

# Comprehensive Annual Financial Report

## **CONSOLIDATED PUBLIC RETIREMENT BOARD**

*Pension Trust Funds of the State of West Virginia*



**Fiscal Years Ended June 30, 2017 and June 30, 2016**



# **West Virginia Consolidated Public Retirement Board**

Pension Trust Funds of the State of West Virginia

## **COMPREHENSIVE ANNUAL FINANCIAL REPORT**

*For the Fiscal Years Ended June 30, 2017 and 2016*

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### **The West Virginia Consolidated Public Retirement Board Administers the Following Retirement Plans:**

Public Employees' Retirement System  
Teachers' Retirement System  
State Police Death, Disability, and Retirement System  
State Police Retirement System  
Deputy Sheriff Retirement System  
Judges' Retirement System  
Emergency Medical Services Retirement System  
Municipal Police Officers & Firefighters Retirement System  
Teachers' Defined Contribution Retirement System

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### **Contact Information:**

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Charleston, WV 25304-1636  
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**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**

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# **INTRODUCTORY SECTION**





# Consolidated Public Retirement Board

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Charleston, West Virginia 25304-1636  
Telephone: 304-558-3570 or 800-654-4406  
Fax: 304-957-7522  
Email: cprb@wv.gov  
www.wvretirement.com



## BOARD MEMBERS

Governor Jim Justice  
Auditor John B. McCuskey  
Treasurer John D. Perdue  
Cabinet Secretary John A. Myers  
Chairman David L. Wyant  
Vice Chairman Captain Michael G. Corsaro

## BOARD MEMBERS

Andy Bird  
Joseph Bunn  
Michael S. Haney  
Joe Lynch  
Mike McKown  
D. Todd Murray  
C. Jeffrey Vallet

## EXECUTIVE DIRECTOR

Jeffrey E. Fleck

January 31, 2018

The Board of Trustees  
The West Virginia Consolidated Public  
Retirement Board  
4101 MacCorkle Ave, S.E.  
Charleston, West Virginia 25304

Dear Board Members:

It is with great pleasure that we submit our Comprehensive Annual Financial Report (CAFR) of the West Virginia Consolidated Public Retirement Board (WVCPRB) for the fiscal year ended June 30, 2017. The West Virginia Consolidated Public Retirement Board includes the Public Employees Retirement System, the Teachers Retirement System, the Teachers Defined Contribution Retirement System, the State Police Death, Disability Retirement System, the State Police Retirement System, the Deputy Sheriffs Retirement System, the Judges Retirement System, the Emergency Medical Service Retirement System and the Municipal Police Officers & Firefighters System. Each system is considered a component unit of the State of West Virginia for financial reporting purposes, and, as such, the financial information contained in this report is also included in the State of West Virginia's Comprehensive Annual Financial Report.

Responsibility for both the accuracy of the data, and the completeness and fairness of the presentation including all disclosures, rests with the management of the Systems. Sufficient internal controls exist to provide reasonable assurance regarding the safekeeping of assets and fair presentation of the financial statements, supporting schedules, and statistical tables. Because the cost of a control should not exceed the benefits to be derived, the objective is to provide reasonable, rather than absolute assurance, that the financial statements are free of any material misstatements. We trust that you and the respective members of the Systems will find this report helpful in understanding your retirement system.

### Administration and Plan History

The PERS, TRS, TDCRS, SPDDRS, DSRS, EMSRS, MPFRS, SPRS and JRS operate under common management and are collectively referred to as The West Virginia Consolidated Public Retirement Board. In addition to executive management, these plans share accounting and information services, the costs of which are allocated to the funds on an equitable basis. The plans were established under various provisions of the Legislature to provide benefits to qualified persons employed by State-supported institutions, entities and components. Additional information regarding the administration and history of each system, including laws establishing the plan and services provided, can be found in the *Financial Section-Notes to the Financial Statements* portion of this report.

### Financial Information

*Accounting Method* - As required by Generally Accepted Accounting Principles (GAAP), the financial information of the PERS, TRS, SPDDRS, TDCRS, DSRS, EMSRS, MPFRS, SPRS and JRS is reported on the accrual basis of accounting. Revenues are recognized when earned and expenses are recognized when the corresponding liability is incurred. Investments are reported at fair value.

*Internal Controls* - The WVCPRB maintains a system of internal controls designed to provide reasonable assurance that assets are properly safeguarded, transactions are properly executed, and financial statements are reliable. Because the cost of internal control should not exceed anticipated benefits, the objective is to provide reasonable, rather than absolute, assurance that the financial statements are free of any material misstatements.

*Summary Comparative Data* - Management's Discussion and Analysis (MD&A) includes a narrative introduction, an overview of the financial statements, including the notes and required supplementary information, and summary comparative data for fiscal years 2017 and 2016. Also, an analysis of significant variances between fiscal years 2017 and 2016 is provided in the MD&A.

### **Plan Funded Position**

The funding objective of the WVCPRB pension trust funds is to meet long-term benefit requirements through contributions, which remain relatively level as a percent of member payroll over time, and through investment earnings. During the year ended June 30, 2017 the funded ratios (based on actuarial valuations completed as of July 1, 2016) of the 8 defined benefit plans administered by the WVCPRB showed 7 plans with a decrease and 1 plan with an increase (due to smoothing methodology). The decreases were due to negative returns in the investment market during the 2016 fiscal year. The funding percentages for PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS and MPFRS for fiscal 2017 (based on actuarial valuations completed as of July 1, 2016) were 89.0%, 65.4%, 79.4%, 95.3%, 90.0%, 155.1%, 88.3% and 161.4%, respectively. Historical information concerning funding progress is presented in the *actuarial section* for each plan.

### **Investment Activity**

Total investments for the WVCPRB increased in fiscal year 2017, primarily due to both a increase in the fair market value of the investments and the income they produced. The total assets for PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS at June 30, 2017 were \$6.386 billion, \$7.291 billion, \$641.75 million, \$166.69 million, \$200.83 million, \$189.96 million, \$71.16 million, \$5.50 million and \$477.51 million respectively compared to investment balances for the PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS of \$5.697 billion, \$6.543 billion, \$578.93 million, \$138.57 million, \$173.27 million, \$167.19 million, \$59.32 million, \$3.32 million and \$430.1 million, respectively, for the fiscal year ended June 30, 2016.

Yields for PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS during fiscal year 2017 were 15.82%; 15.70%; 15.71%; 15.86%; 15.83%; 15.88%; 15.87%; 15.50% and 11.72% respectively, compared to (0.12)%; (0.28)%; (0.21)%; 0.07%; (0.04)%; (0.10)%; 0.03%; 1.13% and 1.07% during fiscal year 2016.

Interest and dividend income for the PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS for the fiscal year ended June 30, 2017, was \$53.29 million, \$60.54 million, \$5.36 million, \$1.41 million, \$1.69 million, \$1.62 million, \$595 thousand, \$40 thousand and \$14.64 million respectively, compared to \$25.65 million, \$29.71 million, \$2.63 million, \$630 thousand, \$792 thousand, \$772 thousand, \$266 thousand, \$11 thousand and \$18.31 million, respectively, for the fiscal year ended June 30, 2016. The change in fair market value of investments for the PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS for the fiscal year 2017 was \$821.81 million, \$934.56 million, \$82.44 million, \$20.94 million, \$25.59 million, \$24.65 million, \$8.91 million, \$566 thousand and \$34.94 million, respectively, compared to the change in fair value of investments of \$(32.47) million, \$(48.12) million, \$(3.86) million, \$(539) thousand, \$(856) thousands, \$(947) thousand, \$(248) thousand, \$17 thousand and \$(14.77) million, respectively, for fiscal year 2016. Additional information concerning investments, including investment policies and procedures, is located in the investment section of this Comprehensive Annual Financial Report.

### **Management's Discussion and Analysis**

GASB Statement No. 34 requires that management provide a narrative introduction, overview, and analysis to accompany the Financial Statements in the form of Management's Discussion and Analysis (MD&A). This letter of transmittal is intended to compliment the MD&A and should be read in conjunction with it. The MD&A can be found immediately following the Independent Auditor's Report.

**Professional Services**

Professional consultants are engaged by the Board to perform certain professional services that are essential to the effective operation of the respective plans. The Certification letters from the independent actuary, in conjunction with our internal actuary, are included in this report. The professional consultants engaged by the Board are listed in the Introductory Section of this report.

**Financial Statement Audit**

Suttle and Stalnaker, PLLC, Certified Public Accountants, issued an unmodified (“clean”) opinion on the West Virginia Consolidated Public Retirement Board’s financial statements for the fiscal year ended June 30, 2017. The independent auditor’s report is located at the front of the Financial Section of this report.

**Highlights and Initiatives**

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the West Virginia Consolidated Public Retirement Board for its comprehensive annual financial report for the fiscal year ended June 30, 2016. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized comprehensive annual financial report. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current comprehensive annual financial report continues to meet the Certificate of Achievement Program’s requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

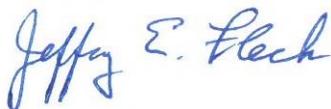
During fiscal year 2015, the WVCPRB began the process of designing our new computer system that, when completed, will enhance the experience of the members and retirees as well as expand the reporting capabilities and increase the efficiency in the administration of the plans. The first phase of our computer project, named COMPASS, “went live” in the first quarter of calendar year 2016 and the second phase “went live” in the second quarter of calendar year 2017.

**Acknowledgments**

The compilation of this report reflects the combined effort of the staff of the West Virginia Consolidated Public Retirement Board under the leadership of its Executive Director and the Guidance of the Board Members. It is intended to provide extensive and reliable information as a basis for making management decisions, determining compliance with legal provisions, and determining responsible stewardship of the funds of the PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS.

We would like to take this opportunity to express our gratitude to the staff, the Governor, the Board of Trustees, the legislature, the consultants, and the many people who have worked so diligently through continued cooperative efforts to assure the successful operation and financial soundness of the PERS, TRS, SPDDRS, SPRS, DSRS, JRS, EMSRS, MPFRS and TDCRS systems.

Sincerely,



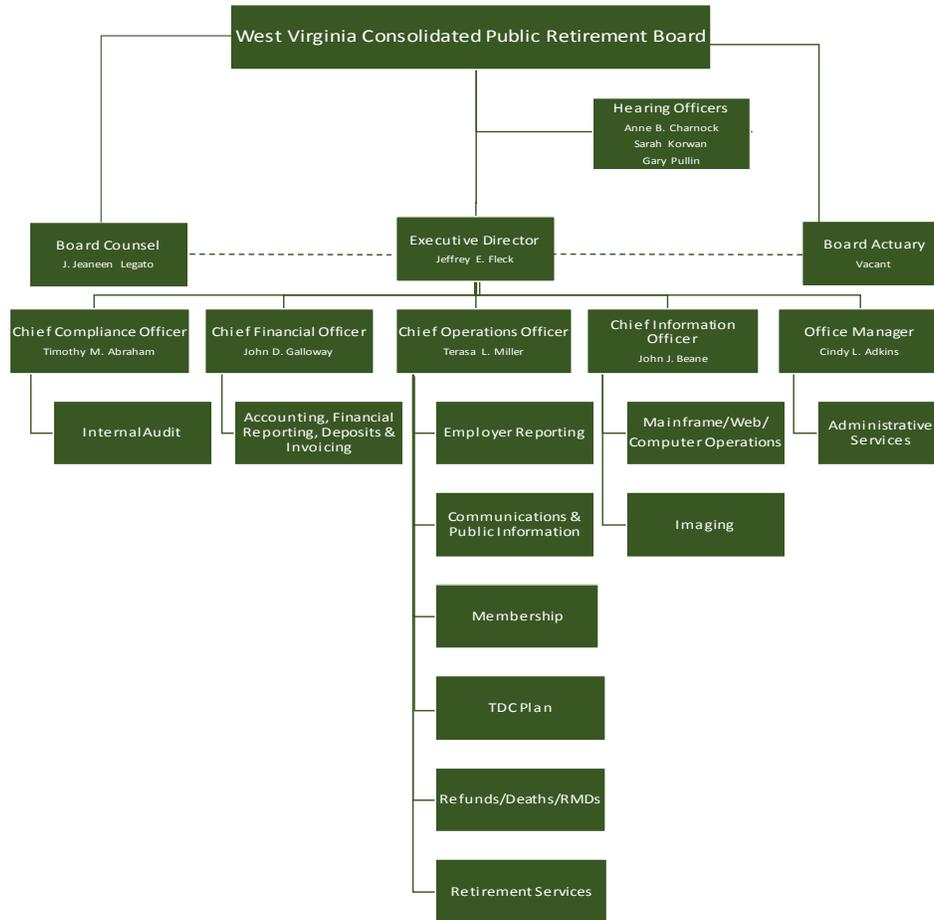
Jeffery E. Fleck  
Executive Director



John D. Galloway  
Chief Financial Officer

**INTRODUCTORY SECTION**  
**Organization Chart**

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**INTRODUCTORY SECTION**  
Board of Trustees

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**West Virginia Consolidated Public Retirement Board**

Board of Trustees

Chairman - David L. Wyant, Esquire  
*Governor James C. Justice, III*  
*State Auditor John B. McCuskey*  
*Treasurer John Perdue*  
*Cabinet Secretary John A. Myers*  
Andy Bird  
Joseph Bunn, Esquire  
Captain Michael Corsaro  
Michael Haney  
Joe Lynch  
Michael McKown  
D. Todd Murray  
C. Jeffrey Vallet

**INTRODUCTORY SECTION**  
Staff and Advisors

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**West Virginia Consolidated Public Retirement Board**

Administrative Staff

Executive Director - Jeffrey E. Fleck  
Executive Assistant - Candi E. Kinslow  
Chief Operating Officer/Deputy Director - Terasa L. Miller  
Administrative Services Manager - Cindy L. Adkins  
Chief Financial Officer - John D. Galloway  
Accounting Manager - Lori A. Cottrill  
Contract Legal Counsel - J. Jeaneen Legato  
Membership Manager - Vicki L. Sutton  
Retirement Services Manager - Lisa Trump  
Employer Reporting Manager - Caroline Brady  
TDC Manager - Paula M. Van Horn  
Refunds/Deaths/RMDs Manager - Deana Gose  
Communications/Public Information Manager - Jamie E. Hardman  
Chief Compliance Officer - Timothy M. Abraham  
Chief IT/Information Officer - John J. Beane

Advisors

Bowles, Rice, LLP, Attorneys  
Conduent Human Resources Services, Consulting Actuary  
West Virginia Investment Management Board, Investment Manager  
Suttle & Stalnaker, PLLC, Independent Certified Public Accountants  
LRWL, Inc., Information Technology



Government Finance Officers Association

**Certificate of  
Achievement  
for Excellence  
in Financial  
Reporting**

Presented to

**The West Virginia**

**Consolidated Public Retirement Board**

For its Comprehensive Annual  
Financial Report  
for the Fiscal Year Ended

**June 30, 2016**

*Christopher P. Morill*

Executive Director/CEO



# FINANCIAL SECTION



## INDEPENDENT AUDITOR'S REPORT

To the Members of the  
West Virginia Consolidated Public Retirement Board  
Charleston, West Virginia

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

We have audited the accompanying financial statements of each of the pension funds (pension trust funds of the State of West Virginia) of the West Virginia Consolidated Public Retirement Board (the Board) as of and for the years ended June 30, 2017 and 2016, and the related notes to the financial statements, which collectively comprise the Board's basic financial statements as listed in the table of contents.

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

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

### ***Auditor's Responsibility***

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

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

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

### ***Opinions***

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of each of the pension funds of the Board, as of June 30, 2017 and 2016, and the respective changes in financial position thereof for the years then ended in accordance with accounting principles generally accepted in the United States of America.

## **Emphasis of Matter**

As discussed in Note 1, the financial statements present only the pension trust funds of the State of West Virginia and do not purport to, and do not present fairly the financial position of the State of West Virginia, as of June 30, 2017 and 2016, the changes in its financial position, or, where applicable, its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America. Our opinion is not modified with respect to this matter.

## **Other Matters**

### *Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis on pages 15 through 20, the schedules of net pension liability and changes in net pension liability, schedules of contributions, schedules of investment returns, and the accompanying notes to the required supplementary information presented on pages 75 through 80 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### *Other Information*

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the Board's basic financial statements. The introductory section, schedule of administrative expenses, schedule of payments to consultants, investment section, actuarial section, and statistical section are presented for purposes of additional analysis and are not a required part of the basic financial statements.

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

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



Charleston, West Virginia  
January 31, 2018

**MANAGEMENT'S DISCUSSION AND ANALYSIS**  
(Unaudited)

The Management of the West Virginia Consolidated Public Retirement Board (WV CPRB) provides this discussion and analysis as an overview of the WV CPRB's financial activities for the fiscal years ended June 30, 2017 and June 30, 2016. This section should be read in conjunction with the Independent Auditor's Report, the audited financial statements, and the accompanying notes to the financial statements.

**FINANCIAL HIGHLIGHTS**

- The net position restricted for pensions (total assets minus total liabilities) of the WV CPRB at June 30, 2017 was approximately \$15.42 billion, increasing over \$1.6 billion (11.89%) from the plan net position restricted for pensions at June 30, 2016. The net position restricted for pensions of the Board at June 30, 2016 was approximately \$13.78 billion, decreasing over \$432 million (-3.0%) from the net position restricted for pensions at June 30, 2015. The net position restricted for pensions is held in trust to meet future benefit obligations.
- Contribution revenue for fiscal year 2017 totaled approximately \$832.72 million, an increase of .90% compared to fiscal year 2016. Contribution revenue for fiscal year 2016 totaled approximately \$825.31 million, a decrease of 8.6% compared to fiscal year 2015. The fluctuations from 2016 to 2017 were due to changes in the employer contribution rates and an increase in other statutorily required contribution amounts.
- Net investment income (loss) for fiscal years 2017 and 2016 were approximately \$2.1 billion and \$(23) million, respectively.
- Total benefits, refunds, and forfeitures paid for fiscal year 2017 were approximately \$1.283 billion, an increase of 4.38% over fiscal year 2016 total benefits, refunds, and forfeitures paid of approximately \$1.229 billion, which was an increase of 5.54% over fiscal year 2015.
- Total administrative expenses for fiscal year 2017 were approximately \$11.14 million, as compared to approximately \$11.09 million in 2016. This represented a .51% increase over the prior year. From 2015 to 2016 administrative expenses increased 5.43%

**OVERVIEW OF THE FINANCIAL STATEMENTS**

The WV CPRB financial statements consist of the *Statements of Fiduciary Net Position - Pension Funds*, *Statements of Changes in Fiduciary Net Position - Pension Funds*, and the *Notes to the Financial Statements*. In addition, *Required Supplementary Information* is presented, which includes this *Management's Discussion and Analysis*.

The *Statements of Fiduciary Net Position - Pension Funds* and the *Statements of Changes in Fiduciary Net Position - Pension Funds* report information about the fiduciary net position as of the end of the fiscal year and the changes in fiduciary net position during the fiscal year. These statements include all assets and liabilities using the accrual basis of accounting. Under the accrual basis of accounting, the current year's additions and deductions are included in the financial activity, regardless of when cash is received or paid. The difference between the total assets and total liabilities on the *Statements of Fiduciary Net Position - Pension Funds*, or net position restricted for pensions, provides a measurement of the financial position of the WV CPRB as of the end of the fiscal year. The *Statements of Changes in Fiduciary Net Position - Pension Funds* provide information on the activities that caused the financial position to change during the fiscal year. Over time, increases or decreases in the net position restricted for pensions of the WV CPRB are one indicator of the whether the systems' financial health is improving or deteriorating.

**MANAGEMENT'S DISCUSSION AND ANALYSIS  
(Unaudited)**

**OVERVIEW OF THE FINANCIAL STATEMENTS (Continued)**

In addition to the basic financial statements, the reader should also review the Required Supplementary Information, which includes the *Schedules of Net Pension Liability and Changes in Net Pension Liability*, *Schedules of Contributions*, and *Schedules of Investment Returns* to gain an understanding of the funded status of the WV CPRB over time. These schedules provide an indication of the WV CPRB's ability to meet both the current and future benefit payment obligations. The *Notes to the Financial Statements* are also essential to the reader's understanding of the financial statements and provide additional information regarding the WV CPRB, such as descriptions of the plans administered by the WV CPRB, including contribution and benefit provisions, and information about the accounting policies and investment activities.

**ANALYSIS OF ASSETS, LIABILITIES AND NET POSITION RESTRICTED FOR PENSIONS**

At June 30, 2017, the WV CPRB had net position restricted for pensions of approximately \$15.42 billion, an increase of over \$1.64 billion (11.89%) from approximately \$13.78 billion at June 30, 2016. This followed the fiscal year 2016 decrease of approximately \$432 million (-3.0%) from the approximately \$14.22 billion of net position restricted for pensions as of June 30, 2015. The assets of the WV CPRB consist primarily of investments. The increase in net position restricted for pensions is primarily the result of investment returns in equity markets. Condensed financial information comparing the WV CPRB plan assets for the past three fiscal years follows.

**CONDENSED FIDUCIARY NET POSITION (in thousands)**

	<u>June 30, 2017</u>	<u>June 30, 2016</u>	<u>FY17-16 Percentage Change</u>	<u>June 30, 2015</u>	<u>FY16-15 Percentage Change</u>
<b><u>ASSETS</u></b>					
Cash	\$ 5,315	\$ 8,666	-38.67%	\$ 27,254	-68.20%
Investments at fair value	15,315,786	13,651,813	12.19%	14,051,639	-2.85%
Contributions receivable	40,711	41,333	-1.50%	33,433	23.63%
Participant loans receivable	2,477	3,026	-18.14%	3,648	-17.05%
Miscellaneous revenue receivable	500	1,265	-60.47%	1,498	-15.55%
Due from State of West Virginia	<u>65,000</u>	<u>85,000</u>	-23.53%	<u>105,000</u>	-19.05%
	15,429,789	13,791,103	11.88%	14,222,472	-3.03%
<b><u>LIABILITIES</u></b>					
Accrued expenses and other payables	<u>7,432</u>	<u>7,343</u>	1.21%	<u>6,435</u>	14.11%
Net position restricted for pensions	<u>\$ 15,422,357</u>	<u>\$ 13,783,760</u>	11.88%	<u>\$ 14,216,037</u>	-3.04%

**MANAGEMENT'S DISCUSSION AND ANALYSIS**  
(Unaudited)

**ANALYSIS OF ADDITIONS AND DEDUCTIONS TO NET POSITION RESTRICTED FOR PENSIONS**

Contributions to WV CPRB increased approximately \$7.41 million (.90%) compared to fiscal year 2016. With the increase in investment income of approximately \$2.1 billion for fiscal year 2017 compared to investment income for fiscal year 2016, the overall increase in revenues for 2017 was (263.06%) compared to revenues for fiscal year 2016.

Contributions to the WV CPRB for fiscal year 2016 decreased by approximately \$78 million (-8.64%) over contributions for fiscal year 2015. With the decrease of net investment income of approximately \$557 million (-104.31%) for fiscal year 2016 compared to investment income for fiscal year 2015, the overall decrease in revenues for 2016 was (-44.01%) compared to revenues for fiscal year 2015.

Total benefits, refunds, and forfeitures paid during the year ended June 30, 2017 were approximately \$1.283 billion, an increase of (4.38%) over fiscal year 2016 total benefits, refunds, and forfeitures paid. Total benefits and refunds paid during the year ended June 30, 2016 were approximately \$1.229 billion, an increase of (5.54%) over fiscal year 2015. The increase in benefit expenses for each year is attributed to more retirees receiving benefits during the fiscal years. Total refunds paid increased approximately \$618 thousand (1.55%) in fiscal year 2017 from fiscal year 2016. Total refunds paid had increased approximately \$3.59 million (14.3%) in fiscal year 2016 over fiscal year 2015.

Administrative expenses for the year ended June 30, 2017 were approximately \$11.14 million, an increase of (.51%) from fiscal year 2016 administrative expenses. Administrative expenses for the year ended June 30, 2016 were approximately \$11.1 million, an increase of (5.4%) over fiscal year 2015 administrative expenses. The increase each year was primarily due to budgetary increases deemed necessary for several expense areas, namely the new Line of Business software implemented during 2017.

