 31, 2019. If PMRS had earned an annualized compound rate of 5.25% since inception, it would have been worth \$517,452,917 or \$2,283,361,419 less than the actual value as of December 31, 2019.

Investment Guidelines

INTRODUCTION

The following represents highlights from the board's investment guidelines. These guidelines, which set forth the board's expectations, restrictions, and policy decisions, were developed to assist PMRS' staff and consultants in the daily management of PMRS' assets.

BACKGROUND

PMRS is currently experiencing a positive cash flow and expects this trend to gradually increase in the future. PMRS currently meets routine benefit payments from incoming revenue as opposed to any depletion of invested assets.

PHILOSOPHY

The board considers itself a conservative fiduciary, placing the greatest emphasis on quality of investment and consistency in return. Despite this conservative posture, the board still believes that the five-year rate of return on investments should exceed the recognized market indices for the various asset vehicles. The board established its allocation goals as follows:

Domestic equities (large capitalized firms)	25%
Domestic equities (small capitalized firms)	15%
International equities (developed markets)	15%
International equities (emerging markets)	10%
Fixed income	15%
Real estate	12.5%
Timberland	7.5%

OBJECTIVE

The board's investment objective is to benefit PMRS member municipalities by adding value to their assets. Recognizing that inflation can erode value, the board's goal is to have PMRS earn at least 2% more annually than the average inflation rate over a long period of time. While this is the overall goal, individual investment managers' performance measures rely on other characteristics that are included in the individual contractual service agreement.

PORTFOLIO CONSTRUCTION

Short-Term Considerations

It is the board's desire to remain as fully invested as possible. Therefore, any manager in a cash or cash equivalent position must invest in vehicles authorized by PMRS. The manager must use PMRS' depository relationship with the Pennsylvania Treasury who, as custodian of PMRS' investments, will invest all cash in a short-term fund. PMRS does not pay a management fee on the portion of a manager's average assets exceeding 5% in cash equivalents at Pennsylvania Treasury after the end of any quarter.

Fixed Income Considerations

The board seeks to bring income and stability to the overall portfolio through fixed income vehicles. The bond portfolio must be invested in quality vehicles and is expected to be diversified from a geographic and industrial standpoint. With the exception of U.S. government bonds, no single holding of an investment manager is to account for more than 5% of the fair value of their bond portfolio. PMRS shall not hold as assets more than 10% of any one bond issue not more than 5% of any one bond issue nor more than 5% of the bonds of any one issuing agent. Corporate bonds of any given industry are not to account for more than 25% of the fair value of the bond portfolio. When an index fund is used to meet PMRS' commitment to the fixed income allocation, the underlying securities of the index shall not have to comply with the specific requirements of this paragraph.

EQUITY INVESTMENT POLICY

PMRS' equity portfolio reflects the board's desire to include growth through market appreciation. The board requires an equity portfolio with diversification, quality issuance and underlying value. No single equity holding may account for more than 7.5% of the fair value of PMRS' equity portfolio. Generally, no single sector should account

for more than 20% of the value of an individual manager's portfolio. The cumulative holdings of a manager for all clients shall account for no more than 7.5% of the outstanding voting common stock of a corporation.

REAL ESTATE POLICY

The board believes that diversification in investment vehicles should enhance the potential return on investments without significantly altering the overall risk of the portfolio. Investment decisions regarding the real estate portfolio shall be guided by the objective to preserve capital, maximize cash distributions and income, achieve a total return competitive with other asset classes, and maintain a broad diversification of assets and managers. Real estate vehicles may be both direct equity participation and participation in commingled funds that involve equity participation with consideration given to types of properties and geographic location. The investment process and specific limitations shall be detailed in each real estate manager's contract.

PROHIBITED TRANSACTIONS

The board prohibits (1) purchasing of commodities, mineral rights and warrants except those previously authorized; (2) short selling and the purchasing of securities on margin; and (3) selling or buying options or future contracts on either fixed income or equity instruments. Leveraged derivatives of any nature or the use of derivatives to create leverage are strictly prohibited.

EXECUTION AND OPERATION

PMRS uses the Pennsylvania Treasury as custodian and the Bank of New York Mellon as the sub-custodian.

Investment managers are directed to execute orders on the best net execution/price basis. Transactional costs and the rate of turnover are monitored. Active equity managers are expected to execute trades on the auction market at a rate close to the execution-only cost.

The investment managers may enter into agreements with certain brokerage houses to participate in a recapture program whereby a designated percentage of PMRS' trades handled by these brokerage firms will be returned as cash to PMRS' and be treated as new income for the benefit of the membership. It is expected that under such an arrangement, the average execution cost of all trades will approximate the execution-only price.

The board assumes full responsibility for exercising the voting privilege contained in proxy solicitations generated by companies domiciled in the U.S. and has adopted specific guidelines for staff guidance. These guidelines as adopted, and hereafter amended, are an integral part of PMRS' investment guidelines. Proxy solicitations by non-U.S. domiciled companies are handled by the investment manager that holds the company's security in their portfolio.

COMMUNICATIONS

The board expects an open and constant line of communication between PMRS' staff and investment managers. Reports required of investment managers to the board and staff include a timely confirmation of all transactions, a quarterly statement of asset values at cost and fair value, any explanation of contemplated major shifts in investment strategy or manager style before implementation, and an explanation of major changes in organization or the personnel associated with PMRS' account. Active equity managers are required to report on

a quarterly basis the average commission price per share traded during the quarter. In addition to the written reports, the investment managers are obligated to make periodic personal appearances before the board as specifically spelled out in the investment manager's contract.

Investment managers' fees are based on the fair value of the firm's quarterly average balance in the PMRS' portfolio. For the years ended December 31, 2019 and 2018, the total investment managers' fees based upon the average monthly net asset values of PMRS' total investment portfolio were 46 basis points and 48 basis points, respectively.

MONITORING

PMRS monitors the performance of its investment managers through direct involvement of the board, PMRS' staff and any consultant hired for this purpose by the board.

Report on Investment Activity

RELATIVE PERFORMANCE

Total Fund

For the year ended December 31, 2019, the gross rate of return for PMRS' total portfolio was 21.1%, which was 2.1% more than the shadow index¹ return of 19.0% and ranked in the 15th percentile of the Investment Metrics (IM) Public Fund universe. For the five years ended December 31, 2019, the gross rate of return for PMRS' total portfolio was 8.4%, which was 0.7% more than the shadow index return of 7.7% and ranked in the 5th percentile. Since inception, the gross rate of return for PMRS' total portfolio was 8.9%, compared to the shadow index return of 8.7%.

Large Cap Equity

For the year ended December 31, 2019, the gross rate of return for the large cap equity portfolio was 35.4%, which was 3.9% more than the S&P 500 Index return of 31.5% and ranked in the 14th percentile. For the five years ended December 31, 2019, the gross rate of return for the large cap equity portfolio was 13.2%, which was 1.5% more than the S&P 500 Index return of 11.7% and ranked in the 21st percentile.

Small Cap Equity

For the year ended December 31, 2019, the gross rate of return for the small cap equity portfolio was 28.7%, which was 3.2% more than the Russell 2000 Index return of 25.5% and ranked in the 26th percentile. For the five years ended December 31, 2019, the gross rate of return for the small cap equity portfolio was 8.5%, which was 0.3% more than the Russell 2000 Index return of 8.2% and ranked in the 54th percentile.

Developed International Equity

For the year ended December 31, 2019, the gross rate of return for the developed international equity portfolio was 29.3%, which was 6.6% more than the MSCI EAFE Index return of 22.7% and ranked in the 16th percentile. For the five years ended December 31, 2019, the gross rate of return for the developed international equity portfolio was 8.6%, which was 2.4% more than the MSCI EAFE Index return of 6.2% and ranked in the 25th percentile.

Emerging Markets Equity

For the year ended December 31, 2019, the gross rate of return for the emerging market equity portfolio was 18.4%, which was 0.5% less than the MSCI Emerging Markets Index return of 18.9% and ranked in the 63rd percentile. For the five years ended December 31, 2019, the gross rate of

¹ The shadow index is a customized index created by PMRS' investment consultant. It is constructed at the asset class level with corresponding benchmark allocations matching the portfolio.

return for the emerging market equity portfolio was 5.6%, which was 0.4% less than the MSCI Emerging Markets Index return of 6.0% and ranked in the 57th percentile.

Real Estate

For the year ended December 31, 2019, the gross rate of return for the real estate portfolio was 5.3%, which was 1.1% less than the NCREIF Property Index return of 6.4%. For the five years ended December 31, 2019, the gross rate of return for the real estate portfolio was 8.0%, which was 0.3% less than the NCREIF Property Index return of 8.3%.

Fixed Income

For the year ended December 31, 2019, the gross rate of return for fixed income portfolio was 8.8%, which was .01% more than the Barclays Aggregate Index return of 8.7% and ranked in the 75th percentile. For the five years ended December 31, 2019, the gross rate of return for the fixed income portfolio was 3.1%, which was exactly the same as the Barclays Aggregate Index return of 3.1% and ranked in the 86th percentile.

Asset Allocation

The following table shows the allocation of assets as of December 31, 2019.

ASSET ALLOCATION

(As of December 31, 2019)

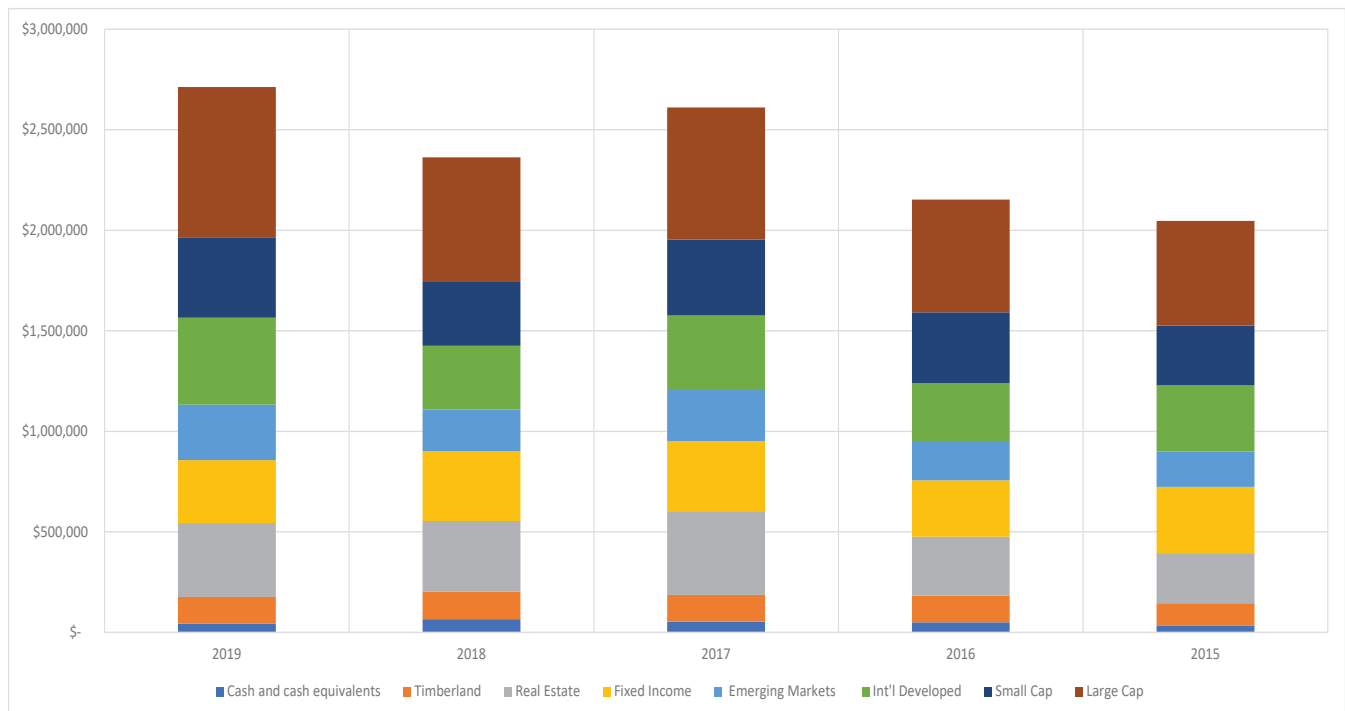
TYPE	PERCENTAGE OF PORTFOLIO	AMOUNT
Large cap equity	26.6%	\$ 747,503,327
Small cap equity	14.3%	399,589,731
Total domestic equity	40.9%	1,147,093,058
International developed markets	15.4%	432,275,065
International emerging markets	9.9%	276,636,099
Total international equity	25.3%	708,911,164
Total equities	66.2%	1,856,004,222
Real estate	17.8%	500,027,435
Fixed income	14.4%	403,053,072
Cash and cash equivalents⁽¹⁾	1.6%	43,557,561
Total portfolio	100.0%	\$ 2,802,642,290

⁽¹⁾ Cash and cash equivalents include funds held by the Pennsylvania Treasury.

The following graph shows PMRS' five year trend of investments at fair value as of December 31, 2019.

PORTFOLIO DISTRIBUTION FIVE-YEAR TREND

(Fair Value – Amounts in Millions)



Portfolio Rates of Return⁽¹⁾

(As of December 31, 2019)

The following table compares the gross rates of return for PMRS' total investment portfolio as of December 31, 2019 with standard indexes for one year, three year, five year, ten year and since inception in December 1985. The calculations of yields were prepared using a time-weighted

rate of return methodology based on fair values. PMRS' returns have been competitive with other professionally managed funds.

PERFORMANCE SUMMARY

	1 YEAR	3 YEAR	5 YEAR	10 YEAR	SINCE INCEPTION DECEMBER 1985
Total Portfolio	21.1	11.2	8.4	9.1	8.9
Public Fund Rank ^[2]	(15)	(5)	(5)	(15)	-
Shadow Index ^[3]	19	9.7	7.7	8.8	8.7
Large Cap Equity	35.4	18.6	13.2	14.5	11.2
Large Cap Rank ^[4]	(14)	(20)	(21)	(23)	-
S&P 500	31.5	15.3	11.7	13.5	10.8
Small Cap Equities	28.7	9.2	8.5	12.5	-
Small Cap Rank ^[4]	(26)	(44)	(54)	(59)	-
Russell 2000	25.5	8.6	8.2	11.8	9.4
International Equity	29.3	13.9	8.6	7.7	-
International Equity Rank ^[5]	(16)	(23)	(25)	(37)	-
MSCI EAFE	22.7	10.1	6.2	6	7.8
Emerging Markets Equity	18.4	11.6	5.6	3.5	-
Emerging Markets Rank ^[6]	(63)	(45)	(57)	(91)	-
MSCI Emerging Markets	18.9	12.0	6.0	4.0	-
Real Estate	5.3	6.8	8	8.7	6.9
NCREIF	6.4	6.7	8.3	10.2	7.8
Fixed Income	8.8	4.1	3.1	3.7	6.4
Core Fixed Income Rank ^[7]	(75)	(83)	(86)	(90)	-
Barclays Aggregate	8.7	4	3.1	3.8	6.4

1 Rate of return is a mathematical measure of the rate of change in the asset value of a fund. All rates of return are based on the fair value of the assets. Rates of return reflect both realized and unrealized capital gains and losses as well as total earnings from interest and dividends received. Rates of return are gross of fees.

2 Ranked against balanced funds

3 The shadow index is a customized index created by PMRS' investment consultant. It is constructed at the asset class level with corresponding benchmark allocations matching the portfolio.

4 Ranked against equity oriented funds.

5 Ranked against international developed markets oriented funds.

6 Ranked against international emerging markets oriented funds. PMRS entered emerging markets equities in late 2008.

7 Ranked against fixed income oriented funds.

Asset Allocation

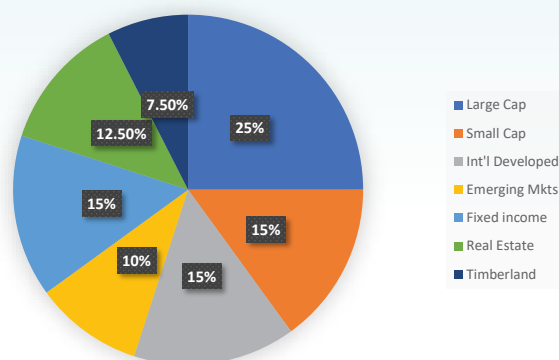
The board established its allocation goals as follows:

Domestic equities (large capitalized firms)	25%
Domestic equities (small capitalized firms)	15%
International equities (developed markets)	15%
International equities (emerging markets)	10%
Fixed income	15%
Real estate	12.5%
Timberland	7.5%

PMRS' asset allocation as of December 31, 2019, was \$1,147.0 million committed to domestic equities (\$747.5 million to large cap and \$399.6 million to small cap), \$708.9 million to international equities (\$432.2 million to developed markets and \$276.6 to emerging markets), \$403.0 million to bonds, \$367.6 to real estate, \$132.3 million to timber and \$43.6 million to cash equivalents. The percentage distribution is illustrated below.

