

# Comprehensive Annual Financial Report

*for the years ended December 31, 2016 and 2015*

**PENNSYLVANIA MUNICIPAL RETIREMENT SYSTEM**



# The Pennsylvania Municipal Retirement System

Comprehensive Annual Financial Report  
for the Years Ended December 31, 2016 and 2015

**Barry Sherman, Chairman**

*Pennsylvania Municipal Retirement Board*

**George Milakovic, Vice Chairman**

*Pennsylvania Municipal Retirement Board*

**Stephen W. Vaughn, Secretary**

*Pennsylvania Municipal Retirement System*

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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 and Mission Statement

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## **Vision Statement**

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

## **Mission Statement**

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

June 29, 2017

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, the System, the Fund) Comprehensive Annual Financial Report (CAFR) for the years ended December 31, 2016 and 2015. This report is intended to provide financial, investment, actuarial, and statistical information in a single publication. The management of the System is solely responsible for the accuracy and completion of this report. As required by the Pennsylvania Municipal Retirement Law, Act of 1974, P.L. 34, No. 15 (the Act) as amended, the System makes available the CAFR to our governing board, the members of the General Assembly of Pennsylvania, each participating municipal employer, and all other interested parties upon request. The CAFR is also published on the System's website ([www.pmr.state.pa.us](http://www.pmr.state.pa.us)).

## OVERVIEW OF THE SYSTEM

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

The System 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 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, 2016.

The System 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 from a menu of options 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 breadth, amounts and receipt timing of employee benefits, 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": the percentage of an employee's final annual salary that will be replaced by a plan's annual retirement benefits. Income replacement in PMRS plans range 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 what percentage of plan costs are paid by employers vs employees. Employee cost sharing in PMRS plans range from 0% to 60% of the plan's total cost with individual required contributions up to 7.5% of an employee's salary.

## ECONOMIC ENVIRONMENT

The first quarter of 2016 saw the U.S. economy grow at 1.1 percent, which was a decline from the 2015 fourth quarter's Gross Domestic Product (GDP) of 1.4 percent but still a positive figure. The unemployment rate initially ticked down to 4.9 percent and then reverted to 5.0 percent in March. The first

quarter's Consumer Price Index (CPI) increased 0.9 percent year over year. The U.S. dollar weakened relative to the euro. Value stocks outperformed their growth counterparts in particular among the smaller cap sizes. In the first quarter, the quarterly gross rate of return for the System's total portfolio was 1.1 percent.

The second quarter GDP was a tame 1.4 percent. Citing weaker-than-expected new jobs through May, inflation well-below target and Brexit concerns, the Fed held steady its fund rate. Unemployment was at 4.9 percent. The second quarter's CPI increased 1.0 percent year over year. The U.S. dollar strengthened slightly, relative to the euro. Value stocks again outperformed their growth counterparts with mid cap earning higher returns than larger and smaller names. In the second quarter, the quarterly gross rate of return for the System's total portfolio was 0.8 percent and the year-to-date gross rate of return was 1.8 percent.

In the third quarter, the GDP advanced to 3.5 percent. Unemployment ticked up to 5 percent. CPI increased 1.5 percent year over year. The U.S. dollar weakened very slightly against the euro. Growth stocks produced stronger returns this quarter than their value counterparts last quarter. Smaller names outperformed the larger cap sizes. In the third quarter, the quarterly gross rate of return for the System's total portfolio was 5.2 percent and the year-to-date gross rate of return was 7.1 percent.

The worldwide trend of nationalism over globalism that began with the Brexit vote in the second quarter continued in the fourth quarter of 2016 with the U.S. Presidential election victory of Donald Trump. Long-term economic forecasts are marked by high uncertainty, as no one can confidently predict what changes may come to domestic and global policy, regulations, NAFTA, and even NATO. While the long-term is uncertain, many economic indicators helped reduce the short-term angst. In the fourth quarter, the GDP was 2.1 percent. Unemployment dipped to 4.7 percent. CPI increased 2.1 percent year over year. The U.S. dollar strengthened relative to the euro. The Federal Reserve Board voted unanimously to raise rates 0.25 percent at its December 13-14 meeting based on expanding GDP, continued labor gains and inflation approaching its 2 percent target. Value stocks raced ahead of their growth counterparts in the fourth quarter and were also ahead for all of 2016. Smaller cap sizes outperformed larger ones in the fourth quarter. Mid caps joined in the

lead with small cap names in outperforming for the year. In the fourth quarter, the quarterly gross rate of return for the System's total portfolio was 1.5 percent and the year-to-date gross rate of return was 8.7 percent.

## FINANCIAL INFORMATION

The System's financial statements were prepared in accordance with generally accepted accounting principles of the United States of America. The financial statements and the required supplementary information in the report have been prepared in accordance with governmental accounting standards. The independent auditors' report is located in the Financial Section on page 16 and the Management's Discussion and Analysis commences on page 18.

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."

The System's net position was \$2.151 billion at December 31, 2016. The System's net position increased by \$156.9 million or 7.9% from \$1.994 billion at December 31, 2015. Net investment income increased the net position by \$163.9 million. Contributions and miscellaneous income increased the net position by \$94.0 million. Benefit payments, plan withdrawals, and administrative expenses reduced the net position by \$101.0 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 21 and 22.

The System has established internal control policies and procedures for the review and verification of all receipts and payments made to and from the fund. In addition, the System's staff prepares 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 2016 administrative budget was adopted in September 2015 and set at \$6.9 million

exclusive of investment fees. Expenditures (exclusive of investment fees) in 2016 amounted to \$6.0 million. More information on the System's expenses is included in the Financial Section of this report ("Schedule 2 – Administrative Expenses").

## ADDITIONS TO FIDUCIARY NET POSITION

The System 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, 2016, and also shows the amount and percentage of increases and decreases in relation to the prior year ended December 31, 2015.

Municipal contributions are based upon 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 \$25.3 million or 36.7 percent from \$68.7 million in 2015 to \$94.0 million in 2016 primarily due to an increase in transfers from other plan administrations of \$19.9 million for new plans.

Net investment income 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 the System's investment portfolio increased from \$1.997 billion at December 31, 2015 to \$2.157 billion at December 31, 2016. Net investment income was \$163.9 million in 2016 compared to a net investment loss of \$5.2 million in 2015. The increase in net investment income is primarily due to appreciation in fair values in the equity and real estate markets.

Each municipality is charged a \$20 assessment per member to help cover administrative expenses incurred by the System. Any fluctuation in assessments 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 the System.

Ten-year historical trend information listing the System's additions to fiduciary net position is presented in Part I of the Statistical Section of this report.

## DEDUCTIONS FROM FIDUCIARY NET POSITION

The System's primary deductions from fiduciary net position represents the purpose for which it was created: payment of plan benefits. The following schedule presents a summary of the System's deductions from fiduciary net position for the year ended December 31, 2016, and shows the amount and percentage of increases and decreases in relation to the prior year ended December 31, 2015. The major deduction for 2016 was annuity benefits and

### SUMMARY OF ADDITIONS TO FIDUCIARY NET POSITION

Years Ended December 31, 2016 and 2015

ADDITIONS TO FIDUCIARY NET POSITION	2016	PERCENT OF TOTAL	2015	\$ INCREASE (DECREASE)	PERCENT INCREASE (DECREASE)
Contributions, net of refunds	\$ 93,999,086	36.4	\$ 68,740,888	\$ 25,258,198	36.7
Net investment income (loss)	163,943,015	63.6	(5,197,261)	169,140,276	(3,254.4)
Miscellaneous income	-	0.0	253,740	(253,740)	(100.0)
<b>Total</b>	<b>\$ 257,942,101</b>	<b>100.0</b>	<b>\$ 63,797,367</b>	<b>\$ 194,144,734</b>	<b>304.3</b>

### SUMMARY OF DEDUCTIONS FROM FIDUCIARY NET POSITION

Years Ended December 31, 2016 and 2015

DEDUCTIONS FROM FIDUCIARY NET POSITION	2016	PERCENT OF TOTAL	2015	\$ INCREASE (DECREASE)	PERCENT INCREASE (DECREASE)
Annuity benefits and terminations	\$ 94,334,813	93.3	\$ 89,855,588	\$ 4,479,225	5.0
Transfers to other plan administrators	678,605	0.7	20,448,089	(19,769,484)	(96.7)
Administrative expenses	6,041,638	6.0	4,983,399	1,058,239	21.2
<b>Total</b>	<b>\$ 101,055,056</b>	<b>100.0</b>	<b>\$ 115,287,076</b>	<b>(\$ 14,232,020)</b>	<b>(12.3)</b>



terminations. Transfers to other plan administrators decreased from \$20.4 million in 2015 to \$678,605 in 2016 due to decreased plan withdrawals. A breakdown of the System's 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, 2016, the gross rate of return for the System's total portfolio was 8.7 percent, ranking in the 14th percentile of the Investment Metrics (IM) Public Fund Universe. For the five years ended December 31, 2016, the gross rate of return for the System's total portfolio was 9.2 percent, ranking in the 24th percentile. Since inception in December 1985, the gross rate of return for the System's total portfolio was 8.6%.

The gross rate of return by asset class for the year ended December 31, 2016 and the allocation of assets in the portfolio as of December 31, 2016 are as follows: Large Cap Equity returned 9.4 percent (26.1 percent of portfolio); Small Cap Equity returned 21.8 percent (16.3 percent); Developed International Equity returned 2.0 percent (13.4 percent); Emerging Markets Equity returned 11.6 percent (9.1 percent); Real Estate returned 8.8 percent (19.7 percent); and Fixed Income returned 2.7 percent (13.1 percent). At December 31, 2016, the allocation of assets in the portfolio for cash equivalents was 2.3 percent.

## FUNDING

The System's level of funding is based on the actuarial reserve method. Funds are derived from the excess of revenues over expenses and are accumulated by the System in order 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. The System's net position increased by \$156.9 million or 7.9 percent from \$1.994 billion at December 31, 2015 to \$2.151 billion at December 31, 2016.

The "Schedule of Funding Progress" was calculated based on the most recent actuarial valuation dated January 1, 2016. The funded ratio decreased from 100.7 percent at January 1, 2015 to 100.1 percent as of the last valuation date of January 1, 2016. As a result, the surplus has decreased from \$14.2 million as of January 1, 2015 to \$2.3 million as of January 1, 2016. Additional information on the System's 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 (PERS), the System

reports to each of the plans it administers, providing the governing authority of plans with complete actuarial, accounting, and funding data. Detailed information on the System's aggregate plan funding can be found in the Actuarial Section of this report beginning on page 47.

## MAJOR INITIATIVES

After making significant decisions on the System's direction in 2015, System activities in 2016 focused on a multi-year implementation of those decisions.

### PLAN ADMINISTRATION AND ACCOUNTING SOFTWARE SYSTEM ENHANCEMENTS

#### Plan Administration Software Project

For the plan administration software enhancements, PMRS and its selected software partner, CPAS Systems, began the implementation project in early 2016, with a "go live" target of 4th quarter 2017. For much of 2016, the project remained on schedule with intermittent delays of project segments. In early 2017, PMRS and CPAS agreed to alter the delivery schedule of the remaining project segments and in turn, these alterations required the "go live" target to be delayed by approximately six months to early 2nd quarter 2018.

One of the most significant features of the software enhancement will be online access for our plan sponsor employers and their plan member employees. For our plan sponsors, among the many features will be their ability to upload most data now submitted on paper including employee salary and contributions, new employee enrollment information and changing data for existing employees. Once data is submitted online, employers will have review capability to monitor the accuracy of PMRS recorded data. For plan member employees, they will be able to create retirement benefit estimates and retain them for historical review. In addition, many benefit transactions will be able to be initiated on-line and employee initiated data modifications such as new beneficiaries will be able to be handled directly on-line. In addition to these external facing enhancements will be internal processing improvements which are intended to reduce the time between ending employment and receiving retirement benefits while improving internal processing tracking.

#### Accounting Software Project

The project began on time with the selection of the software, Microsoft Dynamics AX in the fall of 2016. In order to meet an implementation target of January 1, 2018, PMRS secured Dell Consulting services for pre-implementation assistance to design the

implementation objectives to assist in the selection of an implementation services provider in the 3rd quarter of 2017. The unexpected delay in the procurement of implementation services required the “go live” date be moved to the 2nd quarter of 2018 and will likely coincide with the implementation of the plan administration software project.

Among the many advantages of the new accounting system will be its ability to automate the data transfers between the new system, the Commonwealth’s two financial software systems, Oracle PeopleSoft and SAP, and the plan member retirement financial activity from the CPAS software. Moving from a manual entry of financial transactions to an automated system will improve both the speed and the accuracy of System financial reporting both internally and externally.

### **STAFFING REALIGNMENT FOR SELECT NON-CORE OPERATIONS**

In late 2015, the System began a comprehensive review of how to receive the breadth and depth of what the System considers essential non-core services through contractual services. Beginning in late 2015 and continuing throughout 2016, the System began implementation with three Commonwealth agencies that specialize in providing services to specialized Commonwealth organizations such as PMRS.

During 2016, for Human Resource services, PMRS executed a Memorandum of Understanding (MOU) with the Executive Office of Human Resources. For Procurement services, PMRS executed a MOU with the Office of Administrative Services. For Information Technology Support services, PMRS has transferred responsibility for desktop support services to the Office of Administration’s Office of Information Technology (OA-OIT). Further discussion with OA-OIT is continuing to possibly expand the provided services to include server and network support along with specialized application hosting. It is anticipated that a MOU will be executed with OA-OIT to formalize the final, negotiated support services.

### **PMRS HEADQUARTERS RELOCATION**

As reported in the 2015 CAFR, the PMRS Board authorized PMRS staff and its real estate investment advisor to make an offer on an approximately 19,000 square foot building located at 1721 N. Front St. in Harrisburg. The building would be an asset in the PMRS investment portfolio. The offer of \$1.2 million was accepted by the building’s owner in August 2016 and the sale transaction was completed September 2, 2016. The building’s owner of record is

1721 North Front Street Holdings, Inc., (PMRS Real Estate Corporation) a 501 (c)(25)(C) non-profit corporation whose three member Board of Directors are senior PMRS staff. In October 2016 the PMRS Real Estate Corporation selected a design and build vendor to renovate the building and design office space for the future needs of PMRS. Construction began in February 2017 and is expected to be completed by July 2017. PMRS plans to occupy approximately 12,000 square feet on the top two floors with the remaining first floor space available for lease to an outside organization.

Along with the PMRS headquarters relocation, PMRS will complete a document imaging project to track, manage and store existing PMRS documents electronically and to reduce future paper file storage. Following completion of the imaging project, PMRS will be implementing a comprehensive electronic document and records management system to manage documents and records throughout the document lifecycle from creation to destruction with a target completion in mid-2018.

### **GASB 68 PENSION REPORTING FOR EMPLOYERS**

In December 2016, PMRS provided information to its employers to assist them in complying with the Governmental Accounting Standards Board (GASB) Statement No. 68, “*Accounting and Financial Reporting for Pensions.*” PMRS provided a variety of schedules audited by PMRS’ independent public accountants as well as unaudited schedules. PMRS strives to incorporate all the information necessary for employers to comply with GASB 68 reporting requirements in these audited and unaudited schedules. Additionally, PMRS continues to make itself available to assist employers and their auditors should they have any additional requests in order to comply with GASB 68.

### **PROFESSIONAL SERVICES**

Professional consultants are appointed by the Board to perform services essential to the efficient operation of the System. 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 the System is reviewed by an investment evaluation firm on a quarterly basis. The consultants providing services to the System are listed in the Financial Section and Investment Section of this report.

## INTERNAL CONTROLS

PMRS' management is responsible for and has implemented internal controls designed to provide reasonable assurance for the safeguarding of assets and the reliability of financial records. This report has been prepared in accordance with accounting principles generally accepted in the United States of America. The System's financial statements are prepared on the accrual basis of accounting. More specific accounting information is detailed in the Summary of Significant Accounting Policies (Note 2) in the notes to the financial statements found in the Financial Section of this report.

## SYSTEM 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 Comprehensive Annual Financial Report for the year ended December 31, 2015. 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 comprehensive annual financial report whose contents conform to program standards. Such a comprehensive annual financial report must satisfy both generally accepted accounting principles and applicable legal requirements.

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

The System believes the current report continues to conform to the Certificate of Achievement program requirements and will be submitting this report to the GFOA to determine eligibility for the 2016 certificate.

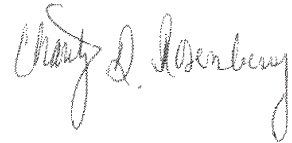
## ACKNOWLEDGMENTS

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

Respectfully submitted,



Stephen W. Vaughn  
Secretary



Charity D. Rosenberry  
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, 2015**



Executive Director/CEO

# Administrative Organization

## Pennsylvania Municipal Retirement Board

As of December 31, 2016



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



**George Milakovic, Vice Chair**  
*Represents Pennsylvania  
State Association of  
Township Commissioners*



**Cory S. Adams**  
*Represents Pennsylvania  
State Association of  
Township Supervisors*



**Pedro Cortés**  
*Secretary of the Commonwealth  
(ex-officio)*



**Steven T. Heinly**  
*Represents active police  
officers enrolled in PMRS*



**William J. Junkin III**  
*Represents active firefighters  
enrolled in PMRS*



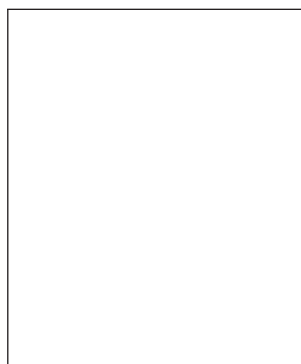
**Timothy A. Reese<sup>(1)</sup>**  
*State Treasurer (ex-officio)*



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



**David S. Perruso**  
*Represents Pennsylvania State  
Association of Boroughs*



**Vacant<sup>(2)</sup>**  
*Represents Pennsylvania  
State Association of County  
Commissioners*



**Vacant**  
*Represents Pennsylvania  
Municipal Authorities Association*

<sup>(1)</sup> Joseph M. Torsella sworn in as Treasurer in January 2017.

<sup>(2)</sup> Jeff Pisarcik appointed in June 2017.