**FINANCIAL SECTION**

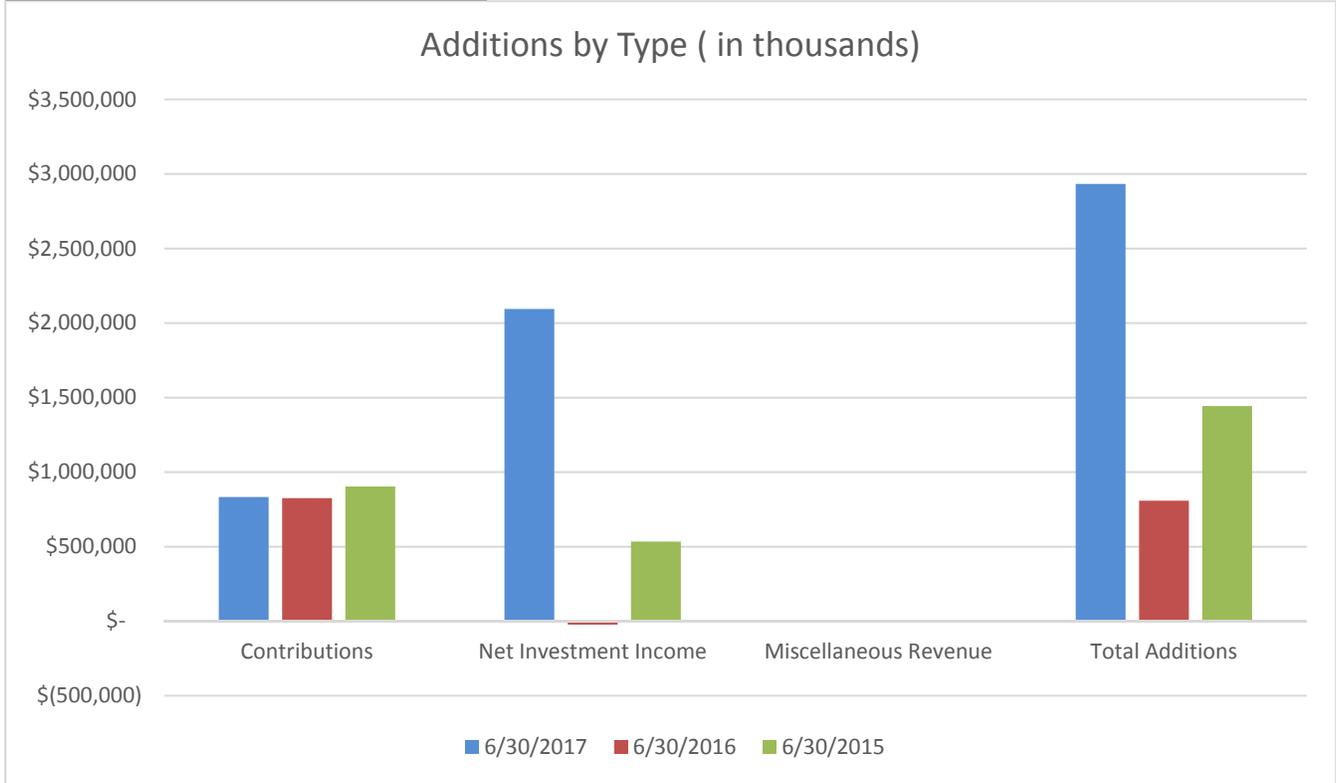
**MANAGEMENT'S DISCUSSION AND ANALYSIS  
(Unaudited)**

**CONDENSED CHANGES IN FIDUCIARY NET POSITION (in thousands)**

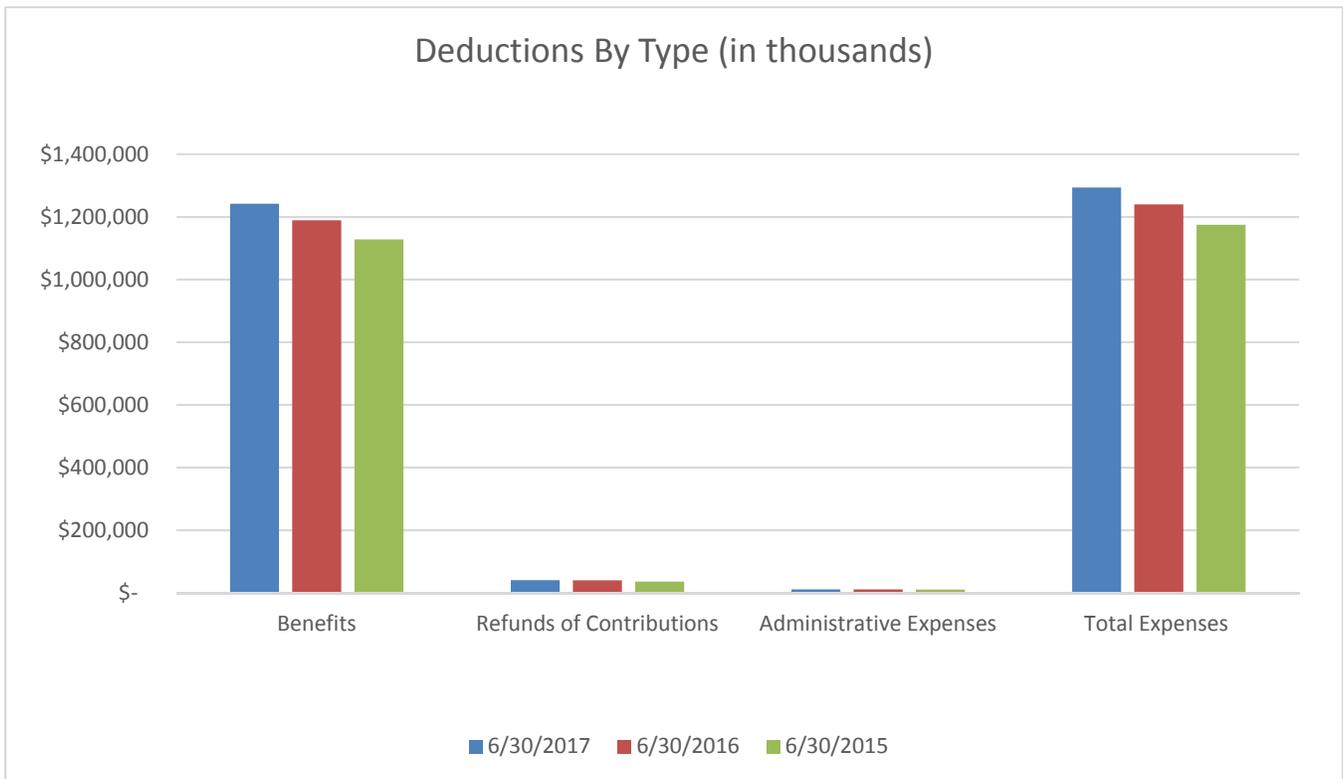
	<u>2017</u>	<u>2016</u>	<u>FY17-16 Percentage Change</u>	<u>2015</u>	<u>FY16-15 Percentage Change</u>
Additions:					
Contributions:					
Member contributions	\$ 173,746	\$ 176,046	-1.31%	\$ 174,059	1.14%
Employer contributions	<u>658,978</u>	<u>649,265</u>	1.50%	<u>729,350</u>	-10.98%
Total contributions	<u>832,724</u>	<u>825,311</u>	.90%	<u>903,409</u>	-8.64%
Investment income:					
Net increase in fair value of investments	1,954,392	(101,788)	2020.06%	452,153	-122.51%
Investment income	<u>139,167</u>	<u>78,769</u>	76.68%	<u>81,801</u>	-3.71%
Net investment income	<u>2,093,559</u>	<u>(23,019)</u>	9194.92%	<u>533,954</u>	-104.31%
Other income					
	<u>6,113</u>	<u>5,391</u>	13.39%	<u>5,198</u>	3.71%
Total additions	<u>2,932,396</u>	<u>807,683</u>	263.06%	<u>1,442,561</u>	-44.01%
Deductions and transfers:					
Benefit expense	1,242,193	1,189,018	4.47%	1,128,067	5.40%
Refunds of contributions/withdrawals	40,462	39,844	1.55%	36,252	9.91%
Administrative expense	<u>11,144</u>	<u>11,098</u>	0.41%	<u>10,526</u>	5.43%
Total deductions and transfers	<u>1,293,799</u>	<u>1,239,960</u>	4.34%	<u>1,174,845</u>	5.54%
Net increase (decrease) in net position	1,638,597	(432,277)	479.06%	267,716	-261.47%
Net position restricted for pensions:					
Beginning of year	<u>13,783,760</u>	<u>14,216,037</u>	-3.04%	<u>13,948,321</u>	1.92%
End of year	<u>\$ 15,422,357</u>	<u>\$ 13,783,760</u>	11.89%	<u>\$ 14,216,037</u>	-3.04%

**MANAGEMENT'S DISCUSSION AND ANALYSIS  
(Unaudited)**

**ADDITIONS BY TYPE (in thousands)**



**DEDUCTIONS BY TYPE (in thousands)**



**MANAGEMENT'S DISCUSSION AND ANALYSIS**  
(Unaudited)

**ECONOMIC FACTORS, FUTURE FUNDING PROVISIONS, OVERALL OUTLOOK**

The defined benefit plans are funded with the expectation that they will return 7.5 percent on the invested assets. When that return is not achieved, there is an increase in the net pension liability. The turmoil in the capital markets in fiscal year 2009 and the subsequent negative return for invested assets increased the net pension liability causing an increase in employer contributions in previous years.

The average investment return for all retirement plans for fiscal 2017 was 15.8% which exceeded our 7.5% target rate. In aggregate, the funds have a five year annualized rates of return at 9.9% which is above the 7.5% long term expectation. The 10 year annualized rate of return is below our target of 7.5% at 6.0%.

**CONTACTING THE WV CPRB**

This report is designed to provide a financial overview of the WV CPRB to state legislators, members of the Board of Trustees of the WV CPRB, state officials, participating employers and any other interested parties. Questions or requests for additional information regarding the financial information presented in this report may be addressed in writing to the West Virginia Consolidated Public Retirement Board, 4101 MacCorkle Avenue, S.E., Charleston West Virginia 25304

West Virginia Consolidated Public Retirement Board  
 Statements of Fiduciary Net Position - Pension Funds  
 (In Thousands)  
 June 30, 2017

	Public Employees' Retirement System	Teachers' Retirement System	State Police Death, Disability and Retirement System	State Police Retirement System	Deputy Sheriff Retirement System	Judges' Retirement System	Emergency Medical Services Retirement System	Municipal Police Officers & Firefighters Retirement System	Teachers' Defined Contribution Retirement System	Total
<b>ASSETS</b>										
Cash	\$ 479	\$ 77	\$ -	\$ -	\$ 46	\$ -	\$ -	\$ -	\$ 4,713	\$ 5,315
Investments at fair value:										
Mutual funds	-	-	-	-	-	-	-	-	247,084	247,084
Collective investment trusts	-	-	-	-	-	-	-	-	90,676	90,676
Guaranteed investment contract (contract value)	-	-	-	-	-	-	-	-	133,068	133,068
Large cap equity	1,314,918	1,478,485	130,581	34,933	42,054	40,196	14,838	1,085	-	3,057,090
Non-large cap equity	265,878	301,980	26,793	6,994	8,450	8,075	2,971	210	-	621,351
International qualified	619,041	710,479	62,649	15,852	19,537	18,525	6,708	463	-	1,453,254
International equity	1,161,509	1,304,818	113,961	30,915	36,601	35,068	13,092	958	-	2,696,922
Private equity	660,702	750,422	65,706	17,288	20,805	19,859	7,335	528	-	1,542,645
Real estate	657,835	769,812	67,657	16,667	20,039	19,130	7,068	510	-	1,558,718
Total return fixed income	626,141	701,801	58,980	17,330	20,309	19,045	7,241	540	-	1,451,387
Core fixed income	267,966	298,234	25,902	7,356	8,686	8,157	3,074	230	-	619,605
Hedge fund	601,483	688,375	59,671	15,016	18,431	17,743	6,457	445	-	1,407,621
TRS annuity	-	(135)	-	-	-	-	-	-	-	(135)
Opportunistic debt	123,627	140,488	12,288	3,241	3,894	3,719	1,374	100	-	288,731
Short term fixed income	12,781	114,834	17,560	891	661	439	297	306	-	147,769
Total investments at fair value	6,311,881	7,259,593	641,748	166,483	199,467	189,956	70,455	5,375	470,828	15,315,786
Contributions receivable	8,159	28,967	-	-	1,005	-	706	147	1,727	40,711
Participants loans receivable	-	2,204	-	-	273	-	-	-	-	2,477
Miscellaneous revenue receivable	5	-	-	208	37	-	4	-	246	500
Due from State of West Virginia	65,000	-	-	-	-	-	-	-	-	65,000
Total assets	6,385,524	7,290,841	641,748	166,691	200,828	189,956	71,165	5,522	477,514	15,429,789
<b>LIABILITIES AND PLAN NET POSITION</b>										
Liabilities:										
Accrued expenses and other payables	427	379	-	3	8	-	-	-	6,615	7,432
Net position restricted for pensions	\$ 6,385,097	\$ 7,290,462	\$ 641,748	\$ 166,688	\$ 200,820	\$ 189,956	\$ 71,165	\$ 5,522	\$ 470,899	\$ 15,422,357

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board  
 Statements of Fiduciary Net Position - Pension Funds  
 (In Thousands)  
 June 30, 2016

	Public Employees' Retirement System	Teachers' Retirement System	State Police Death, Disability and Retirement System	State Police Retirement System	Deputy Sheriff Retirement System	Judges' Retirement System	Emergency Medical Services Retirement System	Municipal Police Officers & Firefighters Retirement System	Teachers' Defined Contribution Retirement System	Total
<b>ASSETS</b>										
Cash	\$ 2,646	\$ 116	\$ 168	\$ 155	\$ 38	\$ 16	\$ 24	\$ 2	\$ 5,501	\$ 8,666
Investments at fair value:										
Mutual funds	-	-	-	-	-	-	-	-	217,622	217,622
Collective investment trusts	-	-	-	-	-	-	-	-	79,560	79,560
Guaranteed investment contract (contract value)	-	-	-	-	-	-	-	-	125,820	125,820
Large cap equity	1,208,725	1,386,945	121,457	29,775	37,009	35,736	12,643	642	-	2,832,932
Non-large cap equity	287,306	330,567	29,329	6,001	8,752	8,576	2,979	151	-	673,661
International qualified	512,339	594,432	52,215	12,443	15,596	15,247	5,314	269	-	1,207,855
International equity	1,034,365	1,181,323	105,304	25,322	31,668	30,934	10,797	551	-	2,420,264
Private equity	582,482	669,655	58,643	14,287	17,840	17,386	6,091	309	-	1,366,693
Real estate	610,902	713,178	63,514	14,145	18,288	17,323	6,095	305	-	1,443,750
Total return fixed income	510,761	574,012	50,605	13,395	15,239	15,478	5,377	258	-	1,185,125
Core fixed income	234,932	263,148	24,353	6,144	7,134	7,070	2,495	136	-	545,412
Hedge fund	580,641	664,889	57,311	15,033	18,794	18,232	6,354	323	-	1,361,577
TRS annuity	-	(135)	-	-	-	-	-	-	-	(135)
Opportunistic debt	27,595	31,268	2,745	688	854	825	292	15	-	64,282
Short term fixed income	7,511	104,030	13,286	894	775	371	407	121	-	127,395
Total investments at fair value	5,597,559	6,513,312	578,762	138,127	171,949	167,178	58,844	3,080	423,002	13,651,813
Contributions receivable	12,163	26,213	-	-	805	-	446	235	1,471	41,333
Participants loans receivable	-	2,705	-	-	321	-	-	-	-	3,026
Miscellaneous revenue receivable	12	740	-	287	154	-	1	-	71	1,265
Due from State of West Virginia	85,000	-	-	-	-	-	-	-	-	85,000
Total assets	5,697,380	6,543,086	578,930	138,569	173,267	167,194	59,315	3,317	430,045	13,791,103
<b>LIABILITIES AND PLAN NET POSITION</b>										
Liabilities:										
Accrued expenses and other payables	-	-	132	-	-	-	-	-	7,211	7,343
Net position restricted for pensions	\$ 5,697,380	\$ 6,543,086	\$ 578,798	\$ 138,569	\$ 173,267	\$ 167,194	\$ 59,315	\$ 3,317	\$ 422,834	\$ 13,783,760

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board  
 Statements of Changes in Fiduciary Net Position - Pension Funds  
 (In Thousands)  
 Year Ended June 30, 2017

	Public Employees' Retirement System	Teachers' Retirement System	State Police Death, Disability and Retirement System	State Police Retirement System	Deputy Sheriff Retirement System	Judges' Retirement System	Emergency Medical Services Retirement System	Municipal Police Officers & Firefighters Retirement System	Teachers' Defined Contribution Retirement System	Total
Additions:										
Contributions:										
Member contributions	\$ 63,578	\$ 91,503	\$ 362	\$ 3,634	\$ 4,166	\$ 372	\$ 2,314	\$ 846	\$ 6,971	\$ 173,746
Employer contributions	165,676	131,289	444	3,657	5,917	747	2,859	846	10,510	321,945
Other statutorily required contributions	-	282,502	-	-	-	-	-	-	-	282,502
Other contributions - appropriations	-	37,656	16,875	-	-	-	-	-	-	54,531
Total contributions	<u>229,254</u>	<u>542,950</u>	<u>17,681</u>	<u>7,291</u>	<u>10,083</u>	<u>1,119</u>	<u>5,173</u>	<u>1,692</u>	<u>17,481</u>	<u>832,724</u>
Investment income:										
Net increase in fair value of investments	821,805	934,557	82,437	20,938	25,591	24,652	8,911	566	34,935	1,954,392
Investment income	<u>53,285</u>	<u>60,538</u>	<u>5,356</u>	<u>1,408</u>	<u>1,691</u>	<u>1,618</u>	<u>595</u>	<u>40</u>	<u>14,636</u>	<u>139,167</u>
Net investment income (loss)	875,090	995,095	87,793	22,346	27,282	26,270	9,506	606	49,571	2,093,559
Other income										
Transfers from plans	1,031	2,822	847	-	433	-	-	-	980	6,113
Total additions	<u>1,105,485</u>	<u>1,541,016</u>	<u>106,321</u>	<u>29,637</u>	<u>37,798</u>	<u>27,389</u>	<u>14,679</u>	<u>2,298</u>	<u>68,032</u>	<u>2,932,655</u>
Deductions and transfers:										
Benefit expenses	402,213	780,030	43,325	957	8,957	4,510	2,201	-	-	1,242,193
Forfeitures	-	-	-	-	-	-	-	-	1,603	1,603
Refunds of contributions/withdrawals	10,566	9,028	-	497	1,186	99	575	79	16,829	38,859
Transfers to plans	-	-	-	-	-	12	-	-	247	259
Administrative expenses	4,989	4,582	46	64	102	6	53	14	1,288	11,144
Total deductions and transfers	<u>417,768</u>	<u>793,640</u>	<u>43,371</u>	<u>1,518</u>	<u>10,245</u>	<u>4,627</u>	<u>2,829</u>	<u>93</u>	<u>19,967</u>	<u>1,294,058</u>
Net increase in plan net position	687,717	747,376	62,950	28,119	27,553	22,762	11,850	2,205	48,065	1,638,597
Net position restricted for pensions:										
Beginning of year:	<u>5,697,380</u>	<u>6,543,086</u>	<u>578,798</u>	<u>138,569</u>	<u>173,267</u>	<u>167,194</u>	<u>59,315</u>	<u>3,317</u>	<u>422,834</u>	<u>13,783,760</u>
End of year	<u>\$ 6,385,097</u>	<u>\$ 7,290,462</u>	<u>\$ 641,748</u>	<u>\$ 166,688</u>	<u>\$ 200,820</u>	<u>\$ 189,956</u>	<u>\$ 71,165</u>	<u>\$ 5,522</u>	<u>\$ 470,899</u>	<u>\$ 15,422,357</u>

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board  
 Statements of Changes in Fiduciary Net Position - Pension Funds  
 (In Thousands)  
 Year Ended June 30, 2016

	Public Employees' Retirement System	Teachers' Retirement System	State Police Death, Disability and Retirement System	State Police Retirement System	Deputy Sheriff Retirement System	Judges' Retirement System	Emergency Medical Services Retirement System	Municipal Police Officers & Firefighters Retirement System	Teachers' Defined Contribution Retirement System	Total
Additions:										
Contributions:										
Member contributions	\$ 62,801	\$ 95,177	\$ 320	\$ 3,755	\$ 4,306	\$ 383	\$ 2,222	\$ 644	\$ 6,438	\$ 176,046
Employer contributions	186,770	133,681	768	3,724	6,071	739	2,744	644	11,401	346,542
Other statutorily required contributions	-	255,042	-	-	-	-	-	-	-	255,042
Other contributions - appropriations	-	34,472	13,209	-	-	-	-	-	-	47,681
Total contributions	<u>249,571</u>	<u>518,372</u>	<u>14,297</u>	<u>7,479</u>	<u>10,377</u>	<u>1,122</u>	<u>4,966</u>	<u>1,288</u>	<u>17,839</u>	<u>825,311</u>
Investment income:										
Net increase (decrease) in fair value of investments	(32,472)	(48,115)	(3,856)	(539)	(856)	(947)	(248)	17	(14,772)	(101,788)
Investment income	25,645	29,712	2,627	630	792	772	266	11	18,314	78,769
Net investment income (loss)	(6,827)	(18,403)	(1,229)	91	(64)	(175)	18	28	3,542	(23,019)
Other income										
Transfers from plans	297	3,918	594	-	494	-	1	-	87	5,391
Total additions	<u>243,041</u>	<u>503,887</u>	<u>13,662</u>	<u>7,570</u>	<u>10,807</u>	<u>947</u>	<u>4,985</u>	<u>1,316</u>	<u>21,468</u>	<u>807,683</u>
Deductions and transfers:										
Benefit expenses	382,577	749,139	41,969	811	8,187	4,382	1,953	-	-	1,189,018
Forfeitures	-	-	-	-	-	-	-	-	1,371	1,371
Refunds of contributions/withdrawals	11,877	10,364	-	260	611	47	605	34	14,675	38,473
Transfers to plans	-	133	-	-	-	-	-	-	-	133
Administrative expenses	4,886	4,507	49	47	99	27	48	11	1,417	11,091
Disability recertification fees	-	-	4	-	2	-	1	-	-	7
Total deductions and transfers	<u>399,217</u>	<u>764,143</u>	<u>42,022</u>	<u>1,118</u>	<u>8,899</u>	<u>4,456</u>	<u>2,607</u>	<u>45</u>	<u>17,453</u>	<u>1,239,960</u>
Net increase (decrease) in plan net position	(156,176)	(260,256)	(28,360)	6,452	1,908	(3,509)	2,378	1,271	4,015	(432,277)
Net position restricted for pensions:										
Beginning of year:	5,853,556	6,803,342	607,158	132,117	171,359	170,703	56,937	2,046	418,819	14,216,037
End of year	<u>\$ 5,697,380</u>	<u>\$ 6,543,086</u>	<u>\$ 578,798</u>	<u>\$ 138,569</u>	<u>\$ 173,267</u>	<u>\$ 167,194</u>	<u>\$ 59,315</u>	<u>\$ 3,317</u>	<u>\$ 422,834</u>	<u>\$ 13,783,760</u>

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

Reporting Entity - During fiscal year 1991, the West Virginia State Legislature created the Consolidated Public Retirement Board (the Board) to administer nine of the State of West Virginia's ten retirement plans. The nine retirement plans included within these financial statements are the Public Employees' Retirement System (PERS), the Teachers' Retirement System (TRS), the State Police Death, Disability and Retirement System (SPDDRS), the State Police Retirement System (SPRS), the Deputy Sheriff Retirement System (DSRS), the Judges' Retirement System (JRS), the Emergency Medical Services Retirement System (EMSRS), Municipal Police Officers and Firefighters Retirement System (MPFRS) and the Teachers' Defined Contribution Retirement System (TDCRS). The Total Pension Funds column included in the statements of fiduciary net position and statements of changes in fiduciary net position is for informational purposes only. The assets of each plan are only available to satisfy the obligations of that plan. The Board's retirement plans are reported as pension trust funds by the State of West Virginia (the State). The Governmental Employees Deferred Compensation Plan is administered by the West Virginia State Treasurer's Office and has been excluded from these financial statements in accordance with Governmental Accounting Standards Board (GASB) Statement No. 32, *Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans*.

The Board is managed by a Board of Trustees, which consists of, by virtue of their position, the Governor, State Auditor, State Treasurer, and Secretary of the Department of Administration, together with the following gubernatorial appointments that are subject to the advice and consent of the State Senate: four residents of the State who are not participants in the retirement plans, one State and one non-State employee participant in PERS, and one participant each from TRS, SPDDRS, SPRS, DSRS, EMSRS, MPFRS and TDCRS.

Pursuant to the West Virginia Code, the Board submits a detailed budgetary schedule of administrative expenses to the Secretary of the Department of Administration prior to the beginning of each fiscal year. The fundamental purpose of budgetary control is to plan for the expected level of operations and to provide management with a tool to control deviation from such plan but does not constitute a legally adopted budget.

Basis of Accounting - Revenue Recognition - The financial statements of the Board have been prepared in conformity with accounting principles generally accepted in the United States of America (GAAP) as applied to governmental units. The Governmental Accounting Standards Board (GASB) is the accepted standard setting body for establishing governmental accounting and financial reporting principles for governmental units. The accompanying pension fund financial statements have been prepared using the economic resources measurement focus and the accrual basis of accounting. Plan member contributions are recognized in the period when contributions are due. Employer contributions to the plan are recognized when due and the employer has made a formal commitment to provide contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of each plan. The Board's assets are held primarily in accounts maintained by the State Treasurer, the West Virginia Investment Management Board (the WVIMB), and the third-party administrator of its defined contribution plan (Empower).