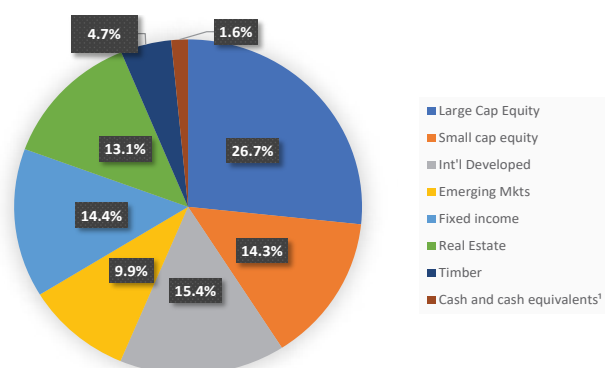
ASSET ALLOCATION TARGETS

As of December 31, 2019



ACTUAL ASSET ALLOCATION

As of December 31, 2019



ASSET ALLOCATION

As of December 31, 2019

SECTOR	TARGET PERCENTAGE ALLOCATION	TARGET DOLLAR ALLOCATION	CURRENT PERCENTAGE ALLOCATION	CURRENT DOLLAR ALLOCATION	DOLLAR VARIANCE	PERCENTAGE VARIANCE
Large cap	25%	\$ 700,660,573	26.6%	\$ 747,503,327	\$ 46,842,754	1.6%
Small cap	15%	420,396,344	14.3%	399,589,731	(20,806,613)	(0.7%)
Total domestic equity	40%	\$ 1,121,056,917	40.9%	\$ 1,147,093,058	\$ 26,036,141	0.9%
International developed	15%	420,396,344	15.4%	432,275,065	11,878,721	0.4%
Emerging markets	10%	280,264,229	9.9%	276,636,099	(3,628,130)	(0.1%)
Total international equity	25%	\$ 700,660,573	25.3%	\$ 708,911,164	\$ 8,250,591	0.3%
Total equity	65%	\$ 1,821,717,490	66.2%	\$ 1,856,004,222	\$ 34,286,732	1.2%
Fixed income	15%	420,396,344	14.4%	403,053,072	(17,343,272)	(0.6%)
Real estate	12.5%	350,330,286	13.1%	367,640,118	17,309,832	0.6%
Timber	7.5%	210,198,172	4.7%	132,387,317	(77,810,855)	(2.8%)
Cash and cash equivalents	0%	-	1.6%	43,557,561	43,557,561	1.6%
TOTAL	100%	\$ 2,802,642,292	100%	\$ 2,802,642,290		

Investment Summary

SUMMARY OF INVESTMENT EXPENSES

Comparative Two-Year Schedule
Years ended December 31, 2019 and 2018

FIRM NAME	2019	2018
Large Cap Domestic Managers		
Eagle Capital Management, LLC	\$ 1,155,630	\$ 1,136,752
Polen Capital Management	946,248	988,411
Federated Investors, Inc.	778,068	756,878
LSV Asset Management	624,297	677,216
Total Large Cap Domestic Manager Fees	\$ 3,504,243	\$ 3,559,257
Small Cap Domestic Managers		
Emerald Advisers, Inc.	549,933	657,523
Smith Graham & Co.	501,211	508,822
LSV Asset Management	421,416	430,217
AMI Asset Management	292,116	318,210
Copeland Asset Management	221,237	201,355
Total Small Cap Domestic Manager Fees	\$ 1,985,912	\$ 2,116,127
Passive Manager		
State Street Global Advisors	306,969	257,418
Total Passive Manager Fees	\$ 306,969	\$ 257,418
International Managers		
HGK Asset Management, Inc.	816,820	813,805
Hardman Johnston Global Advisors	714,817	664,245
Jarislowsky, Fraser Limited	177,162	376,799
Total International Manager Fees	\$ 1,708,799	\$ 1,854,849
Real Estate Managers		
Nuveen Real Estate	1,863,050	1,806,440
Prudential Financial, Inc.	1,612,548	1,319,538
Forest Investment Associates	1,027,292	1,083,669
Total Real Estate Manager Fees	\$ 4,502,890	\$ 4,209,647
Total Investment Management Fees	\$ 12,008,813	\$ 11,997,298
Investment Consultant - Dahab Associates, Inc.	189,878	190,000
Custodial Fees – BNY Mellon	102,645	101,163
Proxy Voting services - ISS	17,649	17,176
Total Investment Expenses	\$ 12,318,985	\$ 12,305,637

TEN LARGEST COMMON STOCK HOLDINGS

As of December 31, 2019 (Fair Value)

STOCK	SHARES	FAIR VALUE	PERCENTAGE OF PORTFOLIO
Microsoft Corp.	275,319	\$ 43,417,806	1.56%
Alphabet Inc-Class C	23,693	31,678,015	1.14%
Facebook Inc.	129,570	26,594,243	0.96%
VISA Inc.	114,130	21,445,027	0.77%
Mastercard Inc.	55,859	16,678,939	0.60%
Zoetis Inc.	121,417	16,069,540	0.58%
Adobe Inc.	46,368	15,292,630	0.55%
Citigroup Inc.	169,100	13,509,399	0.49%
Bershire Hathaway Inc.	53,751	12,174,602	0.44%
Accenture PLC	57,773	12,165,261	0.44%

A complete list of portfolio holdings can be obtained from PMRS.

PORTFOLIO SUMMARY

As of December 31, 2019

TYPE OF INVESTMENT	COST VALUE	FAIR VALUE	PERCENTAGE OF TOTAL FAIR VALUE
Corporate and government bonds			
U.S. Government bonds	\$ 220,070,778	\$ 283,709,057	10%
Corporate bonds	92,574,169	119,344,015	4%
Total	\$ 312,644,947	\$ 403,053,072	14%
Common stock			
Domestic	823,867,108	1,147,093,058	41%
International	505,001,426	708,911,164	25%
Total	\$ 1,328,868,534	\$ 1,856,004,222	66%
Other investments			
Real estate	387,643,801	500,027,435	18%
Cash and cash equivalents ¹	43,557,547	43,557,561	2%
Total	\$ 431,201,348	\$ 543,584,996	19%
Grand total	\$ 2,072,714,829	\$ 2,802,642,290	100%

SUMMARY OF COMMISSIONS PAID TO BROKERS

Year Ended December 31, 2019

BROKER NAME	COMMISSION PAID	BROKER NAME	COMMISSION PAID
BAIRD, ROBERT W & CO INC, MILWAUKEE	\$ 7,060	INSTINET AUSTRALIA CLEARING SERV, SYDNEY	\$ 2,134
BARCLAYS CAPITAL INC./LE, NEW JERSEY	918	INSTINET CLEARING SER INC, NEW YORK	9,540
BARCLAYS CAPITAL, LONDON (BARCGB33)	351	INSTINET CORP, NEW YORK	1,840
BERENBERG GOSSLER & CIE, HAMBURG	1,505	INSTINET EUROPE LIMITED, LONDON	8,691
BERNSTEIN SANFORD C & CO, NEW YORK	16,293	INSTINET PACIFIC LTD, HONG KONG	6,501
BNP PARIBAS SEC SRVS SA, SINGAPORE	5,583	INVESTMENT TECH GROUP INC, NEW YORK	749
BNP PARIBAS SEC SVCS, LONDON (PARBGB2L)	206	INVESTMENT TECHNOLOGY GROUP LTD, DUBLIN	1,563
BNY CONVERGEX EXECUTION SOL, NEW YORK	31,619	ISI GROUP INC, NEW YORK	1,570
BOENNING & SCATTERGOOD, W CONSHOHOCKEN	662	J P MORGAN SECS LTD, LONDON	5,882
BOFA SECURITIES, INC, NEW YORK	1,243	J.P MORGAN SECURITIES INC, NEW YORK	9,822
CARNEGIE ASA, OSLO	672	J.P. MORGAN SECURITIES LLC, NEW YORK	6,449
CARNEGIE SECS LTD, HELSINKI (CASFFIH1)	1,435	J.P. MORGAN SECURITIES, HONG KONG	465
CITIBANK CUSTODIAL, TORONTO (CITC)	35	JANNEY MONTGOMERY SCOTT, PHILADELPHIA	49
CITIGROUP GBL MKTS INC, NEW YORK	1,507	JEFFERIES & CO INC, NEW YORK	23,592
CITIGROUP GBL MKTS/SALOMON, NEW YORK	2,545	JEFFERIES & CO LTD, LONDON	2,484
CITIGROUP GLOBAL MARKETS LTD, LONDON	4,673	JMP SECURITIES, SAN FRANCISCO	646
CITIGROUP GLOBAL MARKETS, INC., NEW YORK	11,237	JONESTRADING INST SVCS LLC, NEW YORK	2,373
CLSA AMERICAS, NEW YORK	2,868	JPMORGAN SECURITIES INC, NEW YORK	554
CONVERGEX EXECUTION SOLUTION, NEW YORK	2,489	KEEFE BRUYETTE + WOODS INC, NEW YORK	783
COWEN AND CO LLC, NEW YORK	6,321	KEYBANC CAPITAL MARKETS INC, NEW YORK	5,655
COWEN AND COMPANY, LLC, JERSEY CITY	12,936	KING (CL) & ASSOCIATES, ALBANY	56
CRAIG HALLUM, NEW YORK	8,573	LEERINK SWANN AND COMPANY, NEW YORK	5,705
CREDIT LYONNAIS SECS (ASIA), HONG KONG	2,648	LIBERUM CAPITAL LIMITED, LONDON	2,737
CREDIT LYONNAIS SECS, SINGAPORE	5,818	LIQUIDNET INC, NEW YORK	8,556
CREDIT SUISSE, NEW YORK (CSUS)	21,836	LOGBOW SECURITIES LLC, NEW YORK	146
DAIWA SEC SMBC EUROPE LTD, LONDON	86	LOOP CAPITAL MARKETS, JERSEY CITY	1,224
DAIWA SECS AMER INC, NEW YORK	2,038	LUMINEX TRADING AND ANALYTICS, BOSTON	104
DAVIDSON (D A) & CO INC, NEW YORK	441	MAXIM GROUP, JERSEY CITY	651
DEN DANSKE BANK, COPENHAGEN	1,550	MERRILL LYNCH INTL LONDON EQUITIES	20,679
DEN NORSKE CREDITBANK, OSLO	58	MERRILL LYNCH PIERCE FENNER SMITH INC NY	23,070
DEUTSCHE BK INTL EQ, LONDN (DEUTGB2EEQ)	769	MERRILL LYNCH PROFESSIONAL CLRG, PURCHAS	239
DEUTSCHE BK SECS INC, NY (NWCUS33)	5,618	MIRAE ASSET SEC USA, NEW YORK	2,604
DIRECT TRADING, UNITED STATES	137	MORGAN STANLEY & CO INC, NY	15,610
DOUGHERTY & COMPANY LLC, MINNEAPOLIS	241	MORGAN STANLEY & CO, LONDON (MSLNGB2X)	3,984
EXANE, PARIS (EXANFRPP)	8,448	NATIONAL FINL SVCS CORP, NEW YORK	1,211
FIDELITY CAPITAL MARKETS, NEW YORK	2,114	NEEDHAM AND CO LLC, NEW YORK	2,458
FIDELITY CLEARING CANADA ULC, TORONTO	175	NORTHLAND SECURITIES INC., NEW YORK	18
FOKUS BANK, TRONDHEIM	197	OPPENHEIMER & CO INC, NEW YORK	1,973
FOX RIVER EXECUTION TECH, LLC, JERSEY CITY	766	PARETO FONDS AS, OSLO	2,025
GOLDMAN SACHS & CO, NY	36,566	PERSHING LLC, JERSEY CITY	5,377
GOLDMAN SACHS INTL, LONDON (GSILGB2X)	1,417	PIPER JAFFRAY & CO., JERSEY CITY	6,708
GUGGENHEIM CAPITAL MARKETS LLC, NEW YORK	725	PIPER JAFFRAY & CO, MINNEAPOLIS	264
GUGGENHEIM LIQUIDITY SVCS, NEW YORK	248	RAYMOND JAMES & ASSOC INC, ST PETERSBURG	12,429
ICBC FINCL SVCS, NEW YORK	515	RBC CAPITAL MARKETS LLC, NEW YORK	22,352

BROKER NAME	COMMISSION PAID
RBC DOMINION SECS INC, TORONTO (DOMA)	\$ 865
REDBURN PARTNERS LLP, LONDON	5,652
ROYAL BANK OF CANADA EUROPE LTD, LONDON	324
S G WARBURG, SEOUL	2,239
SANDLER ONEILL AND PARTNER LP, NEW YORK	5,364
SANFORD C BERNSTEIN & CO INC, LONDON	2,957
SEAPORT GROUP SECURITIES, LLC, NEW YORK	1,800
SG AMERICAS SECURITIES LLC, NEW YORK	636
SG SEC (LONDON) LTD, LONDON	463
SIDOTI AND COMPANY LLC, NEW YORK	569
STEPHENS INC, LITTLE ROCK	284
STIFEL NICOLAUS	12,226
STURDIVANT AND CO INC, NEW YORK	2,908
SUNTRUST CAPITAL MARKETS INC, NEW YORK	6,760
THOMPSON DAVIS & CO, JERSEY CITY	241
TULLETT PREBON FIN SERV, LLC, NEW YORK	502
UBS AG LONDON BRANCH, LONDON	1,266
UBS EQUITIES, LONDON	12,891
UBS SECURITIES LLC, STAMFORD	5,521
UBS WARBURG ASIA LTD, HONG KONG	3,673
UBS WARBURG, LONDON	72
WEDBUSH MORGAN SECS INC, LOS ANGELES	1,539
WEEDEN & CO, NEW YORK	2,177
WELLS FARGO SECURITIES LLC, CHARLOTTE	599
WELLS FARGO SECURITIES, LLC, NEW YORK	6,915
WESTMINSTER RES ASSC/BROADCORT, NEW YORK	6,450
WILEY BROS-AINTREE CAPITAL, JERSEY CITY	709
WILLIAM BLAIR & CO, CHICAGO	1,304
Total Brokerage Commissions Paid	\$ 531,566



Actuarial

Actuary's Certification Letter



Classic Values, Innovative Advice

Via Electronic Mail

August 25, 2021

Pennsylvania Municipal Retirement Board of the
Pennsylvania Municipal Retirement System
c/o Timothy A. Reese, Chief Executive Officer
P.O. Box 1165
Harrisburg, Pennsylvania 17108-1165

Dear Board Members:

At your request, we are re-submitting this letter that replaces the original letter dated July 24, 2020 to account for updates to the organization and terminology since that time. We confirm that the following tables from the annual Actuarial Valuation Report of the Pennsylvania Municipal Retirement System (the System) as of January 1, 2019 will be published in the end-of-year Annual Comprehensive Financial Report (ACFR). These tables were determined based on the results of the valuation as outlined in our actuarial valuation report. The figures and data disclosed in these tables, as presented in the actuarial valuation report, were provided by Cheiron for 2014 – 2019.

1. Required Supplemental Information
2. Solvency Test which shows the portion of the Actuarial Liability covered by Assets
3. Funded Status of Actuarial Liabilities
4. Schedule of Retirees and Beneficiaries
5. Schedule of Total Membership by Status
6. Schedule of Total Membership and Salary
7. Schedule of Active Member Valuation Data
8. Actuarial Methods and Significant Assumptions

As provided in the Funded Status of Actuarial Liabilities table, the System, as of January 1, 2019, is 100.4% funded on an actuarial asset value basis. The funded ratio on a market value basis is 93.2%.