## Staff, Consultants, and Managers

As of December 31, 2016

### ADMINISTRATIVE STAFF

#### Secretary

Stephen W. Vaughn

#### Assistant Secretary

Kristine M. Cline

#### Chief Financial Officer

Charity D. Rosenberry

### PROFESSIONAL CONSULTANTS

#### Actuary

Cheiron | McLean, VA

*Kenneth Kent, FSA, FCA, MAAA, EA*

#### Auditor

CliftonLarsonAllen LLP | Timonium, MD

*Owen Ward, CPA, Principal*

#### Comptroller

Commonwealth of Pennsylvania | Harrisburg, PA

*Anna Maria Kiehl, Chief Accounting Officer*

#### Legal Counsel

Commonwealth of Pennsylvania | Harrisburg, PA

*Charles K. Serine, Chief Counsel*

#### Investment Consultant

Dahab Associates, Inc. | Bay Shore, NY

*Richard E. Dahab, CFA, President*

#### Custodian

State Treasurer | Harrisburg, PA

#### Sub-Custodian

BNY Mellon | Pittsburgh, PA

*Gordon Sapko, Relationship Manager*

### INVESTMENT MANAGERS

#### Eagle Capital Management, LLC

New York, NY

*John Johnson, Managing Director*

#### Emerald Advisors, Inc.

Leola, PA

*Stacey L. Sears, Senior Vice President*

#### Federated Investors, Inc.

Pittsburgh, PA

*Amy Michaliszyn, Senior Vice President*

#### Forest Investment Associates

Atlanta, GA

*Michael L. Clutter, Vice President*

#### HGK Asset Management, Inc.

Jersey City, NJ

*Matthew Kosara, Client Portfolio Manager*

#### Jarislowsky, Fraser Limited

Montreal, QC

*Dario Mazzarello, Partner*

#### Johnston Asset Management

Stamford, CT

*James Pontone, Director and Portfolio Manager*

#### LSV Asset Management

Chicago, IL

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

#### Polen Capital Management

Boca Raton, FL

*Jim Haymes, Director of Institutional Relations*

#### Prudential Financial, Inc.

Madison, NJ

*Larry Teitelbaum, Executive Director–Business Development*

#### Smith, Graham & Co.

New York, NY

*Lynda Leslie, Senior Vice President*

#### State Street Global Advisors

Boston, MA

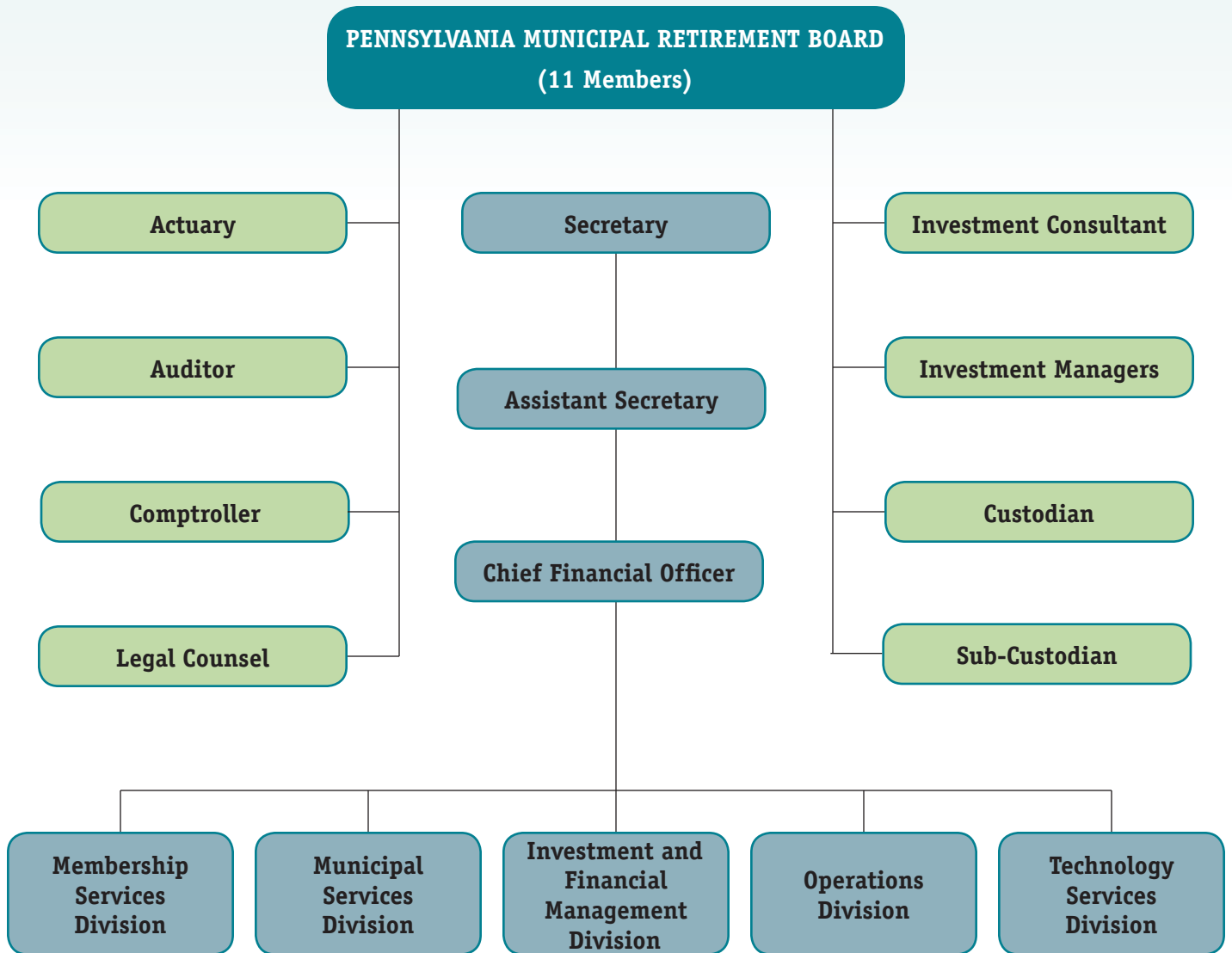
*Gregory Balewicz, Vice President*

#### TIAA Global Asset Management

New York, NY

*Cameron Jones, Director*

# Organizational Chart



# Chairman's Report

June 29, 2017

Dear Members:

As the Chairman of the Pennsylvania Municipal Retirement System, I am pleased to share with you the System's Comprehensive Annual Financial Report for the years ended December 31, 2016 and 2015. The report identifies the System's strong financial position as of December 31, 2016 along with the numerous activities conducted by the System throughout the year on your behalf.

For the year ended December 31, 2016, the gross rate of return for the System's total portfolio was 8.7 percent. This was the System's best investment performance since 2013 and ranked among the best relative performances in 2016 among large U.S. public pension plans in the 14th percentile. The System's net position increased by \$156.9 million or 7.9 percent from \$1.994 billion at December 31, 2015 to \$2.151 billion at December 31, 2016. Despite the strong investment performance in 2016, PMRS' January 1, 2016 Actuarial Valuation, which does not include the 2016 investment returns, showed only a slight reduction of its actuarial funding ratio to 100.1 percent and a reduction of its fair market value funding ratio to 92.7 percent. Despite the decline in the fair market value funding ratio, PMRS continues to be one of the best funded local government retirement systems in the United States. When the 2016 investment performance is incorporated into the January 1, 2017 Actuarial Valuation, we anticipate the fair market value funding ratio will likely increase to the mid-90 percent range.

In 2015, the Board authorized three major projects designed to strengthen client interaction by realigning personnel, modernizing program operations, and expanding financial disclosure and transparency. 2016 was the first year of a projected two to three-year implementation. By the end of 2016, PMRS was halfway through a \$1 million plan administration software enhancement, a quarter way through the implementation of a comprehensive accounting and financial reporting software system, and just in beginning stages to move PMRS staff into its first headquarter building since its inception in 1974. While we continue in 2017 to implement the two major software enhancements with a target completion of 2nd quarter 2018, I am pleased to announce that we completed the purchase and renovation of the PMRS headquarters and will be relocating to 1721 North Front Street in Harrisburg in July 2017. This building will be added to the PMRS portfolio; what was once a significant administrative rental expense will be transformed into an income stream for the benefit of our plan members and plan sponsors while providing the PMRS staff with a modern facility and the latest technology.

I encourage you to read this report in full. I know its transparency will allow you to learn more about the System's strengths. I believe you will, above all else, be pleased by the openness and candor with which the agency's operations are revealed. We believe that the more you know about the agency, the more you will appreciate it. I encourage you to contact us with your inquiries, comments, and suggestions. We welcome your involvement and appreciate your support. I thank you for allowing us to serve you.

Sincerely,



Chairman

Phone: (717) 787-2065

(800) 622-7968

Fax: (717) 783-8363

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



## Summary of Plan Provisions<sup>(1)</sup>

### INTRODUCTION

The System offers a variety of alternative pension plans. Municipalities may design their own pension benefit structures. Most municipalities select this option and work with the System to create a combination of benefits that meet the individual needs of the municipality and its employees. Additionally, the System has two basic benefit plans designed by the State General Assembly: one for municipal employees and one for police and firefighters.

### SUPERANNUATION AND EARLY ANNUITY ELIGIBILITY BENEFITS

Under the basic plans, the minimum normal retirement age is 65 for municipal employees and 55 for police and firefighters. A member may retire early at any age after 24 years of service. 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 the System's medical examiners to determine whether the member is eligible for the disability benefit.

A disability that results directly from doing one's job is classified as a service-connected disability. A disability that is not caused by one's work is termed a non-service disability.

Conditions for disability benefits are defined in the municipality's contract. The System's basic plans provide for (1) a service-connected disability annuity of 50 percent 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 percent final average salary annuity.

### VESTING ANNUITY ELIGIBILITY BENEFITS

Conditions for vesting are defined in the municipality's contract. The basic plans have a 12-year service requirement for vesting.

A member who terminates service before retirement and is eligible to vest may elect to leave the member's accumulated contributions in the System and defer receipt of benefits until normal retirement age. Then when the member receives the vested benefits, checks 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 percent survivorship annuity
- **Option 3:** Joint and 50 percent 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 at 5.5 percent. 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 the System, the employee may transfer the service credits unimpaired to the new municipal employer.

<sup>(1)</sup> Descriptions are not identical to those in the audit report. Information has been rewritten for ease of understanding.



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# Financial

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# Independent Auditors' Report



CliftonLarsonAllen

CliftonLarsonAllen LLP  
CLAAconnect.com

## INDEPENDENT AUDITORS' REPORT

Pennsylvania Municipal Retirement Board  
Pennsylvania Municipal Retirement System  
Harrisburg, Pennsylvania

### **Report on the Financial Statements**

We have audited the accompanying financial statements of the Pennsylvania Municipal Retirement System (the System), which comprise the statements of fiduciary net position as of December 31, 2016 and 2015, and the related statements of changes in fiduciary net position for the years then ended, and the related notes to the financial statements, as listed in the table of contents.

### ***Management's Responsibility for the Financial Statements***

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

### ***Auditors' Responsibility***

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the 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 auditors' 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 financial position of the System as of December 31, 2016 and 2015, and the respective changes in its financial position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

***Emphasis of a Matter***

During the year ended December 31, 2015, the System adopted GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* and the related GASB Statement No. 71, *Pension Transition for Contributions Made Subsequent to the Measurement Date – an amendment of GASB Statement No. 68*. As a result of the implementation of these standards, the System reported a restatement for the change in accounting principle (see Note 2). Our auditors' opinion was not modified with respect to the restatement.

***Other Matters***

*Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and schedule of investment returns, 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 audits 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.

*Supplementary and Other Information*

Our audits were conducted for the purpose of forming an opinion on the System's financial statements. The supplementary schedules, 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, as listed in the table of contents, 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 audits 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, as listed in the table of contents, 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 the auditing procedures applied in the audits of the financial statements, and accordingly, we do not express an opinion or provide any assurance on it.



**CliftonLarsonAllen LLP**

Harrisburg, Pennsylvania  
June 29, 2017

## Management's Discussion and Analysis

This section presents management's discussion and analysis of the Pennsylvania Municipal Retirement System's (PMRS, the System, the Fund) financial performance for the years ended December 31, 2016, 2015, and 2014. It is presented as required supplementary information to the financial statements.

### OVERVIEW OF FINANCIAL STATEMENTS

The System administers sound, cost-effective pension plans on a contracted basis for local government employers throughout the Commonwealth. Our services include accounting services, 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, 2016.

The Statement of Fiduciary Net Position provides a snapshot of the financial position of PMRS at December 31, 2016, including comparative amounts for the prior year. The Statement of Changes in Fiduciary Net Position summarizes the System's financial activities that occurred for the year ended December 31, 2016, including comparative amounts for the prior year.

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

The Required Supplementary Information following the Notes to Financial Statements provides a schedule of investment returns.

The remaining supplementary schedules provide additional detailed information concerning the administrative expenses, investment expenses, and payments to consultants. All of this supplementary information is considered useful in understanding and evaluating the financial activities of PMRS.

### FINANCIAL HIGHLIGHTS

- The System's net position increased by \$156.9 million or 7.9 percent from \$1.994 billion at December 31, 2015 to \$2.151 billion at December 31, 2016. The System's net position decreased by \$55.1 million or 2.7 percent from \$2.050 billion<sup>(1)</sup> at December 31, 2014 to \$1.994 billion at December 31, 2015. The changes in fair value are recognized as part of the net appreciation/depreciation in the fair value of investments.
- The funded ratio decreased from 100.7 percent at January 1, 2015 to 100.1 percent as of the last valuation date of January 1, 2016. As a result, the surplus has decreased from \$14.2 million as of January 1, 2015 to \$2.3 million as of January 1, 2016.

<sup>(1)</sup> PMRS implemented GASB statement No. 68 effective January 1, 2015 and the 2015 beginning net position was restated from \$2.050 billion to \$2.046 billion.

- The portfolio gross rate of return for the year ended December 31, 2016 was 8.7 percent compared to 0.1 percent and 5.7 percent for the years ended December 31, 2015 and 2014, respectively.
- Contributions increased by \$25.3 million or 36.7 percent from \$68.7 million in 2015 to \$94.0 million in 2016 primarily due to an increase in transfers from other plan administrators of \$19.9 million for new plans. Contributions decreased by \$21.0 million or 23.4 percent from \$89.8 million in 2014 to \$68.7 million in 2015 primarily due to a one-time payment of \$27.4 million from one municipality towards its unfunded liability in 2014.
- Annuity benefits and terminations increased by \$4.5 million or 5.0 percent from \$89.9 million in 2015 to \$94.3 million in 2016. Annuity benefits and terminations increased by \$5.8 million or 6.9 percent from \$84.0 million in 2014 to \$89.9 million in 2015. The fluctuation in annuity benefits and terminations is primarily due to increased annuity benefits from 2014 to 2016.
- Transfers to other plan administrators decreased from \$20.4 million in 2015 to \$678,605 in 2016 due to decreased plan withdrawals. Transfers to other plan administrators increased from \$3.4 million in 2014 to \$20.4 million in 2015 due to increased plan withdrawals.
- Administrative expenses increased by \$1.0 million or 21.2 percent from \$5.0 million in 2015 to \$6.0 million in 2016 primarily due to increases in pension expenses and actuarial fees with implementation of GASB Statement No. 68, and information technology expenses for the pension administration system upgrade. Administrative expenses increased by \$0.6 million or 13.0 percent from \$4.4 million in 2014 to \$5.0 million in 2015 primarily due to increases in other post-employment benefit costs and actuarial and legal fees. Administrative expenses were within PMRS' budgeted amounts for all three years.

### FUNDED STATUS

PMRS uses an actuarial reserve method of funding that is financed by member contributions, employer contributions, and earnings from invested assets. The System has historically chosen to have actuarial valuations performed bi-annually. The January 1, 2016 actuarial valuation was derived from actual values for the four defined benefit plans that are required to redetermine contribution levels bi-annually on even years and actuarial adjustments to the January 1, 2015 liabilities for 718 municipalities required to redetermine contribution levels bi-annually on odd years. The January 1, 2015 liabilities were adjusted to reflect January 1, 2016 actual active counts to estimate the liabilities for these plans to provide an overall measure of the funded status of the System.

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 that PMRS is 100.1 percent funded as of January 1, 2016.

### **INVESTMENTS**

PMRS is a long-term investor and the Board manages the Fund 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 taking into account the risk associated with each asset class as well as the financial objectives of the Fund.

For the year ended December 31, 2016, the System's gross rate of return on investments was 8.7 percent. The gross rate of return over the past three and five years ended December 31, 2016 was 4.8 percent and 9.2 percent, respectively.

### **SHORT-TERM**

Short-term investments increased by \$18.2 million or 48.7 percent from \$37.4 million at December 31, 2015 to \$55.6 million at December 31, 2016. Short-term investments decreased by \$21.3 million or 36.3 percent from \$58.7 million at December 31, 2014 to \$37.4 million at December 31, 2015. The annual fluctuations represent the normal cash flow necessary to meet operating expenses.

### **FIXED INCOME**

Fixed income decreased by \$49.3 million or 14.9 percent from \$330.3 million at December 31, 2015 to \$281.0 million at December 31, 2016, primarily due to changes in fair value. Fixed income increased by \$28.7 million or 9.5 percent from \$301.6 million at December 31, 2014 to \$330.3 million at December 31, 2015, primarily due to changes in fair value.

### **COMMON AND PREFERRED STOCK**

Common and preferred stock including international stock increased by \$124.2 million or 9.8 percent from \$1.272 billion at December 31, 2015 to \$1.396 billion at December 31, 2016. Common and preferred stock including international stock decreased by \$89.2 million or 6.6 percent from \$1.361 billion at December 31, 2014 to \$1.272 billion at December 31, 2015 due to changes in fair value in domestic and international markets.

### **REAL ESTATE**

Real estate increased by \$66.5 million or 18.6 percent from \$357.9 million at December 31, 2015 to \$424.3 million at December 31, 2016. Real estate increased by \$29.5 million or 9.0 percent from \$328.4 million at

December 31, 2014 to \$357.9 million at December 31, 2015. The increases were due to gains in fair value and net purchases of additional real estate.

### **CONTRIBUTIONS AND INVESTMENT INCOME**

Contributions increased by \$25.3 million or 36.7 percent from \$68.7 million in 2015 to \$94.0 million in 2016 primarily due to an increase in transfers from other plan administrators of \$19.9 million for new plans. Contributions decreased by \$21.0 million or 23.4 percent from \$89.8 million in 2014 to \$68.7 million in 2015 primarily due to a one-time payment of \$27.4 million from one municipality towards its unfunded liability in 2014.

Net investment income was \$163.9 million in 2016 compared to net investment loss of \$5.2 million in 2015 and net investment income of \$100.4 million in 2014. Investment income (loss) is primarily attributable to appreciation (depreciation) in fair values in the equity and real estate markets.

Investment expenses were \$9.1 million in 2016 and 2015. Investment expenses increased by \$1.2 million or 15.8 percent from \$7.9 million in 2014 to \$9.1 million in 2015. 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 \$94.3 million in 2016, compared to \$89.9 million in 2015 and \$84.0 million in 2014. 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 (COLA adjustments) that may be applied each year. Annuity benefits excluding death payments were \$84.1 million in 2016, compared to \$78.2 million in 2015 and \$74.0 million in 2014.

Transfers to other plan administrators decreased from \$20.4 million in 2015 to \$678,605 in 2016 due to decreased plan withdrawals. Transfers to other plan administrators increased from \$3.4 million in 2014 to \$20.4 million in 2015 due to increased plan withdrawals.

Administrative expenses were \$6.0 million in 2016, compared to \$5.0 million in 2015 and \$4.4 million in 2014.

### **FINANCIAL CONTACT**

The System's financial statements are designed to present users with a general overview of the System's 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, Investment and Financial Management Division, Pennsylvania Municipal Retirement System at P.O. Box 1165, Harrisburg, PA 17108-1165.

## SUMMARY OF FIDUCIARY NET POSITION

As of December 31, 2016, 2015, and 2014  
(amounts in thousands)

ANALYSIS OF FIDUCIARY NET POSITION	2016	2015	2014
<b>Assets</b>			
Receivables	\$ 5,660	\$ 16,845	\$ 4,648
Investments	2,156,745	1,997,183	2,049,464
Capital assets	93	121	134
<b>Total assets</b>	<b>\$ 2,162,498</b>	<b>\$ 2,014,149</b>	<b>\$ 2,054,246</b>
Deferred outflows of resources related to pensions	944	453	-
<b>Liabilities</b>			
Deferred inflows of resources related to pensions	3	2	-
<b>Total fiduciary net position</b>	<b>\$ 2,151,378</b>	<b>\$ 1,994,491</b>	<b>\$ 2,049,615<sup>(1)</sup></b>

## SUMMARY OF CHANGES IN FIDUCIARY NET POSITION

Years Ended December 31, 2016, 2015, and 2014  
(amounts in thousands)

ANALYSIS OF FIDUCIARY NET POSITION	2016	2015	2014
<b>Additions</b>			
Contributions, net of refunds <sup>(2)</sup>	\$ 93,999	\$ 68,741	\$ 89,763
Net investment income (loss)	163,943	(5,197)	100,443
Miscellaneous income	-	253	10
<b>Total additions</b>	<b>\$ 257,942</b>	<b>\$ 63,797</b>	<b>\$ 190,216</b>
<b>Deductions</b>			
Annuity benefits and terminations <sup>(3)</sup>	94,335	89,856	84,025
Transfers to other plan administrators <sup>(4)</sup>	678	20,448	3,411
Administrative expenses	6,042	4,983	4,412
<b>Total deductions</b>	<b>\$ 101,055</b>	<b>\$ 115,287</b>	<b>\$ 91,848</b>
<b>Total fiduciary net position</b>	<b>\$ 156,887</b>	<b>(\$ 51,490)</b>	<b>\$ 98,368</b>

## ASSET DISTRIBUTION AT FAIR VALUE

As of December 31, 2016, 2015, and 2014  
(amounts in thousands)

	2016	PERCENT	2015	PERCENT	2014	PERCENT
<b>Asset class</b>						
Short term <sup>(5)</sup>	\$ 55,609	2.6	\$ 37,390	1.9	\$ 58,712	2.9
Fixed income	281,015	13.0	330,327	16.5	301,574	14.7
Common and preferred stock	912,142	42.3	816,383	40.9	873,000	42.6
International stock	483,637	22.4	455,212	22.8	487,819	23.8
Real estate	424,342	19.7	357,871	17.9	328,359	16.0
<b>Total</b>	<b>\$ 2,156,745</b>	<b>100.0</b>	<b>\$ 1,997,183</b>	<b>100.0</b>	<b>\$ 2,049,464</b>	<b>100.0</b>

<sup>(1)</sup> PMRS implemented GASB statement No. 68 effective January 1, 2015 and the 2015 beginning fiduciary net position was restated from \$2.050 billion to \$2.046 billion.