Cash - The State Treasurer has statutory responsibility for the daily cash management activities of the state's agencies, departments, boards and commissions. The amounts on deposit with the State Treasurer are available for immediate withdrawal and, accordingly, are presented as cash and cash equivalents in the accompanying financial statements.

Investments - All defined benefit plan funds not required to meet disbursement needs are invested in accordance with the West Virginia Code, as well as policies established by the WVIMB. The WVIMB has established various investment pools to provide for the investment of the defined benefit plans' assets. These investment pools are structured as multiparticipant variable net asset funds.

The investments in the WVIMB Pools are carried at fair value using the net asset value per share (or its equivalent) as a practical method.

The TDCRS investments are held by an investment company which also serves as the third-party administrator for the plan. As prescribed by West Virginia Code, the TDCRS investments are allocated to participant accounts and the participants direct the investment of their individual account balances by selecting from a list of plan mutual funds or a long term fixed investment option.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)**

The TDCRS investments are carried at fair value (except for fully benefit-responsive investment contracts, which are reported at contract value) as determined by a third-party pricing service utilized by an investment management company. For fully benefit-responsive investment contracts, contract value is the relevant measure for the portion of investments attributable to fully benefit-responsive investment contracts because contract value is the amount participants normally would receive if they were to initiate permitted transactions under the terms of the plan. Investment income for the TDCRS is determined monthly and distributed to the individual participant accounts.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. See Note 4 for further discussion regarding the fair value of the Board's investments.

Contributions Receivable - Contributions receivable represent funds owed to the Board from other government employer or non-government employer entities participating in the various retirement plans.

Participant Loans Receivable - The TRS and DSRS make loans to its members, hired prior to July 1, 2005, up to the lesser of one-half of a member's accumulated contributions or \$8,000, at an interest rate indexed to the interest rate used by the Board for determining actuarial contribution levels. TRS and DSRS loans require repayment over varying terms, with a maximum term of five years and a minimum period of six months.

During the 2008 First Special Session, the West Virginia Legislature passed House Bill 101 regarding retirement benefits for teachers and educational service personnel which became effective March 16, 2008. The legislation provided an opportunity for members of the Teachers' Defined Contribution Retirement System (TDCRS) to elect to transfer to the West Virginia Teachers' Retirement System (TRS). The transfer occurred on July 1, 2008 and a total of 15,152 TDCRS members transferred to TRS. These members were granted 75% service credit under TRS for their years of service in TDCRS. These members were also granted a one-time opportunity to receive a loan in order to purchase the additional 25% service credit at a 7.5% interest rate and with a maximum term of five years. The last day to receive such a loan was June 30, 2010.

Accrued Expenses and Other Payables - Accrued expenses and other payables primarily represent retirement annuity amounts due to new retirees.

Investment Related Expenses - Investments are invested in multiparticipant pools and investment related expenses are not readily separable by participant in each pool. Investment income from the pools is reported net of investment expenses.

Accounting Estimates - The preparation of financial statements in accordance 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, liabilities, and disclosure of actuarial accrued liabilities, contingent assets, and contingent liabilities as of the financial statement date, and the reported amounts of additions and deductions for the reporting period. Actual amounts could differ from those estimates.

The various retirement plans utilize various investment instruments. Investment securities, in general, are exposed to various risks, such as interest rate, credit, and overall market volatility. Due to the level of risk associated with certain investment securities, it is reasonably possible that changes in the value of investment securities will occur in the near term and that such change could materially affect the amounts reported in the statements of fiduciary net position. Changes in the value of investment securities could affect the future funding status of the plans or require additional contributions to maintain the current funding status.

**FINANCIAL SECTION**

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION**

Membership in the plans consisted of the following as of July 1, 2017 and 2016:

As of July 1, 2017:

	<u>PERS</u>	<u>TRS</u>	<u>SPDDRS</u>	<u>SPRS</u>	<u>DSRS</u>	<u>JRS</u>	<u>EMSRS</u>	<u>MPFRS</u>
Retirees and beneficiaries								
currently receiving benefits	26,552	35,007	715	26	369	57	85	-
Terminated members entitled to benefits but not yet receiving them	4,153	2,173	3	9	91	2	50	-
Terminated nonvested members	18,102	3,803	6	121	199	1	137	51
Active members	<u>36,812</u>	<u>34,459</u>	<u>39</u>	<u>595</u>	<u>1,051</u>	<u>42</u>	<u>640</u>	<u>235</u>
 Total	 <u>85,619</u>	 <u>75,442</u>	 <u>763</u>	 <u>751</u>	 <u>1,710</u>	 <u>102</u>	 <u>912</u>	 <u>286</u>

As of July 1, 2016:

	<u>PERS</u>	<u>TRS</u>	<u>SPDDRS</u>	<u>SPRS</u>	<u>DSRS</u>	<u>JRS</u>	<u>EMSRS</u>	<u>MPFRS</u>
Retirees and beneficiaries								
currently receiving benefits	26,293	35,440	747	24	353	54	81	-
Terminated members entitled to benefits but not yet receiving them	4,214	1,867	3	11	102	1	63	-
Terminated nonvested members	16,474	3,258	1	124	204	2	144	43
Active members	<u>36,150</u>	<u>35,811</u>	<u>42</u>	<u>611</u>	<u>1,042</u>	<u>42</u>	<u>586</u>	<u>191</u>
 Total	 <u>83,131</u>	 <u>76,376</u>	 <u>793</u>	 <u>770</u>	 <u>1,701</u>	 <u>99</u>	 <u>874</u>	 <u>234</u>

Funding policies for all plans have been established by and are changed from time-to-time by action of the State Legislature. While contribution rates are legislatively determined, actuarial valuations are performed to assist the Board and the State Legislature in determining contribution rates. The following information is provided for general information purposes only. Plan participants should refer to the respective West Virginia State Code Section for more complete information.

**Defined Benefit Plans**

Public Employees' Retirement System

*Plan Description* - PERS is a multiple employer defined benefit cost sharing public employee retirement system covering substantially all employees of the State and its component units, as well as employees of participating non-State governmental entities who are not participants of another state or municipal retirement system. The numbers of participating employers are as follows:

	<u>June 30, 2017</u>	<u>June 30, 2016</u>
West Virginia state agencies	138	134
Cities and towns	118	116
Counties	55	55
Special districts	<u>344</u>	<u>341</u>
	 <u>655</u>	 <u>646</u>

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)**

PERS provides retirement benefits as well as death and disability benefits. Qualification for normal retirement is age 60 with five years of service or at least age 55 with age and service equal to 80 or greater. A member may retire with the pension reduced actuarially if the member is at least age 55 and has at least 10 years of contributory service, or at any age with 30 years of contributory service. For all employees hired after July 1, 2015, qualification for normal retirement is age 62 with 10 years of service. A member hired after July 1, 2015 may retire with the pension reduced actuarially if the member is between ages 60 and 62 with at least ten years of contributory service, between ages 57 and 62 with at least twenty years of contributory service, or between ages 55 and 62 with at least thirty years of contributory service. The straight life annuity retirement benefit is equivalent to 2% of average salary multiplied by years of service. Average salary is the average of the three consecutive highest annual earnings out of the last fifteen years of earnings. For all employees hired after July 1, 2015, average salary is the average of the five consecutive highest annual earnings out of the last fifteen years of earnings. Terminated members with at least five years of contributory service who do not withdraw their accumulated contributions may elect to receive their retirement annuity beginning at age 62. For all employees hired after July 1, 2015, this age increases to 64 with at least ten years of contributory service, or age 63 with at least twenty years of contributory service.

Chapter 5, Article 10 of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the State Legislature. In certain circumstances, this Article also permits members of TRS to transfer accumulated service credit and member contributions into PERS.

*Contributions* - Per Chapter 5, Article 10, for periods prior to July 1, 2015, the members contribute 4.5% of annual earnings. Effective July 1, 2015, newly hired members contribute 6% of annual earnings. State and non-state governmental employers' contribution rates were 12.0% and 13.5% of covered employees' annual earnings for fiscal years ending June 30, 2017 and 2016, respectively. Effective July 1, 2017 the employer contribution rate decreased to 11% of members' annual earnings. Contributions as a percentage of payroll for members are established by statutes, subject to legislative limitations and are not actuarially determined. Contributions as a percentage of payroll for employers are established by the Board. Employer contributions from State and non-State agencies for the fiscal years ended June 30, 2017 and 2016, were (in thousands):

	2017	2016
State	\$ 109,742	\$ 125,089
Non-State	55,934	61,681
	\$ 165,676	\$ 186,770

Teachers' Retirement System

*Plan Description* - TRS is a multiple employer defined benefit cost sharing public employee retirement system covering all full-time employees of the 55 county public school systems in the State and certain personnel of the 13 State-supported institutions of higher education, State Department of Education and the Higher Education Policy Commission hired prior to July 1, 1991. Employees of the State-supported institutions of higher education and the Higher Education Policy Commission hired after June 30, 1991, are required to participate in the Higher Education Retirement System. TRS closed membership to new hires effective July 1, 1991. However, effective July 1, 2005, all new employees hired for the first time are required to participate in TRS. There were 79 employers and one non-employer contributing entity participating in TRS as of June 30, 2017.

During the 2008 First Special Session, the West Virginia Legislature passed House Bill 101 regarding retirement benefits for teachers and educational service personnel which became effective March 16, 2008. The legislation provided an opportunity for members of the Teachers' Defined Contribution Retirement System (TDCRS) to elect to transfer to the West Virginia Teachers' Retirement System (TRS). The transfer occurred on July 1, 2008 and a total of 15,152 TDCRS members transferred to TRS.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)**

TRS provides retirement benefits as well as death and disability benefits. A member is eligible for normal retirement at age 60 with five years of service, age 55 with 30 years of service or any age with 35 years of service. A member may retire with the pension reduced actuarially if the member is less than age 55 and has between 30 and 35 years of service. For all employees hired after July 1, 2015, qualification for normal retirement is age 62 with 10 years of service. All members hired after July 1, 2015 may retire with the pension reduced actuarially if the member is between ages 60 and 62 with 10 years of service or between ages 55 and 62 with 30 years of service. Terminated members with at least five, but less than 20, years of credited service who do not withdraw their accumulated contributions are entitled to a deferred retirement commencing at age 62. Terminated members with at least twenty years of credited service who do not withdraw their accumulated contributions are entitled to a deferred retirement commencing at age 60. For all employees hired after July 1, 2015, this age increases to 64 with ten years of service, or age 63 with 20 years of service. Retirement benefits are equivalent to 2% of average annual salary multiplied by years of service. Average salary is the average of the 5 highest fiscal years of earnings during the last 15 fiscal years of earnings.

Chapter 18, Article 7A of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the State Legislature.

*Contributions* - A member who withdraws from service for any cause other than death or retirement may request that the accumulated employee contributions plus interest be refunded.

TRS funding policy provides for member contributions based on 6% of members' gross salary. Contributions as a percentage of payroll for members and employers are established by State law and are not actuarially determined. Employers make the following contributions:

The State, county boards of education, and other employers contribute 15% of gross salary of their TRS members hired prior to July 1, 1991. The State, county boards of education, and other employers contribute 7.5% of the gross salary of their TRS covered employees hired for the first time after July 1, 2005 and for those TDCRS members who selected to transfer to TRS effective July 1, 2008. The other employers and county boards of education, utilizing funds made available through the State's School Aid Formula (SAF) contribute 7.5% of the gross salary of their TDCRS covered employees. In addition, the State contributes a certain percentage of fire insurance premiums paid by State residents to assist in extinguishing the TRS unfunded liability within 40 years of June 30, 1994. Other statutorily required contributions of \$282,501,656 and \$255,042,149 were made through the State's school aid formula during the years ended June 30, 2017 and 2016, respectively. Certain additional contributions of approximately \$37,656,000 and \$34,472,000 were made during the years ended June 30, 2017 and 2016, respectively, representing extra appropriations to reduce the unfunded liability.

State Police Death, Disability and Retirement System

*Plan Description* - SPDDRS is a single employer defined benefit public employee retirement system covering all West Virginia State Police (State Police) hired on or before March 11, 1994. This plan is closed to new entrants.

SPDDRS provides retirement benefits as well as death and disability benefits. A member is eligible for normal retirement at age 50 after 20 years of contributory service, or at any age upon completion of 25 years of service. There is no vesting in the State's contributions prior to ten years of service. Benefits payable to members retiring prior to age 50 are deferred until the normal retirement date. The annual retirement benefit is 5.5% of the members' aggregate salary, but not less than \$6,000 per year. Total service related disability benefits are equal to the member's annual salary, but not less than \$15,000 per year. Aggregate salary is the total salary paid to a member during his or her period of service, which may include up to 5 years of active military service credited at the average departmental salary. Aggregate salary for purposes of determining disability benefits may include salary that would have been earned had the participant served at least 25 years notwithstanding the disability. An annual cost-of-living adjustment of 3.75% is granted to retirees and beneficiaries. For service-connected total disability retirees, the adjustment begins at age 65. A member who terminates employment is entitled to a refund of his or her contributions plus interest.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)**

*Contributions* - SPDDRS funding policy provides for member contributions based on 9% of their annual earnings. The State makes contributions based on 15% of the annual payroll of State Police, as well as contributing all revenue generated by the sale of traffic accident reports, criminal investigation reports and other fees. In addition, certain additional contributions of approximately \$16,875,000 and \$13,209,000 were made during the years ended June 30, 2017 and 2016, respectively, representing extra appropriations to reduce the unfunded liability. Contributions, as a percentage of payroll for members and the employer, are established by State law and are not actuarially determined.

State Police Retirement System

*Plan Description* - SPRS is a single employer defined benefit public employee retirement system that was established for all State Police hired on or after March 12, 1994. SPRS provides retirement, death, and disability benefits. A member is eligible for normal retirement at age 50 with 25 years of service or age 52 with 20 years of credited service. A member is eligible for a reduced benefit with 20 years of credited service and retiring before age 52. The annual regular retirement benefit, paid monthly, is equal to 2.75% of the final average salary multiplied by the years of service. Final average salary is the average of the five highest calendar years of earnings during the last ten years of earnings. Annual retirement annuity adjustments are 1.0% for regular retirement and are payable on July 1 of each year after the member reaches 63 years of age.

*Contributions* - Members contribute 12% of annual base salary. Employer contribution rates were 12.0% of covered employees' annual base salary for fiscal years ending June 30, 2017 and 2016. Effective July 1, 2017, the employer contribution rate increased to 14% of covered employees' annual base salary.

Chapter 15, Article 2 and Article 2A of the West Virginia State Code assigns the authority to establish and amend the provisions of the SPDDRS and SPRS plans to the State Legislature.

Deputy Sheriff Retirement System

*Plan Description* - DSRS, a multiple employer defined benefit cost sharing public employee retirement system, was established for all deputy sheriffs hired by all 55 county governments on or after July 1, 1998. The DSRS was also made available to any deputy sheriff employed in covered employment participating in PERS on the effective date so long as he/she made notification in writing before January 31, 1999, to both the County Commission in the county in which he/she was employed and the Board of his/her desire to transfer to the DSRS. Approximately 600 deputy sheriffs elected such transfer and as a result, approximately \$28,638,000 of accumulated member and employer contributions and interest were transferred from PERS to DSRS in fiscal year 1999, in accordance with Chapter 7, Article 14D of the West Virginia State Code. There were 55 employers participating in DSRS as of June 30, 2017.

DSRS provides retirement as well as death and disability benefits. A member is eligible for normal retirement under the following circumstances:

1. Member is in covered employment, with attainment of at least age 55 with age plus service equal to 70 or greater
2. Member is in covered employment, has attained the age of 60 years, and has completed five or more years of service
3. Attainment of the age of 50 and completion of 20 or more years of service
4. Attainment of the age of 62 years and has completed five or more years of service

The annual regular retirement benefit is equal to 2.25% of a member's final average salary multiplied by the member's years of credited service. Final average salary refers to the average of the highest annual compensation received for covered employment by the member during any five consecutive plan years within the member's last ten years of service. A member may elect to receive retirement income payments equal to his/her accrued benefit in the normal form or in a variety of annuity options. The normal form signifies a monthly annuity which is 1/12 of the amount of a members accrued benefit which is payable for the member's life.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)**

Benefit payments did not begin prior to January 1, 2000, except benefit payments resulting from disability.

Chapter 7, Article 14D of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the State Legislature.

*Contributions* - Members contribute 8.5% of monthly base salary, and the Sheriff's Office/County Commission of the County in which the member is employed contributed an additional 12% of the member's monthly salary during both the years ended June 30, 2017 and 2016. In addition, the Sheriff's Office/County Commissions contribute certain fees charged for reports and other services provided by the sheriff's offices.

Judges' Retirement System

*Plan Description* - JRS is a single employer defined benefit public employee retirement system covering State judges and justices who elect to participate. JRS provides retirement as well as death and disability benefits. A member who was appointed or elected to the bench prior to July 2, 2005 is eligible for normal retirement upon the attainment of 24 years of service of which at least 12 years is as a sitting judge or justice, 16 years of service at age 65 of which at least 12 years is as a sitting judge or justice, or 8 full years of service after age 65. A member who was appointed or elected to the bench on or after July 2, 2005 is eligible for normal retirement upon the attainment of 24 years of service of which at least 14 years is as a sitting judge or justice, or 16 years of service at age 65 of which 14 years is as a sitting judge or justice. A member on the bench prior to July 2, 2005 is eligible for a deferred benefit at age 65 provided the member completes 16 years of service of which 12 years of service is as a sitting judge or justice. A member of the bench on or after July 2, 2005 is eligible for a deferred benefit at age 65 provided the member completes 16 years of service of which 14 years of service are as a sitting judge or justice.

The annual benefit paid to judges and justices appointed or elected prior to July 2, 2005 is 75% of the current annual salary of the office from which the participant retires, with surviving spouse and dependent child benefits. This benefit is proportionally increased upon increase in salary for active sitting judges and justices.

The annual benefit paid to judges and justices appointed or elected on or after July 2, 2005 is 75% of the member's final average salary. Final average salary means the average of the highest thirty-six consecutive month's compensation received as a judge or justice. No increases in benefits are given by virtue of increase in salary of active sitting judges or justices.

Chapter 51, Article 9 of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the State Legislature.

*Contributions* - JRS funding policy provides for member contributions based on 7% of their annual earnings. This policy also provides for periodic employer contributions at varying amounts appropriated annually by the State Legislature. However, annual appropriations are determined in consideration of the most recent actuarial valuation. Any participant who terminates before becoming eligible for benefits may elect to withdraw his or her contributions without interest.

Emergency Medical Services Retirement System (EMSRS)

*Plan Description* - EMSRS is a multiple employer defined benefit cost sharing retirement system. The EMSRS Act was passed by the Legislature in March 2007. The legislation provided for a voluntary participation election of eligible emergency medical service officers and mandated that certain participation levels be reached by December 31, 2007, in order for the provisions of the Emergency Medical Services Retirement System to become effective. At the close of the election period, fifteen licensed EMS public employers, consisting of twelve eligible Public Employees Retirement System (PERS) political subdivisions and three eligible Non-PERS political subdivisions, passed corporate resolutions to become participating public employers of this retirement system. Statewide, over five hundred eligible Emergency Medical Services Officers elected to opt into this new retirement plan. The WV Emergency Medical Services Retirement System (EMSRS) became effective January 1, 2008. There were 14 employers participating in EMSRS as of June 30, 2017.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)**

The statute prohibited any payout of benefits from the EMSRS fund prior to January 1, 2011, with the exception of duty disability retirement. An EMSRS member is eligible for "normal" retirement when one of the following occurs:

- Attainment of age 50 and the completion of 20 years of contributory service; or
- Attainment of age 50 when age plus contributory service equals 70 while still in covered employment; or
- Attainment of age 60 and completion of 10 years contributory service while still in covered employment; or
- Attainment of age 62 and completion of 5 years of contributory service.

An EMSRS member is eligible for "early retirement" when they reach age 45 and have completed 20 years of service.

Final Average Salary (FAS) is the average of the highest annual compensation received by the member during covered employment for any 5 consecutive plan years (Jan. 1- Dec. 31) within the last 10 years of service. The accrued benefit on behalf of any member is calculated as follows:

Final Average Salary x Years of Credited Service x Benefit Percentage

Annual Retirement Benefit Formula

2.75% x FAS x Years of Service for years 1-20  
2.00% x FAS x Years of Service for years 21-25  
1.50% x FAS x Years of Service for years 26+

Chapter 16, Article 5V of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the State Legislature.

*Contributions* - Currently, the EMSRS employee contribution rate is 8.5% of gross monthly salary and the employer contribution rate is 10.5% of gross monthly salary.

Municipal Police Officers and Firefighters Retirement System (MPFRS)

*Plan Description* - MPFRS is a multiple employer defined benefit cost sharing plan. The MPFRS Act was passed by the Legislature in November 2009, and became effective January 1, 2010. The legislation provided for any municipality or municipal subdivision employing municipal police officers or firefighters to elect to become a participating employer. MPFRS is a multiple employer defined benefit retirement system. The MPFRS had 275 participating members as of June 30, 2017. All police officers and firefighters first employed in covered employment after the date the municipality or municipal subdivision elected to join MPFRS are required to be members of MPFRS. There were 21 employers participating in MPFRS as of June 30, 2017.

A MPFRS member is eligible for "normal" retirement when one of the following occurs:

- Attainment of age 50 and the completion of 20 years of contributory service; or
- Attainment of age 50 when age plus contributory service equals 70 while still in covered employment; or
- Attainment of age 60 and completion of 10 years contributory service while still in covered employment; or
- Attainment of age 62 and completion of 5 years of contributory service.

Final Average Salary (FAS) is the average of the highest annual compensation received by the member during covered employment for any 5 consecutive plan years (Jan. 1 - Dec. 31) within the last 10 years of service. The accrued benefit on behalf of any member is calculated as follows, not to exceed 67%:

Final Average Salary x Years of Credited Service x Benefit Percentage

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)**

Annual Retirement Benefit Formula

2.6% x FAS x Years of Credited Service for years 1-20  
2.0% x FAS x Years of Credited Service for years 21-25  
1.0% x FAS x Years if Credited Service for years 26-30

Chapter 8, Article 22A of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the State Legislature.

*Contributions* - Currently, the MPFRS employee contribution rate is 8.5% of gross monthly salary and the employer contribution rate is 8.5% of gross monthly salary.

**Teachers' Defined Contribution Retirement System**

*Plan Description* - TDCRS is a multiple employer defined contribution retirement system, which is a money purchase pension plan covering primarily full-time employees of the State's 55 county public school systems, the State Department of Education, and the Schools for the Deaf and Blind who were hired between July 1, 1991 and June 30, 2005. TDCRS members also include former TRS plan members, including higher education employees, who have elected to transfer into or participate in TDCRS. TDCRS benefits depend solely on amounts contributed to the plan plus investment earnings. Employees are eligible to participate from the date of employment. TDCRS closed participation to new members effective June 30, 2005.

During the 2008 First Special Session, the West Virginia Legislature passed House Bill 101 regarding retirement benefits for teachers and educational service personnel which became effective March 16, 2008. The legislation provided an opportunity for members of the Teachers' Defined Contribution Retirement System (TDCRS) to elect to transfer to the West Virginia Teachers' Retirement System (TRS). The transfer occurred on July 1, 2008 and a total of 15,152 TDCRS members transferred to TRS.

The TDCRS provides members with a choice of 20 separate investment options made up of fixed income, balanced, large cap, mid cap, small cap, and international mutual funds, a money market fund and a fixed annuity.

*Contributions* - State law requires employees to contribute 4.5% of their gross compensation and the employers to contribute 7.5% of covered members' gross compensation. Employer contributions are comprised from amounts allocated to the employers through the State's School Aid Formula, forfeitures allotted from the TDCRS and county contributions. Employer contributions for each employee (and interest allocated to the employee's account) become partially vested after six years and fully vested after 12 complete years of service. If a terminated employee does not return to active participant status within five years, the nonvested employer contributions and earnings thereon are forfeited to reduce the employer's current period contribution requirement. Any such forfeitures arising from contributions, plus earnings thereon, will be used to reduce future employer contributions.