In addition, while Cheiron did not explicitly provide the exhibit outlining the required employer contributions provided in the ACFR, it is our understanding that this schedule was determined based on information Cheiron provides in the annual valuation reports. This includes the Normal Cost percentage and the employers' anticipated payroll for each participating plan. It also includes the amortization payment calculated by the actuary or the over-funding credit required under Pennsylvania State Law, Act 205 of 1984. The composite figure is assembled by the agency's staff and has not been reviewed by Cheiron.

The Pennsylvania Municipal Retirement System is defined as an agent multiple-employer retirement system for participating municipalities and counties under Governmental Accounting

Standards Board Statements No. 67 and 68. Assets and liabilities are separately accounted for and reported to the Department of the Auditor General of the Commonwealth of Pennsylvania. The table excerpts provided for the ACFR reflect aggregate valuation results for the System and provide statistics on employer contribution levels for the defined benefit portion of the municipal plans participating in the system as of the valuation date. No new assumption or method changes were effective as of this date.

The assumptions used in preparing the individual municipal valuation are based on a formal Experience Study dated July 2015 with recommendations presented to the Board for consideration and adoption as well as the Board's review of the regular interest rate used for the 2019 actuarial valuation. The actuarial methods were adopted effective January 1, 1985 unless otherwise indicated. The funding method applied provides for an annual normal cost as a level percent of pay and amortization of unfunded and/or surplus over a fixed period in accordance with provisions of Act 205.

The January 1, 2019 actuarial valuation report contains required disclosures for the entire System and a description of the funding methods and assumptions as required by State law and covered under Act 205 which also falls within the methods as defined as acceptable under the Governmental Accounting Standards Board Statement No. 67. Additional details required under the Governmental Accounting Standards Board Statement No. 67 have also been provided to the System.

In preparing the 2019 results, we relied on information (some oral and some written) supplied by the System. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23. The actuarial valuation report provides comments on the sources and reliability of both the data and the actuarial assumptions on which our findings are based. These comments are the basis for our certification of the results. Future valuation results may differ significantly from the current valuation results provided due to such factors as the following: plan experience differing from that anticipated by the assumptions, changes in assumptions, and changes in plan provisions or applicable law.

These tables are prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Pennsylvania Municipal Retirement Board of the
Pennsylvania Municipal Retirement System
August 25, 2021
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Should you have any questions, please do not hesitate to contact us.

Sincerely,
Cheiron



Kenneth A. Kent, FSA, FCA, EA, MAAA
Principal Consulting Actuary



Karen Zangara, FSA, EA, MAAA
Principal Consulting Actuary



Anthony Bucci, FCA, EA, MAAA
Consulting Actuary

cc: Bonnie Rightnour, Cheiron

Required Supplemental Information

Note to Required Supplementary Information

The information presented in the supplementary schedules was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	January 1, 2019 plans that are traditional defined benefit for municipal and authority employers January 1, 2018 County plans rolled forward to January 1, 2019
Measurement date	January 1, 2019
Actuarial cost method	Entry age normal
Amortization method	Level dollar for plan bases and an average for aggregate gain/loss, 10% of surplus is credited against aggregate cost where applicable
Actuarial assumptions:	
Investment rate of return (*)	5.25%
Projected salary increases (*)	2.8% - 7.05%
(*) Includes inflation at	2.8%
Cost-of-living adjustments	ad hoc

The actuarial assumptions used have been reviewed by the actuary and adopted by PMRS' board based on the most recent review of the PMRS' experience study for the period January 1, 2009 through December 31, 2013 completed in 2015 and the updated investment rate of return assumption of 5.25% as of January 1, 2017 based on the board's review of this assumption during 2016.

The rate of employer contributions to PMRS is composed of the normal cost, amortization of the unfunded actuarial liability, and an allowance for administrative expenses. The normal cost is a level percent of payroll cost which, along with member contributions, will pay for projected benefits at

retirement for the average plan participant. The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial liability (or surplus if funds exceed the liabilities). The allowance for administrative expenses is based on PMRS' actual administrative expenses.

SOLVENCY TEST

Aggregate Accrued Liabilities for

VALUATION DATE JANUARY 1,	ACTIVE MEMBER CONTRIBUTIONS (1) ⁽¹⁾	RETIREES, BENEFICIARIES & VESTED TERMINATIONS (2)	ACTIVE MEMBER EMPLOYER FINANCED CONTRIBUTIONS (3)	ACTUARIAL VALUE OF ASSETS ⁽²⁾	PORTION OF ACCRUED LIABILITIES COVERED BY REPORTED ASSETS		
					(1)	(2)	(3)
2019	\$ 474,930,885	\$ 1,258,545,895	\$ 786,667,534	\$ 2,528,939,742	100%	100%	101%
2018	460,805,568	1,175,715,217	764,391,135	2,404,498,404	100%	100%	100%
2017	451,613,188	1,114,835,472	754,316,724	2,270,278,691	100%	100%	93%
2016	435,834,498	999,866,637	715,640,331	2,153,625,821	100%	100%	100%
2015	427,736,008	938,380,470	701,148,372	2,081,439,591	100%	100%	102%
2014	416,472,872	881,502,593	707,246,642	1,972,273,674	100%	100%	95%

⁽¹⁾ This includes the sum of the active member employee contribution balances, the member separate annuity account balances, the municipal for member separate annuity account balances, and the excess interest allocations.

⁽²⁾ The Actuarial Value of Assets (AVA) were determined based on the methodology outlined in PMRS Policy Statement 05-2. The 1/1/2019 AVA was based on the reserves published by PMRS in the ACFR for the years ended December 31, 2018 and 2017 and the adjustment for the \$45.5 million transfer from the Undistributed Earnings Account to the Retired Members' Reserve Account as approved by the Board in July 2018. The 1/1/2019 AVA reflects the \$25.85 million in excess interest awarded by the Board in 2018, which has been incorporated in the 1/1/2019 valuation.

FUNDED STATUS OF ACTUARIAL LIABILITIES

VALUATION DATE JANUARY 1,	ACTUARIAL VALUE OF ASSETS (A) ⁽¹⁾	ACTUARIAL LIABILITY (AL) ENTRY AGE (B)	UNFUNDED AL (SURPLUS) (B-A)	FUNDED RATIO (A/B)	DISCOUNT RATE
2019	\$ 2,528,939,742	\$ 2,520,144,314	\$ (8,795,428)	100.40%	5.25%
2018	2,404,498,404	2,400,911,920	(3,586,484)	100.10%	5.25%
2017	2,270,278,691	2,320,765,384	50,486,693	97.80%	5.25%
2016	2,153,625,821	2,151,341,466	(2,284,355)	100.10%	5.50%
2015	2,081,439,591	2,067,264,850	(14,174,741)	100.70%	5.50%
2014	1,972,273,674	2,005,222,107	32,948,433	98.40%	5.50%

⁽¹⁾ The Actuarial Value of Assets (AVA) were determined based on the methodology outlined in PMRS Policy Statement 05-2. The 1/1/2019 AVA was based on the reserves published by PMRS in the ACFR for the years ended December 31, 2018 and 2017 and the adjustment for the \$45.5 million transfer from the Undistributed Earnings Account to the Retired Members' Reserve Account as approved by the Board in July 2018. The 1/1/2019 AVA reflects the \$25.85 million in excess interest awarded by the Board in 2018, which has been incorporated in the 1/1/2019 valuation.

The actuarial assumptions as of January 1, 2019, are shown in the assumptions and methods section. The above information was derived from the following membership data and number of pension plans, as provided by PMRS regarding:

VALUATION OF DEFINED BENEFIT LIABILITIES			
VALUATION DATE	COMPLETE VALUATION	ROLL-FORWARD	CASH BALANCE PLANS
January 1, 2019	719	4	323
January 1, 2018	4	726	314
January 1, 2017	718	4	311
January 1, 2016	4	718	294
January 1, 2015	717	4	286
January 1, 2014	4	712	268

SCHEDULE OF RETIREES AND BENEFICIARIES

Added to and Removed from Rolls in Last Six Years

VALUATION DATE JANUARY 1	ADDED TO ROLL	AVERAGE ANNUAL ANNUITIES ADDED	AVERAGE BENEFIT INCREASE	DELETED FROM ROLL	AVERAGE ANNUAL ANNUITIES REMOVED	NUMBER ON ROLL	ANNUAL ANNUITIES	PERCENT INCREASE IN ANNUITIES	AVERAGE ANNUAL ANNUITIES	PERCENT INCREASE IN AVERAGE ANNUAL ANNUITIES
2019	429	\$ 19,572	\$419	146	\$ 8,147	6,189	\$ 101,399,088	7.8%	\$ 16,384	2.9%
2018	383	18,912	575	176	9,325	5,906	94,073,168	6.5%	15,928	2.7%
2017	447	18,744	490	108	8,174	5,699	88,360,677	9.5%	15,505	2.9%
2016	339	18,888	161	87	18,915	5,360	80,729,221	6.3%	15,061	1.3%
2015	392	17,908	185	227	10,494	5,108	75,936,364	6.6%	14,866	3.1%
2014	431	20,472	430	168	16,043	4,943	71,257,797	9.5%	14,416	3.7%

SCHEDULE OF TOTAL MEMBERSHIP BY STATUS

Six-Year Trend

VALUATION DATE JANUARY 1	ACTIVE MEMBERS							TOTAL
	DEFINED BENEFIT PLANS	CASH BALANCE PLANS	RETIREEES	BENEFICIARIES	DEFERRED PENSIONS	INACTIVE MEMBERS ⁽¹⁾		
2019	7,949	1,446	5,550	639	1,168	40	16,792	
2018	7,868	1,387	5,307	599	1,090	35	16,286	
2017	7,728	1,303	5,099	600	1,150	28	15,908	
2016	7,698	1,274	4,784	576	1,173	7	15,512	
2015	7,580	1,214	4,566	542	1,027	8	14,937	
2014	7,676	1,185	4,423	520	1,044	14	14,862	

⁽¹⁾ Inactive members represent inactive non-vested participants with employee contribution account balances.

SCHEDULE OF TOTAL MEMBERSHIP AND SALARY

Last Six Years

	AS OF JANUARY 1 ⁽¹⁾					
	2019	2018	2017	2016	2015	2014
a. Retirees currently receiving benefits	5,550	5,307	5,099	4,784	4,566	4,423
b. Beneficiaries currently receiving benefits	639	599	600	576	542	520
c. Terminated vested employees entitled to future benefits from defined benefit plans	853	797	834	872	779	753
d. Terminated non-vested employees entitled to contribution refunds from defined benefit plans	40	35	28	7	8	14
e. Active employees in defined benefit plans	7,949	7,868	7,728	7,698	7,580	7,676
i. Aggregate salary ⁽²⁾	\$ 455,352,355	\$ 434,554,380	\$ 422,621,214	\$ 394,133,120	\$ 384,270,155	\$ 389,410,214
ii. Vested ⁽³⁾	4,470	4,553	4,573	4,676	4,726	4,881
iii. Non-vested	3,479	3,315	3,156	3,022	2,854	2,795
f. Participants in cash balance plans	1,761	1,680	1,619	1,575	1,462	1,473
i. Aggregate salary	\$ 63,302,730	\$ 60,013,152	\$ 53,998,354	\$ 51,642,049	\$ 47,537,851	\$ 45,193,710
ii. Active	1,446	1,387	1,303	1,274	1,214	1,185
iii. Inactive	315	293	316	301	248	291

⁽¹⁾ Includes traditional defined benefit non-county plans, traditional defined benefit county plans, and cash balance plans.

⁽²⁾ Annualized salary paid during the prior plan year for traditional defined benefit plan participants and actual salary for active cash balance participants.

⁽³⁾ Count of vested participants estimated based on service as of the valuation date.

SCHEDULE OF ACTIVE MEMBER VALUATION DATA

Last Six Years

DEFINED BENEFIT PLANS								
VALUATION DATE 1/1	NUMBER OF ACTIVE MEMBERS	PERCENTAGE CHANGE IN MEMBERSHIP	NUMBER OF PARTICIPATING EMPLOYERS	PERCENTAGE INCREASE (DECREASE) IN NUMBER OF PARTICIPATING EMPLOYERS	TOTAL ANNUAL PAYROLL	PERCENTAGE INCREASE (DECREASE) IN PAYROLL	AVERAGE ANNUAL SALARY	PERCENTAGE INCREASE (DECREASE) IN AVERAGE ANNUAL SALARY
2019	7,949	1.0%	723	(1.0%)	\$ 455,352,355	4.8%	\$ 57,284	3.7%
2018	7,868	1.8%	730	1.1%	434,554,380	2.8%	55,231	1.0%
2017	7,728	0.4%	722	0.0%	422,621,214	7.2%	54,687	6.8%
2016	7,698	1.6%	722	0.1%	394,133,120	2.6%	51,199	1.0%
2015	7,580	(1.3%)	721	0.7%	384,270,155	(1.3%)	50,695	(0.1%)
2014	7,676	1.0%	716	0.3%	389,410,214	3.5%	50,731	2.5%

CASH BALANCE PLANS								
VALUATION DATE 1/1	NUMBER OF ACTIVE MEMBERS	PERCENTAGE CHANGE IN MEMBERSHIP	NUMBER OF PARTICIPATING EMPLOYERS	PERCENTAGE INCREASE (DECREASE) IN NUMBER OF PARTICIPATING EMPLOYERS	TOTAL ANNUAL PAYROLL	PERCENTAGE INCREASE (DECREASE) IN PAYROLL	AVERAGE ANNUAL SALARY	PERCENTAGE INCREASE (DECREASE) IN AVERAGE ANNUAL SALARY
2019	1,446	4.3%	323	2.9%	\$ 63,302,730	5.5%	\$ 43,778	1.2%
2018	1,387	6.4%	314	1.0%	60,013,152	11.1%	43,268	4.4%
2017	1,303	2.3%	311	5.8%	53,998,354	4.6%	41,442	2.2%
2016	1,274	4.9%	294	2.8%	51,642,049	8.6%	40,535	3.5%
2015	1,214	2.4%	286	6.7%	47,537,851	5.2%	39,158	2.7%
2014	1,185	4.8%	268	6.8%	45,193,710	1.6%	38,138	(3.1%)

Actuarial Assumptions and Methods

The PMRS demographic actuarial assumptions were revised by the board effective January 1, 2016. The Regular Interest Rate (investment return assumption) was approved by the board effective January 1, 2017. The assumptions are as follows:

A. Healthy Life Mortality Rates:

Based on the information provided by PMRS and review of the actual mortality experience over a five-year period, these mortality tables provide projected mortality improvements for the future. Given that experience analysis is required to be performed every four years the projection periods are sufficient to reflect anticipated improvements until the next study is performed.

Rates of Pre-Retirement Mortality

Males: RP-2000 Non-Annuitant Male table projected 15 years with Scale AA.

Females: RP-2000 Non-Annuitant Female table projected 15 years with Scale, AA, setback five years.

- a) Killed in service mortality rates:
- (i) 15% of mortality is assumed to be

service-related for municipal plans, and

- (ii) 50% of mortality is assumed to be service-related for uniform plans.

Rates of Post-Retirement Mortality

Males: RP-2000 Annuitant Male table projected 5 years with Scale AA.

YEARS OF SERVICE	CURRENT VALUATION RATE			
	NUMBER OF ACTIVE MEMBERS IN PLAN			
	MUNICIPAL PARTICIPANTS (NON-UNIFORM)		UNIFORMED PARTICIPANTS	
	<25	25+	<25	25+
LESS THAN 1	15.0%	18.0%	12.0%	13.0%
1 BUT LESS THAN 2	15.0%	18.0%	12.0%	10.0%
2 BUT LESS THAN 3	11.0%	14.0%	12.0%	7.0%
3 BUT LESS THAN 4	8.0%	12.0%	9.0%	7.0%
4 BUT LESS THAN 5	7.0%	9.0%	7.0%	6.0%
5 BUT LESS THAN 6	6.0%	9.0%	5.0%	5.0%
6 BUT LESS THAN 7	5.5%	8.0%	5.0%	4.0%
7 BUT LESS THAN 8	5.5%	7.5%	5.0%	3.0%
8 BUT LESS THAN 9	5.5%	6.5%	4.5%	3.0%
9 BUT LESS THAN 10	4.0%	5.0%	4.0%	3.0%
10 OR MORE	2.5%	4.0%	3.0%	3.0%

Females: RP-2000 Annuitant Female table projected 10 years with Scale AA.