<sup>(2)</sup> Contributions include transfers from other plan administrators of \$21.4 million in 2016 and a one-time payment of \$27.4 million from one municipality towards its unfunded liability in 2014.

<sup>(3)</sup> Annuity payments increased by \$5.8 million, \$4.2 million, and \$6.7 million in 2016, 2015, and 2014, respectively. Average number of annuitants receiving benefits increased by 262 in 2016 (5.0 percent increase), 181 in 2015 (3.6 percent increase), and 296 in 2014 (6.2 percent increase).

<sup>(4)</sup> Four plans withdrew with total assets of \$678,605 in 2016. Three plans withdrew with total assets of \$20.4 million in 2015. One plan withdrew with total assets of \$3.4 million in 2014.

<sup>(5)</sup> Short-term includes cash and equivalents held by investment managers and the Pennsylvania Treasury Department.

# Financial Statements

## STATEMENT OF FIDUCIARY NET POSITION

As of December 31, 2016 and 2015

ASSETS	2016	2015
<b>Receivables</b>		
Plan members	\$ 1,576,398	\$ 2,125,173
Municipal employers	722,342	1,741,796
Accrued investment income	1,094,751	1,119,459
Investment sales receivable	2,266,187	11,858,823
<b>Total receivables</b>	<b>5,659,678</b>	<b>16,845,251</b>
<b>Investments, at fair value</b>		
Short-term and other investments	55,609,101	37,389,514
U.S. government fixed income pooled funds	192,551,231	226,339,921
Corporate bond pooled funds	88,463,409	103,986,876
Equity index funds, common and preferred stocks	912,143,139	816,383,502
Real estate	424,341,951	357,870,568
International equities	483,636,675	455,212,477
<b>Total investments</b>	<b>2,156,745,506</b>	<b>1,997,182,858</b>
Capital assets (net of accumulated depreciation of \$136,359 and \$133,257 at 2016 and 2015, respectively)	92,922	120,799
<b>Total assets</b>	<b>2,162,498,106</b>	<b>2,014,148,908</b>
Deferred outflows of resources related to pensions	944,083	453,473
<b>Liabilities</b>		
Accounts payable and accrued expenses	8,730,582	7,857,322
Investment purchases payable	3,330,716	12,252,123
<b>Total liabilities</b>	<b>12,061,298</b>	<b>20,109,445</b>
Deferred inflows of resources related to pensions	2,590	1,680
<b>Net position restricted for pensions</b>	<b>\$ 2,151,378,301</b>	<b>\$ 1,994,491,256</b>

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



## STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

Years Ended December 31, 2016 and 2015

ADDITIONS	2016	2015
<b>Contributions, net of refunds</b>		
Municipal employers	\$ 51,622,258	\$ 47,638,265
Plan members	20,776,539	19,472,225
Transfers from other plan administrators	21,372,987	1,424,284
Assessments	227,302	206,114
<b>Total contributions, net of refunds</b>	<b>93,999,086</b>	<b>68,740,888</b>
<b>Investment income</b>		
From investing activities:		
Net appreciation (depreciation) in fair value of investments	141,919,772	(27,307,292)
Short-term and other investments	355,835	103,688
Common and preferred stocks	10,535,203	11,973,079
Real estate	15,057,720	14,466,205
International equities	5,201,817	4,669,589
<b>Total investment income</b>	<b>173,070,347</b>	<b>3,905,269</b>
Less investment expenses	(9,127,332)	(9,102,530)
<b>Total net investment income (loss)</b>	<b>163,943,015</b>	<b>(5,197,261)</b>
Other miscellaneous	-	253,740
<b>Total additions</b>	<b>257,942,101</b>	<b>63,797,367</b>
<b>Deductions</b>		
Annuity benefits and terminations	94,334,813	89,855,588
Transfers to other plan administrators	678,605	20,448,089
Administrative expenses	6,041,638	4,983,399
<b>Total deductions</b>	<b>101,055,056</b>	<b>115,287,076</b>
<b>Net increase (decrease)</b>	<b>156,887,045</b>	<b>(51,489,709)</b>
<b>Net position restricted for pensions</b>		
<b>Balance, beginning of year</b>	<b>1,994,491,256</b>	<b>2,049,615,132</b>
<b>Effect of change in accounting principle</b>		<b>(3,634,167)</b>
<b>Balance, beginning, as restated</b>		<b>2,045,980,965</b>
<b>Balance, end of year</b>	<b>\$ 2,151,378,301</b>	<b>\$ 1,994,491,256</b>

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

# Notes to Financial Statements

## (1) ORGANIZATION AND DESCRIPTION OF THE SYSTEM

### Organization

The Pennsylvania Municipal Retirement System (PMRS, the System, the Fund) 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. 15 (the Act). The System is 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 the System is vested in the 11-member Pennsylvania Municipal Retirement Board (the 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 the System's actuary.

Membership in the System is optional for Pennsylvania's local governments. When a municipality joins the System, 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. As of January 1, 2016, there were 722 municipalities with defined benefit plans and 294 with cash balance plans. The following tables reflect municipal membership and individual membership as of January 1, 2016.

### PARTICIPATING LOCAL GOVERNMENT EMPLOYERS

	DEFINED BENEFITS	CASH BALANCE
Counties	4	0
Cities	18	0
Boroughs	146	53
Townships of the first class	18	3
Townships of the second class	166	145
Authorities and other units	170	76
Police	191	16
Firefighters	9	1
<b>Total*</b>	<b>722</b>	<b>294</b>

\* Total includes plans with no active members.

## INDIVIDUAL MEMBERSHIP

ACTIVE MEMBERS	
Defined benefit plans	
Municipal	6,816
Police	762
Firefighters	120
<b>Total</b>	<b>7,698</b>
Cash balance plans	
Municipal	1,256
Police	17
Firefighters	1
<b>Total</b>	<b>1,274</b>
<b>Total active members</b>	<b>8,972</b>
RETIREES AND BENEFICIARIES	
Retirees	4,784
Beneficiaries	576
<b>Total retirees and beneficiaries</b>	<b>5,360</b>
INACTIVE PARTICIPANTS WITH RIGHTS TO DEFERRED PENSION (VESTED)	
Defined benefit	872
Cash balance	301
<b>Total vested</b>	<b>1,173</b>
Defined benefit	7
Cash balance	0
<b>Total non-vested</b>	<b>7</b>
<b>Total individual memberships</b>	<b>15,512</b>

## Pension Benefits

The System has the broad authority of enabling a municipality to design its own retirement benefit structure. As an alternative, the System 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 System members, as outlined in individual municipal ordinances. 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 upon 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 postretirement benefit increases are optional in plan contracts. Some member municipalities include the automatic increase; others occasionally grant an ad hoc cost-of-living (COLA) increase. The most common method of granting a postretirement benefit increase is through the System's excess interest award (*See Note 3 for an explanation of excess interest*).

Member municipalities interested in amending benefits contact the System's staff to discuss desired amendments and to obtain a cost study. Amendments are drafted by the System's staff, reviewed by the Chief Counsel's Office, adopted by the municipality, and submitted to the Board for formal approval.

## (2) SIGNIFICANT ACCOUNTING POLICIES

### Basis of Accounting

The System's 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 United States of America 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.

### Reclassifications

Certain 2015 amounts have been reclassified in conformity with the 2016 presentation. These reclassifications had no effect on net position restricted for pensions or the changes in net position restricted for pensions.

### 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 upon the value of the underlying investments as determined by quoted market prices. Fixed income pooled 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, primarily office furniture and equipment, are recorded at cost. Depreciation is provided on the straight-line method over the estimated useful lives of the assets, typically eight years for software and office furniture and equipment.

### Pensions for Employees of the System

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 for its employees to SERS is reported in ac-

counts payable and accrued expenses. The pension expense is reported in administrative expenses and is detailed on the Schedule of Administrative Expenses Supplementary Schedule.

### **Compensated Absences**

The System uses the accrual basis of accounting for measuring vacation leave, sick leave, and other compensated absences liabilities. Employees of the System are paid for accumulated vacation leave upon termination or retirement. Retiring employees of the System that meet service, age, or disability requirements are paid between 30 percent and 100 percent of sick days available at retirement, up to 161 maximum days paid. As of December 31, 2016 and 2015, \$189,557 and \$195,055, respectively, were accrued for unused vacation and sick leave for the System's employees and are included in accounts payable and accrued expenses on the Statement of Fiduciary Net Position.

### **Federal Income Taxes**

The System 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, 2016, the System adopted GASB Statement No 72, "Fair Value Measurement and Application" which addresses accounting and financial reporting issues related to fair value measurements.

During the year ended December 31, 2016, the System adopted GASB Statement No. 73 "Accounting and Financial Reporting for Pensions and Related Assets That Are Not within the Scope of GASB Statement 68," and "Amendments to Certain Provisions of GASB Statements No. 67 and No. 68." Upon examination of GASB Statement No. 73, it was determined to have no impact on PMRS.

During the year ended December 31, 2016, the System adopted GASB Statement No. 76 "The Hierarchy of Generally Accepted Accounting Principles

for State and Local Governments." The adoption of this statement had no effect on previously reported amounts.

During the year ended December 31, 2016, the System adopted GASB Statement No. 78 "Pensions Provided through Certain Multiple-Employer Defined Benefit Pension Plans." Upon examination of GASB Statement No. 78, it was determined to have no impact on PMRS.

During the year ended December 31, 2015, the System adopted GASB Statement No 68, "Accounting and Financial Reporting for Pensions" which replaces the requirements of Statement No. 27 and No. 50 related to pension plans that are administered through trusts or equivalent arrangements.

During the year ended December 31, 2015, the System adopted GASB Statement No. 71 "Pension Transition for Contributions Made Subsequent to the Measurement Date" which is to be applied simultaneously with the provisions of Statement No. 68.

### **New Accounting Pronouncements— to Be Adopted**

The GASB issued Statement No. 75 "Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions" in June 2015. The primary objective of Statement No. 75 is to improve accounting and financial reporting by state and local governments for postemployment benefits other than pensions. The requirements of this Statement are effective for financial statements for fiscal years beginning after June 15, 2017.

The GASB issued Statement No. 82 "Pension Issues— an Amendment of GASB Statements No. 67, No. 68, and No. 73" in March 2016. The requirements of this Statement are effective for financial statements for fiscal years beginning after June 15, 2016.

These pronouncements may have a material effect on the System's financial statements once implemented. The System will be analyzing the effects of these pronouncements and plans to adopt them as applicable by their effective date.

### **Change in Accounting Principle**

PMRS implemented GASB Statement No. 68 effective January 1, 2015. Due to the implementation of GASB Statement No. 68, the beginning net position restricted for pension benefits has been restated by (\$3,634,167). The purpose of the restatement was to record the beginning net pension liability of (\$3,777,141), the beginning deferred inflows of resources of (\$2,146), and the beginning deferred outflows of resources of \$145,120.

### (3) CONTRIBUTIONS AND RESERVES

#### Contributions

Contributions to the System are made by members and municipalities. Under Articles II and III of the Act, members are required to contribute 3 percent to 8 percent of their salaries. The amount a member contributes under Article IV of the Act is based upon contracted plan provisions 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, 2016 and 2015 consisted of the following:

	2016	2015
Municipality normal cost	\$ 51,622,258	\$ 47,638,265
Amortization of unfunded actuarial accrued liability	(7,872,340)	(5,099,431)
<b>Total<sup>(1)</sup></b>	<b>\$ 43,749,918</b>	<b>\$ 42,538,834</b>

The actual contributions were 118.0 percent of the required contributions in 2016 and 112.0 percent of the required contributions in 2015.

Total contributions to the System in 2016 were \$94.0 million of which \$20.8 million and \$51.6 million were made by its members and municipalities, respectively, \$21.4 million was transferred from other plan administrators, and \$227,302 was from assessments.

Total contributions to the System in 2015 were \$68.7 million of which \$19.5 million and \$47.6 million were made by its members and municipalities, respectively, \$1.4 million was transferred from other plan administrators, and \$206,114 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 the System 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 the System. The remaining costs of administering the plan are financed by investment income.

<sup>(1)</sup> Total does not include \$20 per member assessment fee to municipalities.

#### Contributions Required and Contributions Made

The System's funding policy requires actuarially determined annual required contributions of plan member municipalities at rates that accumulate sufficient assets to pay benefits when due. The System's 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 percent 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 44<sup>(1)</sup>, 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.

Significant actuarial assumptions used to compute the actuarially determined contribution requirement include (a) an investment rate of return of 5.5 percent per year (net of investment expenses) compounded annually, (b) projected salary increases ranging from 2.8 percent to 7.05 percent with an average increase of 4.3 percent, including a 2.8 percent per year compounded annually for inflation, with an additional age-based component to reflect merit/seniority, (c) postretirement cost-of-living increases of 2.8 percent per year until the maximum

is reached (optional in contracts), (d) pre-retirement mortality based on the 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 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 and, as such, will first be reflected in the Actuarially Determined Contributions for calendar year 2019.

The amortization method uses level dollar for plan bases and average for Aggregate Gain/Loss, 10 percent of surplus is credited against aggregate cost where applicable, based on an open amortization period. The remaining amortization period at December 31, 2016 and 2015 was 10–30 years.

The single amortization period is determined individually for each of our participating plans using the regular interest rate and the amortization payment and unfunded actuarial liability determined in accordance with Act 205 as of January 1, 2015 and Act 293 as of January 1, 2016. The weighted average of the single amortization period is 9.61 years for these underfunded municipalities. This amount was determined by taking the sum of each underfunded plan's single amortization period multiplied by the plan's unfunded liability. The sum is then divided by the sum of the unfunded liability for all of the underfunded plans.

### Reserve Accounts

As of December 31, 2016 and 2015, the Reserve Account balances were as follows:

	2016	2015 <sup>(2)</sup>
Members' Reserve Account	\$ 451,613,188	\$ 435,834,498
Municipal Reserve Account	849,757,878	833,971,469
Retired Members' Reserve Account	960,943,228	877,489,544
DROP Participant Reserve Account	1,258,051	813,394
Disability Reserve Account	892,010	848,658
Undistributed Earnings Reserve Account	(113,086,054)	(154,466,307)
<b>Total</b>	<b>\$2,151,378,301</b>	<b>\$1,994,491,256</b>

<sup>(1)</sup> Act 44 of 2009 made amendments to Act 205 which changes certain amortization periods. These changes affect the cost calculations for the System's plans as of January 1, 2011.

<sup>(2)</sup> As restated.

The Act defines the following funds to be maintained by the System:

#### *Members' Reserve Account*

The Members' Reserve Account is credited with all contributions made by active members of the System. Interest is added to each member's individual account at an annual rate determined by the Board. The System's current regular interest rate is 5.5 percent.

Upon retirement or disability of an active member, the member's accumulated contributions plus interest are transferred to the Retired Members' Reserve Account for subsequent benefit payments. Withdrawals of the contributions of members not eligible for benefits are paid from this reserve. The account is fully funded as of December 31, 2016.

#### *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. Annual interest is added to each separate municipal account at the current regular interest rate of 5.5 percent. The account is fully funded as of December 31, 2016.

#### *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. Annual interest is credited to the Retired Members' Account at the current regular interest rate of 5.5 percent. The account is fully funded as of December 31, 2016.

#### *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 Treasurer. The DROP Interest credited each month shall not be less than zero percent nor more than 0.367 percent per month, and shall not exceed the statutory limit of 4.5 percent annually. The annualized yield of the monthly interest rate for 2016 ranged

from 0.25 percent to 0.78 percent with 0.55 percent as the average for the 12-month period. The interest rate for 2015 ranged from 0.18 percent to 0.22 percent with 0.20 percent as the average for the 12-month period. The first DROP participant enrolled on July 31, 2012. The account is fully funded as of December 31, 2016.

#### *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 percent of the largest value of transfers to the Retired Members' Reserve Account over the most recent three years. The account is fully funded as of December 31, 2016.

#### *Undistributed Earnings Reserve Account*

In addition to regular interest, the System may also award excess interest. Excess interest is investment earnings on the System's 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 the System's actuary. The excess interest is distributed to the member accounts, the municipal accounts, and the retiree accounts as directed by the municipality.

The System did not distribute excess interest in 2016 or 2015. Such calculation would have been prepared in accordance with a Board approved formula and would have been based on the actuarial value (fair value) of the System's assets as of December 31, 2015 and 2014, respectively, and the expected cash flows of the System for 2016 and 2015 if excess interest had been distributed.

While the negative balance is of concern, historical data argues that the markets' reversion to the mean will resolve the shortfall. The long-term outlook of the System remains positive.

### **(4) INVESTMENTS**

Members of the Board are trustees of the System's assets. They have exclusive responsibility for the management of such assets and have full power to invest the System's assets, subject to the terms, conditions, limitations, and restrictions imposed by 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 there from, as well as the probable 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 in regard to the allocation of invested plan assets is established and may be amended by the Board. On May 15, 2014, the Board established its allocation goals as follows:

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

For the years ended December 31, 2016 and 2015, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 8.23 percent and -0.27 percent, respectively. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

The Board has authorized investments in U.S. Government and agency securities, foreign government bonds denominated in U.S. dollars and rated "AA," corporate bonds rated "A" or better, equity securities, direct real estate, and real estate commingled funds allowing for equity participation. The Board specifically prohibits investments in commodities, mineral rights, and options. Additionally, short-selling and margin purchase transactions are prohibited.

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

The System invests in the Commonwealth of Pennsylvania Treasury Department's short-term cash management fund. The fund comprises various short-term investments, including repurchase agreements. Restrictions on these repurchase agreements are outlined as follows.

Repurchase agreements are allowable if (a) collateralized by United States Government Obligations

deemed acceptable by the Treasury Department prior to the transaction; (b) the fair value of collateral equals at least 102 percent of the principal and accrued interest; and (c) the collateral is delivered to the Treasury's bank account. For tri-party agreements, collateral shall be delivered to the Treasury's account with an independent third-party sub-custodian (either a money center bank or a nationally recognized non-bank financial institution).

### 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 is 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 AICPA. 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 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 funds are open-ended funds and may be utilized 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. Because they are liquid funds, there are no unfunded commitments for these types of investments.

Short-term investments are reported at amortized cost.

At December 31, 2016, the System had the following investments.

## INVESTMENTS

As of December 31, 2016

INVESTMENTS BY FAIR VALUE LEVEL	2016	FAIR VALUE MEASUREMENTS USING		
		LEVEL 1	LEVEL 2	LEVEL 3
Common and preferred stock	\$ 959,384,362	\$ 959,384,362	-	-
<b>Total investments by fair value level</b>	<b>959,384,362</b>	<b>959,384,362</b>	<b>-</b>	<b>-</b>
INVESTMENTS MEASURED AT NET ASSET VALUE (NAV)		UNFUNDED COMMITMENTS	REDEMPTION FREQUENCY	REDEMPTION NOTICE PERIOD
Commingled funds - debt	281,014,640	-	Daily, monthly	1-15 days
Commingled funds - equity	436,395,452	-	Daily, monthly	1-15 days
Real estate	424,341,951	-	Not eligible	Not eligible
<b>Total investments measured at NAV</b>	<b>1,141,752,043</b>			
INVESTMENTS AT OTHER THAN FAIR VALUE				
Cash equivalents	55,609,101			
<b>Total investments at other than fair value</b>	<b>55,609,101</b>			
<b>Total investments</b>	<b>\$2,156,745,506</b>			



## Custodial Credit Risk

Custodial credit risk is the risk of loss resulting from the failure of the custodian such that the System would not be able to recover the value of its investments or collateral securities in the possession of the custodian. Since the State Treasurer, as custodian, holds all investments in the name of the System, the System's investments are not exposed to custodial credit risk. The Treasury Department has formally adopted a written investment policy which addresses custodial credit risk.

The System's exposure to the risk of loss of investments due to errors and omissions on behalf of its advisors is covered by the contractual obligation for the advisors to maintain errors and omissions insurance. The investment managers also must provide proof of a fidelity bond covering the advisor, the office, and its employees.

In accordance with a contract between the Treasurer of the Commonwealth of Pennsylvania and the Treasurer's custodial agent, the System may participate in a securities lending program. Under this program, the custodial agent, acting as the lending agent, lends securities (equities, fixed income, and money market instruments) to independent brokers and dealers in exchange for collateral in amounts up to 105 percent of the fair value of securities lent. Collateral is marked-to-market daily. If the fair value of the collateral held falls below the minimum guidelines for securities lent, additional collateral is obtained. In lieu of securities or cash, the borrower may deliver to the lending agent irrevocable bank letters of credit, government securities, or repurchase agreements as collateral. If the collateral obtained consists in whole or in part of cash, the lending agent may use or invest the cash in accordance with reinvestment guidelines approved by the State Treasurer.