**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS**

The total pension liabilities for financial reporting purposes were determined by actuarial valuations as of July 1, 2016 and 2015 and rolled forward to June 30, 2017 and 2016, respectively, using the actuarial assumptions and methods described in the *Actuarial Assumptions and Methods* section of this note.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Schedule of Net Pension Liability

The schedules of net pension liability and changes in net pension liability, presented as required supplemental information (RSI) following the notes to the financial statements, present trend information about whether the actuarial values of plan fiduciary net position are increasing or decreasing over time relative to the actuarial values of the total pension liability. Selected information for each plan as of June 30, 2017 and 2016 were as follows (in thousands):

As of June 30, 2017:	<u>Total Pension Liability</u>	<u>Plan Fiduciary Net Position</u>	<u>Net Pension Liability (Asset)</u>	<u>Plan Fiduciary Net Position as a Percentage of the Total Pension Liability</u>
PERS	\$ 6,816,742	\$ 6,385,097	\$ 431,645	93.67%
TRS	10,745,434	7,290,462	3,454,972	67.85%
SPDDRS	741,892	641,585	100,307	86.48%
SPRS	173,248	166,688	6,560	96.21%
DSRS	204,567	200,820	3,747	98.17%
JRS	113,726	189,956	(76,230)	167.03%
EMSRS	71,482	71,165	317	99.56%
MPFRS	2,714	5,522	(2,808)	203.46%

As of June 30, 2016:	<u>Total Pension Liability</u>	<u>Plan Fiduciary Net Position</u>	<u>Net Pension Liability (Asset)</u>	<u>Plan Fiduciary Net Position as a Percentage of the Total Pension Liability</u>
PERS	\$ 6,616,588	\$ 5,697,470	\$ 919,118	86.11%
TRS	10,652,921	6,543,087	4,109,834	61.42%
SPDDRS	729,007	578,798	150,209	79.40%
SPRS	146,038	138,569	7,469	94.89%
DSRS	205,104	173,268	31,836	84.48%
JRS	113,449	167,194	(53,745)	147.37%
EMSRS	66,075	59,315	6,760	89.77%
MPFRS	1,903	3,317	(1,414)	174.30%

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Long-Term Expected Rates of Return

The long-term rates of return on pension plan investments were determined using the building block method in which estimates of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentages and by adding expected inflation. Best estimates of long-term geometric rates of return are summarized in the following tables and were used for all defined benefit plans for the years ended June 30, 2017 and 2016:

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-term Expected Rate of Return</u>	<u>Weighted Average Expected Real Rate of Return</u>
US Equity	27.5%	7.0%	1.92%
International Equity	27.5%	7.7%	2.12%
Core Fixed Income	7.5%	2.7%	0.20%
High Yield Fixed Income	7.5%	5.5%	0.41%
TIPS	0.0%	2.7%	0.00%
Real Estate	10.0%	7.0%	0.70%
Private Equity	10.0%	9.4%	0.94%
Hedge Funds	10.0%	4.7%	0.47%
 Total	 <u>100.0%</u>		 6.76%
Inflation (CPI)			<u>1.90%</u>
			<u>8.66%</u>

Discount Rate

The discount rate used to measure the total pension liability was 7.5% for all defined benefit plans for fiscal years 2017 and 2016. The projections of cash flows used to determine the discount rates assumed that employer contributions will continue to follow the current funding policies. Based on those assumptions, the fiduciary net position of each defined benefit pension plan was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rates of return on pension plan investments were applied to all periods of projected benefit payments to determine the total pension liabilities of each plan.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Regarding the sensitivity of the net pension liability to changes in the discount rate, the following table presents the plans' net pension liabilities calculated using the current discount rate of 7.5% as well as the plans' net pension liabilities if they were calculated using a discount rate that is one percentage point lower or one percentage point higher as of June 30, 2017 and 2016, respectively (in thousands):

	Total Net Pension Liability (Asset)		
	Current		
	1% Decrease (6.5%)	Discount Rate (7.5%)	1% Increase (8.5%)
As of June 30, 2017:			
PERS	\$ 1,194,983	\$ 431,645	\$ (213,751)
TRS	4,548,621	3,454,972	2,520,522
SPDDRS	197,677	100,307	21,045
SPRS	38,354	6,560	(18,846)
DSRS	32,518	3,747	(19,938)
JRS	(63,701)	(76,230)	(86,873)
EMSRS	11,261	317	(8,515)
MPFRS	(2,078)	(2,808)	(3,352)

	Total Net Pension Liability (Asset)		
	Current		
	1% Decrease (6.5%)	Discount Rate (7.5%)	1% Increase (8.5%)
As of June 30, 2016:			
PERS	\$ 1,663,751	\$ 919,118	\$ 286,731
TRS	5,199,286	4,109,834	3,178,615
SPDDRS	245,100	150,209	72,654
SPRS	34,483	7,469	(14,165)
DSRS	59,830	31,836	8,704
JRS	(41,066)	(53,745)	(64,498)
EMSRS	16,577	6,760	(1,280)
MPFRS	(955)	(1,414)	(1,765)

**West Virginia Consolidated Public Retirement Board  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Annual Money-Weighted Rates of Return

The following table provides the annual money-weighted rates of return, net of investment expenses, for the years ending June 30, 2017 and 2016, respectively, for each defined benefit pension plan:

	Annual Money Weighted Rate of Return	
	2017	2016
PERS	15.82%	-0.12%
TRS	15.70%	-0.28%
SPDDRS	15.71%	-0.21%
SPRS	15.86%	0.07%
DSRS	15.83%	-0.04%
JRS	15.88%	-0.10%
EMS	15.87%	0.03%
MPFRS	15.72%	1.13%

Actuarial Assumptions and Methods

Significant assumptions used in the actuarial valuations are as follows:

PERS	June 30, 2017	June 30, 2016
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2035	Through Fiscal Year 2035
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases:		
PERS:		
State	3.0-4.6% %	3.0-4.6% %
Nonstate	3.35-6.0% %	3.35-6.0% %
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active-100% of RP-2000 Non-Annuitant, Scale AA fully generational Retired healthy males-110% of RP-2000 Healthy Annuitant, Scale AA fully generational Retired healthy females-101% of RP-2000 Healthy Annuitant, Scale AA fully generational Disabled Males-96% of RP2000 Disabled Annuitant, Scale AA fully generational Disabled Females-107% of RP-2000 Disabled Annuitant, Scale AA fully generational	Active-100% of RP-2000 Non-Annuitant, Scale AA fully generational Retired healthy males-110% of RP-2000 Healthy Annuitant, Scale AA fully generational Retired healthy females-101% of RP-2000 Healthy Annuitant, Scale AA fully generational Disabled Males-96% of RP2000 Disabled Annuitant, Scale AA fully generational Disabled Females-107% of RP-2000 Disabled Annuitant, Scale AA fully generational
Withdrawal rates		
State	1.75-35.10%	1.75-35.10%
Non-state	2-35.88%	2-35.88%
Disability rates	0.007 - .675%	0.007 - .675%
Retirement rates	12% - 100%	12% - 100%
Date range in most recent experience study	2009-2014	2009-2014

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<b>TRS</b>	<b>June 30, 2017</b>	<b>June 30, 2016</b>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2034	Through Fiscal Year 2034
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases:		
TRS:		
Teachers	3.00-6.00%	3.00-6.00%
Non-Teachers	3.00-6.50%	3.00-6.50%
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active-100% of RP-2000 Non-Annuitant, Scale AA fully generational Retired healthy males-97% of RP-2000 Healthy Annuitant, Scale AA fully generational Retired healthy females-94% of RP-2000 Healthy Annuitant, Scale AA fully generational Disabled Males-96% of RP2000 Disabled Annuitant, Scale AA fully generational Disabled Females-101% of RP-2000 Disabled Annuitant, Scale AA fully generational	Active-100% of RP-2000 Non-Annuitant, Scale AA fully generational Retired healthy males-97% of RP-2000 Healthy Annuitant, Scale AA fully generational Retired healthy females-94% of RP-2000 Healthy Annuitant, Scale AA fully generational Disabled Males-96% of RP2000 Disabled Annuitant, Scale AA fully generational Disabled Females-101% of RP-2000 Disabled Annuitant, Scale AA fully generational
Withdrawal rates		
Teachers	0.8%-35%	0.8-35%
Non-Teachers	1.316-24.75%	1.316-24.75%
Disability rates	0.008 - 0.704%	0.008 - 0.704%
Retirement rates	15% - 100%	15% - 100%
Date range in most recent experience study	2010 - 2015	2010 - 2015

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<b>SPDDRS</b>	<b>June 30, 2017</b>	<b>June 30, 2016</b>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2025	Through Fiscal Year 2025
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases:		
SPDDRS:	4.0%	5.0% for first 2 yrs of service 4.5% for the next 3 yrs of service 4.0% for the next 5 yrs and 3.25% thereafter
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active – 100% of RP-2014 Non-Annuitant tables (sex-distinct), Scale MP-2016 fully generational Healthy Male Retirees – 103% of RP-2014 Male Healthy Annuitant table, Scale MP-2016 fully generational Healthy Female Retirees – 100% of RP-2014 Female Healthy Annuitant tables, Scale MP-2016 fully generational Disabled Males – 100% of RP-2014 Male Disabled Annuitant table, Scale MP-2016 fully generational Disabled Females – 100% of RP-2014 Female Disabled Annuitant table, Scale MP-2016 fully generational	Active – RP-2000 Non-Annuitant tables projected to 2020 scale BB Healthy Retirees – RP-2000 Healthy Annuitant tables projected to 2025, scale BB Disabled – RP-2000 Healthy Annuitant tables projected to 2025, scale BB, set forward 1 year
Withdrawal rates	0.08 - 2.67%	0.08 - 2.67%
Disability rates	0.04 - 0.60%	0.05 - 0.60%
Retirement rates	25% - 100%	20% - 100%
Date range in most recent experience study	2011 - 2016	2006 - 2011

**West Virginia Consolidated Public Retirement Board  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<u>SPRS</u>	<u>June 30, 2017</u>	<u>June 30, 2016</u>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2026	Through Fiscal Year 2026
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases	4.0%	5.0% for first 2 yrs of service, 4.5% for next 3 yrs of service, 4.0% for the next 5 yrs, and 3.25% thereafter
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active – 100% of RP-2014 Non-Annuitant tables (sex-distinct), Scale MP-2016 fully generational Healthy Male Retirees – 103% of RP-2014 Male Healthy Annuitant table, Scale MP-2016 fully generational Healthy Female Retirees – 100% of RP-2014 Female Healthy Annuitant tables, Scale MP-2016 fully generational Disabled Males – 100% of RP-2014 Male Disabled Annuitant table, Scale MP-2016 fully generational Disabled Females – 100% of RP-2014 Female Disabled Annuitant table, Scale MP-2016 fully generational	Active – RP-2000 Non-Annuitant tables; Projected to 2020 scale BB Healthy Retirees – RP-2000 Healthy Annuitant tables, Projected to 2025 Scale BB Disabled – RP-2000 Healthy Annuitant tables; Projected to 2025, scale BB set forward 1 year
Withdrawal rates	0.23 – 5.70%	0.23 - 7.6%
Disability rates	0.04 - 0.60%	0.05 - 0.60%
Retirement rates	20% - 100%	20% - 100%
Date of most recent experience study	2011 - 2016	2006 - 2011

**West Virginia Consolidated Public Retirement Board  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<u>DSRS</u>	<u>June 30, 2017</u>	<u>June 30, 2016</u>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level percent, fixed period	Level percent, fixed period
Amortization period	Through Fiscal Year 2029	Through Fiscal Year 2029
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases	5.0% for first 2 yrs of service, 4.5% for next 3 yrs of service, 4.0% for the next 5 yrs, and 3.5% thereafter	5.0% for first 2 yrs of service, 4.5% for next 3 yrs of service, 4.0% for the next 5 yrs, and 3.5% thereafter
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active – 100% of RP-2014 Non-Annuitant tables (sex-distinct), Scale MP-2016 fully generational Healthy Male Retirees – 103% of RP-2014 Male Healthy Annuitant table, Scale MP-2016 fully generational Healthy Female Retirees – 100% of RP-2014 Female Healthy Annuitant tables, Scale MP-2016 fully generational Disabled Males – 100% of RP-2014 Male Disabled Annuitant table, Scale MP-2016 fully generational Disabled Females – 100% of RP-2014 Female Disabled Annuitant table, Scale MP-2016 fully generational	Active – RP-2000 Non-Annuitant tables, Projected to 2020 scale BB Healthy Retirees – RP-2000 Healthy Annuitant tables, Projected to 2025 Scale BB Disabled – RP-2000 Healthy Annuitant table, Projected to 2025, scale BB set forward 1 year
Withdrawal rates	4.00% - 12.32%	0.35% - 12.32%
Disability rates	0.04% - 0.60%	0.05% - 0.60%
Retirement rates	16% - 100%	20% - 100%
Date of most recent experience study	2011 - 2016	2006 - 2011

**West Virginia Consolidated Public Retirement Board  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<u>JRS</u>	<u>June 30, 2017</u>	<u>June 30, 2016</u>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	-	-
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases	4.25%	4.25%
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active - N/A Healthy Retirees – RP-2000 Healthy Annuitant tables, Projected to 2025 Scale BB Disabled – RP-2000 Healthy Annuitant tables; Projected to 2025, scale BB set forward 1 year	Active - N/A Healthy Retirees – RP-2000 Healthy Annuitant tables, Projected to 2025 Scale BB Disabled – RP-2000 Healthy Annuitant tables; Projected to 2025, scale BB set forward 1 year
Withdrawal rates	-	-
Disability rates	-	-
Retirement rates	5% - 100%	5% - 100%
Date of most recent experience review	2013	2013

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<u>EMSRS</u>	<u>June 30, 2017</u>	<u>June 30, 2016</u>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2038	Through Fiscal Year 2038
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases	By age from 4.75% at age 30 declining to 3.25% at age 65	By age from 4.75% at age 30 declining to 3.25% at age 65
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active – 100% of RP-2014 Non-Annuitant tables (sex-distinct), Scale MP-2016 fully generational Healthy Male Retirees – 103% of RP-2014 Male Healthy Annuitant table, Scale MP-2016 fully generational Healthy Female Retirees – 100% of RP-2014 Female Healthy Annuitant tables, Scale MP-2016 fully generational Disabled Males – 100% of RP-2014 Male Disabled Annuitant table, Scale MP-2016 fully generational Disabled Females – 100% of RP-2014 Female Disabled Annuitant table, Scale MP-2016 fully generational	Active – RP-2000 Non-Annuitant tables; Projected to 2020 scale BB Healthy Retirees – RP-2000 Healthy Annuitant tables, Projected to 2025 Scale BB Disabled – RP-2000 Healthy Annuitant tables; Projected to 2025, scale BB set forward 1 year
Withdrawal rates	6.00% - 28.00%	3.00% - 14.00%
Disability rates	0.04% - 0.60%	0.008 - 0.525%
Retirement rates	25% - 100%	20% - 100%
Date of most recent experience study/review	2011-2016	2013

**West Virginia Consolidated Public Retirement Board  
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**3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)**

Actuarial Assumptions and Methods (continued)

<b>MPFRS</b>	<b>June 30, 2017</b>	<b>June 30, 2016</b>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	Individual entry age normal cost with level percentage of payroll
Asset valuation method	Fair value	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period
Amortization period	-	-
Actuarial assumptions:		
Investment rate of return	7.50%	7.50%
Projected salary increases	By age from 4.75% at age 30 declining to 3.25% at age 65	By age from 4.75% at age 30 declining to 3.25% at age 65
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active – 100% of RP-2014 Non-Annuitant tables (sex-distinct), Scale MP-2016 fully generational Healthy Male Retirees – 103% of RP-2014 Male Healthy Annuitant table, Scale MP-2016 fully generational Healthy Female Retirees – 100% of RP-2014 Female Healthy Annuitant tables, Scale MP-2016 fully generational Disabled Males – 100% of RP-2014 Male Disabled Annuitant table, Scale MP-2016 fully generational Disabled Females – 100% of RP-2014 Female Disabled Annuitant table, Scale MP-2016 fully generational	Active – RP-2000 Non-Annuitant tables, Projected to 2020 scale BB Healthy Retirees – RP-2000 Healthy Annuitant tables, Projected to 2025 Scale BB Disabled – RP-2000 Healthy Annuitant tables; Projected to 2025, scale BB set forward 1 year
Withdrawal rates	3.00% - 28.00%	3.00% - 14.00%
Disability rates	0.04% - 0.60%	0.05% - 0.60%
Retirement rates	25% - 100%	20% - 100%
Date of most recent experience study/review	2011-2016	2013

The framework for measuring fair value provides a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). The three levels of the fair value hierarchy under are described as follows:

- Level 1      Inputs to the valuation methodology are unadjusted quoted prices in active markets for identical assets or liabilities that the Board can access at the measurement date.
  
- Level 2      Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly, such as: quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in inactive markets; inputs other than quoted prices that are observable for the asset or liability; inputs that are derived principally from or corroborated by observable market data by correlation or other means.
  
- Level 3      Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**4 - FAIR VALUE MEASUREMENTS**

The asset or liabilities fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Valuation techniques maximize the use of observable inputs and minimize the use of unobservable inputs.

The investment risks for the pooled investments in which the Board participates in are described in Note 5. Investments are administered by the IMB, for the Board's defined benefit plans, and the IMB is responsible for setting investment risk policies.

Following is a description of the valuation methodologies used for assets measured at fair value. There have been no changes to the methodologies used at June 30, 2017:

*Mutual funds:* Valued at the daily closing price as reported by the fund. Mutual funds held by the Plan are open-end mutual funds that are registered with the Securities and Exchange Commission. These funds are required to publish their daily net asset value (NAV) and to transact at that price. The mutual funds held by the Plan are deemed to be actively traded.

*Collective investment trusts:* Valued at the NAV of units of a collective trust. The NAV, as provided by the trustee, is used as a practical expedient to estimate fair value. The NAV is based on the fair value of the underlying investments held by the fund less its liabilities. This practical expedient is not used when it is determined to be probable that the fund will sell the investment for an amount different than the reported NAV. Participant transactions (purchases and sales) may occur daily. Were the Plan to initiate a full redemption of the collective trust, the investment adviser reserves the right to temporarily delay withdrawal from the trust in order to ensure that securities liquidations will be carried out in an orderly business manner.

*IMB Investment Pools:* Valued at the NAV of units of an investment pool. The NAV, as provided by the trustee, is used as a practical expedient to estimate fair value. The NAV is based on the fair value of the underlying investments held by the fund less its liabilities. This practical expedient is not used when it is determined to be probable that the fund will sell the investment for an amount different than the reported NAV. Participant transactions (purchases and sales) may occur daily. Refer to the fair value measurement not disclosures within the IMB's annual financial statements for the underlying investments within the fair value hierarchy.

The following is a summary of the investments held by IMB for each plan as of June 30, 2017 and 2016 (in thousands) which are all measured at NAV and not within the fair value hierarchy:

June 30, 2017	<u>PERS</u>	<u>TRS</u>	<u>SPDDRS</u>	<u>SPRS</u>	<u>DSRS</u>	<u>JRS</u>	<u>EMSRS</u>	<u>MPFRS</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency (If Currently Eligible)</u>	<u>Redemption Notice Period</u>
Large cap equity	\$ 1,314,918	\$ 1,478,485	\$130,581	\$ 34,933	\$ 42,054	\$ 40,196	\$14,838	\$ 1,085	N/A	Daily	Daily
Non-large cap equity	265,878	301,980	26,793	6,994	8,450	8,075	2,971	210	N/A	Daily	Daily
International qualified	619,041	710,479	62,649	15,852	19,537	18,525	6,708	463	N/A	Daily	Daily
International equity	1,161,509	1,304,818	113,961	30,915	36,601	35,068	13,092	958	N/A	Daily	Daily
Private equity	660,702	750,422	65,706	17,288	20,805	19,859	7,335	528	N/A	Daily	Daily
Real estate	657,835	769,812	67,657	16,667	20,039	19,130	7,068	510	N/A	Daily	Daily
Total return fixed income	626,141	701,801	58,980	17,330	20,309	19,045	7,241	540	N/A	Daily	Daily
Core fixed income	267,966	298,234	25,902	7,356	8,686	8,157	3,074	230	N/A	Daily	Daily
Hedge fund	601,483	688,375	59,671	15,016	18,431	17,743	6,457	445	N/A	Daily	Daily
TRS annuity	-	(135)	-	-	-	-	-	-	N/A	Daily	Daily
Opportunistic Debt	123,627	140,488	12,288	3,241	3,894	3,719	1,374	100	N/A	Daily	Daily
Short term fixed income	12,781	114,834	17,560	891	661	439	297	306	N/A	Daily	Daily
Total investments(a)	<u>\$ 6,311,881</u>	<u>\$ 7,259,593</u>	<u>\$641,748</u>	<u>\$166,483</u>	<u>\$199,467</u>	<u>\$189,956</u>	<u>\$70,455</u>	<u>\$ 5,375</u>			

**FINANCIAL SECTION**

**West Virginia Consolidated Public Retirement Board  
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**4 - FAIR VALUE MEASUREMENTS (Continued)**

June 30, 2016	<u>PERS</u>	<u>TRS</u>	<u>SPDDRS</u>	<u>SPRS</u>	<u>DSRS</u>	<u>JRS</u>	<u>EMSRS</u>	<u>MPFRS</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency (If Currently Eligible)</u>	<u>Redemption Notice Period</u>
Large cap equity	\$ 1,208,725	\$ 1,386,945	\$121,457	\$ 29,775	\$ 37,009	\$ 35,736	\$12,643	\$ 642	N/A	Daily	Daily
Non-large cap equity	287,306	330,567	29,329	6,001	8,752	8,576	2,979	151	N/A	Daily	Daily
International qualified	512,339	594,432	52,215	12,443	15,596	15,247	5,314	269	N/A	Daily	Daily
International equity	1,034,365	1,181,323	105,304	25,322	31,668	30,934	10,797	551	N/A	Daily	Daily
Private equity	582,482	669,655	58,643	14,287	17,840	17,386	6,091	309	N/A	Daily	Daily
Real estate	610,902	713,178	63,514	14,145	18,288	17,323	6,095	305	N/A	Daily	Daily
Total return fixed income	510,761	574,012	50,605	13,395	15,239	15,478	5,377	258	N/A	Daily	Daily
Core fixed income	234,932	263,148	24,353	6,144	7,134	7,070	2,495	136	N/A	Daily	Daily
Hedge fund	580,641	664,889	57,311	15,033	18,794	18,232	6,354	323	N/A	Daily	Daily
TRS annuity	-	(135)	-	-	-	-	-	-	N/A	Daily	Daily
Opportunistic Debt	27,595	31,268	2,745	688	854	825	292	15	N/A	Daily	Daily
Short term fixed income	<u>7,511</u>	<u>104,030</u>	<u>13,286</u>	<u>894</u>	<u>775</u>	<u>371</u>	<u>407</u>	<u>121</u>	N/A	Daily	Daily
Total investments(a)	<u>\$ 5,597,559</u>	<u>\$ 6,513,312</u>	<u>\$578,762</u>	<u>\$138,127</u>	<u>\$171,949</u>	<u>\$167,178</u>	<u>\$58,844</u>	<u>\$ 3,080</u>			

(a) - see note 6 for additional information regarding the objective of each pool, commitments, and relevant risks.

The following table sets forth by level, within the fair value hierarchy, the TDC plan's assets at fair value as of June 30, 2017 and 2016. Classification within the fair value hierarchy table is based on the lowest level of any input that is significant to the fair value measurement.

	Fair Value at June 30, 2017			
	Total	Level 1	Level 2	Level 3
Investments in the fair value hierarchy				
Mutual funds	\$ 247,084	\$ 247,084	\$ -	\$ -
Total assets in the fair value hierarchy	<u>247,084</u>	<u>\$ 247,084</u>	<u>\$ -</u>	<u>\$ -</u>
Investments measured at net asset value				
Collective investment trusts	90,676			
	<u>90,676</u>			
Investments at fair value	<u>\$ 337,760</u>			

	Fair Value at June 30, 2016			
	Total	Level 1	Level 2	Level 3
Investments in the fair value hierarchy				
Mutual funds	\$ 217,622	\$ 217,622	\$ -	\$ -
Total assets in the fair value hierarchy	<u>217,622</u>	<u>\$ 217,622</u>	<u>\$ -</u>	<u>\$ -</u>
Investments measured at net asset value				
Collective investment trusts	79,560			
	<u>79,560</u>			
Investments at fair value	<u>\$ 297,182</u>			

**West Virginia Consolidated Public Retirement Board  
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**4 - FAIR VALUE MEASUREMENTS (Continued)**

INVESTMENTS MEASURED USING NAV PER SHARE AS PRACTICAL EXPEDIENT

The following table summarizes investments for which fair value is measured using the net asset value per share practical expedient as of June 30, 2017, and 2016, respectively. There are no participant redemption restrictions for these investments.

	Fair Value		Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
	2017	2016		2017 and 2016	
Collective investment trusts funds(b)	\$ 90,676	\$ 79,560	n/a	Daily	Daily

(b) The object of each fund is to seek capital appreciation and income.

**5 - INVESTMENTS**

The Board has adopted investment guidelines that are consistent with those specified in the West Virginia Code. Those guidelines authorize the Board to invest with IMB in obligations of the United States and certain of its agencies, certificates of deposit, direct and general obligations of states, repurchase agreements relating to certain securities, equity securities, real estate, and guaranteed investment contracts. Plan assets of the defined benefit plans are invested by the IMB. The IMB invests plan assets in accordance with West Virginia Code and policies established by the IMB. Individual defined benefit plan assets are invested by the IMB in the various IMB pools. Investments are managed by a third party administrator as the trustee for the TDCRS.

The investment risks for the various investments in which the plans participate are described below:

Large Cap Equity

The Pool's objective is to exceed, net of external investment management fees, the S&P 500 Stock Index over three to five year periods. Assets are managed by INTECH Investment Management, LLC, and State Street Global Advisors.