B. Disabled Life Mortality Rates:

Males and females: RP-2000 combined with 10-year set forward.

C. Termination Rates Before Retirement:

Rates based on the number of active members in the pension plan, years of service, and the type of plan participants (non-uniform or uniform). Charts on page 64.

D. Disability Incidence Rates:

Municipal—40% of 1964 OASDI (Social Security) Experience for males with adjustments (sample rates shown at right).

Uniformed plans—60% of 1964 OASDI (Social Security) Experience for males with adjustments (sample rates shown at right).

MUNICIPAL RATES	
AGE	CURRENT VALUATION RATE
25	0.014%
35	0.03%
45	0.06%
55	0.13%
65	0.66%

UNIFORMED RATES	
AGE	CURRENT VALUATION RATE
25	0.031%
35	0.058%
45	0.136%
55	0.335%
65	1.123%

- a) Type of disability:
 - (i) 15% of disablements are assumed to be service-related for municipal plans, and
 - (ii) 50% of disablements are assumed to be service-related for uniform plans.

E. Workers Compensation:

Service-related disability benefits payable from municipal plans are offset by 25% of final average salary.

SAMPLE SALARY RATES	
AGE	TOTAL RATE ⁽¹⁾ (INCLUDING INFLATION)
25	7.05%
30	5.44%
35	4.55%
40	4.26%
45	3.97%
50	3.72%
55	3.44%
60	3.28%
65	2.80%

F. Salary Scale:

Three-year select and ultimate rates include 2.8% inflation and age-related scale for merit/seniority based on sample rates as shown at right.

G. Rates of Retirement:

Members are assumed to retire over a range of ages. No early retirement is assumed. Specific assumptions regarding retirement age are:

- a) Municipal Members: Members are assumed to retire over a range of ages as shown to the right.
- b) Uniformed Members: Retirement rates are reflected in the chart to the right.

RETIREMENT RATES FOR MUNICIPAL MEMBERS

AGE	CURRENT RATE OF NORMAL RETIREMENT ⁽²⁾
under 45	2%
45	8%
46	10%
47-50	15%
51-54	17%
55	22%
56-59	14%
60-64	18%
65	25%
66-74	20%
75	100%

RETIREMENT RATES FOR UNIFORMED MEMBERS

AGE	RATE
under 49	0%
50	30%
51-54	10%
55	25%
56-58	20%
59-60	15%
61	20%
62	30%
63-64	20%
65	30%
66+	100%

H. Marital Status and Spouse's Age⁽³⁾:

80% of members are assumed to be married at time of retirement with the 50% Joint and Survivor form of payment. Males spouses are assumed to be three-years older than female spouses.

I. Social Security Projections⁽³⁾:

- a) The Social Security Taxable Wage Base will increase by 3.3% compounded annually;
- b) The Consumer Price Index will increase by 2.8% compounded annually;
- c) The Average Total Wages of All Workers will increase by 3.3% compounded annually.

J. Post-Retirement Cost of Living Increases: ⁽³⁾

2.8% per year, subject to plan limitations.

K. Investment Return Assumption:

5.25% compounded annually (net of investment and certain administrative expenses) for funding purposes.

L. Administrative Expenses:

System-wide Actuarial Value of Assets: The expense assumption is based on the previous

⁽¹⁾ Add 2% for each of the first three years of service and additional 6% increase in year prior to normal retirement age.
⁽²⁾ Rates indicated are adjusted by adding 5% (and 10% for ages 60-62 under current rate assumptions) for the year in which the member is first eligible for normal retirement.
⁽³⁾ If applicable.

year's actual expenses.

Municipalities: The expense assumption is based on the expected expenses for the current year, as reported on the Act 205 forms.

Rationale for Assumptions: An experience study is completed every five years for PMRS. The assumptions outlined above were reviewed and adopted by the board based on the most recent experience study for the period covering January 1, 2009 through December 31, 2013 and the board's review of the regular interest rate in 2017.

ACTUARIAL METHODS

Contribution requirements are individually determined for each participating municipality, on an actuarial basis as described below in the Funding of the Unfunded Actuarial Liability section, at least biennially. The frequency of the actuarial valuation is determined by applicable commonwealth statute (Act 205 of 1984 and Act 293 of 1972). The following actuarial methods were adopted effective January 1, 1985, unless indicated otherwise.

ACTUARIAL VALUE OF ASSETS¹

PMRS' Actuarial Value of Assets equal the sum of all audited reserve accounts as of the valuation date, including Member, Municipal, Retired, Disability, and DROP Reserves, and a one-year administration expense reserve, plus the portion of any additional investment income to be distributed as "excess interest," based on the PMRS Policy Statement 05-2.

The actuarial value can never be less than 90 percent of fair market value.

Each year, municipalities may receive an excess interest allocation derived as a portion of new surplus created during the prior year based on the current financial standing of PMRS. "Surplus" refers to the excess of fair market value over the actuarial value of assets. Once the preliminary actuarial value of assets has been determined, a formula is used to allocate the new surplus. Generally, depending on the relative size of surplus to fair market value, between 10% and 90% of the new surplus will become excess interest.

The Actuarial Value of Assets are set equal to reserves under PMRS based on the unique legislative structure of PMRS, which are increased annually at a rate agreed on by the board named "Regular Interest" as defined under the Pennsylvania Municipal Retirement Law. Therefore, these assets

do not necessarily relate directly or indirectly with the current market value of assets as required under Actuarial Standard of Practice Statement No. 44 which states under Section 3.3:

"... the actuary should select an asset valuation method that is designed to produce actuarial values of assets that bear a reasonable relationship to the corresponding market values. The qualities of such an asset valuation method include the following:

- a. *The asset valuation method is likely to produce actuarial values of assets that are sometimes greater than and sometimes less than the corresponding fair market values.*
- b. *The asset valuation method is likely to produce actuarial values of assets that, in the actuary's professional judgment, satisfy both of the following:*
 1. *The asset values fall within a reasonable range around the corresponding market values. For example, there might be a corridor centered at market value outside of which the actuarial value of assets may not fall, in order to assure that the difference from market value is not greater than the actuary deems reasonable.*
 2. *Any differences between the actuarial value of assets and the market value are recognized within a reasonable period of time. For example, the actuary might use a method where the actuarial value of assets converges toward market value at a pace that the actuary deems reasonable, if the investment return assumption is realized in future periods.*

In lieu of satisfying both (1) and (2) above, an asset valuation method could satisfy section 3.3(b) if, in the actuary's professional judgment, the asset valuation method either (i) produces values within a sufficiently narrow range around market value or (ii) recognizes differences from market value in a sufficiently short period."

The administrative rules adopted by the board in conjunction with the Pennsylvania Municipal Retirement Law, which are not subject to comply with Actuarial Standards of Practice (ASOP), when defining the Actuarial Value of Assets, does not necessarily meet the requirement of ASOP 44 Selection and Use of Asset Valuation Methods for Pension Valuations. The Actuarial Value of Assets provided within this report follow the Pennsylvania Municipal Retirement System Law and PMRS policy

¹ The Actuarial Value of Assets (AVA) were determined based on the methodology outlined in PMRS Policy Statement 05-2. The 1/1/19 AVA was based on the reserves published by PMRS in the ACFR for the years ended December 31, 2018 and 2017 and the adjustment for the \$45.5 million transfer from the Undistributed Earnings Reserve Account to the Retired Members' Account as approved by the board in July 2018. The January 1 2019 AVA reflects the \$25.85 million in excess interest awarded by the board in 2018, which has been incorporated in the 1/1/19 valuation.

statement.

ACTUARIAL COST METHOD

The Entry Age Normal Actuarial Cost Method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of hire and assumed retirement. Entry age is defined as attained age less credited service. The normal cost is based on taking the value, as of entry age into the plan, of each member's projected future benefits. This value is then divided by the value, also at entry age, of each member's expected future salary producing a normal cost rate as a percent of salary. The normal cost rate is multiplied by current salary to determine each member's normal cost. If a plan provides for a Separate Member Annuity through required member contributions, this contribution rate is then added to the total normal cost rate to determine the final total normal cost rate. Within the Minimum Municipal Obligation (MMO) calculation, the normal cost is reduced by the member contribution to produce the employer normal cost to be paid.

The actuarial liability is the difference between the present value of future benefits and the present value of future normal cost. The unfunded actuarial liability is the difference between the actuarial liability and the actuarial value of assets.

FUNDING OF THE UNFUNDED ACTUARIAL LIABILITY

Actuarial gains (or losses), including the effect of contributions greater or lesser than the previously determined actuarial level, are reflected by decreases (or increases) in the unfunded actuarial liability. Under Act 205 of 1984, and updated by Act 44, the unfunded actuarial liability for each plan is amortized as a level dollar amount over the lesser of:

- a) (i.) 30 years, with respect to the initial liability as of 1/1/85 (or first valuation);
 - (ii.) 20 years, with respect to actuarial gains and losses;
 - (iii.) 15 years, with respect to changes due to actuarial assumptions;
 - (iv.) 20 years, with respect to changes due to plan provisions (if state mandated);
 - (v.) 10 years, with respect to changes in benefits for currently active members and 1 year for retired members (if local benefit changes); or
- b) the average assumed working lifetime of active

employees as of the date the liability was established. If there are no active employees, the unfunded liability is amortized one year after the liability was established.

With the two exceptions which follow, the funding method is applied individually with respect to each municipality:

- 1) Retired and disabled members are paid monthly benefits from PMRS' Retired Reserve account, which at the time of retirement receives a transfer from the municipal and member accounts in an amount actuarially determined to be sufficient to pay all future benefits for the member (and, if applicable, a surviving beneficiary). Thus, post-retirement experience is pooled with PMRS.
- 2) A disabled member's pension is met in part from the amount that can be provided by the value of that portion of the member's accrued benefit attributable to municipal contributions, with the balance of the pension being provided by the appropriate transfer from the Disability Reserve Account. The amount of annual transfer from the accumulated municipal contributions to the Disability Reserve Account is determined on the one year term cost basis, i.e., the expected cost of disabilities in the coming year.

If a plan is in a surplus position, then 10% of the surplus is credited against the aggregate cost of the plan.

METHOD TO ESTIMATE ROLL FORWARD LIABILITIES

The defined benefit pension plans for municipalities are valued explicitly every odd calendar year. However, the liabilities for the county plans are explicitly valued every even calendar year. For the odd calendar years, the county plan liabilities are estimated by rolling forward the prior year's liabilities. With the implementation of GASB 68, which required an individual report to be issued for each pension plan, the liabilities for the county defined benefit plans were rolled forward based on the actual benefit payments. These liabilities reflect the assumption changes and any material changes to the liabilities that may have occurred since the prior actuarial valuation. These rolled forward liabilities have been reflected in this report. The liabilities for all participants in pay status for these municipal pension plans are explicitly valued every year. The roll forward active and deferred vested liabilities were proportionally adjusted based on the

prior year liabilities net of in pay status liabilities. All other liabilities for the municipal and cash balance plans were explicitly valued as of January 1, 2019 based on the data, plan provisions, methods, and assumptions.

**CHANGES IN ACTUARIAL
ASSUMPTIONS AND METHODS**

There were no changes in actuarial assumptions and methods.



Statistical

Introduction

The objectives of the statistical section are to provide additional historical perspective, context, and relevant details to assist readers in using information in the financial statements, notes to the financial statements, and required supplementary information to understand and assess PMRS' overall financial condition. GASB Statement No. 44, "Economic Condition Reporting: The Statistical Section" establishes standardized reporting requirements relative to the supplementary information provided in this section.

The graphs and schedules beginning on page 71 provide information relative to financial trends. The graphs and schedules provide detailed information about PMRS' net position and how it has changed over time.

The graphs and schedules beginning on page 75 provide information relative to membership. The graphs and schedules reflect changes in active and retired members of PMRS. The information is intended to provide contextual information about PMRS' membership and framework for the ratio of funding versus obligations. The schedules beginning on page 77 provide information relative to pension payments and pensions awarded. The information is intended to provide contextual information about payment trends of PMRS.

NUMBER OF MEMBERS PER PLAN

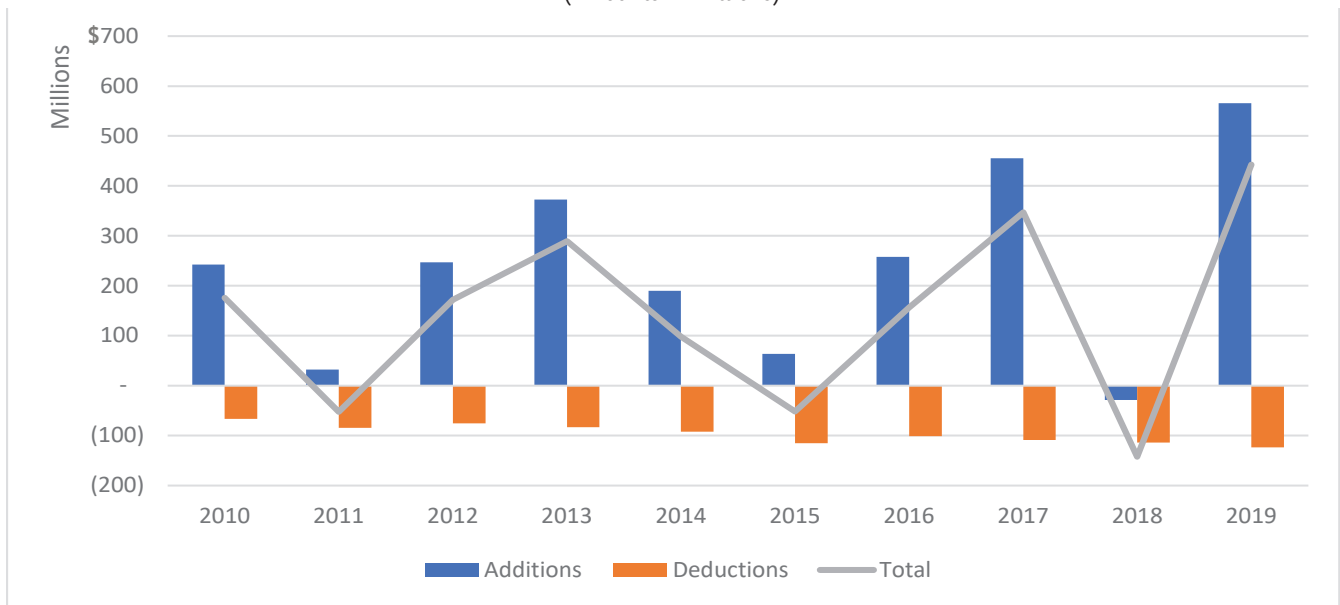
(Plans with 100 or more members)
As of December 31, 2019

PLAN	PLAN MEMBERS
Allentown City	903
Adams County	900
Bethlehem City	672
Harrisburg City	464
Jefferson County	299
Harrisburg City Fire	216
Easton City	207
Lehigh County Authority	200
Monroeville Municipality	196
Wyoming Valley Sanitary Authority	182
Bucks County Water & Sewer Authority	174
Capital Region Water	138
Tredyffrin Township	133
Upper Moreland Township	118
Hermitage City	116
Derry Township (Dauphin County)	100