All securities loans can be terminated on demand by either the System or the borrower. Cash collateral is invested in the lending agent's short-term investment pool. The relationship between the maturities of the investment pool and the System's loans is affected by the maturities of the securities loans made by other entities that use the lending agent's pool, which the System cannot determine. The System cannot pledge or sell collateral securities received unless the borrower defaults.

As of December 31, 2016 and 2015, the System had no credit risk exposure to borrowers because participation in the securities lending program was halted in 2008.

## Credit Risk Concentration

Credit risk concentration is the risk of loss attributed to investments (other than those issued or guaranteed by the U.S. Government) in any one organization that represented 5 percent or more of the plan's net position. The System had no single issuer that exceeded 5 percent of total investments at December 31, 2016 and 2015. Investment in mutual funds, external investment pools and other pooled investments were excluded in accordance with GASB.

## 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. The System had no actively managed long-term fixed income investments. The fixed-income portfolio consists of the following:

### 2016 CREDIT AND INTEREST RATE RISK

SECURITY	QUALITY RATING	MODIFIED ADJUSTED DURATION	FAIR VALUE
U.S. Government fixed income pooled funds*	AAA	5.5	\$ 192,551,231
Corporate bond pooled funds*	AA	5.5	\$ 88,463,409
State Treasury STIF	NR	0.1	\$ 20,551,021

### 2015 CREDIT AND INTEREST RATE RISK

SECURITY	QUALITY RATING	MODIFIED ADJUSTED DURATION	FAIR VALUE
U.S. Government fixed income pooled funds*	AAA	5.5	\$ 226,339,921
Corporate bond pooled funds*	AA	5.5	\$ 103,986,876
State Treasury STIF	NR	0.1	\$ 1,903,602

\* Index is not rated as a security but the average rating of the securities held in the index is AA2.

## Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment. As part of the System's program of diversification, the System invests in non-U.S. markets. At December 31, the System had the following non-U.S. currency exposure:

### 2016 FOREIGN CURRENCY RISK

CURRENCY	EQUITY	SHORT-TERM	TOTAL
European Euro	\$67,281,234	\$ (11)	\$67,281,223
Japanese Yen	51,055,154	-	51,055,154
British Pound Sterling	24,361,893	(28)	24,361,865
Hong Kong Dollar	15,963,001	-	15,963,001
Swiss Franc	11,432,195	-	11,432,195
Danish Krone	5,702,438	(5)	5,702,433
Australian Dollar	4,667,542	-	4,667,542
Norwegian Krone	4,380,051	-	4,380,051
Swedish Krona	2,761,621	-	2,761,621

### 2015 FOREIGN CURRENCY RISK

CURRENCY	EQUITY	SHORT-TERM	TOTAL
European Euro	\$76,667,441	\$ -	\$76,667,441
Japanese Yen	42,201,404	-	42,201,404
British Pound Sterling	34,531,699	-	34,531,699
Swiss Franc	16,256,244	(26)	16,256,218
Hong Kong Dollar	14,109,955	-	14,109,955
Norwegian Krone	3,762,934	-	3,762,934
Swedish Krona	3,425,252	-	3,425,252
South Korean Won	2,473,852	-	2,473,852
Australian Dollar	1,886,688	-	1,886,688
Thailand Baht	1,320,119	-	1,320,119

## (5) SECURITIES LENDING

Under the securities lending program, the lending agent provides indemnification to the Commonwealth if the borrowers fail to return the underlying securities (and the collateral is inadequate to replace the securities lent) or fail to pay income distributions on them. As of December 31, 2016 and 2015, the System had no securities out for loan because of a continued Board policy prohibiting participation in securities lending. The System had no cash collateral invested in the custodial agent's short-term collateral investment pool as of December 31, 2016 and 2015.

## (6) PENSION PLAN FOR EMPLOYEES OF THE SYSTEM

### SERS' Plan Description

The System 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 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. SERS provides retirement, death, and disability benefits. Article II of the Commonwealth's constitution assigns the authority to establish and amend the benefit provision of the plan to the General Assembly.

### SERS' Benefits Provided to Employees of the System

SERS member retirement benefits are generally determined by taking years of credited service times final average salary times 2 percent or 2.5 percent, depending on date of hire. The normal retirement age ranges from 50-65, depending on the membership class.

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

### Contributions to SERS

The contribution requirements of SERS plan members is mandated by Commonwealth statute. The member contribution rate for the majority of SERS' members is 6.25 percent. As of December 31, 2015 and 2014, the blended contribution rates were 22.77 percent and 18.29 percent, respectively. Contributions to SERS from PMRS for the years ended December 31, 2016 and 2015 were \$371,833 and \$343,460, respectively.

### Proportionate Share of Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources from SERS

At December 31, 2016, PMRS reported a liability of \$4.7 million for its proportionate share of the net pension liability for the SERS plan in accounts payable and accrued expenses on the Statement of Fiduciary Net Position. The net pension liability was measured as of December 31, 2015, and the total

pension liability used to calculate the net pension liability was determined by an actuarial valuation as of December 31, 2015. PMRS' proportion of the net pension liability was calculated utilizing a projected-contribution method. At December 31, 2015, PMRS' proportion was 0.02580846 percent.

For the year ended December 31, 2016, PMRS recognized pension expense of \$797,959 in administrative expenses on the Statement of Fiduciary Net Position. At December 31, 2016, PMRS reported \$944,083 of deferred outflows of resources and \$2,590 of deferred inflows of resources. Of the \$944,083 of deferred outflows of resources, PMRS recorded \$371,833 for contributions subsequent to the measurement date which will be recognized as a reduction of the net pension liability in the year ended December 31, 2017. The other amounts reported as deferred outflows of resources and deferred inflows of resources will be recognized over 5 and 5.6 year closed amortization periods, dependent on the type of deferral.

### **SERS' Pension Plan Fiduciary Net Position**

Detailed information about SERS' fiduciary net position is available in SERS' Comprehensive Annual Financial Report which can be found on SERS' website at [www.SERS.pa.gov](http://www.SERS.pa.gov).

### **(7) POSTEMPLOYMENT HEALTHCARE PLAN FOR EMPLOYEES OF THE SYSTEM**

The System participates in the Commonwealth's Retired Employees Health Program (REHP). The REHP is a single-employer plan and provides certain healthcare benefits to qualifying individuals meeting specified age and/or service requirements. The Commonwealth's Office of Administration (OA), in its sole discretion, determines available REHP benefits on an ongoing basis. The Pennsylvania Employees Benefit Trust Fund (PEBTF) is a third-party administrator for the REHP under the provisions of an Administration Agreement between OA and PEBTF.

Employer costs for retiree healthcare benefits are charged as a component of payroll expenditures on a 'pay-as-you-go' basis. REHP funding is arranged between OA and the Governor's Budget Office. FY 2016 employer costs were charged at the rate of \$418/employee/bi-weekly pay period. Plan members who retired after June 30, 2005 contribute to the plan based on a percentage of their final annual gross base salary at the time of retirement. Plan member contribution rates vary based on their REHP enrollment date.

In August 2015, the Commonwealth released an Actuarial Valuation of its Post-Retirement Medical Plan

with calculations made as of January 1, 2015. This valuation provided Other Postemployment Benefits (OPEB) reporting that was used for both FY 2014 and FY 2015. For FY 2015 and FY 2016, the System's allocated Annual OPEB Cost (AOC) was \$424,000 and \$437,000, respectively. Based on the aggregate REHP qualifying contributions for FY 2015, the net OPEB liability for the System was \$666,722 for that fiscal year (as of December 31, 2015 for the System). Based on the aggregate REHP qualifying contributions for FY 2016, the net OPEB liability for the System was \$799,021 for that fiscal year (as of December 31, 2016 for the System).

### **(8) RELATIONSHIPS WITH OTHER COMMONWEALTH AGENCIES**

Responsibility for the organization and administration of the System is vested in the 11-member Pennsylvania Municipal Retirement Board. The State 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 the System. Interested individuals submit an application, and then the Governor appoints someone from the list of applicants.

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

### **(9) PLAN TERMINATION**

Member municipalities may withdraw from the System 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 percent 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 the System shall attach to the withdrawing municipality.

#### **(10) RISK MANAGEMENT**

Exposure of the System through Board or staff activity is covered by various means. The System 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.

The System's implementation policy is to allow contracted external managers to decide what action to take regarding this respective portfolio's foreign currency exposures. The System has no specific policies for interest rate risk and foreign currency risk.

#### **(11) LITIGATION AND CONTINGENCIES**

The System 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 position of the System. The System is exposed to various other liabilities and risks related to fiduciary responsibilities of directors and officers.

#### **(12) COMMITMENTS**

The System leases office facilities under an operating lease that expires August 2017. Total rental expenses under this lease for the years ended December 31, 2016 and 2015 were \$112,444 and \$104,992, 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**

The System will be entering into an operating lease for a new office building effective July 2017 and expiring June 2027 with two five year options. Future minimum lease payments under this lease are anticipated to be \$250,000 per year with annual increases of 2.25%.

The Board approved a reduction of the regular interest rate from 5.5% to 5.25% effective January 1, 2017.

# Schedules

## Required Supplementary Schedule

### SCHEDULE 1

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

YEAR ENDED DECEMBER 31	ANNUAL RATE
2016	8.23%
2015	-0.27%
2014	5.20%

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

## Supplementary Schedules and Information

### SCHEDULE 2 – ADMINISTRATIVE EXPENSES

Comparative Two-Year Schedule  
Years Ended December 31, 2016 and 2015

	2016	2015
<b>PERSONNEL SERVICES</b>		
Salaries and wages	\$ 1,511,682	\$ 1,639,188
Social security contributions	109,945	121,944
Pension expense <sup>(1)</sup>	797,959	34,641
Insurance expenses	735,703	1,346,681
Other employee benefits	6,154	6,900
<b>Total personnel services</b>	<b>3,161,443</b>	<b>3,149,354</b>
<b>PROFESSIONAL SERVICES</b>		
Actuarial <sup>(1)</sup>	1,045,587	590,331
Audit	230,695	162,600
IT consultants <sup>(1)</sup>	219,423	–
Investment consultants	190,125	187,000
Legal	178,796	367,271
Miscellaneous professional	90,264	72,797
Data processing	26,399	21,466
Proxy voting services	17,065	16,100
<b>Total professional costs</b>	<b>1,998,354</b>	<b>1,417,565</b>
<b>COMMUNICATION</b>		
Telephone	44,778	43,574
Travel and conferences	43,330	27,892
Postage	22,136	53,634
Advertising	6,480	7,620
Printing	1,730	9,764
<b>Total communication</b>	<b>118,454</b>	<b>142,484</b>
<b>OTHER SERVICES AND CHARGES</b>		
Contracted EDP services <sup>(1)</sup>	568,817	72,160
Office space rental	112,444	104,992
Equipment leasing	29,319	29,603
Supplies	15,495	24,374
Dues and subscriptions	6,980	7,507
Maintenance	1,119	2,238
Bonding and insurance, net	(681)	1,744
<b>Total other services and charges</b>	<b>733,493</b>	<b>242,618</b>
<b>DEPRECIATION</b>	<b>29,894</b>	<b>31,378</b>
<b>Total administrative expenses<sup>(1)</sup></b>	<b>\$ 6,041,638</b>	<b>\$ 4,983,399</b>

<sup>(1)</sup>Administrative expenses increased by \$1.0 million or 21.2 percent from \$5.0 million in 2015 to \$6.0 million in 2016 primarily due to increases in pension expenses and actuarial fees with implementation of GASB Statement No. 68, and information technology expenses for the pension administration system upgrade.

### SCHEDULE 3 – INVESTMENT EXPENSES

Comparative Two-Year Schedule  
Years Ended December 31, 2016 and 2015

	2016	2015
Investment management fees	\$ 9,035,332	\$ 9,012,672
Custodial fees	92,000	89,858
<b>Total investment expenses</b>	<b>\$ 9,127,332</b>	<b>\$ 9,102,530</b>

### SCHEDULE 4 – PAYMENTS TO CONSULTANTS

Comparative Two-Year Schedule  
Years Ended December 31, 2016 and 2015

FIRM NAME	NATURE OF SERVICE	2016	2015
Cheiron	Actuary	\$ 1,045,587	\$ 590,331
CliftonLarsonAllen, LLP	Auditor	230,695	162,600
Dahab Associates, Inc.	Investment consultant	190,125	187,000
OST, Inc.	IT consultants	163,536	-
Dell	IT consultants	55,887	-
ISS	Proxy voting services	17,065	16,100
<b>Total</b>		<b>\$ 1,702,895</b>	<b>\$ 956,031</b>



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# Investments

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## Basis of Presentation

The data presented in the Investment Section by the System's independent investment consultant has been prepared by using a time-weighted rate of return methodology based upon fair values. The Investment Section includes only those investments under management of advisors which are under contract with the System. These investments are valued in a manner consistent with information present in the Financial Section with the exception of the recognition of unallocated cash and pending sales and purchases. The difference noted above represents the difference between the investment balance of \$2,156,745,506 presented in the Financial Section and the balance of \$2,152,931,984 reported in this section.

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. Mortgage-backed securities are valued on the basis of future principal and interest payments and are discounted at prevailing interest rates for similar instruments. The fair value of real estate investments is based on independent appraisals every three years. In years for which 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, 2016 the Pennsylvania Municipal Retirement Board's investment portfolio was valued at \$2,152,931,984 which was an increase of \$156,359,482 from the December 31, 2015 ending value of \$1,996,572,502. For the year ended December 31, 2016, the fund had net withdrawals of \$14,611,683 and a net investment return of \$170,971,165.

For the five years ended December 31, 2016, the fund had net withdrawals of \$122,726,149 and a net investment return of \$792,745,783. The System's investment portfolio increased from \$1,482,912,350 as of December 31, 2011 to \$2,152,931,984 as of December 31, 2016.

Since inception in December 1985, the fund had net withdrawals of \$247,407,165 and a net investment return of \$2,237,943,718. The System's investment portfolio increased from \$162,395,431 as of December 31, 1985 to \$2,152,931,984 as of December 31, 2016. If the fund had earned an annualized compound rate of 5.5% since inception, it would have been worth \$631,052,122 or \$1,521,879,862 less than the actual value as of December 31, 2016.

## Investment Guidelines

### INTRODUCTION

The following represents highlights from the Board's investment guidelines adopted on May 15, 2014. These guidelines, which set forth the Board's expectations, restrictions, and policy decisions, were developed to assist the System's staff and consultants in the daily management of the System's assets.

### BACKGROUND

The System is currently experiencing a slight negative cash flow and does expect this trend to gradually increase in the future. The System 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 investments 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 percent
Domestic equities (small capitalized firms)	15 percent
International equities (developed markets)	15 percent
International equities (emerging markets)	10 percent
Fixed income	15 percent
Real estate	12.5 percent
Timberland	7.5 percent



## **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 the fund earn at least 2% more annually than the average annual inflation rate over a long period of time. While this is the System-wide goal, individual investment managers' performance measures rely on other characteristics that are specifically spelled out 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 the System. The manager must utilize the System's depository relationship with the State Treasurer who, as custodian of the Fund, will invest all cash on a daily basis in a short-term fund. No management fee will be paid by the System for any portion of a manager's average assets in excess of 5 percent remaining in cash equivalents at 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 it is expected to be diversified from a geographic and industrial standpoint. No single holding of an investment manager other than a U.S. Government bond is to account for more than 5 percent of the fair value of an investment manager's bond portfolio. The System shall not hold as assets more than 10 percent of any one bond issue nor more than 5 percent of the bonds of any one issuing agent. Corporate bonds of any given industry are not to account for more than 25 percent of the fair value of the bond portfolio.

## **EQUITY INVESTMENT POLICY**

The System's 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 percent of the fair value of the System's equity portfolio. Generally, no single sector should account for more than 20 percent of the value of an individual manager's portfolio. No more than 1 percent of the capitalization of any company is to be held by the System. The cumulative holdings of a manager

for all of that manager's clients shall account for no more than 5 percent 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 objectives to preserve capital, maximize cash distributions and income, achieve a total return competitive with the 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**

The System utilizes the State Treasurer as the 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 (currently averaging three cents per share or less).

The investment managers may enter into agreements with certain brokerage houses to participate in a recapture program whereby a designated percentage of the System's trades handled by these brokerage firms will be returned as cash to the System 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 the System's investment guidelines. Proxy solicitations by non-U.S. domiciled companies are handled by the investment manager that holds the security of that company in their portfolio.

### **COMMUNICATIONS**

The Board expects an open and constant line of communication between the System's staff and investment managers. Reports required of investment managers to the Board and staff include a timely confirmation of all transactions, a monthly summary of 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 the System's 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 System's portfolio. Total investment managers' fees are approximately 40 basis points of the System's total investment portfolio.

### **MONITORING**

The System monitors the performance of its investment managers through direct involvement of the Board, the System's 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, 2016, the gross rate of return for the System's total portfolio was 8.7 percent, which was 0.7 percent less than the shadow index return of 9.4 percent and ranked in the 14th percentile of the Investment Metrics (IM) Public Fund universe. For the five years ended December 31, 2016, the gross rate of return for the System's total portfolio was 9.2 percent, which was 0.1 percent less than the shadow index return of 9.3 percent and ranked in the 24th percentile. Since inception, the gross rate of return for the System's total portfolio was 8.6%, compared to the shadow index return of 8.7%.

#### **Large Cap Equity**

For the year ended December 31, 2016, the gross rate of return for the large cap equity portfolio was 9.4 percent, which was 2.6 percent less than the S&P 500 Index return of 12.0 percent and ranked in the 60th percentile. For the five years ended December 31, 2016, the gross rate of return for the large cap equity portfolio was 14.7 percent, compared to the S&P 500 Index return of 14.7 percent, and ranked in the 42nd percentile.

#### **Small Cap Equity**

For the year ended December 31, 2016, the gross rate of return for the small cap equity portfolio

was 21.8 percent, which was 0.5 percent more than the Russell 2000 Index return of 21.3 percent and ranked in the 42nd percentile. For the five years ended December 31, 2016, the gross rate of return for the small cap equity portfolio was 14.9 percent, which was 0.4 percent more than the Russell 2000 Index return of 14.5 percent and ranked in the 58th percentile.

#### **Developed International Equity**

For the year ended December 31, 2016, the gross rate of return for the developed international equity portfolio was 2.0 percent, which was 0.5 percent more than the MSCI EAFE Index return of 1.5 percent and ranked in the 59th percentile. For the five years ended December 31, 2016, the gross rate of return for the developed international equity portfolio was 8.4 percent, which was 1.4 percent more than the MSCI EAFE Index return of 7.0 percent and ranked in the 35th percentile.

#### **Emerging Markets Equity**

For the year ended December 31, 2016, the gross rate of return for the emerging market equity portfolio was 11.6 percent, compared to the MSCI Emerging Markets Index return of 11.6 percent and ranked in the 37th percentile. For the five years ended December 31, 2016, the gross rate of return for the emerging market equity portfolio was 1.2 percent, which was 0.4 percent less than the MSCI Emerging Markets Index return of 1.6 percent and ranked in the 91st percentile.

## Fixed Income

For the year ended December 31, 2016, the gross rate of return for the fixed income portfolio was 2.7 percent, compared to the Barclays Aggregate Index return of 2.7 percent and ranked in the 74th percentile. For the five years ended December 31, 2016, the gross rate of return for the fixed income portfolio was 2.3 percent, which was 0.1 percent more than the Barclays Aggregate Index return of 2.2 percent and ranked in the 88th percentile.

## Real Estate

For the year ended December 31, 2016, the gross rate of return for the real estate portfolio was 8.8 percent, which was 0.8 percent more than the NCREIF Property Index return of 8.0 percent. For the five years ended December 31, 2016, the gross rate of return for the real estate portfolio was 10.0 percent, which was 0.9 percent less than the NCREIF Property Index return of 10.9 percent.

## Asset Allocation

The following table shows the allocation of assets as of December 31, 2016.

\* Numbers may not add due to rounding.