The Pool is exposed to credit risk from certain investments made with cash collateral for securities loaned. This risk is limited by requiring minimum ratings on debt instruments. Long-term debt instruments must be rated A or better by Moody's or Standard & Poor's at the time of purchase. Short-term debt instruments must be rated P-1 by Moody's or A-1 by Standard & Poor's at the time of purchase. The Pool is exposed to interest rate risk from certain investments made with cash collateral for securities loaned. The weighted average maturity for investments made with cash collateral for securities loaned is not to exceed 90 days. The following table provides the weighted average credit ratings and weighted average maturities (WAM) as of June 30, 2017 (in thousands).

Investment Type	Moody's	S&P	WAM (Days)	Fair Value	Percent of Total Investments
Common stock	N/A	N/A	N/A	\$ 3,490,823	94.0%
Money market mutual fund	Aaa	AAA	N/A	34,740	0.9
Repurchase agreements	Aaa	AA	3	110,335	3.0
Time deposits	A-1	P-1	3	76,236	2.1
Total investments				\$ 3,712,134	100.0%

**West Virginia Consolidated Public Retirement Board  
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Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Large Cap Equity (continued)

The following table provides information on the weighted average credit ratios of the Pool's investments as of June 30, 2016 (in thousands).

Investment Type	Moody's	S&P	Fair Value	Percent of Assets
Foreign corporate bonds	A	A	\$ 3,156	0.1%
Foreign government bonds	Aa	A	10	0.0
Money market mutual funds	Aaa	AAA	132,987	3.6
Time deposits	P-1	A-1	105,546	2.8
U.S. corporate bonds	A	A	12,246	0.3
U.S. Government agency bonds	Aaa	AA	3,335	0.1
U.S. Government agency MBS	Aaa	AA	109,742	2.9
U.S. Treasury bonds	Aaa	AA	32,119	0.9
Total rated investments			399,141	10.7
Common stock			3,322,262	89.3
Total investments			\$ 3,721,403	100.0%

This table includes investments received as collateral for repurchase agreements with a fair value of \$332,025 (in thousands) as compared to the amortized cost of the repurchase agreements of \$314,482 (in thousands).

The following table provides the WAM for the investments made with cash collateral for securities loaned as of June 30, 2016 (in thousands).

Investment Type	June 30, 2016	
	Fair Value	WAM (days)
Asset backed issues	\$ -	-
Repurchase agreements	314,482	2
Time deposits	105,545	1
Total	\$ 420,027	1

*Concentration of Credit Risk*

The Pool is restricted from investing more than 5 percent of the value of the Pool in any one company. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were subject to custodial credit risk. Repurchase agreements, when held, are collateralized to a minimum of 102 percent and the collateral is held in the name of the IMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the IMB's custodian in the name of the IMB. All remaining securities are held by the IMB's custodian in the name of the IMB.

*Foreign Currency Risk*

The Pool is exposed to no or minimal foreign currency risk.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Non-Large Cap Equity

The Pool invests in the equities of small- to mid-sized companies and its objective is to exceed, net of external investment management fees, the Russell 2500 Index over three- to five-year periods. Assets are managed by AJO and Westfield Capital Management (Westfield).

*Credit Risk and Interest Rate Risk*

The Pool is exposed to credit risk from certain investments made with cash collateral for securities loaned. This risk is limited by requiring minimum ratings on debt instruments. Long-term debt instruments must be rated A or better by Moody's or Standard & Poor's at the time of purchase. Short-term debt instruments must be rated P-1 by Moody's or A-1 by Standard & Poor's at the time of purchase. The Pool is exposed to interest rate risk from certain investments made with cash collateral for securities loaned. The weighted average maturity for investments made with cash collateral for securities loaned is not to exceed 90 days. The following table provides the weighted average credit ratings and weighted average maturities (WAM) as of June 30, 2017 (in thousands).

Investment Type	Moody's	S&P	WAM (Days)	Fair Value	Percent of Total Investments
Common stock	N/A	N/A	N/A	\$ 717,579	76.1%
Money market mutual fund	Aaa	AAA	N/A	13,317	1.4
Repurchase agreements	Aaa	AA	3	125,660	13.3
Time deposits	A-1	P-1	3	86,826	9.2
Total investments				<u>\$ 943,382</u>	<u>100.0%</u>

The following table provides information on the weighted average credit ratings of the Pool's investments as of June 30, 2016 (in thousands).

Investment Type	Moody's	S&P	Fair Value	Percent of Assets
Foreign corporate bonds	A	A	\$ 2,198	0.2%
Foreign government bonds	Aa	A	7	0.0
Money market mutual funds	Aaa	AAA	88,686	7.7
Time deposits	P-1	A-1	73,468	6.4
U.S. corporate bonds	A	A	8,524	0.7
U.S. Government agency bonds	Aaa	AA	2,322	0.2
U.S. Government agency MBS	Aaa	AA	76,389	6.6
U.S. Treasury bonds	Aaa	AA	22,357	1.9
Total rated investments			<u>273,951</u>	<u>23.7</u>
Common stock			<u>880,130</u>	<u>76.3</u>
Total investments			<u>\$ 1,154,081</u>	<u>100.0%</u>

This table includes investments received as collateral for repurchase agreements with a fair value of \$231,116 (in thousands) as compared to the amortized cost of the repurchase agreements of \$218,904 (in thousands).

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Non-Large Cap Equity (continued)

The following table provides the WAM for the investments made with cash collateral for securities loaned as of June 30, 2016 (in thousands).

Investment Type	June 30, 2016	
	Fair Value	WAM (days)
Asset backed issues	\$ -	-
Repurchase agreements	218,904	2
Time Deposits	73,468	1
Total	<u>\$ 292,372</u>	<u>1</u>

*Concentration of Credit Risk*

The Pool is restricted from investing more than 5 percent of the value of the Pool in any one company. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were subject to custodial credit risk. Repurchase agreements, when held, are collateralized to a minimum of 102 percent and the collateral is held in the name of the IMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the IMB's custodian in the name of the IMB. All remaining securities are held by the IMB's custodian in the name of the IMB.

*Foreign Currency Risk*

The Pool is exposed to no or minimal foreign currency risk.

International Qualified

The Pool invests in The Silchester International Investors International Value Equity Group Trust (Silchester). The Pool's objective is to produce investment returns that exceed the Morgan Stanley Capital International's Europe Australasia Far East Index by 200 basis points on an annualized basis over three- to five-year periods, net of external investment management fees. Only "qualified participants" (as defined by the *Internal Revenue Code*) may invest in the Pool. Silchester invests in a diversified developed country, non-U.S. equity, bottom-up value oriented portfolio of securities with limited exposure to emerging markets and no unreasonable concentration exposure to any single issuer or country. Redemptions from Silchester can be made monthly with ten days advance written notice. Redemptions will generally be made within seven business days following month-end.

The Pool invests in a collective trust fund that invests in equities denominated in foreign currencies. The value of this investment at June 30, 2017 and 2016, was \$1,453,466 (in thousands) and \$1,208,025 (in thousands), respectively. This investment, although denominated in U.S. dollars, is exposed to foreign currency risk through the underlying investments. The Pool is not exposed to credit risk, interest rate risk, custodial credit risk, or concentration of credit risk.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

International Equity

The Pool invests in the equities of international companies. Assets are managed by Acadian Asset Management, LLC (Acadian), Axiom International Investors, LLC (Axiom), Brandes Investment Partners, L.P. (Brandes), LSV Asset Management (LSV), and Oberweis Asset Management, Inc (Oberweis). The objective of the Pool is to exceed, net of external investment management fees, Morgan Stanley Capital International's All Country World Free Ex US Index over three- to five-year periods.

*Credit Risk and Interest Rate Risk*

The Pool is exposed to credit risk from investments made with cash collateral for securities loaned. This risk is limited by requiring minimum ratings on debt instruments. Long-term debt instruments must be rated A or better by Moody's or Standard & Poor's at the time of purchase. Short-term debt instruments must be rated P-1 by Moody's or A-1 by Standard & Poor's at the time of purchase. The Pool is exposed to interest rate risk from certain investments made with cash collateral for securities loaned. The weighted average maturity for investments made with cash collateral for securities loaned is not to exceed 90 days. The following table provides the weighted average credit ratings and weighted average maturities (WAM) as of June 30, 2017 (in thousands).

Investment Type	Moody's	S&P	WAM (days)	Fair Value	Percent of Total Investments
Common stock	N/A	N/A	N/A	\$ 2,958,970	93.2%
Money market mutual funds	Aaa	AAA	N/A	38,306	1.2
Preferred stock	N/A	N/A	N/A	67,086	2.1
Repurchase agreements	Aaa	AA	3.0	63,972	2.0
Rights	N/A	N/A	N/A	2,562	0.1
Time deposits	A-1	P-1	3.0	44,201	1.4
Total investments				\$ 3,175,097	100.0%

The following table provides information on the weighted average credit ratings of the Pool's investments as of June 30, 2016 (in thousands).

Investment Type	Moody's	S&P	Fair Value	Percent of Assets
Foreign corporate bonds	A	A	\$ 1,127	0.0%
Foreign government bonds	Aa	A	4	0.0
Money market mutual funds	Aaa	AAA	69,992	2.4
Time deposits	P-1	A-1	37,717	1.2
U.S. corporate bonds	A	A	4,376	0.1
U.S. Government agency bonds	Aaa	AA	1,192	0.0
U.S. Government agency MBS	Aaa	AA	39,216	1.3
U.S. Treasury bonds	Aaa	AA	11,478	0.4
Total rated investments			165,102	5.4
Common stock			2,797,848	92.4
Preferred stock			68,037	2.2
Rights			217	0.0
Total investments			\$ 3,031,204	100.0%

This table includes investments received as collateral for repurchase agreements with a fair value of \$118,650 (in thousands) as compared to the amortized cost of the repurchase agreements of \$112,380 (in thousands).

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

International Equity (continued)

The following table provides the WAM for the investments made with cash collateral for securities loaned as of June 30, 2016 (in thousands).

Investment Type	June 30, 2016	
	Fair Value	WAM (days)
Asset backed issues	\$ -	-
Repurchase agreements	112,380	2
Time Deposits	37,716	1
Total	\$ 150,096	1

*Concentration of Credit Risk*

The Pool is restricted from investing more than 5 percent of the value of the Pool in any one company. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were subject to custodial credit risk. Repurchase agreements, when held, are collateralized to a minimum of 102 percent and the collateral is held in the name of the IMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the IMB's custodian in the name of the IMB. All remaining securities are held by the IMB's custodian in the name of the IMB.

*Foreign Currency Risk*

The Pool has both equity securities and cash that are denominated in foreign currencies and are exposed to foreign currency risks. The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2017 are as follows (in thousands):

Currency	Investments	Cash	Total	Percent of Total Investments and Cash
Australian Dollar	\$ 86,903	\$ 3,905	\$ 90,808	2.8%
Brazil Real	107,336	1,305	108,641	3.4
British Pound	268,603	8,426	277,029	8.6
Canadian Dollar	114,239	77	114,316	3.6
Chilean Peso	14,919	-	14,919	0.5
Czech Koruna	7,352	108	7,460	0.2
Danish Krone	11,750	(1)	11,749	0.4
Egyptian Pound	1,605	-	1,605	0.0
Emirati Dirham	6,060	10	6,070	0.2
Euro Currency Unit	463,410	6,309	469,719	14.6
Hong Kong Dollar	332,332	9,785	342,117	10.6
Hungarian Forint	6,749	58	6,807	0.2
Indian Rupee	93,581	1,604	95,185	3.0
Indonesian Rupiah	33,767	59	33,826	1.1
Israeli Shekel	13,482	35	13,517	0.4
Japanese Yen	371,110	2,302	373,412	11.6
Malaysian Ringgit	26,081	508	26,589	0.8
Mexican Peso	47,583	263	47,846	1.5

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
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**5 - INVESTMENTS (Continued)**

International Equity (continued)

New Taiwan Dollar	75,661	2,418	78,079	2.4
New Zealand Dollar	6,060	7	6,067	0.2
Norwegian Krone	19,812	598	20,410	0.6
Pakistan Rupee	3,848	-	3,848	0.1
Philippine Peso	10,603	2	10,605	0.3
Polish Zloty	13,957	-	13,957	0.4
Qatari Riyal	99	32	131	0.0
Singapore Dollar	18,722	445	19,167	0.6
South African Rand	56,807	30	56,837	1.8
South Korean Won	218,894	1,856	220,750	6.9
Swedish Krona	37,428	(1)	37,427	1.2
Swiss Franc	109,989	1,566	111,555	3.5
Thailand Baht	54,069	(6)	54,063	1.7
Turkish Lira	55,190	96	55,286	1.7
Total	<u>\$ 681,139</u>	<u>\$ 88,046</u>	<u>\$ 688,182</u>	<u>41.2%</u>

This table excludes investments and cash held by the Pool that are denominated in U.S. dollars. The market value of the U.S. dollar denominated investments and cash is \$487,320 or 15.1 percent.

The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2016 are as follows (in thousands):

<u>Currency</u>	<u>Investments</u>	<u>Cash</u>	<u>Total</u>	<u>Percent</u>
Australian Dollar	\$ 70,519	\$ 1,384	\$ 71,903	2.4%
Brazil Real	134,558	1,156	135,714	4.5
British Pound	251,332	2,256	253,588	8.3
Canadian Dollar	114,574	211	114,785	3.8
Chilean Peso	12,200	685	12,885	0.4
Czech Koruna	8,630	368	8,998	0.3
Danish Krone	21,390	1,390	22,780	0.7
Egyptian Pound	1,631	(20)	1,611	0.1
Emirati Dirham	5,631	5	5,636	0.2
Euro Currency Unit	423,512	504	424,016	13.8
Hong Kong Dollar	277,680	776	278,456	9.2
Hungarian Forint	8,991	135	9,126	0.3
Indian Rupee	64,154	697	64,851	2.1
Indonesian Rupiah	28,164	132	28,296	0.9
Israeli Shekel	16,429	49	16,478	0.5
Japanese Yen	381,024	2,588	383,612	12.6
Malaysian Ringgit	24,344	207	24,551	0.8
Mexican Peso	44,979	383	45,362	1.5
New Taiwan Dollar	63,355	1,166	64,521	2.1
New Zealand Dollar	7,782	3	7,785	0.3
Norwegian Krone	20,899	28	20,927	0.7
Pakistan Rupee	5,150	-	5,150	0.2
Philippine Peso	10,085	1	10,086	0.3
Polish Zloty	5,239	-	5,239	0.2

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

International Equity (continued)

Qatari Riyal	407	16	423	0.0
Singapore Dollar	13,817	105	13,922	0.5
South African Rand	38,313	94	38,407	1.3
South Korean Won	188,612	1,479	190,091	6.3
Swedish Krona	52,296	1	52,297	1.7
Swiss Franc	95,697	-	95,697	3.1
Thailand Baht	47,149	1	47,150	1.6
Turkish Lira	55,220	507	55,727	1.8
	<u>55,220</u>	<u>507</u>	<u>55,727</u>	<u>1.8</u>
Total	<u>\$ 2,493,763</u>	<u>\$ 16,307</u>	<u>\$ 2,510,070</u>	<u>82.5%</u>

This table excludes investments held by the Pool that are denominated in U.S. dollars. The market value of the U.S. dollar denominated investments is \$531,171 (in thousands) or 17.5 percent.

Short-Term Fixed Income

The main objective of the Pool is to maintain sufficient liquidity to fund withdrawals by the participant plans and to invest cash contributions until such time as the money can be transferred to other asset classes without sustaining capital losses. JP Morgan Investment Advisors, Inc. (JPM) manages the Pool. The Pool's investment objective, net of external investment management fees, is to meet or exceed the Citigroup ninety-day T-bill Index plus fifteen basis points.

*Credit Risk and Interest Rate Risk*

The IMB limits the exposure to credit risk in the Pool by requiring all corporate bonds to be rated AA or higher. Commercial paper must be rated A-1 by Standard & Poor's and P-1 by Moody's. Additionally, the Pool must have at least 15 percent of its assets in United States Treasury issues. The weighted average maturity of the investments of the Pool is not to exceed 60 days. The maturity of floating rate notes is assumed to be the next interest rate reset date. The following table provides information on the weighted average credit ratings and the weighted average maturities (WAM) of the Pool's investments as of June 30, 2017 (in thousands).

<u>Investment Type</u>	<u>Moody's</u>	<u>S&amp;P</u>	<u>WAM (days)</u>	<u>Carrying Value</u>	<u>Percent of Total Investments</u>
Commercial paper	P-1	A-1	23	\$ 36,775	16.9%
Repurchase agreements	Aaa	A	3	50,000	22.9
U.S. Government agency bonds	P-1	A-1	9	88,415	40.5
U.S. Treasury bonds	P-1	A-1	60	42,873	19.7
Total investments			<u>20</u>	<u>\$ 218,063</u>	<u>100.0%</u>

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
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**5 - INVESTMENTS (Continued)**

Short-Term Fixed Income (continued)

The following table provides information on the weighted average credit ratings of the Pool's investments as of June 30, 2016 (in thousands):

Investment Type	Moody's	S&P	Carrying Value	Percent
Commercial paper	P-1	A-1	\$ 52,734	14.9%
Money market mutual fun	Aaa	AAA	82,161	23.2
U.S. Government agency bonds	P-1	A-1	130,482	37.0
U.S. Treasury bonds	Aaa	AA	88,046	24.9
Total rated investments			<u>\$ 353,423</u>	<u>100.0%</u>

This table includes U.S. treasury notes received as collateral for a repurchase agreement with a fair value of \$13,260 (in thousands) as compared to the amortized cost of the repurchase agreement of \$13,000 (in thousands).

The following table provides the WAM for the investments made with cash collateral for securities loaned as of June 30, 2016 (in thousands).

Investment Type	June 30, 2016	
	Carrying Value	WAM (days)
Commercial paper	\$ 52,734	22
Money market mutual fund	82,161	N/A
Repurchase agreement	13,000	1
U.S. Government agency bonds	130,482	55
U.S. Treasury bonds	74,786	28
Total investments	<u>\$ 353,163</u>	<u>39</u>

*Concentration of Credit Risk*

The Pool is restricted from investing more than 5 percent of the value of the Pool in any one corporate name. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no investments that were subject to custodial credit risk. Repurchase agreements are collateralized at 102 percent and the collateral is held in the name of the IMB. All remaining investments are held by the IMB's custodian in the name of the IMB.

*Foreign currency risk*

The Pool has no investments that are subject to foreign currency risk.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Total Return Fixed Income

The main objective of the Pool is to generate investment income, provide stability and diversification, but not at the expense of total return. Dodge & Cox (DAC), Franklin Templeton Investments (FTI), and Western Asset Management Company (Western) manage the Pool. The Pool's investment objective, net of external investment management fees, is to meet or exceed the Bloomberg Barclays U.S. Universal Bond Index.

*Credit Risk and Interest Rate Risk*

The IMB limits the exposure to credit risk in the Pool by maintaining at least an average rating of investment grade as defined by the Nationally Recognized Statistical Rating Organizations. The IMB monitors interest rate risk of the Pool by evaluating the effective duration of the investments in the Pool. Effective duration is a method of disclosing interest rate risk that measures the expected change in the price of a fixed income security for a 1 percent change in interest rates. The effective duration calculation takes into account the most likely timing of variable cash flows, which is particularly useful for measuring interest rate risk of callable bonds, commercial and residential mortgage-backed securities, asset-backed securities, and collateralized mortgage obligations.

The Pool invests in commercial and residential mortgage-backed securities, asset-backed securities, and collateralized mortgage obligations. The cash flows from these securities are based on the payment of the underlying collateral. The effective duration and yield to maturity of these securities are dependent on estimated prepayment assumptions that consider historical experience, market conditions and other criteria. Actual prepayments may vary with changes in interest rates. Rising interest rates often result in a slower rate of prepayments while declining rates tend to lead to faster prepayments. As a result, the fair values of these securities are highly sensitive to interest rate changes. At June 30, 2017 and 2016, the Pool held \$463,424 (in thousands) and \$407,958 (in thousands) of these securities, respectively. This represents approximately 18 and 19 percent of the value of the Pool's securities, respectively.

The following table provides the weighted average credit ratings and the weighted average effective duration for the various asset types in the Pool as of June 30, 2017 (in thousands).

Investment Type	Moody's	S&P	Effective Duration (Years)	Fair Value	Percent of Total Investments
Common stock	A	N/A	N/A	\$ 14	0.0%
Corporate asset backed issues	Ba	AA	2.0	32,078	1.3
Corporate ABS residual	N/A	N/A	N/A	5,034	0.2
Corporate CMO	Baa	BB	0.9	46,766	1.9
Corporate preferred security	Ba	BB	0.1	10,436	0.4
Foreign asset backed issues	Baa	BBB	0.5	17,436	0.7
Foreign corporate bonds	Baa	BBB	6.6	285,298	11.3
Foreign government bonds	Baa	BBB	5.3	244,812	9.7
Investments in other funds	N/A	N/A	2.4	319,061	12.7
Money market mutual fund	Aaa	AAA	N/A	63,965	2.5
Municipal bonds	A	A	9.0	47,351	1.9
Options contracts purchased	N/A	N/A	N/A	2,098	0.1
Repurchase agreements	Aaa	AA	0.0	119,844	4.8
Time deposits	P-1	A-1	0.0	82,806	3.3
U.S. corporate bonds	Baa	BBB	7.0	460,676	18.1
U.S. Government agency bonds	Aaa	AA	0.7	11,630	0.5
U.S. Government agency CMO	Aaa	AA	1.4	51,865	2.1

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
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**5 - INVESTMENTS (Continued)**

Total Return Fixed Income (continued)

U.S. Government agency CMO interest-only	Aaa	AA	1.8	3,796	0.2
U.S. Government agency MBS	Aaa	AA	3.0	289,155	11.5
U.S. Government agency TBAs	Aaa	AA	5.4	17,294	0.7
U.S. Treasury bonds	Aaa	AA	7.8	361,886	14.4
U.S. Treasury inflation protected securities	Aaa	AA	13.9	42,269	1.7
Total Investments			5.0	\$ 714,400	1167.0%

The following table provides the weighted average credit ratings of the rated assets in the Pool as of June 30, 2016 (in thousands):

Investment Type	Moody's	S&P	Fair Value	Percent of Assets
Bank loan	B	B	\$ 936	0.0%
Corporate asset backed issues	A	A	36,980	1.7
Corporate CMO	Ba	BB	27,879	1.3
Corporate preferred securities	Ba	BB	10,472	0.5
Foreign asset backed issues	A	A	11,726	0.5
Foreign corporate bonds	Baa	BBB	293,586	13.6
Foreign government bonds	Ba	BB	217,700	10.1
Money market mutual funds	Aaa	AAA	66,469	3.1
Municipal bonds	A	A	40,081	1.9
Time deposits	P-1	A-1	20,028	0.9
U.S. corporate bonds	Baa	BBB	542,373	25.2
U.S. Government agency bonds	Aaa	AA	3,332	0.2
U.S. Government agency CMO	Aaa	AA	64,627	3.0
U.S. Government agency CMO interest-only	Aaa	AA	6,519	0.3
U.S. Government agency MBS	Aaa	AA	275,666	12.8
U.S. Government agency TBA	Aaa	AA	637	0.0
U.S. Treasury bonds	Aaa	AA	107,797	5.0
U.S. Treasury inflation-protected Securities	Aaa	AA	26,550	1.2
Total rated investments			1,753,358	81.3
Common stock			32,528	1.5
Corporate ABS residual			5,385	0.3
Investments in other funds			360,669	16.8
Options contracts purchased			1,192	0.1
Total investments			\$ 2,153,132	100.0%

This table includes investments received as collateral for repurchase agreements with a fair value of \$63,005 (in thousands) as compared to the amortized cost of the repurchase agreements of \$59,675 (in thousands).

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Total Return Fixed Income (continued)

The following table provides the weighted average effective duration of the investments in the as of June 30, 2016 (in thousands).