Part I • Financial

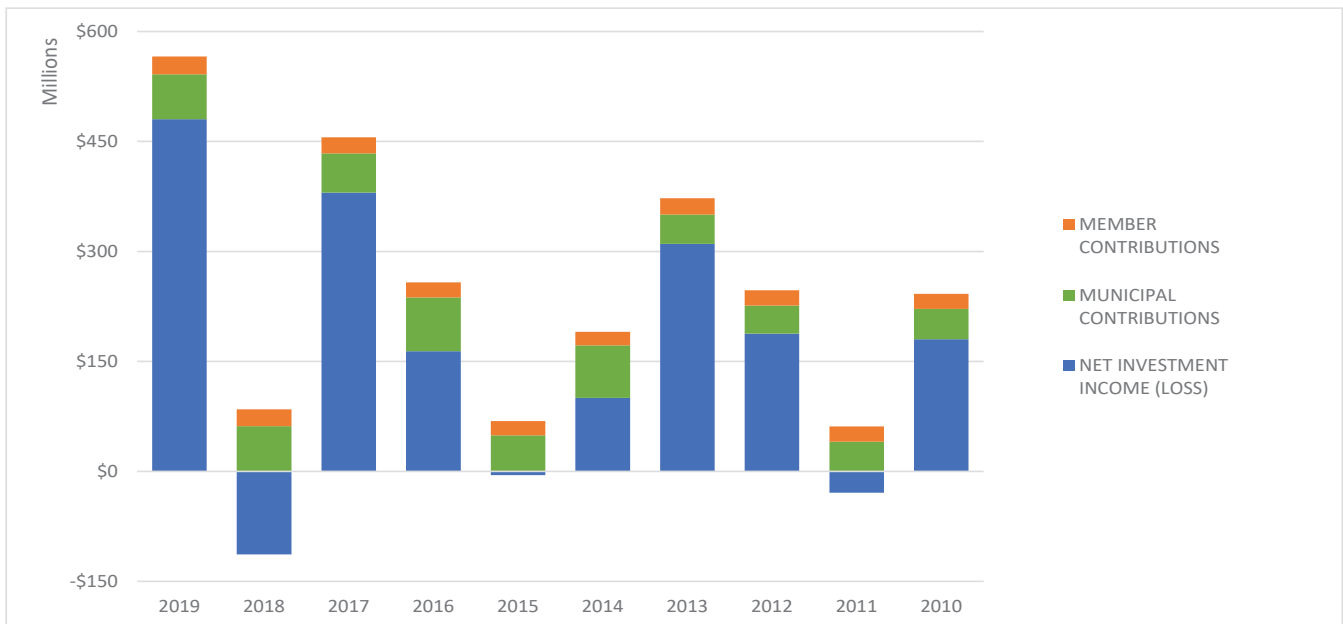
RESULTS OF OPERATIONS 10-YEAR TREND

(Amounts in Millions)



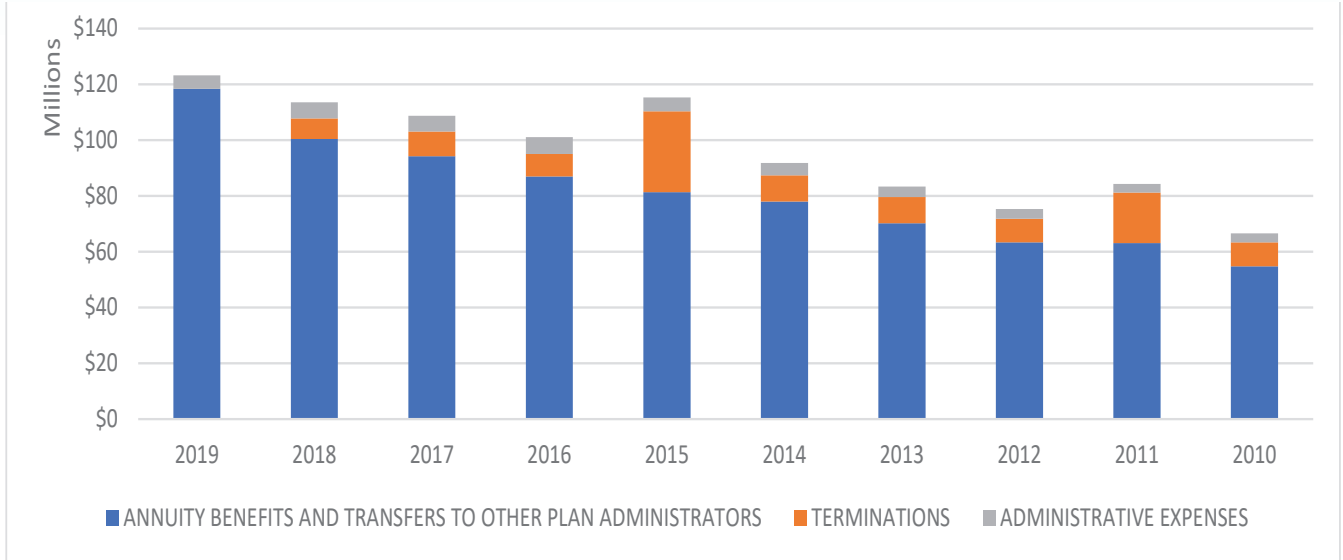
ADDITIONS TO FIDUCIARY NET POSITION 10-YEAR TREND

(Amounts in Millions)



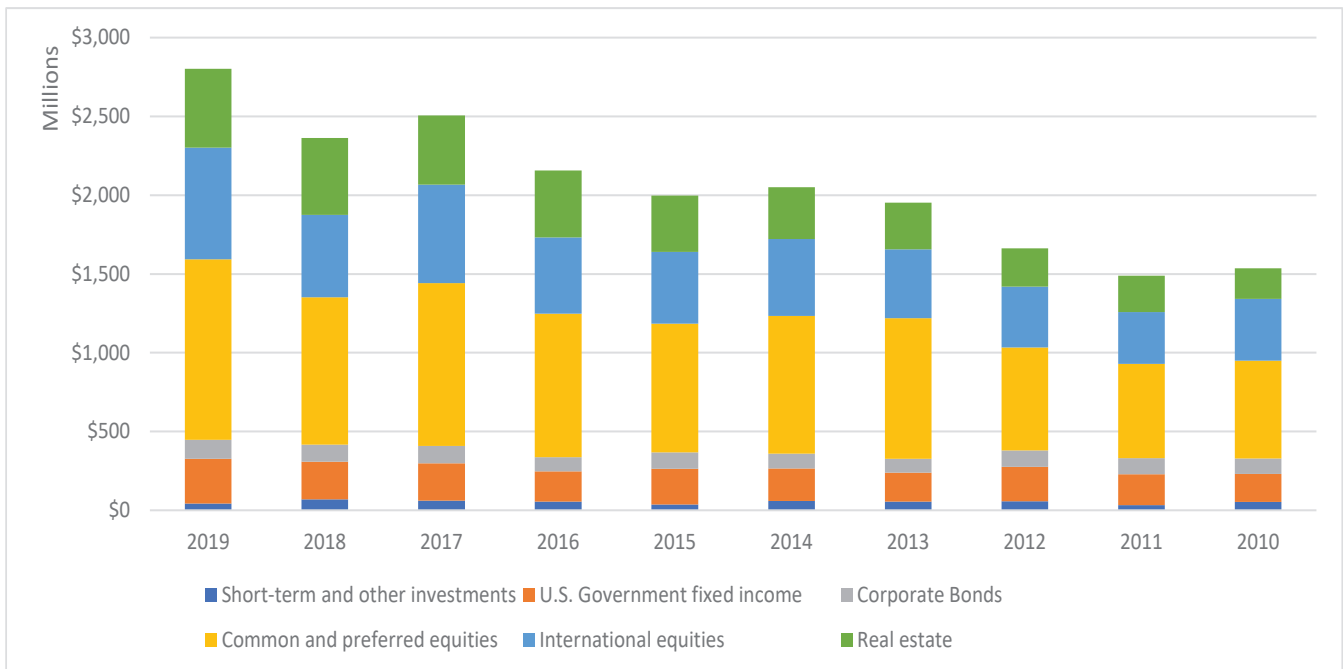
DEDUCTIONS FROM FIDUCIARY NET POSITION 10-YEAR TREND

(Amounts in Millions)



INVESTMENTS 10-YEAR TREND

(Fair Value - Amounts in Millions)



CHANGES IN FIDUCIARY NET POSITION

10-Year Trend

YEAR	CONTRIBUTIONS	NET INVESTMENT INCOME (LOSS) AND MISCELLANEOUS INCOME	ANNUITY BENEFITS AND TERMINATIONS AND TRANSFERS TO OTHER PLAN ADMINISTRATORS	ADMINISTRATIVE EXPENSES	CHANGE IN FIDUCIARY NET POSITION
2019	\$ 85,683,337	\$ 480,282,330	\$ 118,409,245	\$ 4,867,0598	\$ 442,689,364
2018	84,554,720	(113,220,485)	107,803,587	5,770,601	(142,239,953)
2017	75,412,160	379,933,759	103,077,938	5,498,575	346,769,406
2016	93,999,086	163,735,825	95,013,418	5,834,448	156,887,045
2015	68,740,888	(4,943,521)	110,303,677	4,983,399	(51,489,709)
2014	89,762,417	100,453,558	87,436,751	4,411,462	98,367,762
2013	61,092,399	310,197,575	78,245,423	3,723,590	289,321,131
2012	59,253,955	187,755,253	71,827,710	3,424,363	171,757,135
2011	61,265,501	(29,086,613)	81,155,883	3,142,004	(52,118,999)
2010	61,930,391	180,338,425	63,383,838	3,183,373	175,701,605

ADDITIONS TO FIDUCIARY NET POSITION

10-Year Trend

YEAR	MEMBER CONTRIBUTIONS	MUNICIPAL CONTRIBUTIONS AND TRANSFERS FROM OTHER PLAN ADMINISTRATORS ⁽¹⁾	MUNICIPAL ASSESSMENTS ⁽²⁾	NET INVESTMENT INCOME (LOSS) AND MISCELLANEOUS INCOME	ADDITIONS TO FIDUCIARY NET POSITION, NET OF INVESTMENT LOSSES
2019	\$ 24,332,531	\$ 60,994,306	\$ 356,500	\$ 480,282,330	\$ 565,965,667
2018	23,008,066	61,288,746 ⁽³⁾	257,908	(113,220,485)	(28,665,765)
2017	21,717,564	53,446,315	248,281	379,933,759	455,345,919
2016	20,776,539	72,995,245 ⁽⁴⁾	227,302	163,735,825	257,734,911
2015	19,472,225	49,062,549	206,114	(4,943,521)	63,797,367
2014	18,441,437	71,157,740 ⁽⁵⁾	163,240	100,453,558	190,215,975
2013	22,416,432	38,493,407	182,560	310,197,575	371,289,974
2012	20,981,612	37,974,023	298,320	187,755,253	247,009,208
2011	20,732,344	40,231,586	301,571	(29,086,613)	32,178,888
2010	20,684,591	40,949,360	296,440	180,338,425	242,268,816

⁽¹⁾ Contributions were made in accordance with actuarially determined contribution requirements.

⁽²⁾ Municipal assessments are receipts but not assets of the plans.

⁽³⁾ Municipal contributions for 2018 include additional contributions towards unfunded liability of \$8.6 million.

⁽⁴⁾ Municipal contributions for 2016 include transfers from other plan administrators of \$21.4 million.

⁽⁵⁾ Municipal contributions for 2014 include a one-time payment of \$27.4 million for one municipality towards its unfunded liability.

DEDUCTIONS FROM FIDUCIARY NET POSITION

10-Year Trend

YEAR	BENEFITS AND REFUNDS		ADMINISTRATIVE EXPENSES	DEDUCTIONS FROM FIDUCIARY NET POSITION
	ANNUITY	REFUNDS		
2019	\$ 108,465,916	\$ 9,943,329	\$ 4,867,058	\$ 123,276,303
2018	100,465,963	7,337,624	5,770,601	113,574,188
2017	94,172,167	8,905,771	5,498,575	108,576,513
2016	87,046,730	7,966,688	5,834,448	100,847,866
2015	81,299,398	29,004,279	4,983,399	115,287,076
2014	78,046,330	9,390,421	4,411,462	91,848,213
2013	68,901,058	9,344,195	3,723,590	81,968,843
2012	63,390,100	8,437,610	3,424,363	75,252,073
2011	63,105,165	18,050,718	3,142,004	84,297,887
2010	54,771,528	8,612,310	3,183,253	66,567,091

SCHEDULE OF BENEFIT DEDUCTIONS FROM FIDUCIARY NET POSITION BY TYPE

10-Year Trend

YEAR	ANNUITY BENEFITS BY TYPE							TOTAL ANNUITY
	NORMAL	EARLY	DISABILITY	SURVIVOR	DEATH	DROP	TRANSFER AND OTHER	
2019	\$ 86,559,982	\$ 9,085,439	\$ 1,569,152	\$ 8,022,306	\$ 2,860,130	\$ 368,908		\$ 108,465,916
2018	82,214,203	7,545,194	1,498,518	5,728,724	2,456,344	1,022,980	-	100,465,963
2017	76,325,433	7,925,396	1,534,891	5,014,321	2,733,583	638,543	-	94,172,167
2016	70,441,634	7,998,536	983,325	4,477,493	2,742,076	403,666	-	87,046,730
2015	64,508,631	8,698,618	1,036,807	3,900,315	2,614,938	460,751	\$ 79,338	81,299,398
2014	58,291,738	8,769,947	1,362,544	5,569,629	3,234,667	146,215	671,590	78,046,330
2013	52,063,381	8,156,170	1,722,313	5,243,882	1,637,485	68,795	9,032	68,901,058
2012	47,951,194	7,545,724	1,347,255	4,848,070	1,678,836	-	19,021	63,390,100
2011	44,166,997	6,161,604	1,257,354	4,497,860	2,241,312	-	4,780,038	63,105,165
2010	38,721,068	4,263,362	1,392,815	4,376,019	2,653,312	-	3,364,952	54,771,528

SCHEDULE OF REFUND DEDUCTIONS FROM FIDUCIARY NET POSITION BY TYPE

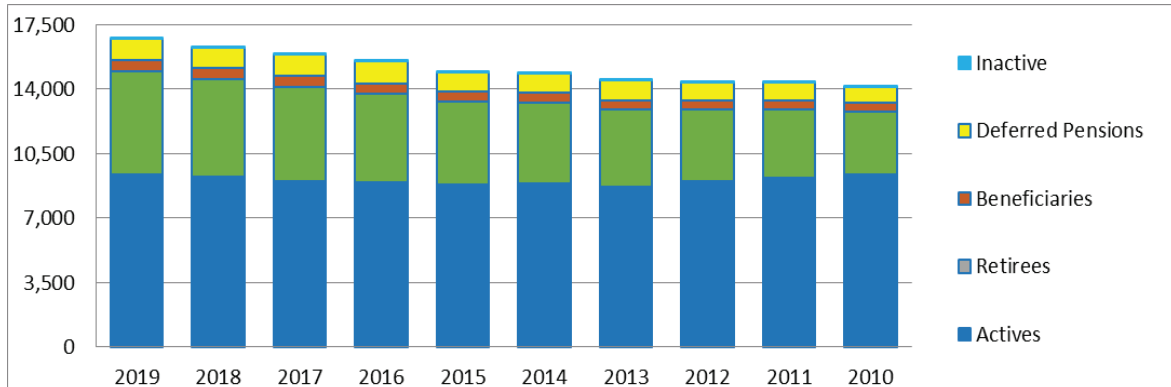
10-Year Trend

YEAR	REFUNDS BY TYPE		
	TERMINATIONS	LUMP SUM	TOTAL REFUNDS
2019	\$ 3,513,448	\$ 6,429,881	\$ 9,943,329
2018	2,869,673	4,467,951	7,337,624
2017	2,424,733	6,481,038	8,905,771
2016	2,757,092	5,209,596	7,966,688
2015	2,838,347	26,165,932	29,004,279
2014	4,788,017	4,602,404	9,390,421
2013	2,449,964	6,894,231	9,344,195
2012	3,908,772	4,528,838	8,437,610
2011	12,421,382	5,629,336	18,050,718
2010	5,657,499	2,954,811	8,612,310

Part II • Membership

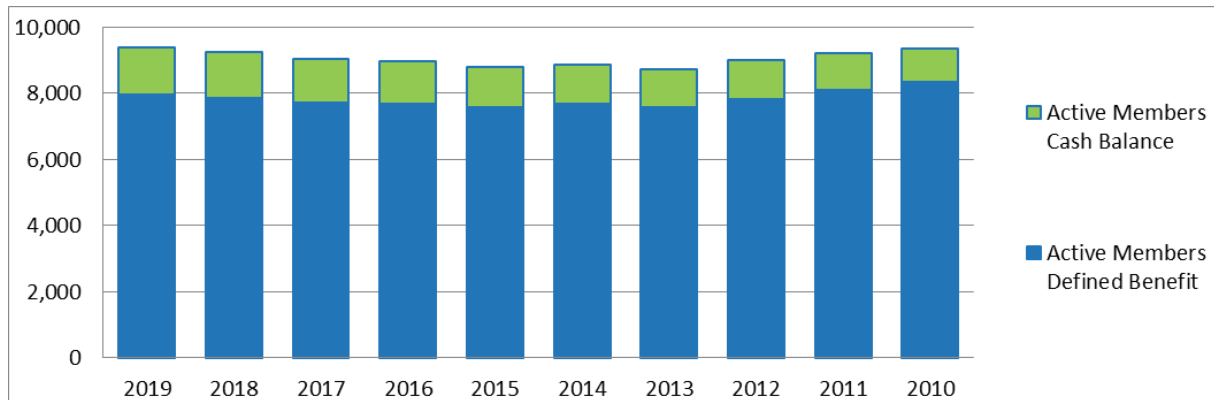
TOTAL MEMBERSHIP 10-YEAR TREND

(Valuation Date 1/1)