### ASSET ALLOCATION

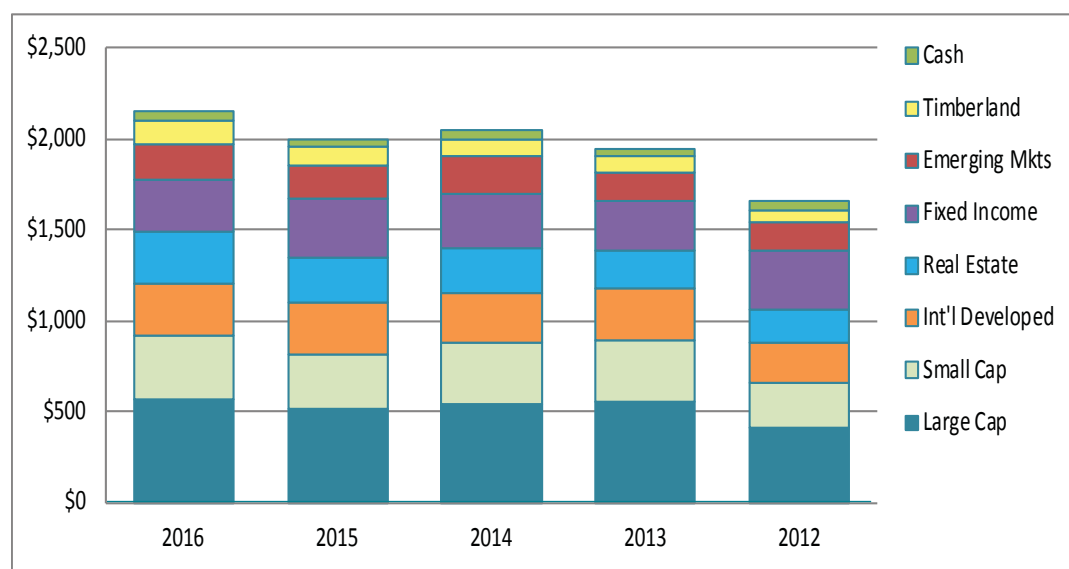
(As of December 31, 2016)

TYPE	PERCENT	AMOUNT
Large cap equity	26.1	\$ 560,980,719
Small cap equity	16.3	351,794,028
International developed markets	13.4	289,132,888
International emerging markets	9.1	194,940,440
<b>Total equities</b>	<b>64.9</b>	<b>\$ 1,396,848,075</b>
Fixed income	13.1	281,014,640
Real estate	19.7	425,428,107
Cash and equivalents <sup>(1)</sup>	2.3	49,641,162
<b>Total portfolio</b>	<b>100.0</b>	<b>\$ 2,152,931,984</b>

The following graph shows the System's five year trend of investments at fair value as of December 31, 2016.

### PORTFOLIO DISTRIBUTION — FIVE YEAR TREND

(Fair Value – Amounts in Millions)



<sup>(1)</sup> Cash and equivalents include funds held by the Pennsylvania Treasury Department.

## Portfolio Rates of Return<sup>(1)</sup>

(As of December 31, 2016)

The following table compares the gross rates of return for the System's total investment portfolio as of December 31, 2016 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 upon fair values. The System's returns have been competitive with other professionally-managed funds.

### PERFORMANCE SUMMARY

	1 YEAR (PERCENT)	3 YEAR (PERCENT)	5 YEAR (PERCENT)	10 YEAR (PERCENT)	SINCE INCEPTION IN DECEMBER 1985 (PERCENT)
Total Portfolio	8.7	4.8	9.2	5.4	8.6
Public Fund Rank <sup>(2)</sup>	(14)	(40)	(24)	(57)	-
Shadow Index <sup>(3)</sup>	9.4	5.3	9.3	5.4	8.7
Large Cap Equity	9.4	8.1	14.7	7.1	10.5
Large Cap Rank <sup>(4)</sup>	(60)	(51)	(42)	(59)	-
S&P 500	12.0	8.9	14.7	6.9	10.4
Small Cap Equities	21.8	6.7	14.9	7.3	-
Small Cap Rank <sup>(4)</sup>	(42)	(61)	(58)	(79)	-
Russell 2000	21.3	6.7	14.5	7.1	9.5
International Equity	2.0	-1.0	8.4	2.4	-
International Equity Rank <sup>(5)</sup>	(59)	(60)	(35)	(57)	-
MSCI EAFE	1.5	-1.2	7.0	1.2	7.6
Emerging Markets Equity	11.6	-2.7	1.2	-	-
Emerging Markets Rank <sup>(6)</sup>	(37)	(82)	(91)	-	-
MSCI Emerging Markets	11.6	-2.2	1.6	2.2	-
Real Estate	8.8	10.2	10.0	5.1	6.9
NCREIF	8.0	11.0	10.9	6.9	7.9
Fixed Income	2.7	3.1	2.3	4.4	6.7
Core Fixed Income Rank <sup>(7)</sup>	(74)	(78)	(88)	(87)	-
Barclays Aggregate	2.7	3.0	2.2	4.4	6.6

Report prepared by DAHAB ASSOCIATES, INC.

<sup>(1)</sup> 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.

<sup>(2)</sup> Ranked against balanced funds.

<sup>(3)</sup> The shadow index is a customized index created by the System's investment consultant. It is constructed at the asset class level with corresponding benchmark allocations matching the portfolio.

<sup>(4)</sup> Ranked against equity oriented funds.

<sup>(5)</sup> Ranked against international developed markets oriented funds.

<sup>(6)</sup> Ranked against international emerging markets oriented funds. PMRS entered emerging markets equities in late 2008.

<sup>(7)</sup> Ranked against fixed income oriented funds.

## Asset Allocation

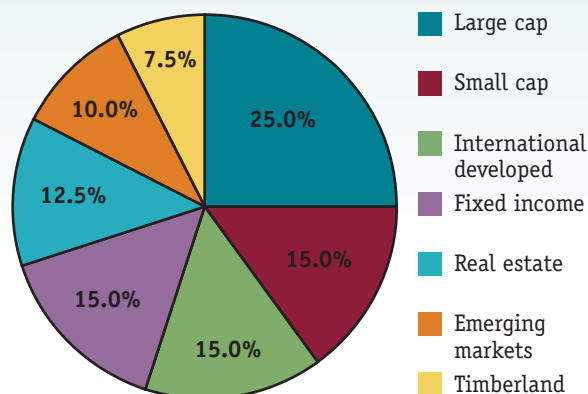
The Board established its allocation goals as follows:

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

The System's asset allocation as of December 31, 2016, was \$912.8 million committed to domestic equities (\$561.0 large cap and \$351.8 small cap), \$484.1 million to international equities (\$289.1 international developed and \$195.0 emerging markets), \$281.0 million to bonds, \$425.4 million to real estate (includes timberland \$134.2), and \$49.6 million to cash equivalents. The percentage distribution is illustrated below.

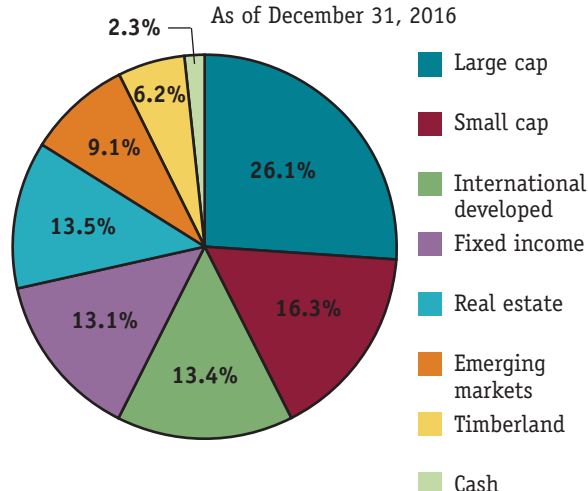
## ASSET ALLOCATION TARGETS

As of December 31, 2016



## ACTUAL ASSET ALLOCATION

As of December 31, 2016



## ASSET ALLOCATION

As of December 31, 2016

SECTOR	TARGET ALLOCATION	TARGET DOLLAR	CURRENT ALLOCATION	CURRENT DOLLAR ALLOCATION	VARIANCE/DOLLAR	VARIANCE/PERCENT
Large cap	25	\$ 538,232,996	26.1	\$ 560,980,719	\$ 22,747,723	1.1
Small cap	15	322,939,798	16.3	351,794,028	28,854,230	1.3
International developed	15	322,939,798	13.4	289,132,888	(33,806,910)	-1.6
Emerging markets	10	215,293,198	9.1	194,940,440	(20,352,758)	-0.9
Fixed income	15	322,939,798	13.1	281,014,640	(41,925,158)	-1.9
Real estate	12.5	269,116,498	13.5	291,244,147	22,127,649	1.0
Timber	7.5	161,469,898	6.2	134,183,960	(27,285,938)	-1.3
Cash	0.0	-	2.3	49,641,162	49,641,162	2.3
<b>TOTAL</b>	<b>100</b>	<b>\$ 2,152,931,984</b>	<b>100</b>	<b>\$ 2,152,931,984</b>		

# Investment Summary

## SUMMARY OF INVESTMENT EXPENSES

Comparative Two-Year Schedule  
Years ended December 31, 2016 and 2015

FIRM NAME	2016	2015
<b>Large Cap Domestic Managers</b>		
Eagle Capital Management <sup>(1)</sup>	\$ 713,596	\$ -
Polen Capital Management	692,646	769,266
LSV Asset Management	577,844	587,637
Federated Investors <sup>(2)</sup>	525,402	364,781
DePrince, Race & Zollo <sup>(3)</sup>	11,740	383,925
	2,521,228	2,105,609
<b>Small Cap Domestic Managers</b>		
BMO Global Asset Management <sup>(4)</sup>	510,948	634,761
Emerald Advisers	447,494	472,433
Smith Graham & Co. <sup>(5)</sup>	72,430	-
LSV Asset Management <sup>(6)</sup>	62,859	-
Brandywine Global Investment <sup>(7)</sup>	3	722,351
	1,093,734	1,829,545
<b>Passive Manager</b>		
State Street Global Advisors	277,964	343,901
	277,964	343,901
<b>International Managers</b>		
HGK Asset Management	607,113	621,742
Johnston Asset Management	493,530	510,761
Jarislowsky, Fraser Limited	317,501	328,610
	1,418,144	1,461,113
<b>Real Estate Managers</b>		
TIAA Global Asset Management	1,632,440	1,494,400
Forest Investment Associates	1,170,032	1,003,959
Prudential Real Estate Investors	921,790	774,145
	3,724,262	3,272,504
<b>Total Investment Management Fees</b>	<b>\$ 9,035,332</b>	<b>\$ 9,012,672</b>
Custodial Fees – BNY Mellon	92,000	89,858
<b>Total Investment Expenses</b>	<b>\$ 9,127,332</b>	<b>\$ 9,102,530</b>

<sup>(1)</sup> Investment manager hired 1st quarter 2016.

<sup>(2)</sup> Investment manager hired 2nd quarter 2015.

<sup>(3)</sup> Investment manager terminated 1st quarter 2016.

<sup>(4)</sup> Investment manager terminated 4th quarter 2016.

<sup>(5)</sup> Investment manager hired 4th quarter 2016.

<sup>(6)</sup> Investment manager hired 4th quarter 2016.

<sup>(7)</sup> Investment manager terminated 4th quarter 2016.

## TEN LARGEST COMMON STOCK HOLDINGS

As of December 31, 2016 (Fair Value)

STOCK	SHARES	FAIR VALUE	% OF PORTFOLIO
Alphabet Inc., Class C	23,480	\$ 18,122,334	0.85
Oracle Corp.	463,052	17,804,349	0.84
Visa Inc.	188,811	14,731,034	0.69
Facebook, Inc.	111,474	12,825,084	0.60
Starbucks Corp.	208,330	11,566,482	0.54
JP Morgan Chase & Co.	131,390	11,337,643	0.53
Automatic Data Processing, Inc.	109,506	11,255,027	0.53
Regeneron Pharmaceuticals Inc	30,341	11,137,878	0.52
TJX COS Inc.	135,576	10,185,825	0.48
Alphabet Inc., Class A	12,684	10,051,436	0.47

A complete list of portfolio holdings can be obtained from the system.

## PORTFOLIO SUMMARY

As of December 31, 2016

TYPE OF INVESTMENT	COST VALUE	FAIR VALUE	% OF TOTAL FAIR VALUE
Corporate and government bonds			
U.S. Government bonds	\$ 159,297,101	\$ 192,551,231	9
Corporate bonds	73,185,533	88,463,409	4
<b>Total</b>	<b>232,482,634</b>	<b>281,014,640</b>	<b>13</b>
Common stock			
Domestic	728,009,562	912,143,139	42
International	414,548,668	483,636,675	22
<b>Total</b>	<b>1,142,558,230</b>	<b>1,395,779,814</b>	<b>64</b>
Other investments			
Real estate	345,667,756	424,341,951	20
Cash equivalents	55,609,101	55,609,101	3
<b>Total</b>	<b>401,276,857</b>	<b>479,951,052</b>	<b>23</b>
<b>Grand total</b>	<b>\$ 1,776,317,721</b>	<b>\$ 2,156,745,506</b>	<b>100</b>

## PORTFOLIO QUALITY

Two-Year Comparative Analysis  
As of December 31, 2016 and 2015

BOND RATING	FAIR VALUE	% OF TOTAL FAIR VALUE	% OF TOTAL CARRYING VALUE
December 31, 2016			
AAA	\$ 192,551,231	69	69
AA	88,463,409	31	31
<b>Total bonds</b>	<b>\$ 281,014,640</b>	<b>100</b>	<b>100</b>
December 31, 2015			
AAA	\$ 226,339,921	69	69
AA	103,986,876	31	31
<b>Total bonds</b>	<b>\$ 330,326,797</b>	<b>100</b>	<b>100</b>

## SUMMARY OF COMMISSIONS PAID TO BROKERS

Year Ended December 31, 2016

BROKER NAME	COMMISSIONS PAID	BROKER NAME	COMMISSIONS PAID
Albert Fried & Company LLC, New York	\$ 156	Dougherty & Company LLC, Minneapolis	\$ 1,402
Ancora Securities Inc., Jersey City	291	Drexel Hamilton LLC, Jersey City	964
Auerbach Grayson & Co. Inc., Jersey City	3,794	Exane, Paris	982
Baader Wertpapierhandelsbank, Unierschle	135	Fidentis Equities SvSa., Madrid	3,355
Baird, Robert W. & Co. Inc., Milwaukee	4,711	First Clearing LLC, Richmond	760
Barclays Capital Inc./LE, New Jersey	2,532	Fox River Execution Tech., LLC, Jersey City	1,081
Barclays Capital LE, Jersey City	4,678	Goldman Sachs & Co., NY	48,659
Barclays Capital, London	2,344	Goldman Sachs Execution & Clearing, NY	5,296
BB&T Securities, LLC, Richmond	574	Goldman Sachs Intl., London	11,514
Bernstein, Sanford C. & Co., New York	13,487	Gordon Haskett Cap. Corp., NJ	2,844
Bloomberg Tradebook LLC, New York	30,777	Greentree Brokerage Services, Jersey City	2,208
Bloomberg Tradebook, New York	14,701	Guggenheim Liquidity Svcs., New York	107
BMO Capital Markets Corp, New York	604	ICBC Fincl. Svcs., New York	200
BNP Paribas Prime Brokerage, Inc., New York	253	Instinet Corp., New York	1,898
BNP Paribas SEC Svcs. SA, Singapore	3,446	Instinet Corp., NY	3,549
BNP Paribas SEC Svcs., Zurich	1,134	Instinet Europe Limited, London	22,965
BNP Paribas, Jersey City	16	Instinet Pacific LTD, Hong Kong	10
BNY Convergenx Execution Sol, New York	2,699	Investment Technology Group LTD, Dublin	2,820
BNY Convergenx, New York	5,310	Investment Technology Group, New York	11,852
Broadcort Capital Corp. FL, New York	685	ISI Group Inc., NY	7,918
BTIG LLC, San Francisco	856	ITG Inc., New York	4,873
Buckingham Research Grp. Inc., Brooklyn	766	IXIS Securities, Paris	877
Caceis Bank Deutschland, Germany	1,143	J.P. Morgan Secs. LTD, London	11,035
Canaccord Genuity Inc., New York	1,990	J.P. Morgan Securities Inc., Brooklyn	16,523
Cantor Clearing Serv, New York	3,084	J.P. Morgan Clearing Corp., New York	10,694
Cantor Clearing Service, New York	53	J.P. Morgan Securities, Hong Kong	32
Cantor Fitzgerald & Co. Inc., New York	25,831	Janney Montgomery Scott, Philadelphia	407
Cap Instl Svcs. Inc.-Equities, Dallas	42,119	Jefferies & Co. Inc., New York	12,968
Capital One Southcoast Inc., New Orleans	1,356	JMP Securities, San Francisco	70
Citigroup Gbl. Mkts. Inc., New York	11,476	JMP Securities Inc., New York	142
Citigroup Gbl. Mkts./Salomon, New York	2,223	Jonestrading Instl. Svcs. LLC, Westlake	5,866
Citigroup Global Markets Ltd., London	3,531	Keefe Bruyette and Woods, Jersey City	16,170
CJS Securities Inc., New York	22	Kepler Equities, Paris	436
Clearview Trading Advisors, Jersey City	885	Keybank Capital Markets Inc., Jersey City	11,937
Converge LLC, New York	3,201	Keybank Capital Markets Inc., New York	10
Cowen and Company LLC, New York	3,429	King (CL) & Associates, Albany	183
Craig Hallum, Minneapolis	4,490	Knight Clearing Services LLC, Jersey City	343
Credit Lyonnais Secs (Asia), Hong Kong	4,964	Knight Equity Markets L.P., Jersey City	550
Credit Lyonnais Secs., Singapore	8,012	Leerink Swann & Co., Jersey City	1,562
Credit Research & Trading LLC, Jersey	616	Liquidnet Inc., New York	103,942
Credit Suisse, New York	171,593	Loop Capital Markets, Jersey City	1,899
D Carnegie AB, Stockholm	1,164	Macquarie Bank Limited, Sydney	639
Daiwa Sec. SMBC Europe LTD, London	4,441	Macquarie Bank LTD, Hong Kong	282
Daiwa Secs. (HK) LTD, Hong Kong	178	Macquarie Capital (USA) Inc., New York	8,097
Daiwa Secs. Amer Inc, New York	1,280	Macquarie Securities (USA) Inc., Jersey City	5,520
Davidson (D A) & Co. Inc., New York	2,399	Mellon Trust of New England, Pittsburgh	1,127
Deutsche Bk. Intl. Eq., London	15,561	Merrill Lynch Intl. London Equities	23,017
Deutsche Bk. Secs. Inc., NY	10,119	Merrill Lynch Pierce Fenner Smith Inc., NY	97,912



BROKER NAME	COMMISSIONS PAID
Merrill Lynch Pierce Fenner, Wilmington	\$ 2,482
Merrill Lynch Professional Clrg., Purchas	6,434
Mizuho Securities USA Inc., New York	1,270
MKM Partner LLC, Greenwich	307
Morgan Stanley & Co. Inc., NY	44,476
National Finl Svcs. Corp., New York	16,347
Needham and Company LLC, Jersey City	2,540
Northland Secs Inc., Jersey City	63
Oneil William & Co. Inc./BCC, Los Angeles	1,346
Oppenheimer & Co. Inc., New York	1,993
Parel, Paris	533
Pareto Fonds As., Oslo	3,412
Pershing LLC, Jersey City	49,135
Pershing Securities LTD, London	942
Pickering Energy Partners, Houston	8,712
Piper Jaffray & Co., Minneapolis	15,087
Raymond James & Assoc Inc., St. Petersburg	10,319
RBC Capital Markets LLC, New York	5,931
Redburn Partners LLP, London	3,590
Rosenblatt Securities LLC, Jersey City	2,152
Royal Bank of Canada Europe LTD, London	1,851
Sandler O'Neill & Partners, New York	1,227
Sanford C. Bernstein & Co. Inc., London	11,230
Sidoti & Co. LLC, New York	12,194
Simmons & Co. Intl., Houston	2,079

BROKER NAME	COMMISSIONS PAID
State Street Brokerage Svcs., Boston	\$ 60,172
State Street Global Markets LLC, Boston	9,554
Stephens Inc., Little Rock	5,081
Stifel Nicolaus	22,089
Strategas Securities LLC, New York	3,972
Sturdivant and Co. Inc., Mount Laurel	4,249
Suntrust Capital Markets Inc., Atlanta	2,985
Telsey Advisory Group LLC, Dallas	1,318
Thompson Davis & Co., Jersey City	296
UBS Equities, London	4,344
UBS Securities LLC, Stamford	22,396
UBS Warburg Asia LTD, Hong Kong	924
UBS Warburg, London	13,872
Union Bank Switzerland Secs, London	284
Vandham Securities Corp., New York	304
Wall Street Access, Jersey City	995
Wedbush Morgan Secs Inc., Los Angeles	3,338
Weeden & Co., New York	10,240
Wells Fargo Securities LLC, Charlotte	8,792
Wiley Bros-Aintree Capital, Jersey City	235
William Blair & Co., Chicago	3,773
Woody Gundy Inc.-NSCC, Boston	33
Wunderlich Securities Inc., Memphis	2,135
Wunderlich Securities, Inc., Memphis	1,186
<b>Total Brokerage Commissions Paid</b>	<b>\$1,274,825</b>



# Actuarial

# Actuary's Certification Letter



*Classic Values, Innovative Advice*

## *Via Electronic Mail*

May 19, 2017

Pennsylvania Municipal Retirement Board of the  
Pennsylvania Municipal Retirement System  
c/o Stephen W. Vaughn, Secretary  
P.O. Box 1165  
Harrisburg, PA 17108-1165

Dear Board Members:

At your request, we have conducted the Annual Actuarial Valuation of the Pennsylvania Municipal Retirement System (the System) as of January 1, 2016. The results of the valuation are contained in our report. The funded ratio of the System as of January 1, 2016 was 100.1% funded on an actuarial asset value basis and 92.7% funded on a market value basis.