Investment Type	Fair Value	Effective Duration (years)
Bank loan	\$ 936	0.1
Corporate asset backed issues	36,980	1.8
Corporate ABS residual	5,385	N/A
Corporate CMO	27,879	1.9
Corporate preferred securities	10,472	0.1
Foreign asset backed issues	11,726	2.4
Foreign corporate bonds	292,987	6.6
Foreign government bonds	217,698	6.0
Investment in other funds	360,669	2.9
Money market mutual funds	66,469	N/A
Municipal bonds	40,081	10.4
Options contracts purchased	1,192	N/A
Repurchase agreements	59,675	0.0
Time deposits	20,028	0.0
U.S. Corporate bonds	540,049	8.3
U.S. Government agency bonds	2,699	3.3
U.S. Government agency CMO	64,627	0.9
U.S. Government agency CMO interest only	6,519	34.0
U.S. Government agency MBS	254,842	1.7
U.S. Government agency TBA	637	0.0
U.S. Treasury bonds	101,702	3.0
U.S. Treasury inflation-protected securities	26,550	19.5
<b>Total investments</b>	<b>\$ 2,149,802</b>	<b>5.1</b>

*Concentration of Credit Risk*

The Pool is restricted from investing more than 5 percent of the value of the Pool in any one corporate name. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were subject to custodial credit risk. Repurchase agreements, when held, are collateralized at 102 percent and the collateral is held in the name of the IMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the IMB's custodian in the name of the IMB. Investments in commingled funds are held in an account in the name of the IMB. All remaining securities are held by the IMB's custodian in the name of the IMB.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Total Return Fixed Income (continued)

*Foreign Currency Risk*

The Pool has foreign government bonds and foreign corporate bonds that are denominated in foreign currencies and are exposed to foreign currency risks. The Pool also has foreign denominated futures contracts and foreign exchange forward contracts. Additionally, the Pool has indirect exposure to foreign currency risk through its ownership interests in certain of the commingled investment pools. Approximately \$87,411 (in thousands), or 27 percent, and \$82,390 (in thousands), or 23 percent, of the commingled investment pools hold substantially all of their investments in securities denominated in foreign currencies as of June 30, 2017 and 2016, respectively. This represents approximately 3 percent and 4 percent of the value of the Pool's securities, respectively. The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2017, are as follows (in thousands):

Currency	Investments	Cash	Total	Percent of Total Investments and Cash
Argentine Peso	\$ 10,274	\$ 455	\$ 10,729	0.4%
Australian Dollar	-	1,207	1,207	0.0
Azerbaijani Manat	652	-	652	0.0
Brazil Real	22,496	1	22,497	0.9
Canadian Dollar	7,653	-	7,653	0.3
Colombian Peso	5,003	-	5,003	0.2
Deutsche Mark	1,932	-	1,932	0.1
Euro Currency Unit	-	7,865	7,865	0.3
British Pound	4,800	61	4,861	0.2
Georgian Lari	1,678	-	1,678	0.1
Ghana Cedi	2,791	-	2,791	0.1
Indian Rupee	620	-	620	0.0
Japanese Yen	49,484	921	50,405	2.0
Kenyan Shilling	2,338	40	2,378	0.1
Mexican Peso	39,783	1,014	40,797	1.6
New Zealand Dollar	-	1,251	1,251	0.0
Peruvian Nuevo Sol	1,440	-	1,440	0.1
Russian Ruble	3,637	861	4,498	0.2
Swedish Krona	-	704	704	0.0
Turkish Lira	4,445	-	4,445	0.2
Ugandan Shilling	1,907	-	1,907	0.1
Uruguayan Peso	7,767	-	7,767	0.3
South African Rand	5,882	-	5,882	0.2
Total	<u>\$ 174,582</u>	<u>\$ 14,380</u>	<u>\$ 188,962</u>	<u>7.4%</u>

This table excludes investments and cash held by the Pool that are denominated in U.S. dollars. The market value of the U.S. dollar denominated investments and cash is \$2,346,267. This represents approximately 93 percent of the value of the Pool's investments and cash.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Total Return Fixed Income (continued)

The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2016, are as follows (in thousands):

Currency	Investments	Cash	Total	Percent
Brazil Real	\$ 18,357	\$ 739	\$ 19,096	0.9%
British Pound	(16)	29	13	0.0
Colombian Peso	3,827	-	3,827	0.2
Deutsche Mark	2,242	-	2,242	0.1
Euro Currency Unit	7,012	4,749	11,761	0.5
Ghanaian Cedi	1,871	308	2,179	0.1
Indian Rupee	3,192	-	3,192	0.1
Japanese Yen	50,390	1,458	51,848	2.4
Kenyan Shilling	2,149	-	2,149	0.1
Mexican Peso	36,421	-	36,421	1.7
Russian Ruble	9,159	588	9,747	0.4
South African Rand	4,814	192	5,006	0.2
Turkish Lira	5,094	-	5,094	0.2
Ugandan Shilling	1,919	-	1,919	0.1
Uruguayan Peso	3,759	-	3,759	0.2
Zambian Kwacha	-	311	311	0.0
	<u>\$ 150,190</u>	<u>\$ 8,374</u>	<u>\$ 158,564</u>	<u>7.2%</u>

This table excludes investments held by the Pool that are denominated in U.S. dollars. The market value of the U.S. dollar denominated investments and cash is \$2,029,009 (in thousands). This represents approximately 93 percent of the value of the Pool's investments.

Opportunistic Income

Effective April 1, 2017, this pool was renamed the Opportunistic Income Pool (Pool). It was previously named the Opportunistic Debt Pool. This change was made to reflect the expansion of permissible investments to include not only middle market direct commercial loans, but also real estate loan funds and other income focused funds that meet the objectives of the Pool.

Assets are managed by Angelo, Gordon & Co. and TCW Asset Management Company. The objective of the Pool is to generate a total net return of 7 to 8 percent over a normal market cycle (typically a 5 to 7-year period), and/or 250 basis points above the return of the Credit Suisse Leveraged Loan Index.

*Credit Risk*

The Pool is exposed to credit risk from investments in unrated direct lending funds. This risk is limited by requiring that underlying fund holdings are at least 90 percent collateralized by one or more assets of the issuer. The Pool also holds shares of a money market fund with the highest credit rating.

*Concentration of Credit Risk*

Each asset manager is restricted from investing more than 10 percent of the capital commitment in a single issuer for investments that are expected to be held longer than one year. At June 30, 2017 and 2016, the Pool was in compliance with this restriction.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Opportunistic Income (continued)

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were subject to custodial credit risk.

*Interest Rate Risk*

The Pool is exposed to interest rate risk from investments in direct lending funds. The IMB manages interest rate risk of the Pool by requiring at least 80 percent of the fund holdings that mature in more than one year to have variable or floating interest rate structures.

*Foreign Currency Risk*

The investments in direct lending funds might be indirectly exposed to foreign currency risk.

*Commitments*

As of June 30, 2016, the IMB has made commitments to two direct lending funds (in thousands).

Fund Classification	Total Commitment	Funded Commitment	Unfunded Commitment
Direct lending funds	\$ 350,000	\$ 113,111	\$ 236,889

Core Fixed Income

The main objective of the Pool is to generate investment income, provide stability and diversification, but not at the expense of total return. JP Morgan Investment Advisors, Inc. (JPM) manages this Pool. This Pool's investment objective, net of external investment management fees, is to meet or exceed the Bloomberg Barclays U.S. Aggregate Bond Index.

*Credit Risk and Interest Rate Risk*

The IMB limits the exposure to credit risk in the Pool by maintaining at least an average rating of investment grade as defined by the Nationally Recognized Statistical Rating Organizations. The IMB monitors interest rate risk of the Pool by evaluating the effective duration of the investments in the Pool. Effective duration is a method of disclosing interest rate risk that measures the expected change in the price of a fixed income security for a 1 percent change in interest rates. The effective duration calculation takes into account the most likely timing of variable cash flows, which is particularly useful for measuring interest rate risk of callable bonds, commercial and residential mortgage-backed securities, asset-backed securities, and collateralized mortgage obligations.

The Pool invests in commercial and residential mortgage-backed securities, asset-backed securities, and collateralized mortgage obligations. The cash flows from these securities are based on the payment of the underlying collateral. The effective duration and yield to maturity of these securities are dependent on estimated prepayment assumptions that consider historical experience, market conditions and other criteria. Actual prepayments may vary with changes in interest rates. Rising interest rates often result in a slower rate of prepayments while declining rates tend to lead to faster prepayments. As a result, the fair values of these securities are highly sensitive to interest rate changes. At June 30, 2017, the Pool held \$440,253 of these securities. This represents approximately 40 percent of the value of the Pool's securities.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Core Fixed Income (continued)

The following table provides the weighted average credit ratings and the weighted average effective duration for the various asset types in the Pool as of June 30, 2017 (in thousands).

Investment Type	Moody's	S&P	Effective Duration (Years)	Fair Value	Percent of Total Investments
Corporate asset backed issues	Aa	A	2.5	\$ 102,422	9.3%
Corporate CMO	A	A	2.6	41,600	3.8
Corporate CMO interest-only	B	Not Rated	(11.6)	599	0.1
Corporate CMO principal-only	Not Rated	AA	6.8	129	0.0
Foreign asset backed issues	Aaa	AAA	2.5	3,446	0.3
Foreign corporate bonds	A	A	5.3	52,706	4.8
Foreign government bonds	Aa	A	8.5	7,218	0.7
Money market mutual fund	Aaa	AAA	N/A	18,950	1.7
Municipal bonds	Aa	AA	13.6	9,013	0.8
Repurchase agreements	Aaa	AA	0.0	60,406	5.5
Time deposits	P-1	A-1	0.0	41,738	3.8
U.S. corporate bonds	A	A	6.1	226,894	20.7
U.S. Government agency bonds	Aaa	AA	2.8	22,596	2.1
U.S. Government agency CMO	Aaa	AA	3.8	114,552	10.5
U.S. Government agency CMO interest-only	Aaa	AA	11.2	3,635	0.3
U.S. Government agency CMO principal-only	Aaa	AA	6.8	7,159	0.7
U.S. Government agency MBS	Aaa	AA	4.2	166,711	15.2
U.S. Treasury bonds	Aaa	AA	9.0	215,469	19.7
U.S. Treasury inflation protected security	Aaa	AA	3.3	432	0.0
Total Investments			<u>5.0</u>	<u>\$ 1,095,675</u>	<u>100.0%</u>

The following table provides the weighted average credit ratings of the rated assets in the Pool as of June 30, 2016 (in thousands):

Investment Type	Moody's	S&P	Fair Value	Percent of Assets
Corporate asset backed issues	Aa	AA	\$ 71,452	6.7%
Corporate CMO	A	A	58,738	5.5
Corporate CMO-interest only	Ba	AAA	713	0.1
Corporate CMO-principal only	B	AA	200	0.0
Foreign asset backed issues	Aa	AA	1,793	0.2
Foreign corporate bonds	A	A	44,793	4.2
Foreign government bonds	Aa	A	7,252	0.7
Money market mutual funds	Aa	AAA	35,271	3.3
Municipal bonds	Aa	AA	9,782	0.9
Time deposits	P-1	A-1	13,097	1.2
U.S. Corporate bonds	A	A	222,175	21.1
U.S. Government agency bonds	Aaa	AA	23,219	2.2
U.S. Government agency CMO	Aaa	AA	129,989	12.3

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Core Fixed Income (continued)

U.S. Government agency CMO interest-only	Aaa	AA	5,229	0.5
U.S. Government agency CMO principal only	Aaa	AA	9,002	0.8
U.S. Government agency MBS	Aaa	AA	201,029	19.0
U.S. Treasury bonds	Aaa	AA	204,730	19.3
U.S. Treasury inflation protected security	Aaa	AA	431	0.0
Total rated investments			1,038,895	98.0
Common stock			21,270	2.0
Total investments			\$ 1,060,165	100.0%

This table includes investments received as collateral for repurchase agreements with a fair value of \$41,198 (in thousands) as compared to the amortized cost of the repurchase agreements of \$39,023 (in thousands).

The following table provides the weighted average effective duration for the various asset types in the Pool as of June 30, 2016 (in thousands):

Investment Type	Fair Value	Effective Duration (years)
Corporate asset backed issues	\$ 71,452	2.1
Corporate CMO	58,738	2.5
Corporate CMO interest-only	713	(17.4)
Corporate CMO principal-only	200	4.2
Foreign asset backed issues	1,793	0.1
Foreign corporate bonds	44,399	5.7
Foreign government bonds	7,251	9.0
Money market mutual funds	35,271	N/A
Municipal bonds	9,782	14.4
Repurchase agreements	39,023	0.0
Time deposits	13,097	0.0
U.S. Corporate bonds	220,665	6.3
U.S. Government agency bonds	22,805	3.8
U.S. Government agency CMO	129,989	3.0
U.S. Government agency CMO interest-only	5,229	5.9
U.S. Government agency CMO principal-only	9,002	7.2
U.S. Government agency MBS	187,410	4.4
U.S. Treasury bonds	200,740	8.5
U.S. Treasury inflation protected security	431	3.4
Total investments	\$ 1,057,990	4.9

*Concentration of Credit Risk*

The Pool is restricted from investing more than 5 percent of the value of the Pool in any one corporate name. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were subject to custodial credit risk. Repurchase agreements, when held, are collateralized at 102 percent and the collateral is held in the name of the IMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the IMB's custodian in the name of the IMB. All remaining securities are held by the IMB's custodian in the name of the IMB.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Core Fixed Income (continued)

*Foreign Currency Risk*

None of the securities held by the Pool are exposed to foreign currency risk.

TRS Annuity Pool

The Pool held an investment contract issued by the Variable Annuity Life Insurance Company (VALIC) strictly for the benefit of the Teachers Retirement System (TRS). On December 10, 2008, the IMB assumed responsibility for this investment as part of the restructuring of the Teachers Defined Contribution (TDC) plan, a separate retirement plan administered solely by the Consolidated Public Retirement System, whereby certain TDC participants elected to transfer the ownership of their individual TDC retirement accounts to the TRS in exchange for current participation in the TRS defined benefit plan. The final amount transferred under the contract was \$248,293 (in thousands).

The IMB initially requested the immediate redemption of the entire balance but VALIC denied the request, claiming the amounts were subject to withdrawal restrictions. Effective April 23, 2009, the IMB, while reserving its rights under the contract, executed the appropriate forms with VALIC to elect to withdraw funds under the Five Year Equal Annual Installment method. By making this election the guaranteed minimum annual yield of 4.5 percent became the fixed rate for this contract. The first four withdrawals of \$55,058 (in thousands) each occurred on May 4, 2009, 2010, 2011, and 2012. The final withdrawal of \$55,191 (in thousands) occurred on May 8, 2013. On that date, all remaining income, net of all management fees, was distributed to TRS and all units of ownership in the Pool were redeemed.

In response to VALIC's denial to allow the IMB to liquidate the contract in its entirety, the IMB sued VALIC. A three-judge arbitration panel issued its decision on April 28, 2017, and no recovery was awarded to the IMB. A notice of appeal has been filed with the West Virginia Supreme Court of Appeals. There are ongoing legal fees associated with this litigation and these expenses are accrued to the Pool. The funding for the payment of these expenses results from contributions by the TRS into the TRS Annuity Pool. No other management fees are charged to the Pool and none have been charged since the final withdrawal on May 8, 2013. Once this matter is finalized the TRS Annuity Pool will be closed.

Private Equity

The Pool holds investments in private equity funds and a commingled investment fund. Franklin Park Associates, LLC has been retained by the IMB to provide consulting services for the private equity funds. The commingled investment fund is managed by State Street Global Advisors.

The Pool holds limited partnerships, a commingled investment fund, and a money market fund with the highest credit rating. The investments in limited partnerships might be indirectly exposed to foreign currency risk, credit risk, interest rate risk, and/or custodial credit risk. The commingled investment fund is held in an account in the name of the IMB. The Pool is restricted from investing more than 10 percent of the IMB's total private equity exposure in a single fund. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Private Equity (continued)

*Commitments*

The IMB, with the assistance of its consultant, began implementing its plan to invest in private equity partnerships in February 2008. As of June 30, the IMB had made the following commitments (in thousands):

<u>Strategies</u>	<u>Fair Value</u>	<u>Number of Funds</u>	<u>Unfunded Commitments</u>	<u>Contractual Termination Date Range</u>
Corporate Finance - Buyout	\$ 663,406	36	\$ 677,544	2017 to 2031
Corporate Finance - Distressed Debt	221,540	5	32,317	2017 to 2025
Corporate Finance - Growth Equity	58,223	2	44,186	2018 to 2020
Corporate Finance - Mezzanine	52,254	3	79,739	2019 to 2024
Corporate Finance - Turnaround	78,256	5	88,487	2017 to 2026
Venture Capital	201,526	9	99,556	2023 to 2031
<b>Total</b>	<b>\$ 1,275,205</b>		<b>\$ 1,021,829</b>	

As of June 30, 2016, the IMB had made the following commitments (in thousands):

<u>Partnership Classification</u>	<u>Total Commitment</u>	<u>Funded Commitment</u>	<u>Unfunded Commitment</u>
Corporate Finance - Buyout Funds	\$ 1,274,000	\$ 615,449	\$ 658,551
Corporate Finance - Distressed Debt	210,000	167,445	42,555
Corporate Finance - Growth Equity	80,000	75,214	4,786
Corporate Finance - Mezzanine	90,000	38,778	51,222
Corporate Finance - Turnaround	200,000	105,327	94,673
Venture Capital	220,500	129,640	90,860
<b>Total</b>	<b>\$ 2,074,500</b>	<b>\$ 1,131,853</b>	<b>\$ 942,647</b>

Real Estate

The Pool holds the IMB's investments in real estate investment trusts (REITs) and real estate limited partnerships and funds. Courtland Partners, Ltd. has been retained by the IMB to provide consulting services for the real estate limited partnerships and funds. The REITs are managed by CBRE Clarion Securities, LLC (CBRE) and Security Capital Research & Management Inc. (SCRM).

*Credit Risk and Interest Rate Risk*

The IMB limits the exposure to credit risk in the Pool by maintaining at least an average rating of investment grade as defined by the Nationally Recognized Statistical Rating Organizations. The IMB monitors interest rate risk of the Pool by evaluating the effective duration of the investments in the Pool. Effective duration is a method of disclosing interest rate risk that measures the expected change in the price of a fixed income security for a 1 percent change in interest rates. The effective duration calculation takes into account the most likely timing of variable cash flows, which is particularly useful for measuring interest rate risk of callable bonds.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Real Estate (continued)

The following table provides the weighted average credit ratings and the weighted average effective duration for the various asset types in the Pool as of June 30, 2017 (in thousands).

Investment Type	Moody's	S&P	Effective Duration (years)	Fair Value	Percent of Total Investments
Common stock	N/A	N/A	N/A	\$ 113,172	6.9%
Money market mutual fund	Aaa	AAA	N/A	40,335	2.5
Preferred stock	N/A	N/A	2.5	12,059	0.7
Real estate limited partnerships and funds	N/A	N/A	N/A	1,456,645	88.7
Repurchase agreements	Aaa	A	0.0	8,873	0.5
Time deposits	A-1	P-1	0.0	6,131	0.4
U.S. corporate bonds	Baa	BBB	3.3	5,256	0.3
Total investments			<u>1.5</u>	<u>\$ 1,642,471</u>	<u>100.0%</u>

The following table provides the weighted average credit ratings of the rated assets in the Pool as of June 30, 2016 (in thousands):

Investment Type	Moody's	S&P	Fair Value	Percent of Total Investments
Foreign corporate bonds	A	A	\$ 198	0.0%
Foreign government bonds	Aa	A	1	0.0
Money market mutual funds	Aaa	AAA	70,652	4.6
Time deposits	P-1	A-1	6,614	0.4
U.S. Corporate bonds	Baa	BBB	8,850	0.6
U.S. Government agency bonds	Aaa	AA	209	0.0
U.S. Government agency MBS	Aaa	AA	6,878	0.4
U.S. preferred stock	Baa	BB	12,767	0.8
U.S. Treasury bonds	Aaa	AA	2,013	0.1
Total rated investments			<u>108,182</u>	<u>6.9</u>
Common stock			119,757	7.8
Real estate limited partnerships and funds			1,314,563	85.3
Total investments			<u>\$ 1,542,502</u>	<u>100.0%</u>

This table includes investments received as collateral for repurchase agreements with a fair value of \$20,809 (in thousands) as compared to the amortized cost of the repurchase agreements of \$19,708 (in thousands).

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Real Estate (continued)

The following table provides the weighted average effective duration for the various asset types in the Pool as of June 30, 2016 (in thousands).

Investment Type	Fair Value	Effective Duration (years)
Common stock	\$ 109,014	N/A
Money market mutual funds	70,652	N/A
Real estate limited partnerships and funds	1,314,563	N/A
Repurchase agreements	19,708	0.0
Time deposits	6,614	0.0
U.S. corporate bonds	8,083	2.5
U.S. preferred stock	12,767	2.2
Total investments	<u>\$ 1,541,401</u>	<u>1.0</u>

Investments in real estate limited partnerships and funds and common stocks do not have an effective duration.

*Concentration of Credit Risk*

The Pool's investments in real estate limited partnerships and funds might be indirectly exposed to concentration of credit risk.

*Custodial Credit Risk*

At June 30, 2017 and 2016, the Pool held no securities that were directly subject to custodial credit risk. Repurchase agreements, when held, are collateralized to a minimum of 102 percent and the collateral is held in the name of the IMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the IMB's custodian in the name of the IMB. All remaining securities, except for the investments in real estate limited partnerships and funds, are held by the IMB's custodian in the name of the IMB. The investments in real estate limited partnerships and funds might be indirectly exposed to custodial credit risk.

*Foreign Currency Risk*

The Pool has real estate investment trusts and real estate limited partnerships and funds, and cash that are denominated in foreign currencies and are exposed to foreign currency risks. The amounts at fair value (in U.S. dollars) of investments denominated in foreign currencies as of June 30, 2017, are as follows (in thousands):

Currency	Investments	Cash	Total	Percent of Total Investments and Cash
Australian Dollar	\$ 3,879	\$ -	\$ 3,879	0.2%
British Pound	4,029	-	4,029	0.2
Canadian Dollar	6,741	2	6,743	0.4
Euro Currency Unit	77,805	-	77,805	4.8
Hong Kong Dollar	5,699	-	5,699	0.3
Japanese Yen	8,241	25	8,266	0.5
Singapore Dollar	1,664	-	1,664	0.1
Swedish Krona	732	-	732	0.0
Total	<u>\$ 108,790</u>	<u>\$ 27</u>	<u>\$ 108,817</u>	<u>6.5%</u>

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Real Estate (continued)

This table excludes investments and cash held by the Pool that are denominated in U.S. dollars. The market value of the U.S. dollar denominated investments and cash is \$1,539,444 (in thousands). This represents approximately 94 percent of the value of the Pool's investments.

The amounts at fair value (in U.S. dollars) of investment denominated in foreign currencies as of June 30, 2016, are as follows (in thousands):

Currency	Investments	Percent
Australian Dollar	\$ 4,949	0.3%
British Pound	3,641	0.2
Canadian Dollar	2,288	0.1
Euro Currency Unity	60,042	3.9
Hong Kong Dollar	4,331	0.3
Japanese Yen	9,529	0.6
Swedish Krona	381	0.0
Total investments	\$ 85,161	5.4%

This table excludes investments held by the Pool that are denominated in U.S. dollars. The market value of the U.S. dollar denominated investments and cash is \$1,456,240 (in thousands). This represents 95 percent of the value of the Pool's investments.

*Commitments*

As of June 30, 2017, the IMB has made the following commitments to forty-seven real estate investment funds/partnerships (in thousands):

Strategies	Fair Value	Number of Funds	Unfunded Commitments	Contractual Termination Date Range (a)
Core Funds (b)	\$ 811,815	8	\$ 78,870	2020 to 2022
Opportunistic Funds (c)	256,375	19	238,268	2018 to 2027
Value Funds (d)	388,455	20	394,813	2017 to 2027
Total investments measured at the NAV	\$ 1,456,645		\$ 711,951	

As of June 30, 2016, the IMB has made the following commitments to thirty-eight real estate investment funds/partnerships (in thousands):

Partnership Classification	Total Commitment	Funded Commitment	Unfunded Commitment
Core funds	\$ 605,000	\$ 550,206	\$ 54,794
Opportunistic funds	542,409	254,448	287,961
Value funds	689,000	368,521	320,479
Total	\$ 1,836,409	\$ 1,173,175	\$ 663,234

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Hedge Fund

The Pool was established to hold the IMB's investments in hedge funds. Albourne America, LLC has been retained by the IMB to provide consulting services for this investment strategy.

The Pool holds shares in hedge funds and shares of a money market fund with the highest credit rating. The investments in hedge funds might be indirectly exposed to foreign currency risk, credit risk, interest rate risk and/or custodial credit risk. The Pool is restricted from investing more than 10 percent of the value of the Pool with any single manager. At June 30, 2017 and 2016, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Investments and Deposits - TDCRS

*Credit Risk*

The TDCRS' investments are not rated as to credit risk.

*Concentration of Credit Risk*

As of June 30, 2017, and 2016, the TDCRS has investment balances with the following issuers which were greater than 5% of the total investment balance of the TDCRS (in thousands):

Mutual Funds:	2017	2016
Western Asset Core Plus Bond A	\$ 29,361	\$ -
PIMCO Total Return Fund	-	21,280
Valic Fixed Annuity Option	133,068	125,820
Great West Secure Foundation Balanced	39,489	35,263
Fidelity New Millennium	69,396	60,646
Putnam Equity Income	40,775	37,013
Vanguard Large Cap Index	45,507	39,235
Other (less than 5% individually)	113,232	103,745
	\$ 470,828	\$ 423,002

*Custodial Credit Risk*

As of June 30, 2017, the TDCRS held no securities that were subject to custodial credit risk.