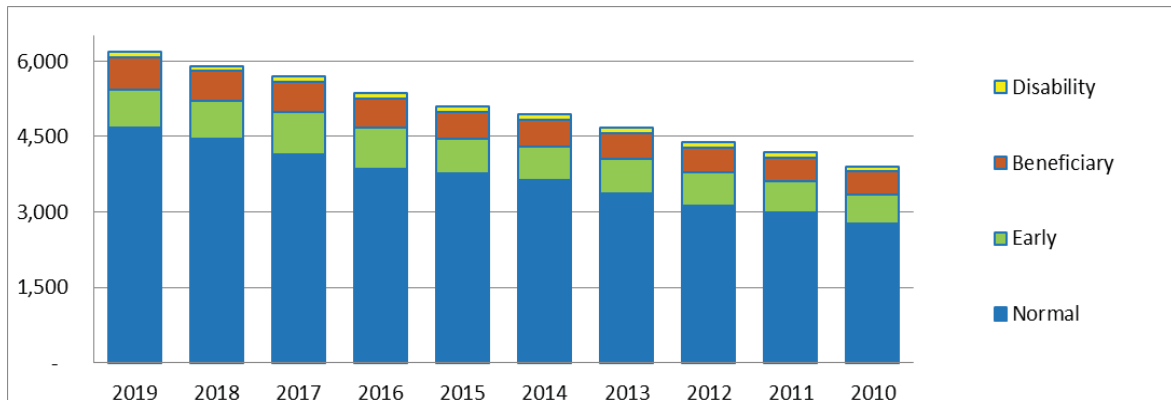
ACTIVE MEMBERS 10-YEAR TREND

(Valuation Date 1/1)



RETIRED MEMBERS 10-YEAR TREND

(Valuation Date 1/1)



DISTRIBUTION OF ACTIVE MEMBERS

Counts by Age/Service as of January 1, 2019

COUNTS BY AGE/SERVICE											
AGE	1 YEAR OR LESS	1 TO 2	2 TO 3	3 TO 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 & UP	TOTAL
Under 20	7	0	0	0	0	0	0	0	0	0	7
20 – 24	125	70	37	37	2	0	0	0	0	0	271
25 – 29	153	142	106	144	82	5	0	0	0	0	632
30 – 34	165	107	88	148	198	85	4	0	0	0	795
35 – 39	117	101	76	148	202	182	80	1	0	0	907
40 – 44	90	66	61	134	171	162	183	40	4	0	911
45 – 49	95	87	77	122	187	197	215	152	76	8	1,216
50 – 54	98	66	74	121	206	221	237	200	142	79	1,444
55 – 59	71	59	68	110	192	231	231	160	166	221	1,509
60 – 64	47	43	39	71	160	182	170	157	124	215	1,208
65 & up	10	14	26	22	77	83	75	50	51	87	495
Total	978	755	652	1,057	1,477	1,348	1,195	760	563	610	9,395

DISTRIBUTION OF ACTIVE MEMBERS

Average Salary by Age/Service as of January 1, 2019

AVERAGE SALARY BY AGE/SERVICE											
AGE	1 YEAR OR LESS	1 TO 2	2 TO 3	3 TO 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 & UP	TOTAL
Under 20	\$23,867	--	--	--	--	--	--	--	--	--	\$23,867
20 – 24	\$35,040	\$40,092	\$43,715	\$48,357	\$92,717	--	--	--	--	--	\$39,773
25 – 29	\$36,461	\$42,338	\$47,167	\$51,589	\$56,166	\$57,972	--	--	--	--	\$45,751
30 – 34	\$39,161	\$47,965	\$49,340	\$55,130	\$55,879	\$59,360	\$65,843	--	--	--	\$50,903
35 – 39	\$41,403	\$46,894	\$52,407	\$54,911	\$58,030	\$64,380	\$67,680	\$82,823	--	--	\$55,818
40 – 44	\$41,272	\$46,324	\$50,673	\$48,673	\$56,222	\$64,165	\$71,604	\$68,139	\$52,236	--	\$57,554
45 – 49	\$42,732	\$44,527	\$49,849	\$50,463	\$54,253	\$61,123	\$67,528	\$69,725	\$73,252	\$61,679	\$58,629
50 – 54	\$34,724	\$50,815	\$46,480	\$52,421	\$53,279	\$56,522	\$59,747	\$65,579	\$73,063	\$71,362	\$57,683
55 – 59	\$40,673	\$49,799	\$53,373	\$52,693	\$53,628	\$55,324	\$58,368	\$60,937	\$66,614	\$66,732	\$57,897
60 – 64	\$36,998	\$42,501	\$54,966	\$54,103	\$54,018	\$52,185	\$57,940	\$58,078	\$60,881	\$63,283	\$56,138
65 & up	\$42,524	\$39,294	\$47,892	\$46,396	\$49,030	\$47,407	\$52,043	\$55,266	\$52,876	\$59,608	\$51,516
Total	\$38,508	\$45,414	\$49,585	\$52,208	\$54,859	\$58,006	\$62,507	\$63,360	\$66,527	\$65,034	\$55,205

PENSIONS IN PAYMENT STATUS ON JANUARY 1, 2019

By Type and Monthly Amount

MONTHLY AMOUNT	TYPE OF PENSION					
	TOTAL	NORMAL	INVOLUNTARY EARLY	VOLUNTARY EARLY	SERVICE DISABILITY	NON-SERVICE DISABILITY
Total	6,189	5,212	223	632	53	69
Under \$100	279	244	18	15	1	1
\$100 - \$199	338	276	28	33	1	-
200 - 299	323	259	26	38	-	-
300 - 399	330	267	24	34	3	2
400 - 499	331	271	25	31	2	2
500 - 599	322	265	9	40		6
600 - 699	272	217	18	33		1
700 - 799	272	223	12	34		2
800 - 899	267	213	11	32		9
900 - 999	250	198	6	31		9
1,000 - 1,199	505	404	15	67		14
1,200 - 1,399	382	300	11	60		6
1,400 - 1,599	352	295	4	38		7
1,600 - 1,799	252	220	5	24		2
1,800 - 1,999	248	208	4	30		1
2,000 - 2,199	212	187	3	18		2
2,200 - 2,399	201	179	3	18		-
2,400 - 2,599	160	144	-	14		1
2,600 - 2,799	132	118	-	11		2
2,800 - 2,999	108	103	-	3		2
3,000 - 3,499	254	237	1	14		-
3,500 - 3,999	171	163	-	8		-
4,000 and over	228	221	-	6		-

PENSIONS AWARDED BY TYPE AND AMOUNT

10-Year Trend

VALUATION DATE 1/1	TOTAL		NORMAL		VOLUNTARY EARLY		INVOLUNTARY EARLY		DISABILITY	
	COUNT	AVERAGE MONTHLY AMOUNT	COUNT	AVERAGE MONTHLY AMOUNT	COUNT	AVERAGE MONTHLY AMOUNT	COUNT	AVERAGE MONTHLY AMOUNT	COUNT ⁽¹⁾	AVERAGE MONTHLY AMOUNT
2019	429	\$ 1,631	382	\$ 1,651	33	\$ 1,475	9	\$ 963	5(4)	\$ 2,277
2018	383	1,576	342	1,616	29	1,350	8	822	4(1)	1,311
2017	447	1,562	397	1,600	28	1,428	11	627	11(3)	1,485
2016	339	1,574	309	1,593	22	1,569	4	562	4(2)	1,113
2015	392	1,492	341	1,524	29	1,575	14	825	8(2)	1,022
2014	431	1,706	364	1,800	34	1,280	17	905	16(2)	1,319
2013	390	1,370	341	1,421	22	1,614	20	520	7(2)	709
2012	438	1,367	352	1,496	40	1,180	37	459	9(3)	888
2011	396	1,552	341	1,632	37	1,250	13	364	5(0)	1,407
2010	296	1,336	249	1,412	26	1,300	17	339	4(0)	1,067

⁽¹⁾ Number of service-related disability pensions are shown in parentheses.

SCHEDULE OF TOTAL MEMBERSHIP

10-Year Trend

VALUATION DATE 1/1	ACTIVE MEMBERS DEFINED BENEFIT PLANS	ACTIVE MEMBERS CASH BALANCE PLANS	RETIREES	BENEFICIARIES	DEFERRED PENSIONS ⁽¹⁾	INACTIVE MEMBERS ⁽²⁾	TOTAL
2019	7,949	1,146	5,550	639	1,168	40	16,492
2018	7,868	1,387	5,307	599	1,090	35	16,286
2017	7,728	1,303	5,099	600	1,150	28	15,908
2016	7,698	1,274	4,784	576	1,173	7	15,512
2015	7,580	1,214	4,566	542	1,027	8	14,937
2014	7,676	1,185	4,423	520	1,044	14	14,862
2013	7,599	1,131	4,160	520	1,098	51	14,559
2012	7,836	1,158	3,899	495	952	21	14,361
2011	8,091	1,119	3,707	477	945	42	14,381
2010	8,357	994	3,449	460	834	23	14,117

⁽¹⁾ Inactive participants with rights to deferred pension (vested)

⁽²⁾ Inactive participants with rights to return of contributions (non-vested)

SCHEDULE OF ACTIVE MEMBER VALUATION DATA

10-Year Trend

DEFINED BENEFIT PLANS								
VALUATION DATE 1/1	NUMBER OF ACTIVE MEMBERS	PERCENTAGE CHANGE IN MEMBERSHIP	NUMBER OF PARTICIPATING EMPLOYERS	PERCENTAGE INCREASE IN NUMBER OF PARTICIPATING EMPLOYERS	TOTAL ANNUAL PAYROLL	PERCENTAGE INCREASE IN PAYROLL	AVERAGE ANNUAL SALARY	PERCENTAGE INCREASE IN AVERAGE ANNUAL SALARY
2019	7,949	1.03%	723	(0.96%)	\$455,352,355	4.79%	\$57,284	3.72%
2018	7,868	1.8%	730	1.1%	434,554,380	2.8%	55,231	1.0%
2017	7,728	0.4%	722	0.0%	422,621,214	7.2%	54,687	6.8%
2016	7,698	1.6%	722	0.1%	394,133,120	2.6%	51,199	1.0%
2015	7,580	(1.3%)	721	0.7%	384,270,155	(1.3%)	50,695	(0.1%)
2014	7,676	1.0%	716	0.3%	389,410,214	3.5%	50,731	2.5%
2013	7,599	(3.0%)	714	0.7%	376,296,674	2.6%	49,519	5.8%
2012	7,836	(3.2%)	709	0.3%	366,882,467	(4.4%)	46,820	1.3%
2011	8,091	(3.2%)	707	1.4%	383,802,844	1.5%	47,436	4.9%
2010	8,357	(0.6%)	697	0.1%	377,960,930	1.5%	45,227	2.2%

CASH BALANCE PLANS								
VALUATION DATE 1/1	NUMBER OF ACTIVE MEMBERS	PERCENTAGE CHANGE IN MEMBERSHIP	NUMBER OF PARTICIPATING EMPLOYERS	PERCENTAGE INCREASE IN NUMBER OF PARTICIPATING EMPLOYERS	TOTAL ANNUAL PAYROLL	PERCENTAGE INCREASE IN PAYROLL	AVERAGE ANNUAL SALARY	PERCENTAGE INCREASE IN AVERAGE ANNUAL SALARY
2019	1,446	4.25%	323	2.87%	\$63,302,730	5.48%	\$43,778	1.18%
2018	1,387	6.4%	314	1.0%	60,013,152	11.1%	43,268	4.4%
2017	1,303	2.3%	311	5.8%	53,998,354	4.6%	41,442	2.2%
2016	1,274	4.9%	294	2.8%	51,642,049	8.6%	40,535	3.5%
2015	1,214	2.4%	286	6.7%	47,537,851	5.2%	39,158	2.7%
2014	1,185	4.8%	268	6.8%	45,193,710	1.6%	38,138	(3.1%)
2013	1,131	(2.3%)	251	4.6%	44,490,671	8.1%	39,337	10.7%
2012	1,158	3.5%	240	4.8%	41,143,383	(1.3%)	35,530	(4.6%)
2011	1,119	12.6%	229	13.4%	41,683,065	18.7%	37,250	5.5%
2010	944	1.6%	203	(0.5%)	35,104,086	6.9%	35,316	5.3%

SCHEDULE OF AVERAGE NEW MONTHLY BENEFIT PAYMENTS FROM DEFINED BENEFIT PLANS⁽¹⁾

10-Year Trend

RETIREMENT EFFECTIVE DATES	YEARS CREDITED SERVICE						
	< 5	5-10	10-15	15-20	20-25	25-30	30+
2019							
Average monthly benefit	\$ 391	\$ 587	\$ 819	\$ 1,364	\$ 1,853	\$ 2,272	\$ 3,242
Average final average salary	\$ 40,467	\$ 44,214	\$ 49,034	\$ 47,161	\$ 51,461	\$ 55,448	\$ 67,055
Number of retired members	12	45	43	58	39	37	90
2018							
Average monthly benefit	\$ 310	\$ 667	\$ 933	\$ 1,251	\$ 1,860	\$ 2,870	\$ 3,674
Average final average salary	\$ 59,831	\$ 43,076	\$ 49,018	\$ 49,312	\$ 52,479	\$ 60,231	\$ 64,982
Number of retired members	13	32	60	49	55	47	97
2017							
Average monthly benefit	\$ 457	\$ 578	\$ 955	\$ 1,512	\$ 1,915	\$ 2,744	\$ 3,501
Average final average salary	\$ 44,940	\$ 37,684	\$ 46,433	\$ 50,159	\$ 53,564	\$ 61,510	\$ 61,257
Number of retired members	14	28	53	44	52	52	82
2016							
Average monthly benefit	\$ 374	\$ 694	\$ 895	\$ 1,336	\$ 2,003	\$ 2,660	\$ 3,460
Average final average salary	\$ 31,616	\$ 49,321	\$ 41,023	\$ 45,681	\$ 53,708	\$ 56,706	\$ 58,295
Number of retired members	12	36	64	65	64	58	108
2015							
Average monthly benefit	\$ 184	\$ 601	\$ 901	\$ 1,328	\$ 1,876	\$ 2,542	\$ 3,841
Average final average salary	\$53,428	\$ 47,415	\$ 40,968	\$ 43,550	\$ 52,415	\$ 55,956	\$ 66,231
Number of retired members	18	35	46	58	42	65	57
2014							
Average monthly benefit	\$ 172	\$ 442	\$ 793	\$ 1,253	\$ 2,106	\$ 2,232	\$ 3,375
Average final average salary	\$ 46,376	\$4 1,257	\$ 38,647	\$ 41,967	\$ 49,967	\$ 50,207	\$ 59,175
Number of retired members	11	36	65	47	48	52	73
2013							
Average monthly benefit	\$ 351	\$ 484	\$ 927	\$ 1,288	\$ 1,833	\$ 2,294	\$ 3,285
Average final average salary	\$ 48,984	\$ 42,915	\$ 46,047	\$ 43,468	\$ 49,235	\$ 52,714	\$ 55,709
Number of retired members	11	49	62	51	53	69	116
2012							
Average monthly benefit	\$ 513	\$ 396	\$ 729	\$ 1,144	\$ 1,546	\$ 2,185	\$ 3,287
Average final average salary	\$ 48,078	\$ 34,996	\$ 37,640	\$ 39,183	\$ 43,646	\$ 48,153	\$ 57,516
Number of retired members	12	32	63	45	60	46	91
2011							
Average monthly benefit	\$ 236	\$ 405	\$ 763	\$ 1,099	\$ 1,706	\$ 2,310	\$ 3,271
Average final average salary	\$ 43,107	\$ 39,033	\$ 46,475	\$ 41,193	\$ 49,092	\$ 52,198	\$ 55,375
Number of retired members	14	38	56	56	76	39	85
2010							
Average monthly benefit	\$ 180	\$ 528	\$ 825	\$ 1,229	\$ 1,511	\$ 2,262	\$ 2,770
Average final average salary	\$ 36,978	\$ 35,405	\$ 35,955	\$ 41,437	\$ 40,035	\$ 50,575	\$ 45,307
Number of retired members	8	28	48	47	58	40	112

⁽¹⁾ Includes normal retirement, early retirement and disability benefit payments from defined benefit plans for new retirees.