This report is for the use of the Pennsylvania Municipal Retirement Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users. This report contains analyses which combine asset and liability performance and projections.

The System is defined as an agent multiple employer plan under Governmental Accounting Standards Board Statement No. 67. Assets and liabilities are separately accounted for and reported to the Public Employee Retirement Commission of the Commonwealth of Pennsylvania. This report reflects aggregate valuation results for the System and provides statistics on employer contribution levels for the defined benefit portion of the municipal plans participating in the system as of the valuation date; the methods and assumptions were updated January 1, 2016.

Our 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, which replaced GASB No. 25. Additional details required under the new Governmental Accounting Standards Board Statement No. 67 have also been provided to the System.

In preparing our report, 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 report provides comments on the sources and reliability of both the data and the actuarial assumptions on which our findings are based. Those comments are the basis for our certification of the results. Future valuation may differ significantly from the current valuation report presented 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.

The assumptions used in preparing the individual municipal valuation have been determined and adjusted based on a formal Experience Study date July 2015 with recommendations presented to the Board for consideration and adoption. 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 complete actuarial valuation report as of January 1, 2016 is included as an attachment to this letter.

The figures and data disclosed in the following schedules for the Financial and Actuarial sections were provided by Cheiron for 2011-2016.

1. Solvency Test which shows the portion of the Actuarial Liability covered by Assets
2. Funded Status of Actuarial Liabilities
3. Required Supplemental Information
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

In addition, while Cheiron did not explicitly provide the Schedule of Required Employer Contributions provided in the CAFR, 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 for each plan and the employers' anticipated payroll for each participating plan. It may also include 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.


To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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.

Should you have any questions, please do not hesitate to contact us.

Sincerely,  
Cheiron

  
Kenneth A. Kent, FSA, FCA  
Principal Consulting Actuary

  
Karen Zangara, FSA  
Principal Consulting Actuary

  
Anthony Bucci, EA, MAAA  
Associate Actuary

## SOLVENCY TEST

Aggregate Accrued Liabilities for

VALUATION DATE JANUARY 1,	ACTIVE MEMBER CONTRIBUTIONS (1) <sup>(1)</sup>	RETIREES & BENEFICIARIES (2)	ACTIVE MEMBER EMPLOYER FINANCED CONTRIBUTIONS (3)	ACTUARIAL VALUE OF REPORTED ASSETS	PORTION OF ACCRUED LIABILITIES COVERED BY REPORTED ASSETS		
					(1)	(2)	(3)
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%
2013	418,163,830	812,688,102	672,720,129	1,886,703,664	100%	100%	97%
2012	407,199,633	639,260,852	680,756,784	1,792,809,433	100%	100%	110%
2011	395,048,320	655,645,661	623,210,164	1,713,751,974	100%	100%	106%

<sup>(1)</sup> 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.

## FUNDED STATUS OF ACTUARIAL LIABILITIES

VALUATION DATE JANUARY 1,	ACTUARIAL VALUE OF ASSETS (A) <sup>(1)</sup>	ACTUARIAL LIABILITY (AL) ENTRY AGE (B)	UNFUNDED AL (SURPLUS) (B-A)	FUNDED RATIO (A/B)	DISCOUNT RATE
2016	\$ 2,153,625,821	\$ 2,151,341,466	(\$ 2,284,355)	100.1%	5.50%
2015	2,081,439,591	2,067,264,850	(14,174,741)	100.7%	5.50%
2014	1,972,273,674	2,005,222,107	32,948,433	98.4%	5.50%
2013	1,886,703,664	1,903,572,061	16,868,397	99.1%	5.50%
2012	1,792,809,433	1,727,217,269	(65,592,164)	103.8%	6.00%
2011	1,713,751,974	1,673,904,145	(39,847,829)	102.4%	6.00%

<sup>(1)</sup> The Actuarial Value Assets (AVA) were determined based upon the methodology outlined in PMRS Policy Statement. The 1/1/2016 AVA was based upon the reserves published by PMRS in the 2015 CAFR.

The actuarial assumptions as of January 1, 2016, 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 the System, regarding:

VALUATION OF DEFINED BENEFIT LIABILITIES			
VALUATION DATE	COMPLETE VALUATION	ROLL FORWARD	CASH BALANCE PLANS
January 1, 2016	4	718	294
January 1, 2015	717	4	286
January 1, 2014	4	712	268
January 1, 2013	710	4	251
January 1, 2012	4	705	240
January 1, 2011	702	5	229
January 1, 2010	5	691	202
January 1, 2009	691	5	203

## Note to 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:

<b>Valuation date</b>	January 1, 2016 - County & Cash balance (CB) plans January 1, 2015 - Municipal plans that are not CB
<b>Measurement date</b>	January 1, 2016
<b>Actuarial cost method</b>	Entry age normal
<b>Amortization method</b>	Level dollar for Plan Bases and an average for Aggregate Gain/Loss, 10% of surplus is credited against aggregate cost where applicable, based on an open amortization period.
<b>Actuarial assumptions:</b>	
Investment rate of return (*)	5.50%
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 the System's Board based on the review of the System's experience study completed in 2015.

The rate of employer contributions to the System 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. The allowance for administrative expenses is based upon the System's actual administrative expenses.

### 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 <sup>(1)</sup>	DELETED FROM ROLL	AVERAGE ANNUAL ANNUITIES REMOVED <sup>(1)</sup>	NUMBER ON ROLL	ANNUAL ANNUITIES	PERCENTAGE INCREASE IN ANNUITIES	AVERAGE ANNUAL ANNUITIES	PERCENTAGE INCREASE IN AVERAGE ANNUAL ANNUITIES
2016	339	\$ 18,888	87	\$ 18,915	5,360	\$ 80,729,221	6.3	\$ 15,061	1.3
2015	392	17,908	227	10,494	5,108	75,936,364	6.6	14,866	3.1
2014	431	20,472	168	16,043	4,943	71,257,797	9.5	14,416	3.7
2013	391	16,440	105	8,288	4,680	65,046,544	9.5	13,899	2.8
2012	438	16,404	228	14,252	4,394	59,411,245	7.5	13,521	2.4
2011	396	18,624	121	8,981	4,184	55,257,189	13.0	13,207	5.6

### SCHEDULE OF TOTAL MEMBERSHIP

Six Year Trend

VALUATION DATE JANUARY 1,	ACTIVE MEMBERS DEFINED BENEFIT PLANS	ACTIVE MEMBERS CASH BALANCE PLANS	RETIREES	BENEFICIARIES	DEFERRED PENSIONS	INACTIVE MEMBERS <sup>(1)</sup>	TOTAL
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

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

**SCHEDULE OF TOTAL MEMBERSHIP  
FUNDED STATUS OF ACTUARIAL LIABILITIES**

Last Six Years

	AS OF JANUARY 1 <sup>(1)</sup>					
	2016	2015	2014	2013	2012	2011
a. Retirees currently receiving benefits	4,784	4,566	4,423	4,160	3,899	3,707
b. Beneficiaries currently receiving benefits	576	542	520	520	495	477
c. Terminated vested employees entitled to future benefits from defined benefit plans	872	779	753	800	723	711
d. Terminated non-vested employees entitled to contribution refunds from defined benefit plans	7	8	14	51	21	42
e. Active employees in defined benefit plans	7,698	7,580	7,676	7,599	7,836	8,091
i. Aggregate salary <sup>(2)</sup>	\$394,133,120	\$384,270,155	\$389,410,214	\$376,296,674	\$366,882,467	\$383,802,844
ii. Vested <sup>(3)</sup>	4,676	4,726	4,881	4,885	4,964	4,992
iii. Non-vested	3,022	2,854	2,795	2,715	2,872	3,099
f. Participants in cash balance-only plans	1,575	1,462	1,476	1,429	1,387	1,353
i. Aggregate salary	\$51,642,049	\$47,537,851	\$45,193,710	\$44,490,671	\$41,143,383	\$41,683,065
ii. Active	1,274	1,214	1,185	1,131	1,158	1,119
iii. Inactive	301	248	291	298	229	234

<sup>(1)</sup> Includes defined benefit non-county plans, defined benefit county plans, and cash balance plans.

<sup>(2)</sup> Actual salary for preceding valuation date.

<sup>(3)</sup> 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 IN NUMBER OF PARTICIPATING EMPLOYERS	TOTAL ANNUAL PAYROLL	PERCENTAGE INCREASE (DECREASE) IN PAYROLL	AVERAGE ANNUAL SALARY	PERCENTAGE INCREASE (DECREASE) IN AVERAGE ANNUAL SALARY
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

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 (DECREASE) IN PAYROLL	AVERAGE ANNUAL SALARY	PERCENTAGE INCREASE (DECREASE) IN AVERAGE ANNUAL SALARY
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

### Actuarial Assumptions and Methods

The PMRS actuarial assumptions approved by the Board effective January 1, 2016 and used in this valuation are as follows.

#### A. Healthy Life Mortality Rates:

##### 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 percent of mortality is assumed to be service-related for municipal plans, and
- (ii) 50 percent 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.

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:

##### TERMINATION RATES BEFORE RETIREMENT

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

<sup>(1)</sup> No termination rates are applied once the employee becomes eligible for voluntary early or normal retirement.



## D. Disability Incidence Rates:

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

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

Type of disability:

- (i) 15 percent of disablements are assumed to be service-related for municipal plans

- (ii) 50 percent of disablements are assumed to be service related for uniform plans.

### MUNICIPAL RATES

AGE	CURRENT VALUATION RATE (%)
25	0.014
35	0.029
45	0.064
55	0.134
65	0.658

### UNIFORMED RATES

AGE	CURRENT VALUATION RATE (%)
25	0.031
35	0.058
45	0.136
55	0.335
65	1.123

## E. Workers Compensation:

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

## F. Salary Scale:

Three-year select and ultimate rates include 2.8 percent inflation and age-related scale for merit/seniority based on sample rates as shown at right plus 2 percent during the select period only then reverting to inflation and merit/seniority thereafter. Final actual salary plans assume an additional 6 percent at retirement.

### SAMPLE SALARY RATES

AGE	TOTAL RATE (%) <sup>(1)</sup> (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

## G. Retirement Age:

The age at which unreduced benefits are available. No early retirement is assumed. Specific assumptions regarding retirement age are:

<sup>(1)</sup> Add 2 percent for each of the first three years of service.

<sup>(2)</sup> Rates indicated are adjusted by adding 5 percent (and 10 percent for ages 60–62 under current rate assumptions) for the year in which the member is first eligible for normal retirement.

<sup>(3)</sup> If applicable.

## 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.

Inactive vested members are assumed to retire when first eligible for unreduced benefits.

### NON-UNIFORM PLAN RETIREMENT ASSUMPTIONS

AGE	CURRENT RATE (%) OF NORMAL RETIREMENT <sup>(2)</sup>
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

## H. Marital Status and Spouse's Age:

80 percent of members will be married at time of retirement and females are three years younger than their spouses.

## I. Social Security Projections <sup>(3)</sup>:

a) The Social Security Taxable Wage Base will increase by 3.3 percent compounded annually;

b) The Consumer Price Index will increase by 2.8 percent compounded annually;

c) The Average Total Wages of All Workers will increase by 3.3 percent compounded annually.

### RETIREMENT RATES FOR UNIFORMED MEMBERS

AGE	RATES (%)
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

## J. Post-Retirement Cost of Living Increases<sup>(1)</sup>:

2.8 percent per year, subject to plan limitations.

## K. Investment Return Assumption:

5.5 percent 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 year's actual expenses increased by 5%.

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

## Actuarial Methods

Contribution requirements are individually determined for each participating municipality, on an actuarial basis as described below, at least biannually. The frequency of 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 ASSETS:

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

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

The Actuarial Value of Assets are set equal to reserves under the System 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 fair 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 fair 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 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 fair values. For example, there might be a corridor centered at fair value outside of which the actuarial value of assets may not fall, in order to assure that the difference from fair value is not greater than the actuary deems reasonable.*
- 2. Any differences between the actuarial value of assets and the fair 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 fair 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 fair value or (ii) recognizes differences from fair value in a sufficiently short period."*

The administrative rules adopted by the PMRS Board in conjunction with 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 CAFR follow the Pennsylvania Municipal Retirement System Law and the PMRS Policy Statement.

### ACTUARIAL COST METHOD

Entry Age Normal 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 Mem-

ber 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 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.

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 updates by Act 44, the unfunded actuarial liability 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 the System's 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 the System.
- 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. For the even calendar years, the liabilities for these plans are estimated by rolling forward the liabilities. With the implementation of GASB 68, which required an individual report to be issued for each pension plan, the liabilities for the municipalities with 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. 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 proportionately adjusted based on the prior year liabilities net of in pay status liabilities.

All other liabilities for the county and cash balance plans were explicitly valued as of January 1, 2016 based on the data, plan provisions, methods and assumptions.

#### **CHANGES IN ACTUARIAL ASSUMPTIONS AND METHODS**

The demographic and economic assumptions were reviewed with the Board as required every four years at the July 2015 Board Meeting. At that meeting, the Board approved updated actuarial assumptions including mortality rates, termination rates, retirement rates, and the salary scale effective January 1, 2016. A complete listing of the assumption changes effective with this valuation can be located in Cheiron's report entitled "Experience Study Results" dated July 14, 2015.



**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 the System's overall financial condition. In support of these objectives, the System has implemented GASB Statement No. 44, Economic Condition Reporting: The Statistical Section. This statement establishes standardized reporting requirements relative to the supplementary information provided in this section.

The schedules beginning on page 59 provide information relative to financial trends. The schedules and graphs provide detailed information about the System's net position and how it has changed over time.

The schedules beginning on page 63 provide information relative to membership. The schedules and graphs reflect changes in active and retired members of the System. The information is intended to provide contextual information about the System's membership and framework for the ratio of funding versus obligations. The schedules beginning on page 65 provide information relative to pension payments and pensions awarded. The information is intended to provide contextual information about payment trends of the System.

All non-accounting data is derived from the System's internal sources.

## NUMBER OF MEMBERS PER PLAN

(Plans with 100 or more members )

As of December 31, 2016

PLAN	MEMBERS	%
Allentown City	867	5.39
Adams County	807	5.02
Bethlehem City	653	4.06
Harrisburg City - Plan B	436	2.71
Jefferson County	287	1.78
Harrisburg City Fire - Plan B	206	1.28
Easton City	199	1.24
Monroeville Municipality	189	1.18
Lehigh County Authority	181	1.13
Bucks County Water & Sewer Authority	168	1.04
Wyoming Valley Sanitary Authority	144	0.90
Tredyffrin Township	128	0.80
Upper Moreland Township	121	0.75
Hermitage City	115	0.71
Capital Region Water	110	0.68

# Part I • Financial

## CHANGES IN FIDUCIARY NET POSITION

10 Year Trend

YEAR	CONTRIBUTIONS	INVESTMENT INCOME (LOSS) AND MISCELLANEOUS INCOME	ANNUITY BENEFITS AND TERMINATIONS	ADMINISTRATIVE EXPENSES	CHANGE IN FIDUCIARY NET POSITION
2016	\$ 93,999,086	\$ 163,943,015	\$ 95,013,418	\$ 6,041,638	\$ 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	78,245,253	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	3,183,253	175,701,725
2009	54,933,975	210,272,809	66,048,632	3,203,478	195,954,674
2008	49,693,605	(387,077,602)	53,771,225	2,986,656	(394,141,878)
2007	46,833,548	114,838,806	49,905,064	2,862,482	108,904,808

## ADDITIONS TO FIDUCIARY NET POSITION

10 Year Trend

YEAR	MEMBER CONTRIBUTIONS	MUNICIPAL CONTRIBUTIONS AND TRANSFERS FROM OTHER PLAN ADMINISTRATORS <sup>(1)</sup>	MUNICIPAL ASSESSMENTS <sup>(2)</sup>	INVESTMENT INCOME (LOSS) AND MISCELLANEOUS INCOME	ADDITIONS TO FIDUCIARY NET POSITION, NET OF INVESTMENT LOSSES
2016	\$ 20,776,539	\$ 72,995,245 <sup>(3)</sup>	\$ 227,302	\$ 163,943,015	\$ 257,942,101
2015	19,472,225	49,062,549	206,114	( 4,943,521)	63,797,367
2014	18,441,437	71,157,740 <sup>(4)</sup>	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
2009	19,331,869	35,309,446	292,660	210,272,809	265,206,784
2008	17,870,426	31,532,859	290,320	(387,077,602)	(337,383,997)
2007	17,491,672	29,059,248	282,628	114,838,806	161,672,354

<sup>(1)</sup> Contributions were made in accordance with actuarially determined contribution requirements.

<sup>(2)</sup> Municipal assessments are receipts but not assets of the plans.

<sup>(3)</sup> Municipal contributions for 2016 include transfers from other plan administrators of \$21.4 million.

<sup>(4)</sup> 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 TO FIDUCIARY NET POSITION
	ANNUITY	REFUNDS		
2016	\$ 87,046,730	\$ 7,966,688	\$ 6,041,638	\$ 101,055,056
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
2009	52,267,003	13,781,629	3,203,478	69,252,110
2008	46,173,544	7,597,681	2,986,656	56,757,881
2007	42,898,882	7,006,182	2,862,482	52,767,546

## 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 <sup>(1)</sup>	TRANSFER AND OTHER	
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
2009	36,648,826	3,780,903	2,462,766	4,284,030	3,523,786	-	1,566,692	52,267,003
2008	34,911,175	4,549,688	1,351,900	3,897,639	1,397,947	-	65,195	46,173,544
2007	31,560,200	4,397,101	1,318,921	3,975,518	1,085,900	-	561,242	42,898,882

## SCHEDULE OF REFUND DEDUCTIONS FROM FIDUCIARY NET POSITION BY TYPE

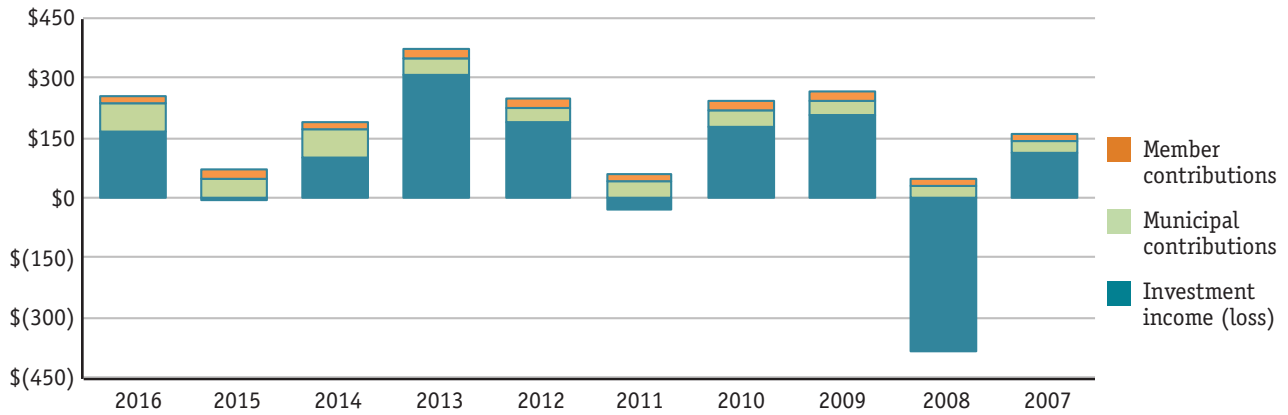
10 Year Trend

YEAR	REFUNDS BY TYPE		
	TERMINATIONS	LUMP SUM	TOTAL REFUNDS
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
2009	11,189,048	2,592,581	13,781,629
2008	6,675,755	921,926	7,597,681
2007	4,262,309	2,743,873	7,006,182

<sup>(1)</sup> First DROP participant to terminate was on January 1, 2013.