*Concentration of Credit Risk - Cash Deposits*

At June 30, 2017 and 2016 TDCRS had \$4,453,000 and \$5,465,000 on deposit with the West Virginia State Treasurer's Office and \$259,000 and \$36,000 in depository accounts with financial institutions, respectively. The deposits with financial institutions, which had a bank balance of \$259,000 and \$36,000 are either insured by the Federal Deposit Insurance Corporation or collateralized with securities held in TDCRS' name by its agent.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**5 - INVESTMENTS (Continued)**

Investments and Deposits - TDCRS (continued)

*Interest Rate Risk*

As of June 30, 2017, the TDCRS had the following investments and maturities (in thousands):

Investment Type	Fair Value	Investment Maturities (in Years)		
		Less than 1	1-5	6-10
Mutual Funds	\$ 247,084	\$ 247,084	\$ -	\$ -
Collective Investment Trusts	90,676	90,676	-	-
Guaranteed Investment Contract	133,068	133,068	-	-
<b>Total</b>	<b>\$ 470,828</b>	<b>\$ 470,828</b>	<b>\$ -</b>	<b>\$ -</b>

As of June 30, 2016, the TDCRS had the following investments and maturities (in thousands):

Investment Type	Fair Value	Investment Maturities (in Years)		
		Less than 1	1-5	6-10
Mutual Funds	\$ 217,622	\$ 217,622	\$ -	\$ -
Collective Investment Trusts	79,560	79,560	-	-
Guaranteed Investment Contract	125,820	125,820	-	-
<b>Total</b>	<b>\$ 423,002</b>	<b>\$ 423,002</b>	<b>\$ -</b>	<b>\$ -</b>

*Foreign Currency Risk*

There are no securities held by TDCRS that are subject to foreign currency risk.

**6 - INVESTMENT CONTRACT WITH INSURANCE COMPANY**

The Plan maintains an investment contract with Variable Annuity Life Insurance Company (VALIC) which is a benefit-responsive individually allocated investment contract with a guaranteed rate of return. The account is credited with earnings on the underlying investments and charged for participant withdrawals and administrative expenses. The guaranteed investment contract issuer is contractually obligated to repay the principal and a specified interest rate that is guaranteed to the Plan. There are no reserves against contract value for credit risk of the contract issuer or otherwise. The crediting interest rate is based on a formula agreed upon with the issuer, but it may not be less than 4.5%. Such interest rates are reviewed quarterly for resetting.

This contract meets the fully-benefit responsive investment contract criteria and is therefore reported at contract value. Contract value is the relevant measurement attribute for that portion of the net assets available for benefits attributable to the guaranteed investment contract because that is the amount received by participants if they were to initiate permitted transactions under the terms of the Plan. Contract value, as reported to the Board by VALIC, represents contributions made under the contract, plus earnings, less participant withdrawals and administrative expenses. Participants may ordinarily direct the withdrawal or transfer of all or a portion of their investment at contract value.

The value of the contract (in thousands) at June 30, 2017 and 2016 was \$133,068 and \$125,820, respectively.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**7 - DUE FROM STATE OF WEST VIRGINIA**

The State of West Virginia reached a settlement with the United States Department of Health & Human Services in January 2011, requiring additional contributions of \$20 million per year for nine years from the State of West Virginia general fund to PERS. Contributions of \$5,000,000 are due quarterly on the 15th day after each quarter end, beginning on October 15, 2011. The remaining balance of the amount due from the state was \$65,000,000 and \$85,000,000 at June 30, 2017 and 2016, respectively.

**8 - CONTINGENCIES**

The Board is engaged in various legal actions that it considers to be in the ordinary course of business. Some of these cases involve potentially significant amounts for which legal counsel is unable to render an opinion on the outcome. Further, the financial impact of some cases is dependent upon judicial rulings in favor of petitioners and would have to be actuarially determined, inasmuch as the relief sought is an increase in the petitioners' annuity benefit. Accordingly, the financial statement impact of such cases cannot be determined at the present time. As legal actions are resolved, the Board recognizes the liability in its financial statements in the period the amount can be estimated.

**9 - RISK MANAGEMENT**

The Board is exposed to various risks of loss related to torts; theft or damage to, and destruction of assets; errors and omissions; injuries to, and illnesses of employees; medical liabilities; and natural disasters.

Health insurance coverage for the Board's employees is obtained through its participation in the West Virginia Public Employees Insurance Agency (PEIA). PEIA provides the following basic employee benefit coverage to all participants: hospital, surgical, group major medical, basic group life, accidental death, and prescription drug coverage for active and retired employees of the State of West Virginia and various related State and non-State agencies. Additionally, the Board has obtained coverage for job-related injuries through the purchase of a policy through a commercial carrier. In exchange for the payment of premiums to PEIA and a commercial carrier, the Board has transferred its risks related to health coverage for employees and job-related injuries of employees. Furthermore, the Board is a participant in the self-insured public entity risk pool administered by the Board of Risk and Insurance Management. Coverage is in the amount of \$1,000,000 per occurrence for general liability and property damage.

There have been no significant reductions in insurance coverage from the prior year. Additionally, the amount of settlements has not exceeded insurance coverage in the past three years.

**10 - NEW ACCOUNTING PRONOUNCEMENTS**

Newly Adopted Statements Issued by the Governmental Accounting Standards Board

The Governmental Accounting Standards Board has also issued Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*, effective for fiscal years beginning after June 15, 2016. The requirements of this Statement will improve the usefulness of information about postemployment benefits other than pensions (other postemployment benefits or OPEB) included in the general purpose external financial reports of state and local governmental OPEB plans for making decisions and assessing accountability. The adoption of this GASB statement had no impact on the June 30, 2017 financial statements.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**10 - NEW ACCOUNTING PRONOUNCEMENTS (Continued)**

Newly Adopted Statements Issued by the Governmental Accounting Standards Board (Continued)

The Governmental Accounting Standards Board has also issued Statement No. 77, *Tax Abatement Disclosures*, effective for fiscal years beginning after December 15, 2015. The requirements of this Statement will improve financial reporting by giving users of financial statements essential information that is not consistently or comprehensively reported to the public at present. Disclosure of information about the nature and magnitude of tax abatements will make these transactions more transparent to financial statement users. As a result, users will be better equipped to understand (1) how tax abatements affect a government's future ability to raise resources and meet its financial obligations and (2) the impact those abatements have on a government's financial position and economic condition. The adoption of this GASB statement had no impact on the June 30, 2017 financial statements.

The Governmental Accounting Standards Board has also issued Statement No. 80, *Blending Requirements for Certain Component Units an amendment of GASB Statement No. 14*, effective for fiscal years beginning after June 15, 2016. The objective of this Statement is to improve financial reporting by clarifying the financial statement presentation requirements for certain component units. This Statement amends the blending requirements established in paragraph 53 of Statement No. 14, The Financial Reporting Entity, as amended. The adoption of this GASB statement had no impact on the June 30, 2017 financial statements.

The Governmental Accounting Standards Board has also issued Statement No. 81, *Irrevocable Split-Interest Agreements*, effective for fiscal years beginning after December 15, 2016. The objective of this Statement is to improve accounting and financial reporting for irrevocable split-interest agreements by providing recognition and measurement guidance for situations in which a government is a beneficiary of the agreement. The adoption of this GASB statement had no impact on the June 30, 2017 financial statements.

The Governmental Accounting Standards Board has also issued Statement No. 86, *Certain Debt Extinguishment Issues*, effective for fiscal years beginning after June 15, 2017. The requirements of this Statement will increase consistency in accounting and financial reporting for debt extinguishments by establishing uniform guidance for derecognizing debt that is defeased in substance, regardless of how cash and other monetary assets placed in an irrevocable trust for the purpose of extinguishing that debt were acquired. The requirements of this Statement also will enhance consistency in financial reporting of prepaid insurance related to debt that has been extinguished. In addition, this Statement will enhance the decision-usefulness of information in notes to financial statements regarding debt that has been defeased in substance. The adoption of this GASB had no impact on the June 30, 2017 financial statements.

Recent Statements Issued by the Governmental Accounting Standards Board

The GASB issued Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. This statement is intended to improve accounting and financial reporting by state and local governments for postemployment benefits other than pensions (other postemployment benefits or OPEB). It also improves information provided by state and local governmental employers about financial support for OPEB that is provided by other entities. This statement is effective for fiscal year 2018, and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 83, *Certain Asset Retirement Obligations*, which addresses accounting and financial reporting for certain asset retirement obligations. Certain asset retirement obligations are a legally enforceable liability associated with the retirement of a tangible capital asset. This statement is effective for fiscal year 2019, and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 84, *Fiduciary Activities*, this statement is to improve guidance with the identification of fiduciary activities for accounting and financial reporting and how those activities should be reported. This statement is effective for fiscal year 2020, and management has not yet determined the financial statement impact of the pronouncement.

**West Virginia Consolidated Public Retirement Board  
Notes to the Financial Statements  
Years Ended June 30, 2017 and 2016**

**10 - NEW ACCOUNTING PRONOUNCEMENTS (Continued)**

Recent Statements Issued by the Governmental Accounting Standards Board (Continued)

The GASB issued Statement No. 85, *Omnibus 2017*, this statement is to address practice issues that have been identified during the implementation and application of certain GASB Statements. This Statement addresses a variety of topics related to the blending of component units, goodwill, fair value measurement, and postemployment benefits. This statement is effective for fiscal year 2018, and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 87, *Leases*, to improve the accounting and financial reporting for leases by governments and to increase the usefulness of the governments financial statements by requiring recognition of certain lease assets and liabilities for leases that were previously classified as operating leases. This statement is effective for fiscal year 2021, and management has not yet determined the financial statement impact of the pronouncement.

**REQUIRED SUPPLEMENTARY INFORMATION**

**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**  
**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULES OF NET PENSION LIABILITY AND CHANGES IN NET PENSION LIABILITY**  
(In Thousands)  
Fiscal Years Ending June 30

	PERS				TRS				SPDDRS				SPRS			
	2017	2016	2015	2014	2017	2016	2015	2014	2017	2016	2015	2014	2017	2016	2015	2014
Total pension liability:																
Service cost	\$ 124,129	\$ 123,073	\$ 137,207	\$ 132,500	\$ 153,006	\$ 149,857	\$ 146,798	\$ 147,149	\$ 1,071	\$ 1,263	\$ 1,774	\$ 2,215	\$ 6,827	\$ 6,750	\$ 6,337	\$ 5,890
Interest	490,075	475,335	456,022	440,022	780,855	753,418	744,455	730,912	53,131	51,913	50,748	49,778	11,410	10,113	9,024	8,021
Differences between actual and expected experience	(1,271)	674	152,277	-	(52,290)	45,210	(36,005)	-	47	6,283	4,344	-	(765)	1,636	(201)	-
Assumption changes	-	-	(89,556)	-	-	195,343	-	-	1,961	-	-	-	11,192	-	-	-
Benefit payments	(412,779)	(394,454)	(374,164)	(353,611)	(789,058)	(759,503)	(718,838)	(676,210)	(43,325)	(41,969)	(39,708)	(37,565)	(1,454)	(1,071)	(1,051)	(913)
Net change in total pension liability	200,154	204,628	281,786	218,911	92,513	384,325	136,410	201,851	12,885	17,490	17,158	14,428	27,210	17,428	14,109	12,998
Total pension liability-beginning	6,616,588	6,411,960	6,130,174	5,911,263	10,652,921	10,268,596	10,132,186	9,930,335	729,007	711,517	694,359	679,931	146,038	128,610	114,501	101,503
Total pension liability - ending (a)	6,816,742	6,616,588	6,411,960	6,130,174	10,745,434	10,652,921	10,268,596	10,132,186	741,892	729,007	711,517	694,359	173,248	146,038	128,610	114,501
Plan fiduciary net position:																
Contributions - employer	165,676	186,867	189,947	194,728	451,447	426,678	490,640	141,840	17,155	13,977	21,668	1,072	3,657	3,887	4,060	4,049
Contributions - member	64,599	62,982	61,838	60,899	91,503	95,177	94,694	90,612	362	320	445	545	3,634	3,755	3,609	3,630
Other statutorily required contributions	-	-	-	-	-	-	-	321,553	-	-	-	-	-	-	-	-
Other contributions - appropriations	-	-	-	-	-	-	-	50,855	-	-	-	25,146	-	-	-	-
Net investment income	875,090	(6,827)	219,329	864,023	994,989	(18,402)	255,988	1,003,180	87,793	(1,230)	22,866	90,872	22,346	91	4,972	17,756
Benefit payments	(412,779)	(394,454)	(374,164)	(353,611)	(789,058)	(759,503)	(718,838)	(676,210)	(43,325)	(41,969)	(39,708)	(37,566)	(1,454)	(1,071)	(1,051)	(912)
Administrative expense	(4,989)	(4,887)	(4,785)	(4,695)	(4,582)	(4,507)	(4,432)	(4,348)	(45)	(48)	(51)	(53)	(64)	(47)	(45)	(43)
Other	120	142	282	132	3,077	302	3,197	3,510	847	590	861	739	-	(163)	-	-
Net change in plan fiduciary net position	687,717	(156,177)	92,447	761,476	747,376	(260,255)	121,249	930,992	62,787	(28,360)	6,081	80,755	28,119	6,452	11,545	24,480
Plan fiduciary net position-beginning	5,697,470	5,853,556	5,761,109	4,999,633	6,543,087	6,803,342	6,682,093	5,751,101	578,798	607,158	601,077	520,322	138,569	132,117	120,572	96,092
Prior period adjustment	(90)	91	-	-	(1)	-	-	-	-	-	-	-	-	-	-	-
Plan fiduciary net position - beginning, as restated	5,697,380	5,853,647	5,761,109	4,999,633	6,543,086	6,803,342	6,682,093	5,751,101	578,798	607,158	601,077	520,322	138,569	132,117	120,572	96,092
Plan fiduciary net position - ending (b)	6,385,097	5,697,470	5,853,556	5,761,109	7,290,462	6,543,087	6,803,342	6,682,093	641,585	578,798	607,158	601,077	166,688	138,569	132,117	120,572
Net pension liability - ending (a) - (b)	\$ 431,645	\$ 919,118	\$ 558,404	\$ 369,065	\$ 3,454,972	\$ 4,109,834	\$ 3,465,254	\$ 3,450,093	\$ 100,307	\$ 150,209	\$ 104,359	\$ 93,282	\$ 6,560	\$ 7,469	\$ (3,507)	\$ (6,071)
Plan fiduciary net position as a percentage of total pension liability	93.67%	86.11%	91.29%	93.98%	67.85%	61.42%	66.25%	65.95%	86.48%	79.40%	85.33%	86.57%	96.21%	94.89%	102.73%	105.30%
Covered-employee payroll	\$ 1,414,584	\$ 1,392,113	\$ 1,373,129	\$ 1,389,850	\$ 1,505,080	\$ 1,511,271	\$ 1,481,786	\$ 1,493,515	\$ 3,181	\$ 3,713	\$ 5,120	\$ 5,988	\$ 31,582	\$ 31,792	\$ 29,574	\$ 27,701
Net pension liability as a percentage of covered-employee payroll	30.51%	66.02%	40.67%	26.55%	229.55%	271.95%	233.86%	231.00%	3153.32%	4045.49%	2038.26%	1557.82%	20.77%	23.49%	-11.86%	-21.92%

**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**  
**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULES OF NET PENSION LIABILITY AND CHANGES IN NET PENSION LIABILITY (Continued)**  
(In Thousands)  
Fiscal Years Ending June 30

	DSRS				JRS				EMSRs				MPFRS			
	2017	2016	2015	2014	2017	2016	2015	2014	2017	2016	2015	2014	2017	2016	2015	2014
Total pension liability:																
Service cost	\$ 7,386	\$ 5,979	\$ 5,887	\$ 5,716	\$ 2,466	\$ 2,681	\$ 2,812	\$ 2,819	\$ 3,402	\$ 3,187	\$ 2,969	\$ 3,010	\$ 984	\$ 687	\$ 485	\$ 237
Interest	15,556	14,509	13,612	12,612	8,521	8,478	8,458	7,978	5,107	4,649	4,345	3,879	214	131	74	28
Differences between actual and expected experience	(10,162)	1,530	946	-	(6,101)	(5,813)	(6,506)	-	(1,079)	724	(1,067)	-	12	38	49	-
Changes of benefit terms	-	-	-	-	-	-	-	-	1,545	-	-	-	-	-	-	-
Assumption changes	(3,174)	-	-	-	-	-	-	-	(792)	-	-	-	(320)	-	-	-
Benefit payments	(10,143)	(8,785)	(8,371)	(7,791)	(4,609)	(4,429)	(4,313)	(4,455)	(2,776)	(2,558)	(2,266)	(1,747)	(79)	(34)	(49)	(7)
Net change in total pension liability	(537)	13,233	12,074	10,537	277	917	451	6,342	5,407	6,002	3,981	5,142	811	822	559	258
Total pension liability - beginning	205,104	191,871	179,797	169,260	113,449	112,532	112,081	105,739	66,075	60,073	56,092	50,950	1,903	1,081	522	264
Total pension liability - ending (a)	204,567	205,104	191,871	179,797	113,726	113,449	112,532	112,081	71,482	66,075	60,073	56,092	2,714	1,903	1,081	522
Plan fiduciary net position:																
Contributions - employer	5,922	6,071	5,972	5,977	739	739	2,845	2,456	2,859	2,744	2,607	2,442	846	644	417	279
Contributions - member	4,163	4,306	4,068	3,908	372	401	413	474	2,314	2,222	2,071	2,077	846	644	417	279
Net investment income	27,282	(44)	6,534	24,438	26,270	(175)	6,525	25,263	9,506	18	2,144	7,874	606	28	66	125
Benefit payments	(10,143)	(8,785)	(8,371)	(7,794)	(4,609)	(4,429)	(4,313)	(4,455)	(2,776)	(2,558)	(2,266)	(1,749)	(79)	(34)	(49)	(7)
Administrative expense	(102)	(102)	(95)	(97)	(6)	(6)	(6)	(7)	(53)	(50)	(45)	(42)	(14)	(11)	(7)	(3)
Other	431	463	505	558	(4)	(39)	-	32	-	1	(1)	141	-	1	-	-
Net change in plan fiduciary net position	27,553	1,909	8,613	26,990	22,762	(3,509)	5,464	23,763	11,850	2,377	4,510	10,743	2,205	1,272	844	673
Plan fiduciary net position - beginning	173,268	171,359	162,746	135,756	167,194	170,703	165,239	141,476	59,315	56,937	53,646	42,903	3,317	2,046	1,202	529
Prior period adjustment	(1)	-	-	-	-	-	-	-	-	1	(1,219)	-	-	(1)	-	-
Plan fiduciary net position - beginning, as restated	173,267	171,359	162,746	135,756	167,194	170,703	165,239	141,476	59,315	56,938	52,427	42,903	3,317	2,045	1,202	529
Plan fiduciary net position - ending (b)	200,820	173,268	171,359	162,746	189,956	167,194	170,703	165,239	71,165	59,315	56,937	53,646	5,522	3,317	2,046	1,202
Net pension liability - ending (a) - (b)	\$ 3,747	\$ 31,836	\$ 20,512	\$ 17,051	\$ (76,230)	\$ (53,745)	\$ (58,171)	\$ (53,158)	\$ 317	\$ 6,760	\$ 3,136	\$ 2,446	\$ (2,808)	\$ (1,414)	\$ (965)	\$ (680)
Plan fiduciary net position as a percentage of total pension liability	98.17%	84.48%	89.31%	90.52%	167.03%	147.37%	151.69%	147.43%	99.56%	89.77%	94.78%	95.64%	203.46%	174.30%	189.27%	230.27%
Covered-employee payroll	\$ 51,004	\$ 49,081	\$ 46,634	\$ 45,106	\$ 9,122	\$ 8,870	\$ 9,248	\$ 8,870	\$ 26,992	\$ 25,963	\$ 24,145	\$ 22,548	\$ 7,898	\$ 5,483	\$ 3,784	\$ 1,833
Net pension liability as a percentage of covered-employee payroll	7.35%	64.86%	43.99%	37.80%	-835.67%	-605.92%	-629.01%	-599.30%	1.17%	26.04%	12.99%	10.85%	-35.55%	-25.79%	-25.50%	-37.10%

**FINANCIAL SECTION**  
**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**  
**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULES OF CONTRIBUTIONS**  
(In Thousands)

Year Ended June 30	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
<b>PERS</b>					
2017	\$ 138,663	\$ 165,676	\$ (27,013)	\$ 1,414,584	11.71 %
2016	149,481	186,867	(37,386)	1,392,113	13.42
2015	183,658	189,947	(6,289)	1,373,129	13.83
2014	189,303	194,728	(5,425)	1,389,850	14.01
2013	194,259	187,576	6,683	1,382,647	13.57
2012	181,481	191,009	(9,528)	1,327,717	14.39
2011	192,577	160,494	32,083	1,315,441	12.20
2010	158,329	139,282	19,047	1,274,485	10.93
2009	132,147	128,010	4,137	1,219,388	10.50
2008	79,009	127,670	(48,661)	1,191,130	10.72
<b>TRS (1)</b>					
2017	\$ 413,976	\$ 451,447	\$ (37,471)	\$ 1,505,080	29.99 %
2016	387,685	426,678	(38,993)	1,511,271	28.23
2015	454,721	490,640	(35,919)	1,481,786	33.11
2014	488,511	514,248	(25,737)	1,493,515	34.43
2013	457,977	486,781	(28,804)	1,510,082	32.24
2012	471,027	482,232	(11,205)	1,505,749	32.03
2011	497,362	501,090	(3,728)	1,500,761	33.39
2010	412,641	445,977	(33,336)	1,499,232	29.75
2009	323,323	381,363	(58,040)	1,409,437	27.06
2008	337,316	371,387	(34,071)	828,939	44.80
<b>SPDDRS (2)</b>					
2017	\$ 16,875	\$ 17,155	\$ (280)	\$ 3,181	539.30 %
2016	13,209	13,977	(768)	3,713	376.43
2015	20,860	21,668	(808)	5,120	423.20
2014	25,146	26,218	(1,072)	5,988	437.84
2013	15,162	16,210	(1,048)	6,779	239.12
2012	22,051	23,297	(1,246)	8,001	291.18
2011	25,940	25,131	809	8,960	280.48
2010	12,416	12,169	247	10,215	119.13
2009	4,018	4,679	(661)	10,400	44.99
2008	5,693	5,352	341	10,997	48.67
<b>SPRS</b>					
2017	\$ 4,427	\$ 3,657	\$ 770	\$ 31,582	11.58 %
2016	3,402	3,887	(485)	31,792	12.23
2015	3,183	4,060	(877)	29,574	13.73
2014	3,363	4,049	(686)	27,701	14.62
2013	3,802	4,193	(391)	27,670	15.15
2012	3,837	4,544	(707)	24,725	18.38
2011	4,387	4,570	(183)	23,635	19.34
2010	4,642	3,005	1,637	22,382	13.43
2009	3,446	2,340	1,106	20,285	11.54
2008	2,161	2,318	(157)	18,850	12.30

See Independent Auditor's Report and Notes to Required Supplementary Information.

**FINANCIAL SECTION**

**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**

**REQUIRED SUPPLEMENTARY INFORMATION**

**SCHEDULES OF CONTRIBUTIONS**

(In Thousands)

Year Ended June 30	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
<b>DSRS (3)</b>					
2017	\$ 4,561	\$ 5,922	\$ (1,361)	\$ 51,004	11.61 %
2016	3,498	6,071	(2,573)	49,081	12.37
2015	3,681	5,972	(2,291)	46,634	12.81
2014	4,774	5,977	(1,203)	45,106	13.25
2013	5,335	5,704	(369)	43,583	13.09
2012	5,354	5,431	(77)	42,366	12.82
2011	5,876	4,227	1,649	41,109	10.28
2010	5,689	4,053	1,636	39,067	10.37
2009	3,770	4,277	(507)	37,366	11.45
2008	2,417	4,237	(1,820)	34,605	12.24
<b>JRS</b>					
2017	\$ 709	\$ 739	\$ (30)	\$ 9,122	8.10 %
2016	739	739	-	8,870	8.33
2015	2,845	2,845	-	9,248	30.76
2014	2,456	2,456	-	8,870	27.69
2013	2,422	2,422	-	8,860	27.34
2012	2,740	3,997	(1,257)	8,860	45.11
2011	3,454	3,954	(500)	8,256	47.89
2010	2,879	3,854	(975)	8,140	47.35
2009	2,763	6,034	(3,271)	8,261	73.04
2008	3,267	6,034	(2,767)	8,261	73.04
<b>EMSRS (4)</b>					
2017	\$ 1,870	\$ 2,859	\$ (989)	\$ 26,992	10.59 %
2016	1,311	2,744	(1,433)	25,963	10.57
2015	1,198	2,607	(1,409)	24,145	10.80
2014	1,561	2,442	(881)	22,548	10.83
2013	1,362	2,308	(946)	21,263	10.85
2012	1,388	2,272	(884)	22,488	10.10
2011	1,345	2,264	(919)	21,362	10.60
2010	1,345	2,190	(845)	20,338	10.77
2009	915	3,779	(2,864)	17,525	21.56
<b>MPFRS (4)</b>					
2017	\$ 349	\$ 846	\$ (497)	\$ 7,898	10.71 %
2016	239	644	(405)	5,483	11.75
2015	178	417	(239)	3,784	11.02
2014	88	279	(191)	1,833	15.22
2013	16	151	(135)	966	15.63
2012	7	72	(65)	343	20.99
2011	3	31	(28)	208	14.90

Notes:

(1) Contributions for the Teachers Retirement System include employer contributions and interest from out-of-state services and surcharges on fire and casualty insurance policies which are specifically identified to fund the plan per West Virginia State Code Section 33-3-14d and 33-33-33.