SCHEDULE OF AVERAGE NEW MONTHLY BENEFIT PAYMENTS FROM CASH BALANCE PLANS⁽¹⁾

10-Year Trend

RETIREMENT EFFECTIVE DATES	YEARS CREDITED SERVICE						
	< 5	5-10	10-15	15-20	20-25	25-30	30+
2019							
Average monthly benefit	\$ 40	\$ 256	\$ 506	\$ 790	\$ 756	\$ 810	\$ 1,350
Number of retired members	6	14	5	13	7	5	9
2018							
Average monthly benefit	\$ 81	\$ 332	\$ 628	\$ 431	\$ 1,390	\$ 1,515	\$ 1,974
Number of retired members	5	11	13	6	8	4	17
2017							
Average monthly benefit	\$ 149	\$ 222	\$ 289	\$ 732	\$ 948	\$ 495	\$ 1,334
Number of retired members	6	6	7	6	6	4	11
2016							
Average monthly benefit	\$ 47	\$ 220	\$ 499	\$ 650	\$ 1,124	\$ 1,595	\$ 1,385
Number of retired members	3	13	11	9	10	8	10
2015							
Average monthly benefit	\$ 131	\$ 189	\$ 239	\$ 823	\$ 1,071	\$ 713	\$ 1,914
Number of retired members	3	10	5	8	9	4	6
2014							
Average monthly benefit	\$ 94	\$ 420	\$ 649	\$ 580	\$ 1,285	\$ 942	\$ 717
Number of retired members	13	10	9	8	6	2	6
2013							
Average monthly benefit	\$ 141	\$ 203	\$ 430	\$ 388	\$ 820	\$ 945	\$ 1,028
Number of retired members	7	10	5	4	7	3	5
2012							
Average monthly benefit	\$ 189	\$ 270	\$ 557	\$ 580	\$ 857	\$ 581	\$ 804
Number of retired members	6	7	8	5	13	5	5
2011							
Average monthly benefit	\$ 139	\$ 219	\$ 393	\$ 217	\$ 1,051	\$ 649	\$ 1,110
Number of retired members	3	11	5	7	10	4	5
2010							
Average monthly benefit	\$ 62	\$ 120	\$ 467	\$ 466	\$ 798	\$ 1,099	\$ 1,049
Number of retired members	2	6	8	1	4	2	3

⁽¹⁾ Includes normal retirement, early retirement and disability benefit payments from cash balance plans for new retirees.

SCHEDULE OF PARTICIPATING PLANS⁽¹⁾⁽²⁾

As of January 1, 2019

COUNTIES

Adams County
Forest County
Jefferson County
Sullivan County

CITIES

Allentown City
Bethlehem City
Clairton City
Connellsville City
Easton City
Farrell City
Greensburg City
Harrisburg City
Hermitage City
Jeannette City
Latrobe City
Lebanon City
Lower Burrell City
Nanticoke City
New Kensington City
Sharon City
Sunbury City
Uniontown City

BOROUGHS

Adamstown Borough
Apollo Borough
Ashland Borough
Atglen Borough
Atglen Borough (CB Plan)
Avondale Borough
Avonmore Borough
Bally Borough
Bangor Borough
Bangor Borough (CB Plan)
Bedford Borough
Bedford Borough (CB)
Bellefonte Borough
Bellefonte Borough (CB Plan)
Bellwood Borough
Bentleyville Borough
Berlin Borough
Berlin Borough (CB Plan)
Big Beaver Borough
Biglerville Borough
Biglerville Borough (CB Plan)
Bloomfield Borough
Bowmanstown Borough

Brackenridge Borough
Bridgeville Borough
Bridgewater Borough
Brockway Borough
Brookville Borough
California Borough
Cambridge Springs Borough
Camp Hill Borough
Camp Hill Borough (CB Plan)
Carnegie Borough
Carroll Valley Borough
Carrolltown Borough
Centerville Borough
Central City Borough
Charleroi Borough
Christiana Borough
(Lancaster County)
Claysville Borough
Cleona Borough
Clymer Borough
Coaldale Borough
Cochranton Borough
Cokeburg Borough
Collegetown Borough
Collingdale Borough
Conneautville Borough
Conshohocken Borough
Conway Borough
Cressona Borough
Dalton Borough
Deemston Borough
Delmont Borough
Derry Borough
Dravosburg Borough
Dublin Borough
Duboistown Borough
Duncannon Borough
Duncansville Borough
East Berlin Borough
East Greenville Borough
East Rochester Borough
East Stroudsburg Borough
East Stroudsburg Borough (CB Plan)
East Washington Borough
Emlenton Borough
Emporium Borough
Etna Borough
Everett Borough
Factoryville Borough
Falls Creek Borough
Ferndale Borough
Forest City Borough
Fountain Hill Borough
Fountain Hill Borough (CB)
Franklin Borough
Franklintown Borough
Freeburg Borough
Freedom Borough (Beaver County)
Freeland Borough
Freeport Borough
Greenville Borough
Hollidaysburg Borough
Homer City Borough
Hughestown Borough
Hummelstown Borough
Huntingdon Borough
Hyndman Borough
Jessup Borough
Jim Thorpe Borough
Johnsonburg Borough
Jonestown Borough
Kenhorst Borough
Kennett Square Borough
Kittanning Borough
Knox Borough
Kulpmont Borough
Kutztown Borough
Larksville Borough
Lehighon Borough
Lewistown Borough
Liberty Borough
Linesville Borough
Lykens Borough
Marcus Hook Borough
Mars Borough
Martinsburg Borough
Marysville Borough
Matamoras Borough
Mayfield Borough
Mercer Borough
Meyersdale Borough
Middleburg Borough
Midway Borough
Millersburg Borough
Millerstown Borough
Millville Borough
Minersville Borough
Monaca Borough

Monroeville Municipality
Mont Alto Borough
Montrose Borough
Moosic Borough
Moosic Borough (CB Plan)
Morrisville Borough
Moscow Borough
Mount Gretna Borough
Mount Jewett Borough
Mount Pleasant Borough
Mount Union Borough
Nanty Glo Borough
Narberth Borough
Nesquehoning Borough
New Eagle Borough
New Florence Borough
New Stanton Borough
Newport Borough
Newtown Borough
Norristown Borough
North East Borough
North Wales Borough
Northumberland Borough
Orwigsburg Borough
Palmerton Borough
Palmyra Borough
Pen Argyl Borough
Pennsburg Borough
Perkasie Borough
Pine Grove Borough
Portage Borough
Pringle Borough
Prospect Borough
Prospect Park Borough
Richland Borough
Ridley Park Borough
Roaring Spring Borough
Rochester Borough
Rouseville Borough
Rural Valley Borough
Salisbury Borough
Sandy Lake Borough
Saxton Borough
Schuylkill Haven Borough
Selinsgrove Borough
Sellersville Borough
Seven Fields Borough
Seven Fields Borough (CB Plan)
Shamokin Dam Borough

⁽¹⁾ County names are in parentheses.

⁽²⁾ The abbreviation CB designates a Cash Balance plan. NU denotes a Non-Uniformed plan.

Sharpsburg Borough
 Sharpsville Borough
 Shenandoah Borough
 Shippingport Borough
 Slippery Rock Borough
 Smithton Borough
 South Waverly Borough
 Southmont Borough
 Springdale Borough
 Stewartstown Borough
 Summit Hill Borough
 Tarentum Borough
 Tatamy Borough (CB)
 Telford Borough
 Thornburg Borough
 Topton Borough
 Trafford Borough
 Trainer Borough
 Turbotville Borough
 Turtle Creek Borough
 Verona Borough
 Versailles Borough
 Waterford Borough
 Waynesburg Borough
 West Grove Borough
 West Middlesex Borough
 West Newton Borough
 West Reading Borough
 Wheatland Borough
 White Haven Borough
 Williamsburg Borough
 Williamstown Borough
 Wilmerding Borough
 Wilson Borough
 Windsor Borough
 Yardley Borough
 Yoe Borough
 York Springs Borough
 Youngwood Borough

TOWNSHIPS OF THE FIRST CLASS

Bristol Township
 Caln Township
 Collier Township
 Crescent Township
 East Deer Township
 Elizabeth Township (Allegheny County)
 Harrison Township
 Hopewell Township (Beaver County)
 North Huntingdon Township
 North Versailles Township

Ridley Township
 Rochester Township
 Salisbury Township
 Springdale Township
 Susquehanna Township
 Swatara Township
 Swatara Township (CB Plan)
 Upper Moreland Township
 Vanport Township
 West Pottsgrove Township
 Whitehall Township
 Whitehall Township (CB Plan)
 Wilkins Township

TOWNSHIPS OF THE SECOND CLASS

Hamiltonban Township
 Allegheny Township (Westmoreland County)
 Antrim Township
 Athens Township
 Bald Eagle Township
 Beaver Township
 Bedminster Township
 Bell Township
 Bethel Township
 Birmingham Township
 Black Creek Township
 Blair Township
 Bloomfield Township
 Blooming Grove Township
 Boggs Township (Centre County)
 Boggs Township (Clearfield County)
 Brecknock Township
 Brecknock Township (Berks County) (CB Plan)
 Briar Creek Township
 Brighton Township
 Broad Top Township
 Brokenstraw Township
 Brothersvalley Township
 Brown Township
 Buckingham Township
 Buffalo Township
 Burnside Township
 Burrell Township
 Burrell Township
 Caernarvon Township
 Cambria Township
 Cambridge Township
 Canal Township
 Canton Township
 Cass Township

Center Township (Greene County)
 Center Township (Indiana County)
 Center Township (Indiana County)
 Center Township (Snyder County)
 Centre Township (Berks County)
 Centre Township (Perry County)
 Cherrytree Township
 Chippewa Township
 Clarion Township
 Clay Township
 Clay Township
 Clearfield Township
 Columbus Township
 Concord Township
 Conemaugh Township
 Conemaugh Township
 Conewago Township
 Cook Township
 Coolspring Township
 Cornplanter Township
 Corydon Township
 Covington Township
 Cranberry Township
 Cross Creek Township
 Cussewago Township
 Darlington Township
 Delaware Township
 Derry Township (Dauphin County)
 Derry Township (Dauphin County) (CB Plan)
 Derry Township (Mifflin County)
 Derry Township (Westmoreland County)
 Dickinson Township
 Dingman Township
 Donegal Township (Butler County)
 Donegal Township (Butler County)
 Donegal Township (Washington County)
 Donegal Township (Westmoreland County)
 Dorrance Township
 Douglass Township (Montgomery County)
 Drumore Township
 East Allen Township
 East Carroll Township

East Coventry Township
 East Coventry Township (CB Plan)
 East Fallowfield Township
 East Finley Township
 East Hanover Township
 East Huntingdon Township
 East Manchester Township
 East Marlborough Township
 East Rockhill Township
 East Rockhill Township (CB Plan)
 Eaton Township
 Eldred Township (Jefferson County)
 Eldred Township (Monroe County)
 Eldred Township (Warren County)
 Elizabeth Township (Lancaster County)
 Elizabeth Township (Lancaster County) (CB Plan)
 Elk Creek Township
 Elk Township
 Fairfield Township
 Fairview Township
 Falls Township
 Farmington Township
 Forks Township
 Forks Township (CB Plan)
 Forward Township
 Foster Township
 Franklin Township (Beaver County)
 Franklin Township (Butler County)
 Franklin Township (Butler County)
 Franklin Township (Carbon County)
 Franklin Township (Greene County)
 Frazer Township
 Freedom Township
 Freehold Township
 Frenchcreek Township
 Girard Township
 Glade Township
 Greene Township
 Greenfield Township (Blair County)
 Greenfield Township (Erie County)
 Greenfield Township (Lackawanna County)
 Hamilton Township

Hamlin Township	London Britain Township	Oil Creek Township (Venango County)	Shade Township
Hanover Township (Beaver County)	London Grove Township	Old Lycoming Township	Sheffield Township
Hanover Township (Lehigh County)	London Grove Township (CB Plan)	Oliver Township (Jefferson County)	Shippensburg Township
Haycock Township	Lower Mahanoy Township	Oliver Township (Mifflin County)	Shrewsbury Township
Hemlock Township	Lower Mahanoy Township	Orange Township	Slippery Rock Township
Henderson Township	Lower Towamensing Township	Paint Township	Slippery Rock Township
Hilltown Township	Lower Towamensing Township (CB Plan)	Paradise Township	Smithfield Township
Hopewell Township (Cumberland County)	Lower Yoder Township	Penn Township	Snake Spring Township
Hopewell Township (Washington County)	Loyalhanna Township	Pennsbury Township	Solebury Township
Hopewell Township (York County)	Loyalhanna Township (CB Plan)	Perry Township	Solebury Township (CB Plan)
Horsham Township	Mahanoy Township	Peters Township	South Abington Township
Howe Township	Mahoning Township	Peters Township (CB Plan)	South Abington Township (CB Plan)
Hunlock Township	Manchester Township	Pike Township	South Beaver Township
Huntington Township	Manchester Township (CB Plan)	Pine Creek Township	South Bend Township
Huston Township	McKean Township	Pine Grove Township (Schuylkill County)	South Franklin Township
Jackson Township (Greene County)	Mead Township	Pine Grove Township (Warren County)	South Hanover Township
Jackson Township (Lebanon County)	Middle Smithfield Township	Pittsfield Township	South Huntingdon Township
Jackson Township (Luzerne County)	Middlesex Township	Pleasant Township	South Manheim Township
Jackson Township (Snyder County)	Milford Township (Bucks County)	Plumcreek Township	South Middleton Township
Jackson Township (Snyder County)	Milford Township (Pike County)	Plumstead Township	South Pymatuning Township
Jackson Township (Susquehanna County)	Millcreek Township	Plymouth Township	South Strabane Township
Jackson Township (Venango County)	Monongahela Township	Pocopson Township	Southampton Township
Jefferson Township (Washington County)	Monroe Township (Snyder County)	Point Township	Southwest Township
Jenks Township	Monroe Township (Wyoming County)	Point Township	Spring Creek Township
Jenner Township	Moore Township	Portage Township	Springfield Township
Jones Township	Morris Township (Greene County)	Porter Township	Stonycreek Township
Keating Township	Morris Township (Tioga County)	Preston Township	Sugar Grove Township
Kennett Township	Morris Township (Washington County)	Price Township	Sullivan Township
Lancaster Township (Butler County)	Mount Joy Township	Providence Township	Summit Township
Lancaster Township (Butler County)	Mount Pleasant Township	Pulaski Township	Summit Township
Lancaster Township (Lancaster County)	Muncy Creek Township	Pymatuning Township	Tinicum Township
Latimore Township	New Garden Township	Raccoon Township	Towamensing Township
LeBoeuf Township	New Sewickley Township	Rice Township	Tredyffrin Township
Lehman Township	Nockamixon Township	Richhill Township	Tunkhannock Township
Liberty Township	North Buffalo Township	Richland Township (Bucks County)	Union Township (Berks County)
Limestone Township (Clarion County)	North Coventry Township	Richland Township (CB Plan)	Union Township (Lebanon County)
Limestone Township (Lycoming County)	North Franklin Township	Richland Township (Venango County)	Union Township (Snyder County)
Limestone Township (Union County)	North Sewickley Township	Ridgway Township	Union Township (Washington County)
Lincoln Township	North Strabane Township	Rome Township	Unity Township
Liverpool Township	North Strabane Township (CB Plan)	Rose Township	Upper Burrell Township
	Nottingham Township	Ross Township	Upper Frederick Township
	Oakland Township	Rutland Township	Upper Milford Township
	Oil Creek Township (Crawford County)	Rye Township	Upper Nazareth Township
		Rye Township (Perry County) (CB Plan)	Valley Township
		Salford Township	Wallace Township
		Scott Township	Warrington Township
		Sewickley Township	Warsaw Township
			Warwick Township
			Washington Township (Berks County)