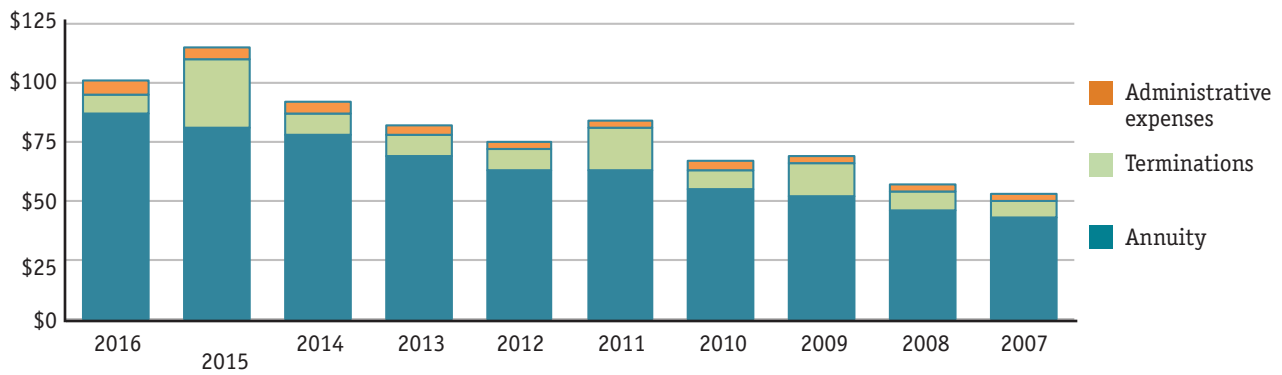
### ADDITIONS TO FIDUCIARY NET POSITION - 10 YEAR TREND

(Amounts in Millions)



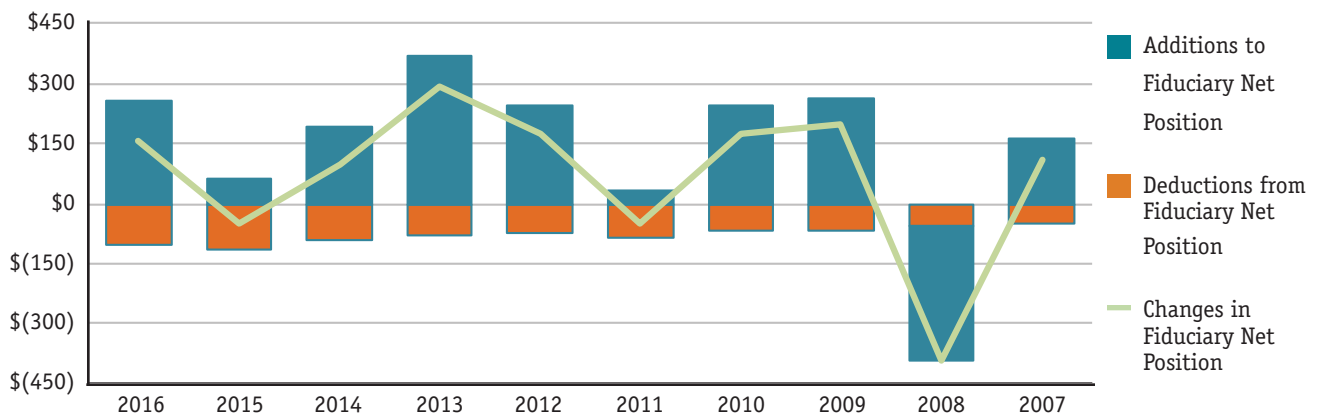
### DEDUCTIONS FROM FIDUCIARY NET POSITION - 10 YEAR TREND

(Amounts in Millions)



### RESULTS OF OPERATIONS - 10 YEAR TREND

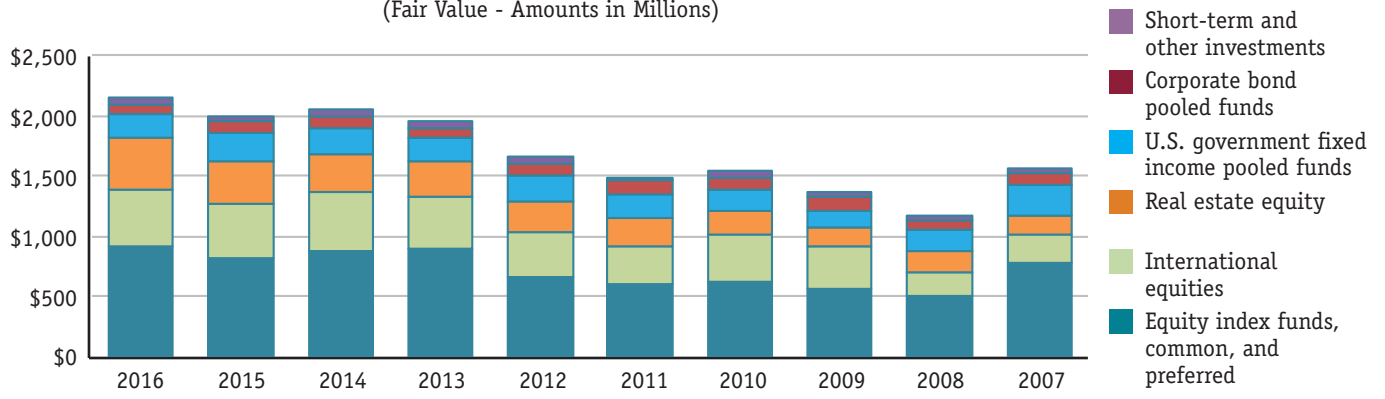
(Amounts in Millions)





## TOTAL INVESTMENTS - 10 YEAR TREND

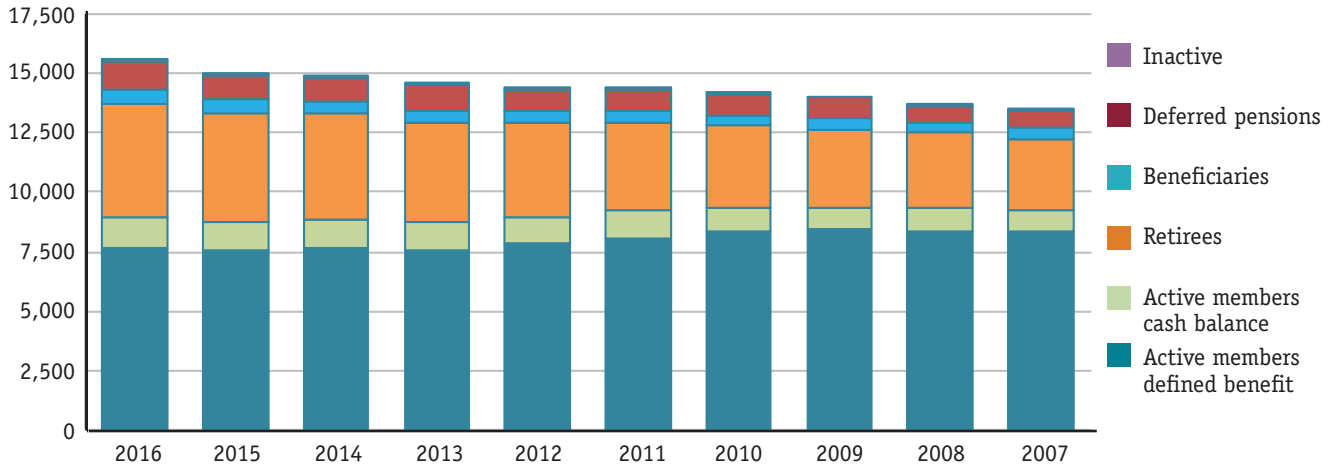
(Fair Value - Amounts in Millions)



# Part II • Membership

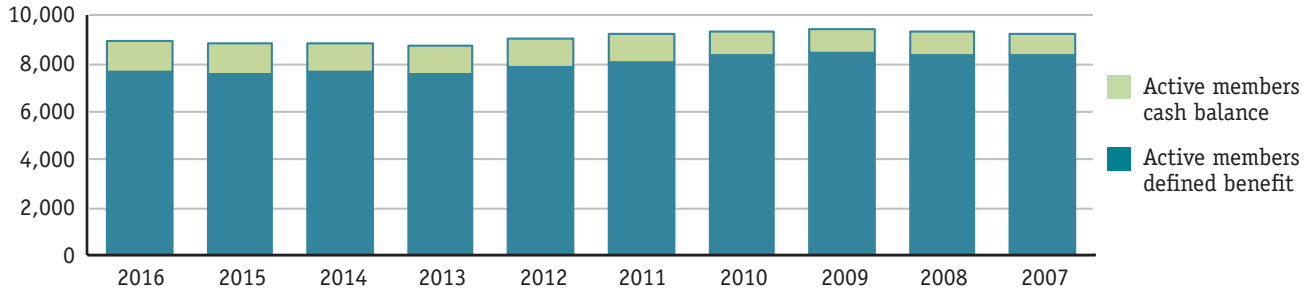
## TOTAL MEMBERSHIP - 10 YEAR TREND

(Valuation Date 1/1)



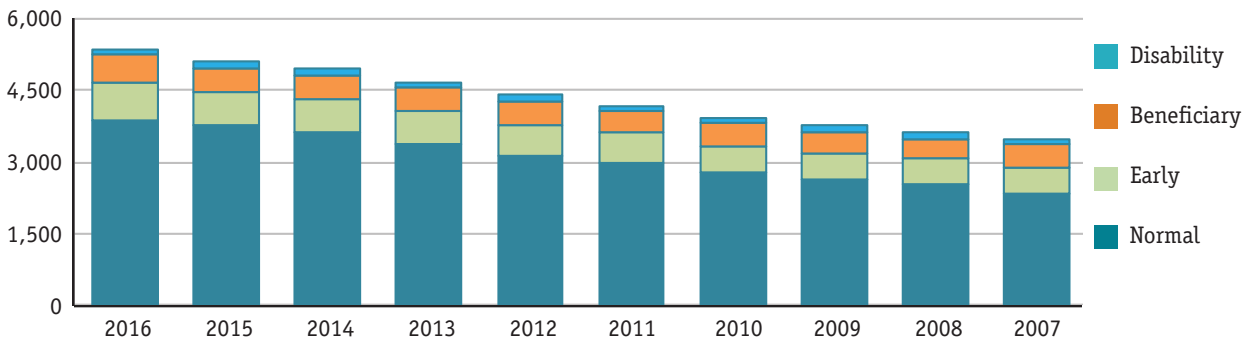
## ACTIVE MEMBERS - 10 YEAR TREND

(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, 2016

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	6	2	0	0	0	0	0	0	0	0	8
20 – 24	104	62	30	13	3	0	0	0	0	0	212
25 – 29	139	108	81	110	85	3	0	0	0	0	526
30 – 34	107	102	84	103	227	67	5	0	0	0	695
35 – 39	87	71	43	78	220	220	60	2	0	0	781
40 – 44	115	55	47	99	201	210	163	61	4	0	955
45 – 49	81	78	66	90	229	255	218	147	89	2	1,255
50 – 54	92	65	72	95	232	254	217	183	192	94	1,496
55 – 59	62	59	63	85	235	246	227	174	176	261	1,588
60 – 64	18	33	45	37	136	152	163	120	125	205	1,034
65 & up	2	10	10	25	63	63	68	57	57	67	422
<b>Total</b>	<b>813</b>	<b>645</b>	<b>541</b>	<b>735</b>	<b>1,631</b>	<b>1,470</b>	<b>1,121</b>	<b>744</b>	<b>643</b>	<b>629</b>	<b>8,972</b>

## DISTRIBUTION OF ACTIVE MEMBERS

Average Annual Salary by Age/Service as of January 1, 2016

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	\$ 10,736	\$34,331	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 16,635
20 – 24	15,841	39,477	38,903	41,294	50,355	-	-	-	-	-	28,066
25 – 29	19,377	43,682	42,563	47,822	48,983	51,221	-	-	-	-	38,852
30 – 34	20,377	45,360	45,017	46,753	53,470	59,366	71,443	-	-	-	45,865
35 – 39	18,763	41,565	50,454	48,597	51,607	60,764	61,399	52,912	-	-	50,007
40 – 44	20,771	45,314	46,536	46,091	53,186	59,439	64,293	63,030	76,371	-	51,763
45 – 49	23,612	43,522	45,429	43,776	49,771	55,943	57,708	63,363	67,251	62,127	52,520
50 – 54	22,229	45,055	46,037	43,808	49,638	52,101	52,766	58,582	63,882	64,290	51,925
55 – 59	19,554	47,531	46,747	44,092	45,864	49,724	53,406	56,816	56,554	60,565	51,316
60 – 64	17,489	44,290	44,831	46,670	47,733	49,333	49,204	54,142	57,294	60,968	51,923
65 & up	67,853	38,336	42,693	45,353	44,183	44,501	44,284	48,824	51,568	55,525	47,679
<b>Total</b>	<b>\$ 19,959</b>	<b>\$ 43,840</b>	<b>\$ 45,204</b>	<b>\$ 45,818</b>	<b>\$ 49,947</b>	<b>\$ 54,432</b>	<b>\$ 55,046</b>	<b>\$ 57,999</b>	<b>\$ 60,048</b>	<b>\$ 60,721</b>	<b>\$ 49,685</b>

## PENSIONS IN PAYMENT STATUS ON JANUARY 1, 2016

By Type and Monthly Amount

MONTHLY AMOUNT	TOTAL	TYPE OF PENSION				
		NORMAL	INVOLUNTARY EARLY	VOLUNTARY EARLY	SERVICE DISABILITY	NON-SERVICE DISABILITY
Total	5,360	4,436	203	607	49	65
Under \$100	259	223	18	16	1	1
\$100 - \$199	316	256	25	34	1	0
200 - 299	307	238	27	41	1	0
300 - 399	311	250	24	36	0	1
400 - 499	296	242	19	31	2	2
500 - 599	315	254	11	41	3	6
600 - 699	266	213	13	35	3	2
700 - 799	260	201	12	41	2	4
800 - 899	237	185	9	29	3	11
900 - 999	225	169	7	33	7	9
1,000 - 1,199	431	339	15	60	7	10
1,200 - 1,399	331	256	5	59	6	5
1,400 - 1,599	288	238	3	35	6	6
1,600 - 1,799	214	185	6	22	0	1
1,800 - 1,999	211	179	4	25	2	1
2,000 - 2,199	172	151	2	17	1	1
2,200 - 2,399	154	140	2	11	1	0
2,400 - 2,599	132	119	0	11	1	1
2,600 - 2,799	101	90	0	8	1	2
2,800 - 2,999	86	83	0	2	0	1
3,000 - 3,499	188	176	1	10	1	0
3,500 - 3,999	117	110	0	6	0	1
4,000 and over	143	139	0	4	0	0

## PENSIONS AWARDED BY TYPE AND AMOUNT

10 Year Trend

VALUATION DATE 1/1	TOTAL		NORMAL		VOLUNTARY EARLY		INVOLUNTARY EARLY		DISABILITY	
	COUNT	AMA <sup>(1)</sup>	COUNT	AMA	COUNT	AMA	COUNT	AMA	COUNT <sup>(2)</sup>	AMA
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
2009	271	1,157	223	1,150	36	1,259	7	843	5(3)	1,162
2008	236	1,065	227	1,056	0	0	6	1,259	3(0)	1,350
2007	252	1,069	192	1,082	32	1,196	19	572	9(2)	1,373

## 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 <sup>(3)</sup>	INACTIVE MEMBERS <sup>(4)</sup>	TOTAL
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
2009	8,411	978	3,289	461	847	0	13,986
2008	8,383	950	3,173	425	744	7	13,682
2007	8,314	918	2,965	494	723	33	13,447

<sup>(1)</sup> Average Monthly Amount

<sup>(2)</sup> Number of service-related disability pensions are shown in parentheses.

<sup>(3)</sup> Inactive participants with rights to deferred pension (vested)

<sup>(4)</sup> 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
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
2009	8,411	0.3	696	0.6	372,370,037	2.0	44,272	1.7
2008	8,383	0.8	692	1.3	364,865,000	1.7	43,524	0.9
2007	8,314	(0.7)	683	0.0	358,691,000	7.6	43,143	8.4

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
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
2009	978	3.0	204	11.0	32,811,919	5.5	33,550	2.5
2008	950	3.5	183	3.4	31,107,000	10.3	32,744	6.5
2007	918	2.5	177	2.9	28,213,000	1.0	30,734	(1.6)

## SCHEDULE OF AVERAGE NEW MONTHLY BENEFIT PAYMENTS FROM DEFINED BENEFIT PLANS<sup>(1)</sup>

10 Year Trend

RETIREMENT EFFECTIVE DATES	YEARS CREDITED SERVICE						
	< 5	5-10	10-15	15-20	20-25	25-30	30+
<b>2016</b>							
Average monthly benefit	\$374	\$694	\$895	\$1,336	\$2,003	\$2,660	\$3,468
Average final average salary	\$31,616	\$49,321	\$41,023	\$45,681	\$53,708	\$56,706	\$58,255
Number of retired members	12	36	64	65	64	58	107
<b>2015</b>							
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
<b>2014</b>							
Average monthly benefit	\$172	\$442	\$797	\$1,253	\$2,106	\$2,232	\$3,375
Average final average salary	\$46,376	\$41,257	\$38,804	\$41,967	\$49,967	\$50,207	\$59,175
Number of retired members	11	36	64	47	48	52	73
<b>2013</b>							
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
<b>2012</b>							
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
<b>2011</b>							
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
<b>2010</b>							
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
<b>2009</b>							
Average monthly benefit	\$235	\$430	\$566	\$1,166	\$1,613	\$2,319	\$2,652
Average final average salary	\$31,401	\$31,302	\$24,517	\$33,126	\$45,654	\$49,517	\$47,354
Number of retired members	14	36	44	43	50	36	71
<b>2008</b>							
Average monthly benefit	\$384	\$421	\$579	\$1,245	\$1,184	\$2,282	\$2,742
Average final average salary	\$32,219	\$34,214	\$31,146	\$43,673	\$32,099	\$50,829	\$50,022
Number of retired members	10	23	31	48	26	32	53
<b>2007</b>							
Average monthly benefit	\$77	\$400	\$647	\$1,014	\$1,301	\$1,749	\$2,626
Average final average salary	\$23,381	\$33,115	\$32,575	\$35,633	\$34,527	\$40,400	\$48,883
Number of retired members	8	25	41	41	31	36	36

<sup>(1)</sup> 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 <sup>(1)</sup>

10 Year Trend

RETIREMENT EFFECTIVE DATES	YEARS CREDITED SERVICE						
	< 5	5-10	10-15	15-20	20-25	25-30	30+
<b>2016</b>							
Average monthly benefit	\$47	\$220	\$499	\$650	\$1,124	\$1,595	\$1,385
Number of retired members	3	13	11	9	10	8	10
<b>2015</b>							
Average monthly benefit	\$131	\$189	\$239	\$823	\$1,071	\$713	\$1,914
Number of retired members	3	10	5	8	9	4	6
<b>2014</b>							
Average monthly benefit	\$100	\$420	\$649	\$580	\$1,285	\$942	\$717
Number of retired members	12	10	9	8	6	2	6
<b>2013</b>							
Average monthly benefit	\$141	\$203	\$430	\$388	\$820	\$945	\$1,028
Number of retired members	7	10	5	4	7	3	5
<b>2012</b>							
Average monthly benefit	\$189	\$270	\$557	\$580	\$857	\$581	\$804
Number of retired members	6	7	8	5	13	5	5
<b>2011</b>							
Average monthly benefit	\$139	\$219	\$393	\$217	\$1,051	\$649	\$1,110
Number of retired members	3	11	5	7	10	4	5
<b>2010</b>							
Average monthly benefit	\$62	\$120	\$467	\$466	\$798	\$1,099	\$1,049
Number of retired members	2	6	8	1	4	2	3
<b>2009</b>							
Average monthly benefit	\$17	\$205	\$402	\$464	\$372	\$428	\$488
Number of retired members	3	7	4	9	5	3	4
<b>2008</b>							
Average monthly benefit	\$43	\$231	\$947	\$628	\$1,596	\$605	\$793
Number of retired members	3	4	4	7	2	2	2
<b>2007</b>							
Average monthly benefit	\$43	\$178	\$402	\$693	\$1,598	\$1,208	\$102
Number of retired members	2	3	6	4	1	3	1

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



## SCHEDULE OF PARTICIPATING PLANS<sup>(1)(2)</sup>

As of January 1, 2016

### 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)  
Avondale Borough  
Avonmore Borough  
Bally Borough  
Bangor Borough  
Bedford Borough  
Bellefonte Borough  
Bellefonte Borough (CB)  
Bellwood Borough  
Bentleyville Borough  
Berlin Borough  
Berlin Borough (CB)  
Big Beaver Borough  
Biglerville Borough  
Biglerville Borough (CB)  
Bloomfield Borough  
Bowmanstown Borough  
Brackenridge Borough  
Bridgeville Borough

Bridgewater Borough  
Brockway Borough  
Brookville Borough  
California Borough  
Cambridge Springs Borough  
Camp Hill Borough  
Carnegie Borough  
Carroll Valley Borough  
Carrolltown Borough  
Centerville Borough  
Central City Borough  
Charleroi Borough  
Claysville Borough  
Cleona Borough  
Clymer Borough  
Coaldale Borough  
Cochranon Borough  
Cokeburg Borough  
Collegeville 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)  
East Washington Borough  
Emlenton Borough  
Emporium Borough  
Etna Borough  
Everett Borough  
Factoryville Borough  
Falls Creek Borough  
Ferndale Borough  
Forest City Borough  
Fountain Hill Borough  
Franklin Borough  
Franklintown Borough

Freeburg Borough  
Freedom Borough  
Freeland Borough  
Freeport Borough  
Greenville Borough  
Holidaysburg Borough  
Homer City Borough  
Honey Brook Borough  
Hughestown Borough  
Hummelstown Borough  
Huntingdon Borough  
Jim Thorpe Borough  
Johnsonburg Borough  
Kenhorst Borough  
Kennett Square Borough  
Kittanning Borough  
Knox Borough  
Kulpmont Borough  
Kutztown 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)  
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)  
Shamokin Dam Borough  
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

<sup>(1)</sup> County names are in parentheses.