County)	Police	East Franklin Township Police	Lykens Borough Police
Washington Township (Cambria County)	Bedminster Township Police	East Marlborough Township Police	Mahoning Township Police (Lawrence County)
Washington Township (Dauphin County)	Bellwood Borough Police	East Pennsboro Township Police	Mahoning Township Police (Montour County)
Washington Township (Erie County)	Bentleyville Borough Police	East Washington Borough Police	Manor Borough Police
Washington Township (Fayette County)	Bentleyville Borough Police (CB Plan)	Elizabeth Township (Allegheny County) Police	Mars Borough Police
Washington Township (Greene County)	Big Beaver Borough Police	Emlenton Borough Police	Martinsburg Borough Police
Washington Township (Jefferson County)	Biglerville Borough Police	Emporium Borough Police	Marysville Borough Police
Washington Township (Northampton County - CB Plan)	Birmingham Township Police	Everett Borough Police	Maxatawny Township Police
Washington Township (Northampton County)	Blair Township Police	Factoryville Borough Police	Mayfield Borough Police
Washington Township (Schuylkill County)	Brecknock Township Police	Fairview Township Police	Mead Township Police
Washington Township (Westmoreland County)	Briar Creek Township Police	Falls Creek Borough Police	Mercer Borough Police
Washington Township (Wyoming County)	Bridgewater Borough Police	Farrell City Police	Middleburg Borough Police
Waverly Township	Buckingham Township Police	Forest City Borough Police	Middlesex Township Police
Wayne Township	California Borough Police	Forward Township Police	Millcreek Township Police
West Bradford Township	Cambria Township Police	Franklin Borough Police	Millersburg Borough Police
West Brunswick Township	Cambridge Springs Borough Police	Franklin Township Police (Beaver County)	Millville Borough Police
West Caln Township	Camp Hill Borough Police	Frazer Township Police	Montour Township Police
West Carroll Township	Carroll Township Police	Freedom Township Police	Moore Township Police
West Fallowfield Township	Carroll Valley Borough Police	Freeland Borough Police	Moosic Borough Police
West Lampeter Township	Carrolltown Borough Police	German Township Police	Morris Township Police (Greene County)
West Pennsboro Township	Central City Borough Police	Gilpin Township Police	Morrisville Borough Police
West Rockhill Township	Centre Township (Berks County) Police	Greene County Regional Police, Greene County	Moscow Borough Police
West Sadsbury Township	Clymer Borough Police	Greenfield Township (Blair County) Police	Mount Jewett Borough Police
West Salem Township	Cochranton Borough Police	Greenville Borough Police	Mount Pleasant Borough Police
West Wheatfield Township	Colebrookdale Township Police	Hamiltonban Township Police	Mount Pleasant Township Police (Washington Co)
West Wheatfield Township	Conneaut Lake Regional Police	Harveys Lake Borough Police	Mount Union Borough Police
Westtown Township	Covington Township Police	Heidelberg Township Police	New Castle Township Police
Wetmore Township	Crescent Township Police	Hellam Township Police	New Garden Township Police
White Township	Danville Borough Police	Hemlock Township Police	New Wilmington Borough Police
Whiteley Township	Darlington Township Police	Hilltown Township Police	Newport Borough Police
Wiconisco Township	Decatur Township Police	Honey Brook Borough Police	Newtown Borough Police
Williams Township	Delmont Borough Police	Hummelstown Borough Police	Nockamixon Township Police
Wilmington Township	Donegal Township Police (Washington County)	Independence Township Police	North Coventry Township Police
Windsor Township	Douglass Township (Montgomery County) Police	Jackson Township Police (Luzerne County)	North Hopewell Township Police
Woodward Township	Douglass Township Police (Berks County)	Johnsonburg Borough Police	North Huntingdon Township Police
Wright Township	Dublin Borough Police	Kennett Township Police	North Middleton Township Police
Wrightstown Township	Duboistown Borough Police	Knox Borough Police	North Sewickley Township Police
Zerbe Township	Dunbar Borough Police	Lancaster Township (Butler County) Police	Northeastern Regional Police Department
Zerbe Township	Duncannon Borough Police	Larksville Borough Police	Northumberland Borough Police
	Duncansville Borough Police	Lewistown Borough Police	Old Lycoming Township Police
	East Bangor Borough Police	Liberty Borough Police	Orangeville Area Police Board
	East Berlin Borough Police	Linesville Borough Police	Orwigsburg Borough Police
	East Coventry Township Police	Locust Township Police	Palmyra Borough Police
	East Deer Township Police	Lower Windsor Township Police	
	East Fallowfield Township Police	Lower Yoder Township Police	

POLICE

Apollo Borough Police
Ashley Borough Police
Bally Borough Police
Beaver Meadows Borough

Paxtang Borough Police
 Penbrook Borough Police
 Pennridge Regional Police Dept
 Pequea Township Police
 Perkasio Borough Police
 Pine Grove Borough Police
 Point Township Police
 Polk Borough Police
 Pulaski Township Police
 Pymatuning Township Police
 Quarryville Borough Police
 Red Lion Police
 Redstone Township Police
 Richland Borough Police
 Richland Township Police
 Roaring Brook Township Police
 Roaring Spring Borough Police
 Rochester Township Police
 Rye Township Police
 Sadsbury Township Police
 Sandy Lake Borough Police
 Saxton Borough Police
 Schwenksville Borough Police
 Scott Township Police
 Scottdale Borough Police
 Selinsgrove Borough Police
 Shade Township Police
 Shamokin Dam Borough Police
 Sheffield Township Police
 Shippingport Borough Police
 Shiremanstown Borough Police
 Sinking Spring Borough Police
 South Beaver Township Police
 South Centre Township Police
 South Pymatuning Township Police
 South Waverly Borough Police
 South Williamsport Borough Police
 Southern Chester County Regional Police Department
 Southern Police Commission
 Springdale Township Police
 Summit Hill Borough Police
 Tatamy Borough Police (CB)
 Telford Borough Police
 Tincum Township Police
 Tulpehocken Township Police
 Tunkhannock Township Police
 Upper Burrell Township Police

Upper Macungie Township Police
 Vanport Township Police
 Versailles Borough Police
 Washington Township Police (Fayette County)
 Washington Township Police (Westmoreland County)
 Waverly Township Police
 West Caln Township Police
 West Fallowfield Township Police
 West Grove Borough Police
 West Lampeter Township Police
 West Middlesex Borough Police
 West Newton Borough Police
 West Pikeland Township Police
 West Pottsgrove Township Police
 West Sadsbury Township Police
 West Vincent Township Police
 Westfield Borough Police
 White Haven Borough Police
 Wiconisco Township Police
 Williamsburg Borough Police
 Williamstown Borough Police
 Windsor Township Police
 Wrightstown Township Police
 Yardley Borough Police
 Youngwood Borough Police

FIREFIGHTERS

Clairton Firefighters
 Farrell City Firefighters
 Greenville Borough Firemen
 Harrisburg Fire
 Larksville Borough Firemen
 Manchester Township Firefighters
 Manchester Township Firefighters (CB Plan)
 North Strabane Township Fire
 North Strabane Township Fire (CB)
 South Strabane Township Fire
 Upper Moreland Firefighters
 Wilson Borough Firemen

AUTHORITIES AND OTHER UNITS

Allegheny Valley Joint Sewage Authority
 Ambridge Borough Municipal Authority

Armstrong Conservation District
 Avonmore Borough Municipal Authority
 B.A.R.T.A.
 Bangor Borough Authority
 Bath Borough Authority
 Bedford Township Municipal Authority
 Belle Vernon Municipal Authority
 Bethlehem Authority
 Bethlehem City Redevelopment Authority
 Bethlehem Parking Authority
 Blair Township Water and Sewer Authority
 Bloomfield Township Sewage Authority
 Bradford City Water Authority
 Bradford Regional Airport Authority
 Brighton Township Municipal Authority
 Brighton Township Sewage Authority
 Brockway Area Sewage Authority
 Brockway Borough Municipal Authority
 Brodhead Creek Regional Authority
 Brookville Municipal Authority
 Bucks County Redevelopment Authority
 Bucks County Water & Sewer Authority
 Bucks County Water and Sewer Authority (CB Plan)
 Burrell Township Sewage Authority
 Butler Area Public Library
 Cambria County Conservation & Recreation Authority
 Cambria County Conservation District
 Cambria Township Sewer Authority
 Cambria Township Water Authority
 Capital Region Water
 Carbon County Conservation District
 Carmichaels-Cumberland Joint Sewer Authority
 Carroll Township Authority
 Catawissa Borough Municipal Water Authority
 Centerville Borough Sanitary

Authority
 Central Carbon Municipal Authority
 Central Indiana County Joint Sanitary Authority
 Centre County Library & Historical Museum
 Clarion County Housing Authority
 Clarion County Housing Authority (CB Plan)
 Coaldale-Lansford-Summit Hill Sewer Authority
 Collier Township Municipal Authority
 Columbia County Conservation District
 Connellsville Municipal Authority
 Connellsville Redevelopment Authority
 Conshohocken Borough Authority
 Coolspring, Jackson & Lake Latonka Joint Authority
 Coplay-Whitehall Sewer Authority
 Cressona Borough Authority
 Creswell Heights Joint Authority
 Cumberland-Franklin Joint Municipal Authority
 Curwensville Municipal Authority
 Delaware Valley Municipal Management Association
 Delaware Valley Municipal Management Association (CB Plan)
 Derry Township Municipal Authority
 Derry Township Sanitary Sewer Authority
 DuBois City Redevelopment Authority
 East Berlin Area Joint Authority
 East Norriton-Plymouth-Whitpain Joint Sewer Authority
 Eastern Snyder County Regional Authority
 Economy Borough Municipal Authority
 Elizabeth Borough Municipal Authority
 Elizabeth Township Sanitary Authority
 Elizabethtown Area Authority
 Emlenton Area Municipal Authority

Erie County Housing Authority	Johnstown Redevelopment Authority	Mifflintown Municipal Authority	Authority
Everett Area Municipal Authority	Juniata County Conservation District	Milford Water Authority	North Huntingdon Township Municipal Authority
Fairfield Municipal Authority	Kiskiminetas Township Municipal Authority	Millcreek - Richland Joint Authority	North Middleton Authority
Fawn Township Sewage Authority	Kittanning Suburban Joint Water Authority	Millersburg Area Authority	North Strabane Township Municipal Authority
Fawn-Frazer Joint Water Authority	Kulpmont-Marion Heights JMA	Mon Valley Sewage Authority	Northampton Borough Municipal Authority
Fayette County Conservation District	Lancaster City Parking Authority	Monroe County Control Center	Northampton Borough Municipal Authority (CB Plan)
Frackville Area Municipal Authority	Lansford - Coaldale Joint Water Authority	Monroe County Municipal Waste Management Authority	Northeastern Regional Police NU
Franklin City Housing Authority	Lebanon City Authority	Monroe County Redevelopment Authority	Northern Lancaster County Authority
Franklin Township Municipal Sanitary Authority	Lebanon City Authority (CB Plan)	Montgomery County Sewer Authority	Northern York County Regional Police NU
Franklin Township Sewer Authority	Lebanon Community Library	Montour County Conservation District	Northwest Regional Lancaster County Police NU
Frazer Transportation Authority	Leetsdale Borough Municipal Authority	Montrose Municipal Authority	Oil City Housing Authority
Fredericksburg Sewer & Water Authority	Lehigh County Authority	Moon Township Municipal Authority	Parker Area Authority
Freeland Borough Municipal Authority	Lehigh County Authority	Mount Jewett Borough Authority	Parker Area Authority (CB Plan)
Glendale Valley Municipal Authority	Leighton Water Authority	Mount Joy Township Authority	Parks Township Municipal Authority
Greater Lebanon Refuse Authority	Linesville Pine Joint Municipal Authority	Mount Lebanon Parking Authority	Penn Township Sewage Authority
Greenville Municipal Authority	London Grove Township Municipal Authority	Mount Pleasant Township Municipal Authority	Pennridge Regional Police N-U
Guilford Township Authority	Lower Bucks County Joint Municipal Authority	Mount Pocono Municipal Authority	Pennridge WasteWater Treatment Authority
Guilford Water Authority	Lower Bucks County Joint Municipal Authority Supervisors	Municipal Authority of the Borough of Kittanning	Pennsylvania Municipal League
Harrison Township Water Authority	Lower Indiana County Municipal Authority	Municipal Authority of the Borough of Matamoras	Perkasie Regional Authority
Hawley Area Authority	Lower Mahanoy Township Municipal Authority	Municipal Authority of the Borough of Morrisville	Peters Creek Sanitary Authority
Hellertown Borough Authority	Lower Providence Township Sewer Authority	Municipal Authority of the Borough of Portage Water Department	Peters Township Municipal Authority
Hilltown Township Water & Sewer Authority	Luzerne Conservation District	Municipal Authority of the Borough of Portage Water Department	Pleasant Hills Authority
Horsham Water and Sewer Authority	Luzerne County Flood Protection Authority	Municipal Authority of Westmoreland County of COJMA	Portage Area Sewer Authority
Hughesville-Wolf Township Joint Municipal Authority	Mahanoy Township Authority	Myerstown Community Library Association	Possum Valley Municipal Authority
Hyndman Borough Municipal Authority	Maidencreek Township Authority	Myerstown Water Authority	Redevelopment Authority in the City of Corry
Indiana County Conservation District	Manheim Area Water and Sewer Authority	Nanty Glo Sanitary Sewer Authority	Reynoldsville Water Authority
Indiana County Solid Waste Authority	Manor Township Joint Municipal Authority	Nanty Glo Water Authority	Riverview Sanitary Authority
Jackson Township Water Authority	Mary Meuser Memorial Library	Nesquehoning Borough Authority	Robesonia-Wernersville Municipal Authority
Jefferson Conservation District	McKean County Solid Waste Authority	New Kensington Municipal Sanitary Authority	Robinson Township Municipal Authority
Jefferson County Solid Waste Authority (Jefferson County)	Mercer County Regional Planning Commission	New Kensington Redevelopment Authority	Rochester Area Joint Sewer Authority
Jenner Area Joint Sewer Authority	Mid Mon Valley Water Authority	Newport Borough Water Authority	Rostraver Township Sewer Authority
Johnsonburg Municipal Authority	Middlesex Township Municipal Authority	Norristown Municipal Waste Authority	Saxton Borough Municipal Authority
	Middletown Township Sewer Authority	North & South Shenango Joint Municipal Authority	Seward/St. Clair Township Sanitary Authority
	Mifflin County Regional Police NU	North Coventry Municipal	Shade-Central City Joint Authority
			Shannock Valley General Services Authority

Sharon Sanitary Authority	Municipal Authority (Fayette County)
Sheffield Township Municipal Authority	Waterford Borough Municipal Authority
Slippery Rock Municipal Authority	Wayne County Redevelopment Authority
Smithton Borough Municipal Authority	Wayne Library Authority
Snake Spring Township Municipal Authority	Wernersville Municipal Authority
Snyder County Housing Authority	West Carroll Water Authority
Somerset Conservation District	West Hanover Township Water & Sewer Authority (CB)
South Fayette Township Municipal Authority	Western Butler County Authority
South Middleton Township Municipal Authority	Western Clinton County Municipal Authority
Southern Police Commission NU	Western Westmoreland Municipal Authority
Southwest Regional Dispatch Center	Western Westmoreland Municipal Authority (CB Plan)
Southwestern Pa Water Authority	Westmoreland-Fayette Municipal Sewage Authority
Southwestern Regional Police NU	White Run Regional Municipal Authority
St. Marys Area Water Authority	Whitehall Township Authority
Stormwater Authority of the City of Chester	Williamstown Borough Authority
Sunbury Municipal Authority	Womelsdorf-Robeson Joint Authority
Swatara Township Authority	Wyoming Valley Sanitary Authority
Tower City Borough Authority	York County Planning Commission
Township of Falls Authority	
Tri-County COG IBC	
Tri-County Joint Municipal Authority	
Twin Boroughs Sanitary Authority	
Upper Allegheny Joint Sanitary Authority	
Upper Montgomery Joint Authority	
Upper Southampton Municipal Authority	
Vanport Township Municipal Authority	
Vernon Township Sanitary Authority	
Vernon Township Water Authority	
Warren County Housing Authority	
Warren County Solid Waste Authority	
Warwick Township Municipal Authority	
Washington Area COG	
Washington Township Municipal Authority (Berks County)	
Washington Township	



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