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

Telford Borough  
 Thornburg Borough  
 Topton 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  
 Swatara Township  
 Upper Moreland Township  
 Vanport Township  
 West Pottsgrove Township  
 Whitehall Township  
 Whitehall Township (CB)  
 Wilkins Township

## TOWNSHIPS OF THE SECOND CLASS

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  
 Briar Creek Township  
 Brighton Township  
 Broad Top Township  
 Brokenstraw Township  
 Brothersvalley Township  
 Brown Township  
 Buckingham Township  
 Buffalo Township  
 Burnside 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 (Snyder County)  
 Centre Township (Berks County)  
 Centre Township (Perry County)  
 Cherrytree Township  
 Clarion Township  
 Clay Township  
 Clearfield Township  
 Columbus Township  
 Concord 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)  
 Derry Township (Mifflin County)  
 Derry Township (Westmoreland County)  
 Dickinson Township  
 Dingman Township  
 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)  
 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)  
 Eaton Township  
 Eldred Township (Jefferson County)  
 Eldred Township (Monroe County)  
 Eldred Township (Warren County)  
 Elizabeth Township (Lancaster County)  
 Elk Creek Township  
 Elk Township  
 Fairfield Township  
 Fairview Township  
 Falls Township  
 Farmington Township  
 Forks Township  
 Forks Township (CB)  
 Forward Township  
 Foster Township  
 Franklin Township (Beaver 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  
 Hamiltonban Township  
 Hanover Township (Beaver County)  
 Hanover Township (Lehigh County)  
 Haycock Township  
 Hemlock Township  
 Henderson Township  
 Hilltown Township  
 Hopewell Township (Cumberland County)  
 Hopewell Township (Washington County)  
 Hopewell Township (York County)  
 Horsham Township  
 Howe Township  
 Hunlock Township  
 Huntington Township  
 Huston Township  
 Jackson Township (Greene County)  
 Jackson Township (Lebanon County)  
 Jackson Township (Luzerne County)  
 Jackson Township (Snyder County)  
 Jackson Township (Susquehanna County)  
 Jackson Township (Venango County)  
 Jefferson Township (Washington County)  
 Jenks Township  
 Jenner Township  
 Jones Township  
 Keating Township  
 Kennett Township

Lancaster Township (Butler County)  
Lancaster Township (Lancaster County)  
Latimore Township  
LeBoeuf Township  
Lehman Township  
Liberty Township  
Limestone Township (Clarion County)  
Limestone Township (Lycoming County)  
Limestone Township (Union County)  
Lincoln Township  
Liverpool Township  
London Britain Township  
London Grove Township  
London Grove Township (CB)  
Lower Mahanoy Township  
Lower Towamensing Township  
Lower Yoder Township  
Loyalhanna Township  
Loyalhanna Township (CB)  
Mahoning Township  
Manchester Township  
Manchester Township (CB)  
McKean Township  
Mead Township  
Middle Smithfield Township  
Middlesex Township  
Milford Township (Bucks County)  
Milford Township (Pike County)  
Millcreek Township  
Monongahela Township  
Monroe Township (Snyder County)  
Monroe Township (Wyoming County)  
Moore Township  
Morris Township (Greene County)  
Morris Township (Tioga County)  
Morris Township (Washington County)  
Mount Joy Township  
Mount Pleasant Township  
Muncy Creek Township  
New Garden Township  
New Sewickley Township  
Nockamixon Township  
North Buffalo Township  
North Coventry Township  
North Franklin Township  
North Sewickley Township  
North Strabane Township  
North Strabane Township (CB)  
Nottingham Township  
Oakland Township  
Oil Creek Township (Venango County)  
Oil Creek Township (Crawford County)  
Old Lycoming Township  
Oliver Township (Mifflin County)  
Oliver Township (Jefferson County)  
Orange Township  
Paint Township  
Paradise Township  
Pennsbury Township  
Perry Township  
Peters Township  
Peters Township (CB)  
Pike Township  
Pine Creek Township  
Pine Grove Township (Schuylkill County)  
Pine Grove Township (Warren County)  
Pittsfield Township  
Pleasant Township  
Plumcreek Township  
Plumstead Township  
Plymouth Township  
Pocopson Township  
Point Township  
Portage Township  
Porter Township  
Preston Township  
Price Township  
Providence Township  
Pulaski Township  
Pymatuning Township  
Raccoon Township  
Rice Township  
Richhill Township  
Richland Township (Bucks County)  
Richland Township (Bucks County CB)  
Richland Township (Venango County)  
Ridgway Township  
Rome Township  
Rose Township  
Ross Township  
Rutland Township  
Rye Township  
Scott Township  
Sewickley Township  
Shade Township  
Sheffield Township  
Shippensburg Township  
Shrewsbury Township  
Slippery Rock Township  
Smithfield Township  
Snake Spring Township  
Solebury Township  
Solebury Township (CB)  
South Abington Township  
South Abington Township (CB)  
South Beaver Township  
South Bend Township  
South Franklin Township  
South Hanover Township  
South Huntingdon Township  
South Manheim Township  
South Middleton Township  
South Pymatuning Township  
South Strabane Township  
Southampton Township  
Southwest Township  
Spring Creek Township  
Springfield Township  
Stonycreek Township  
Sugar Grove Township  
Sullivan Township  
Summit Township  
Tinicum Township  
Towamensing Township  
Tredyffrin Township  
Tunkhannock Township  
Union Township (Berks County)  
Union Township (Lebanon County)  
Union Township (Snyder County)  
Union Township (Washington County)  
Unity Township  
Upper Burrell Township  
Upper Frederick Township  
Upper Nazareth Township  
Valley Township  
Wallace Township  
Warrington Township  
Warsaw Township  
Warwick Township  
Washington Township (Berks County)  
Washington Township (Cambria County)  
Washington Township (Dauphin County)  
Washington Township (Erie County)  
Washington Township (Fayette County)  
Washington Township (Greene County)  
Washington Township (Jefferson County)  
Washington Township (Northampton County)  
Washington Township (Schuylkill County)  
Washington Township (Westmoreland County)  
Washington Township (Wyoming County)  
Waverly Township  
Wayne Township  
West Bradford Township  
West Brunswick Township  
West Caln Township  
West Carroll Township  
West Fallowfield Township  
West Lampeter Township  
West Pennsboro Township  
West Rockhill Township  
West Sadsbury Township  
West Salem Township  
West Wheatfield Township  
Westtown Township  
Wetmore Township  
White Township  
Whiteley Township  
Wiconisco Township  
Williams Township  
Wilmington Township  
Windsor Township  
Woodward Township  
Wright Township  
Wrightstown Township  
Zerbe Township

**POLICE**

Apollo Borough Police  
Ashley Borough Police  
Bally Borough Police  
Beaver Meadows Borough Police  
Bedminster Township Police  
Bellwood Borough Police  
Bentleyville Borough Police  
Bentleyville Borough Police (CB)  
Big Beaver Borough Police  
Biglerville Borough Police

Birmingham Township Police  
 Blair Township Police  
 Brecknock Township Police  
 Briar Creek Township Police  
 Bridgewater Borough Police  
 Buckingham Township Police  
 California Borough Police  
 Cambria Township Police  
 Cambridge Springs Borough Police  
 Camp Hill Borough Police  
 Carroll Township Police  
 Carroll Valley Borough Police  
 Carrolltown Borough Police  
 Central City Borough Police  
 Centre Township Police (Berks County)  
 Clairton Police  
 Clymer Borough Police  
 Cochranon Borough Police  
 Colebrookdale Township Police  
 Conneaut Lake Regional Police  
 Covington Township Police  
 Crescent Township Police  
 Danville Borough Police  
 Darlington Township Police  
 Decatur Township Police  
 Delmont Borough Police  
 Donegal Township Police (Washington County)  
 Douglass Township Police (Berks County)  
 Douglass Township Police (Montgomery County)  
 Dublin Borough Police  
 Duboistown Borough Police  
 Dunbar Borough Police  
 Duncannon Borough Police  
 Duncansville Borough Police  
 East Bangor Borough Police  
 East Berlin Borough Police  
 East Coventry Township Police  
 East Deer Township Police  
 East Fallowfield Township Police  
 East Franklin Township Police  
 East Marlborough Township Police  
 East Pennsboro Twp Police  
 East Washington Borough Police  
 Elizabeth Township Police (Allegheny County)  
 Emlenton Borough Police  
 Emporium Borough Police  
 Everett Borough Police  
 Factoryville Borough Police  
 Fairview Township Police  
 Falls Creek Borough Police  
 Farrell City Police  
 Forest City Borough Police  
 Forward Township Police  
 Franklin Borough Police  
 Franklin Township Police (Beaver County)  
 Frazer Township Police  
 Freedom Township Police  
 Freeland Borough Police  
 Gilpin Township Police  
 Greenfield Township Police  
 Greenville Borough Police  
 Hamiltonban Township Police  
 Harveys Lake Borough Police  
 Heidelberg Township Police  
 Hellam Township Police  
 Hemlock Township Police  
 Hilltown Township Police  
 Honey Brook Borough Police  
 Hummelstown Borough Police  
 Independence Township Police  
 Jackson Township Police (Luzerne County)  
 Johnsonburg Borough Police  
 Kennett Township Police  
 Knox Borough Police  
 Lancaster Township Police (Butler County)  
 Larksville Borough Police  
 Lewistown Borough Police  
 Liberty Borough Police  
 Linesville Borough Police  
 Locust Township Police  
 Lower Windsor Township Police  
 Lower Yoder Township Police  
 Lykens Borough Police  
 Mahoning Township Police (Lawrence County)  
 Mahoning Township Police (Montour County)  
 Manor Borough Police  
 Mars Borough Police  
 Martinsburg Borough Police  
 Marysville Borough Police  
 Maxatawny Township Police  
 Mayfield Borough Police  
 Mead Township Police  
 Mercer Borough Police  
 Middleburg Borough Police  
 Middlesex Township Police  
 Millcreek Township Police  
 Millersburg Borough Police  
 Millville Borough Police  
 Montour Township Police  
 Moore Township Police  
 Moosic Borough Police  
 Morris Township Police (Greene County)  
 Morrisville Borough Police  
 Moscow Borough Police  
 Mount Jewett Borough Police  
 Mount Pleasant Borough Police  
 Mount Pleasant Township Police (Washington County)  
 Mount Union Borough Police  
 New Castle Township Police  
 New Garden Township Police  
 New Wilmington Borough Police  
 Newport Borough Police  
 Newtown Borough Police  
 Nockamixon Township Police  
 North Coventry Township Police  
 North Hopewell Township Police  
 North Huntingdon Township Police  
 North Middleton Township Police  
 North Sewickley Township Police  
 Northeastern Regional Police Department  
 Northumberland Borough Police  
 Old Lycoming Township Police  
 Orangeville Area Police Board  
 Orwigsburg Borough Police  
 Palmyra Borough Police  
 Paxtang Borough Police  
 Penbrook Borough Police  
 Pennridge Regional Police Dept.  
 Perkasie 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  
 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 Police Commission  
 Southern Regional Police Commission  
 Springdale Township Police  
 Summit Hill Borough Police  
 Telford Borough Police  
 Tinicum 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  
 Wheatland Borough Police  
 White Haven Borough Police  
 Wiconisco Township Police  
 Williamsburg Borough Police  
 Williamstown Borough Police  
 Windsor Borough Police  
 Windsor Township Police  
 Wrightstown Township Police  
 Yardley Borough Police  
 Youngwood Borough Police

**FIREFIIGHTERS**

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

**AUTHORITIES AND OTHER UNITS**

Allegheny Valley Joint Sewer Authority  
 Ambridge Borough Municipal Authority  
 Armstrong Conservation District  
 Avonmore Borough Municipal Authority  
 B.A.R.T.A.  
 Bangor Borough Authority  
 Bath Borough Authority  
 Bedford Borough Water 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 Sewer

Authority  
 Bradford City Water Authority  
 Bradford Regional Airport Authority  
 Brighton Township Municipal Authority  
 Brighton Township Sewer 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  
 Burrell Township Sewage Authority  
 Butler Area Public Library  
 Cambria County Conservation & Recreation Authority  
 Cambria Township Sewer Authority  
 Cambria Township Water Authority  
 Capital Region Water  
 Carbon County Conservation District  
 Carmichaels-Cumberland Joint Sewer  
 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)  
 Coaldale-Lansford-Summit Hill Sewer 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)  
 Derry Township Municipal Authority  
 Derry Township Sanitary Sewer Authority  
 DuBois City Redevelopment Authority  
 DuFAST 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  
 Elizabethville Area Authority  
 Emlenton Area Municipal Authority  
 Erie County Housing Authority  
 Everett Area Municipal Authority  
 Fairfield Municipal Authority  
 Fawn Township Sewage Authority  
 Fawn-Frazer Joint Water Authority  
 Fayette County Conservation District  
 Forward Township Municipal Authority  
 Frackville Area Municipal Authority  
 Franklin City Housing Authority  
 Franklin Township Municipal Sanitary Authority  
 Franklin Township Sewer Authority  
 Frazer Transportation Authority  
 Fredericksburg Sewer & Water Authority

Freeland Borough Municipal Authority  
 Glendale Valley Municipal Authority  
 Greater Lebanon Refuse Authority  
 Greenville Municipal Authority  
 Guilford Township Authority  
 Guilford Water Authority  
 Harrison Township Water Authority  
 Hawley Area Authority  
 Hazleton Transit Authority  
 Hellertown Borough Authority  
 Hilltown Township Water & Sewer Authority  
 Horsham Township Sewer Authority  
 Hughesville-Wolf Township Joint Municipal Authority  
 Hyndman Borough Municipal Authority  
 Indiana County Conservation District  
 Indiana County Solid Waste Authority  
 Jackson Township Water Authority  
 Jeannette Municipal Authority  
 Jefferson Conservation District  
 Jenner Area Joint Sewer Authority  
 Johnsonburg Municipal Authority  
 Juniata County Conservation District  
 Kiskiminetas Township Municipal Authority  
 Kittanning Suburban Joint Water Authority  
 Kulpmont-Marion Heights JMA  
 Lancaster City Parking Authority  
 Lansford-Coaldale Joint Water Authority  
 Lebanon City Authority  
 Lebanon City Authority (CB)  
 Lebanon Community Library  
 Leetsdale Borough Municipal Authority  
 Lehigh County Authority  
 Lehighon Water Authority  
 Linesville Pine Joint Municipal Authority  
 London Grove Township Municipal Authority

Lower Bucks County Joint Municipal Authority

Lower Bucks County Joint Municipal Authority Supervisors

Lower Indiana County Municipal Authority

Lower Mahanoy Township Municipal Authority

Lower Providence Township Sewer Authority

Luzerne Conservation District

Lycoming Sanitary Committee

Mahanoy Township Authority

Mahoning Township Authority

Maidencreek Township Authority

Manheim Borough Authority

Manor Township Joint Municipal Authority

Mary Meuser Memorial Library

McKean County Solid Waste Authority

Mercer County Regional Planning Commission

Mid Mon Valley Water Authority

Middlesex Township Municipal Authority

Middletown Township Sewer Authority

Mifflin County Regional Police NU

Mifflintown Municipal Authority

Milford Water Authority

Millcreek-Richland Joint Authority

Millersburg Area Authority

Mon Valley Sewage Authority

Monroe County Control Center

Monroe County Municipal Waste Management Authority

Monroe County Redevelopment Authority

Montgomery County Sewer Authority

Montour County Conservation District

Montrose Municipal Authority

Moon Township Municipal Authority

Mount Jewett Borough Authority

Mount Joy Township Authority

Mount Lebanon Parking Authority

Mount Pleasant Township Municipal Authority

Mount Pocono Municipal Authority

Municipal Authority of the Borough of Matamoras

Municipal Authority of the Borough of Morrissville

Municipal Authority of the Borough of Portage Water Department

Myerstown Community Library Association

Myerstown Water Authority

Nanty Glo Sanitary Sewer Authority

Nanty Glo Water Authority

Nesquehoning Borough Authority

New Kensington Municipal Sanitary Authority

New Kensington Redevelopment Authority

Newport Borough Water Authority

Norristown Municipal Waste Authority

North & South Shenango Joint Municipal Authority

North Coventry Municipal Authority

North Huntingdon Township Municipal Authority

North Middleton Authority

North Strabane Township Municipal Authority

Northampton Borough Municipal Authority

Northampton Borough Municipal Authority (CB)

Northeastern Regional Police (NU)

Northern Lancaster County Authority

Northern York County Regional Police (NU)

Northwest Regional Lancaster County Police (NU)

Oil City Housing Authority

Parks Township Municipal Authority

Penn Township Sewage Authority

Pennridge Regional Police (NU)

Pennridge Waste Treatment Authority

Pennsylvania League of Cities & Municipalities

Perkasie Regional Authority

Peters Creek Sanitary Authority

Peters Township Municipal Authority

Pleasant Hills Authority

Portage Area Sewer Authority

Possum Valley Municipal Authority

Redevelopment Authority in the City of Corry

Reynoldsville Water Authority

Riverview Sanitary Authority

Robesonia-Wernersville Municipal Authority

Robinson Township Municipal Authority

Rochester Area Joint Sewer Authority

Rostraver Township Sewer Authority

Saxton Borough Municipal Authority

Seward/St. Clair Township Sanitary Authority

Shade-Central City Joint Authority

Shamokin City Redevelopment Authority

Shannock Valley General Services Authority

Sharon Sanitary Authority

Sheffield Township Municipal Authority

Slippery Rock Municipal Authority

Smithton Borough Municipal Authority

Snake Spring Township Authority

Snyder County Housing Authority

Somerset Conservation District

South Fayette Township Municipal Authority

South Middleton Township Municipal Authority

Southern Police Commission NU

Southwest Regional Dispatch Center

Southwestern PA Water Authority

Southwestern Regional Police NU

St. Marys Area Water Authority

Sunbury Municipal Authority

Susquehanna Township Authority

Swatara Township Authority

Tower City Borough Authority

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 Municipal Authority (Fayette County)

Waterford Borough Municipal Authority

Wayne County Redevelopment Authority

Wayne Library Authority

Wernersville Municipal Authority

West Carroll Township Water & Sewer Authority

Western Butler County Authority

Western Clinton County Municipal Authority

Western Westmoreland Municipal Authority

Westmoreland-Fayette Municipal San Authority

White Run Regional Municipal Authority

Whitehall Township Authority

Williamstown Borough Authority

Womelsdorf-Robesonia Joint Authority

York County Planning Commission



P.O. Box 1165  
Harrisburg, PA 17108-1165  
Telephone: 717-787-2065; 1-800-622-7968  
Fax: 717-783-8363  
Website: [www.pmr.state.pa.us](http://www.pmr.state.pa.us)  
Email: [ra-staff@pa.gov](mailto:ra-staff@pa.gov)