(2) Contributions for SPDDRS include employer contributions and other payments designated by WV State Code Section 15-2-26 - Payments to members for court attendance and mileage; rewards for apprehending wanted persons; fees for traffic accident reports and photographs; fees for criminal investigation reports and photographs; fees for criminal history record checks; and fees for criminal history record reviews and challenges; or from any other sources designated by the superintendent.

(3) Contributions for DSRS include employer contributions and various other fees designated for the fund from charges and fees per WV State Code Section 7-14E-2 and 17A-3-17 - Charges for obtaining reports (i.e., accident reports); fees for performing certain services (adult private employment finger printing for federal firearm permits, motor vehicle number identification, adult identification card, and photo-identification card); fees for nongovernmental background investigation reports; and fees for renewal of a Class A or G vehicle registration.

(4) The EMSRS and MPFRS do not have ten years of data available.

See Independent Auditor's Report and Notes to Required Supplementary Information.

**FINANCIAL SECTION**  
**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**  
**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULES OF INVESTMENT RETURNS**  
**Fiscal Years Ended June 30, 2008 through 2017**

Plan	Annual Return*									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
PERS	15.8%	-0.1%	3.9%	17.9%	13.1%	1.1%	20.7%	16.0%	-15.6%	-6.5%
TRS	15.7%	-0.1%	4.0%	17.9%	13.0%	1.0%	20.5%	15.2%	-16.1%	-7.7%
SPDDRS	15.8%	0.0%	4.0%	17.9%	13.1%	1.1%	20.9%	16.1%	-15.6%	-6.8%
SPRS	15.8%	-0.1%	4.0%	17.9%	13.0%	1.0%	20.5%	16.0%	-15.2%	-6.6%
DSRS	15.8%	-0.1%	4.0%	17.9%	13.0%	1.1%	20.7%	16.0%	-15.4%	-6.8%
JRS	15.9%	-0.1%	4.0%	18.0%	13.0%	1.1%	20.7%	16.0%	-15.5%	-6.8%
EMSRS	15.8%	-0.1%	4.0%	17.9%	13.0%	0.9%	20.8%	15.7%	-15.1%	**
MPFRS	15.5%	-0.2%	4.0%	17.0%	11.9%	3.6%	0.1%	***	***	***

\*Annual money-weighted rate of return, net of investment expenses

\*\* This plan was established in January 2008

\*\*\* This plan was established in January 2010

**WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD**  
**NOTES TO REQUIRED SUPPLEMENTARY INFORMATION**

**1 - ACTUARIAL ASSUMPTIONS AND METHODS**

The information presented in the Schedules of Net Pension Liability and Changes in Net Pension Liability and Schedules of Investment Returns was based on the actuarial valuations as of July 1, 2016 and rolled forward to June 30, 2017 using the actuarial assumptions and methods described in Note 5 to the Financial Statements, Actuarial Valuations - Defined Benefit Plans.

The information presented in the Schedule of Contributions was based on the actuarial valuations as of July 1, 2016 using the actuarial assumptions and methods as follows:

Actuarial cost method	PERS	TRS	SPDDRS	SPRS	DSRS	JRS	EMSRS	MPPRS
	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost
Asset valuation method	4-year 25% level smoothing of actuarial gain or (loss) on trust fund return	4-year 25% level smoothing of actuarial gain or (loss) on trust fund return	Market value	Market value	Market value	Market value	Market value	Market value
Amortization method	Level dollar	Level dollar	Level dollar	Level dollar	Level percent of pay	Level dollar	Level dollar	Level dollar
Amortization period	Through FY 2035	Through FY 2034	Through FY 2025	Through FY 2026	Through FY 2029	Fully funded as of 7/1/2016	Through FY 2038	Fully funded as of 7/1/2016
Actuarial assumptions: Investment rate of return	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
Projected salary increases:								
PERS:								
State	3.00% - 4.60%	-	-	-	-	-	-	-
Nonstate	3.35% - 6.00%	-	-	-	-	-	-	-
TRS:								
Teachers	-	3.00% - 6.00%	-	-	-	-	-	-
Non Teachers	-	3.00% - 6.50%	-	-	-	-	-	-
Other plans			5.0% per year for the first 2 years of service; 4.5% for the next 3 years; 4.0% for the next 5 years and 3.25% thereafter	5.0% per annum for the first 2 years of service; 4.5% for the next 3 years; 4.0% for the next 5 years and 3.25% thereafter	5.0% per year for the first 2 years of service; 4.5% for the next 3 years; 4.0% for the next 5 years and 3.50% thereafter	4.25%	3.25% - 4.75% based on age	3.25% - 4.75% based on age
Inflation rate	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Mortality rates	Active:  RP-2000 Non-Annuitant tables, scale AA, fully generational  Retired: Healthy males: 110% RP-2000 Healthy Annuitant, scale AA fully generational  Healthy females: 101% RP-2000 Healthy Annuitant, scale AA fully generational  Disabled males: 96% RP-2000 Disabled Annuitant, scale AA fully generational Disabled females: 107% RP-2000 Disabled Annuitant, scale AA fully generational	Active:  RP-2000 Non-Annuitant tables, scale AA fully generational  Retired: Healthy males: 97% RP-2000 Healthy Annuitant, scale AA fully generational  Healthy females: 94% RP-2000 Healthy Annuitant, scale AA fully generational  Disabled males: 96% RP-2000 Disabled Annuitant, scale AA fully generational Disabled females: 101% RP-2000 Disabled Annuitant, scale AA fully generational	Active:  RP-2000 Non-Annuitant, scale BB projected to 2020  Retired: Healthy: RP-2000 Healthy Annuitant, scale BB projected to 2025  Disabled: RP-2000 Healthy Annuitant, scale BB projected to 2025, set forward 1 year	Active:  RP-2000 Non-Annuitant, scale BB projected to 2020  Retired: Healthy: RP-2000 Healthy Annuitant, scale BB projected to 2025 Disabled: RP-2000 Healthy Annuitant, scale BB projected to 2025, set forward 1 year	Active:  RP-2000 Non-Annuitant, scale BB projected to 2020  Retired: Healthy: RP-2000 Healthy Annuitant, scale BB projected to 2025 Disabled: RP-2000 Healthy Annuitant, scale BB projected to 2025, set forward 1 year	None  Retired: Healthy: RP-2000 Healthy Annuitant, scale BB projected to 2025 Disabled: RP-2000 Healthy Annuitant, scale BB projected to 2025, set forward 1 year	RP-2000 Non-Annuitant, scale BB projected to 2020  Retired: Healthy: RP-2000 Healthy Annuitant, scale BB projected to 2025 Disabled: RP-2000 Healthy Annuitant, scale BB projected to 2025, set forward 1 year	RP-2000 Non-Annuitant, scale BB projected to 2020  Retired: Healthy: RP-2000 Healthy Annuitant, scale BB projected to 2025 Disabled: RP-2000 Healthy Annuitant, scale BB projected to 2025, set forward 1 year
Withdrawal rates	State: 1.75% - 35.10% Non-state: 2% - 35.88%	Teachers: 0.8% - 35.0% Non-teachers: 1.316% - 24.750%	0.08% - 2.67%	0.23% - 7.60%	0.35% - 12.32%	0%	3.00% - 14.00%	3.00% - 14.00%
Disability rates	0.005% - 0.675%	0.006% - 0.704%	0.05%-0.60%	0.05% - 0.60%	0.05% - 0.60%	0%	0.008% - 0.525%	0.05% - 0.6%
Retirement rates	12% - 100%	15% - 100%	20% - 100%	20% - 100%	20% - 100%	5% - 100%	20% - 100%	20% - 100%
Date range in most recent experience study/review	2009-2014	2010-2015	2006 - 2011	2006 - 2011	2006-2011	2013	2013	2013

**2 - HISTORICAL TREND INFORMATION**

Generally accepted accounting principles require 10 years of historical trend information to be included in the various schedules of RSI that are presented. Due to changes in actuarial methods and assumptions related to the implementation of new accounting standards during fiscal years ending June 30, 2015 and 2014, historical trend information is not readily available for fiscal years ending prior to June 30, 2014 and is not presented.

**SUPPLEMENTARY INFORMATION**

**FINANCIAL SECTION**  
Schedule of Administrative Expenses

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**Years Ended June 30, 2017 and 2016**  
**(in thousands)**

	2017	2016
Salaries	\$ 3,280	\$ 2,864
Employee Benefits	1,223	1,046
Occupancy	386	345
Computer Services	1,559	732
Legal	245	305
External Actuarial Services	226	131
Accounting and Auditing	302	130
Third Party Administrator's Fees*	558	623
Disability Exams	86	99
Office Expenses	216	185
Postage	189	200
Depreciation	735	168
Insurance	31	29
Travel	16	34
Miscellaneous	284	52
	<u>\$ 9,336</u>	<u>\$ 6,943</u>
Administrative Fees Collected from the Retirement Systems	<u>\$ 11,144</u>	<u>\$ 11,091</u>

The excess of fees collected over administrative costs incurred is allocated to reserves for information technology improvements currently in progress and other long-term costs. Fees are assessed to recover costs such that the fees collected match expenses over time.

\* Third Party Administrative fees relate to the Teacher's Defined Contribution Retirement System only

See Independent Auditor's Report.

**FINANCIAL SECTION**  
Schedule of Payments to Consultants

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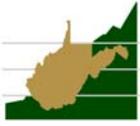
The following were the payments to consultants for the year ended June 30, 2017:

Legal:		
Bowles Rice, LLP	\$	144,400
Actuary:		
Conduent Human Resources	\$	225,837
Audit:		
Suttle & Stalnaker, PLLC	\$	175,000
Gibbons & Kawash, A.C.	\$	127,275
Information Technology:		
LRWL, Inc.	\$	602,270



# INVESTMENT SECTION





## West Virginia Investment Management Board

500 Virginia Street, East - Suite 200  
Charleston, West Virginia 25301

Fax: (304) 345-5939  
Website: [www.wvimb.org](http://www.wvimb.org)

Phone: (304) 345-2672

January 31, 2018

Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304-1636

On behalf of the West Virginia Investment Management Board (IMB), it is with pleasure that I submit the investment section of the Consolidated Public Retirement Board's comprehensive annual financial report for the fiscal year ended June 30, 2017.

As described in more detail herein, the IMB is a public body corporate, an independent organization statutorily charged with the responsibility for investing all assets of the State of West Virginia with long time horizons. These assets include the assets of all eight of the defined benefit pension plans administered by the Consolidated Public Retirement Board. The investments are carried at fair value using the net asset value per share (or its equivalent) as a practical method. As an investment fiduciary, the IMB's only focus is to invest the assets entrusted to it in the best interest of the beneficiaries. Note that in this section, the defined benefit pension plans, as a group, are generally referred to as "Participant Plans." To a large extent, each participant plan's performance is a function of the assets in which it invests. As such, a review of asset class performance for the year may be helpful.

The first half of fiscal year 2017 began with modest improvement in growth in the U.S. and the promise of an uptick in international markets due to quantitative easing in Europe and Japan. After struggling throughout fiscal year 2016, energy gained strength through the first half of the fiscal year, but the big story was the surprise results in the U.S. presidential election. After an initial overnight plunge in futures market, U.S. equities rallied on expectations of a more pro-business regulatory environment and the possibility of large-scale fiscal stimulus. While the rally in the U.S. moderated somewhat in the second half of the fiscal year, developed and emerging economies exhibited coordinated positive growth for the first time in this recovery. Central bankers appear optimistic that markets are normalizing and seem eager to take further steps to wean their economies off easy monetary policy. In the end, U.S. stocks were up 18.5 percent (Russell 3000) for the fiscal year, although they were eclipsed by international stocks which were up 21.0 percent (MSCI AC World ex US IMI). Fixed income suffered returning 0.9 percent (Bloomberg Barclay Capital Universal), as rates rose on the strength of the economy. The private markets produced good positive performance across the board.

*Our mission is to exercise our best independent judgment in providing prudent and professional investment management for the exclusive benefit of the beneficiaries.*

The Investment Management Board enjoyed good nominal, if not relative, performance across all asset classes in fiscal year 2017. International equity and fixed income were the greatest contributors on a relative basis, if not nominal. The IMB's international equity portfolio outperformed its benchmark (MSCI AC World ex US IMI) by 4.8 percent for the fiscal year. The IMB's fixed income portfolio outperformed its benchmark (Bloomberg Barclay's Capital Universal) by 3.7 percent, driven, to a large extent, by its short duration position in the U.S., a position that had contributed significantly to sluggish performance in the prior fiscal year. Performance measurement of private market assets, which include private equity and the majority of the IMB's real estate portfolio, is not meaningful over shorter time periods. Regardless, the private equity portfolio returned 19.7 percent and the real estate portfolio returned 8.4 percent. The hedge fund portfolio, which is intended to be a diversifying component of the entire portfolio, returned 5.7 percent, short of its benchmark by 1.7 percent.

Defined benefit pension plans make up approximately 80 percent of the IMB's total assets under management. For general comparison purposes, the IMB used the Public Employees' Retirement System (PERS) as a proxy for the other pension plans because of its similarity to other statewide public pension plans throughout the nation. As of June 30, 2017, the return for PERS was 15.8 percent net of expenses for the fiscal year. Of greater significance is the longer-term performance. In that regard, over the five-year period ending June 30, 2017, the IMB's annualized return was 9.9 percent versus the base portfolio benchmark of 7.9 percent. This represents millions of dollars in value added by trustees and staff. The other defined benefit pension plans' returns for the fiscal year ending June 30, 2017, were essentially identical to PERS. Since asset allocations are virtually the same for each plan, differences in the returns for the various plans are a function of the differences in the timing of cash flows into and out of each plan and relative levels of cash equivalent securities necessary to make benefit payments.

As an investor, the IMB's capacity to generate return on assets is largely a function of growth in the world capital markets. Diversification helps reduce short-term volatility in the capital markets, what is commonly referred to as risk, but it is generally at the expense of long-term growth. Growth is the engine of returns. The IMB's asset allocation is clearly tilted towards long-term growth for those assets with long time horizons, such as defined benefit pension plans. These plans are structured to spread risk and cost over multiple generations. The correct target rate of return is one that fairly does this. While the IMB does not set that rate, it has an obligation to advise those that do. The IMB believes that the current target is achievable. That being said, the state of the capital markets will make it very difficult to achieve that rate in the near term. Central banks in the U.S., European Union and Japan have engaged in unprecedented amounts of quantitative easing, driving up asset prices and reducing risk premiums in an effort to stave off deflation. Growth has finally picked up suggesting that it may be self-sustaining. As a result, the U.S. is already weaning itself off easy monetary policy

and other markets hope to follow suit. There are dangers, however, as rates are now extraordinarily low, leaving central banks little fuel to stoke growth should economies take a downturn. Downside market potential appears to outweigh upside market potential. Regardless, the IMB's portfolio is built for the long term. We have and will continue to moderate the structure on the margins to accommodate what we believe the markets are offering, but not so much as to compromise the portfolio's ability to take advantage of the long term growth. The IMB staff looks forward to helping trustees meet the challenges as fiscal year 2018 unfolds.

Sincerely,

A handwritten signature in black ink, appearing to read 'CS', with a horizontal line extending to the right.

Craig Slaughter, JD, CFA

Executive Director/Chief Investment Officer

## **Investment Section**

### **Investment Background, Philosophy, and Objectives**

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The West Virginia Investment Management Board came into existence in the spring of 1997 after years of hard work modernizing the State's investment management structure. This structural modernization was widely acknowledged as a necessary precursor to the passage of a constitutional referendum to allow investment in stocks. The risks were perceived to be too great to be managed by anything but a modern, professional entity.

Although the West Virginia Investment Management Board's predecessors, the West Virginia State Board of Investments and the West Virginia Trust Fund, Inc., brought about vast improvements, each had significant shortcomings. However, with the creation of the West Virginia Investment Management Board, the State achieved a balance between control and independence that helps foster efficient and prudent investment management of long-term assets well into the future.

The beginning of the modern era in investment management by the State goes back to the late 1970s with the consolidation of the investment authority for the State's defined benefit plans, employment security plans, and other assets into a newly created West Virginia State Board of Investments. One of the goals of the legislation was to achieve economies of scale by commingling like assets.

Significantly, this newly created West Virginia Board of Investments was staffed by the State Treasury and the board itself was made up of the State's Governor, Treasurer, and Auditor.

Although a step in the right direction, the initial West Virginia State Board of Investments lacked proper or sufficient control features. After a few problems in the 1980s, principally involving its short-term pool, the Consolidated Fund, the board was expanded to seven members, adding four members from the private sector including an attorney experienced in financial matters and a Certified Public Accountant.

In the fall of 1990, the Legislature took a huge leap forward by creating a staff for the West Virginia State Board of Investments separate from the staff of the Treasury. This provided clear accountability to the Board of Investments – something that did not exist previously. Other very important control features included: (1) a statutory requirement for an Internal Auditor, (2) an annual external audit by a certified public accounting firm, and (3) monthly reporting requirements to government leaders in accordance with generally accepted accounting principles. This last feature dictated that all pools with a weighted average maturity in excess of 90 days must be marked-to-market (carried at market value), something that had not been done in the 1980s.

At the same time, the West Virginia Board of Investments made its first tepid step towards a diversified portfolio to be invested in stocks domiciled in the United States. Although it made some initial stock purchases in 1993, which were subsequently liquidated at a gain, the statute was challenged and the West Virginia Supreme Court ruled that investing in equities was unconstitutional.

In 1996, in an effort to satisfy the constitutional strictures, the Legislature carved out the pension and employment security funds with long time horizons and placed them in a trust to be managed by a new entity called the West Virginia Trust Fund, Inc. The creation of the trust as a vehicle to allow investment in stocks was also challenged and was struck down, failing to satisfy the constitutional concerns of the Supreme Court. It did, however, bring about three very important changes. The Legislature, demonstrating impeccable managerial foresight, granted the West Virginia Trust Fund, Inc. control over its own budget. With the same foresight, the Legislature imposed personal fiduciary liability on the board and staff of the West Virginia Trust Fund, Inc. Of no less importance was the creation of representative roles for members of the retirement systems and employment security systems.

With the failure of the West Virginia Trust Fund, Inc., it and the West Virginia State Board of Investments were replaced in 1997 by a new entity, the present day West Virginia Investment Management Board. The basic modernization process was complete. All of the improvements made in the Board of Investments and the West Virginia Trust Fund, Inc. were incorporated into the new entity.

The Legislature, for policy reasons, transferred the Consolidated Fund on July 8, 2005 to a newly created West Virginia Board of Treasury Investments, chaired by the State Treasurer. This was widely perceived as a policy move to ensure direct governmental oversight of State general and special revenue funds. The West Virginia Investment Management Board continues to manage the retirement funds, the employment security funds, and other assets with long time horizons.

## **Investment Section**

### Investment Background, Philosophy, and Objectives

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In 2007, the Legislature expanded the investable universe of assets, increasing the allowable allocation to public equity and international securities, while also providing for a significant allocation to “alternative investments,” loosely defined as hedge funds and private equity. Then, in 2014, the Legislature eliminated the percentage limitations on allowable asset classes or securities, joining most of its peers in recognizing the prudent investor standard of care is the most effective control on investor behavior for institutions.

The West Virginia Investment Management Board was created during the 1997 legislative session and is cited as the *West Virginia Investment Management Board Act* (the Act). The legislative findings of the Act make it clear that the West Virginia Investment Management Board was intended to be a professional, apolitical, financial management organization dedicated to the interests of the State’s teachers, public employees and workers in general. The Act was intended to give the West Virginia Investment Management Board “...the authority to develop, implement and maintain an efficient and modern system for the investment and management of the State’s money.” In order to accomplish this purpose, the Act further stated that the West Virginia Investment Management Board must “...operate as an independent board with its own full-time staff of financial professionals immune to changing political climates...” [West Virginia Code §12-6-1(a)(b)] The Act also mandates that the assets contributed by the public employee and employer to the 401(a) Plans and the assets of the Workers’ Compensation Fund and the Coal Workers’ Pneumoconiosis Fund, are “declared to be irrevocable trusts, available for no use or purpose other than for the benefit of those public employees...workers, miners and their beneficiaries...” [West Virginia Code §12-6-1(c)(d)] The West Virginia Investment Management Board is further “empowered by this Article to act as Trustee of the irrevocable trusts created by this Article, and to manage and invest other state funds.” [West Virginia Code §12-6-1a(f)]

The standard of care mandated by the Statute is that codified in the “Uniform Prudent Investor Act,” Article 6C of Chapter 44 of the *West Virginia Code*. The West Virginia Investment Management Board is further subject to the following requirements:

- (a) Trustees shall discharge their duties with respect to the 401(a) Plans for the exclusive purpose of providing benefits to participants and their beneficiaries;
- (b) Trustees shall diversify fund investments so as to minimize the risk of large losses unless, under the circumstances, it is clearly prudent not to do so;
- (c) Trustees shall defray reasonable expenses of investing and operating the funds under management;
- (d) Trustees shall discharge their duties in accordance with the trust documents and instruments governing the trusts or other funds under the management insofar as the documents and instruments are consistent with provisions of this Article; and
- (e) The duties of the Board apply only with respect to those assets deposited with or otherwise held by it. [West Virginia Code §12-6-11]

Governance of the West Virginia Investment Management Board is vested, by statute, in a thirteen-member Board of Trustees. Three members of the Board serve by virtue of their office: the Governor, the Auditor, and the Treasurer. The other ten are appointed by the Governor and confirmed by the Senate. All appointees must have experience in pension management, institutional management or financial markets. In addition, one must be an attorney experienced in finance and investment matters and another must be a Certified Public Accountant. Only six of the ten appointed Trustees may be from the same political party. The Governor serves as Chairman of the Board. A Vice-Chairman is elected by the Trustees. A Secretary, who need not be a member of the Board, is also elected by the Trustees to keep a record of the proceedings of the Board.

A member of each defined benefit retirement plan is designated by the Consolidated Public Retirement Board to represent the Participant Plans’ interests. Likewise, the West Virginia Insurance Commission designates a representative for the Coal Workers’ Pneumoconiosis Fund and the Workers’ Compensation Old Fund. Each of the Representatives may designate up to three persons to comprise a committee representing their respective plan’s beneficiaries. The Representatives and Committee Members do not have a vote but have the right to be heard at the annual meetings of the Board and are subject to the same code of conduct and requirements of confidentiality that apply to the Trustees.

## **Investment Section**

### **Investment Background, Philosophy, and Objectives**

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The day-to-day management of the West Virginia Investment Management Board is delegated to the Executive Director who is appointed by the Board and serves at its will and pleasure. The Executive Director acts as an advisor to the Board on all matters.

The staff of the West Virginia Investment Management Board is divided into two principal divisions—Investments and Operations. The Operations Division is focused on providing the back office support necessary for the organization to function on a day-to-day basis. The Investments Division is structured to devote its time and resources to staying current with new developments and research in the investment field and being prepared to apply this knowledge to the investment of assets for the West Virginia Investment Management Board.

The primary objective of the investment pools is to provide benefits to its participants and beneficiaries. Based on general beliefs about the investment return available from a well-diversified, prudently invested portfolio, the Board has adopted specific investment objectives for each Participant Plan.

In order to achieve the investment objectives for each Participant Plan, the IMB relies on prevailing financial theory. This is a philosophy that is generally characterized by prudent diversification across different asset classes (stocks, bonds, cash, non-traditional, etc.) to reduce risk, taking into account each Participant Plan's time horizon, liquidity needs, financial condition (funded status), and return objectives in determining each Participant Plan's appropriate allocation to various assets. Diversification is not just limited to asset classes although it is, generally, considered the most significant factor. Other factors, including, but not limited to, geography/country, industry, and maturity, are also considered from the Participant Plan's perspective. These factors may also dictate the extent to which the Participant Plan may be impacted by general business conditions. Importantly, the factors mentioned here are not intended to be limiting; rather, they are outlined as a general indication of the importance of diversification and customization to proper asset allocation. The Board determines the proper allocation among asset classes and managers, based on advice and analysis provided by the IMB and an external general investment consultant.

The Board recognizes that even though its investments may be subject to short-term volatility, it is critical that the IMB maintain a focus on longer time horizons for most Participant Plans, during which time the impact of short-term market volatility generally averages out. Impulsive reactions to short-term market events are not conducive to achieving long-term investment objectives. The strategies employed for each Participant Plan factor in an acceptable level of expected volatility given the relevant time horizon and liquidity needs for that Participant Plan. This prevents ad-hoc revisions to its philosophy and policies in reaction to either speculation or short-term market fluctuations. It is important to note that the Board recognizes that markets may become dislocated due to behavioral or other factors. When major dislocations occur, the Board has allowed for minor adjustments to the asset allocation for each Participant Plan through its Allocation Committee. In order to preserve a longer-term perspective generally, however, the Board of Trustees has adopted the following formal review schedule:

<b>Agenda Item</b>	<b>Review Schedule</b>
Investment Performance	Quarterly
Investment Policy	Every Year
Allocation Ranges	Every Three Years
Asset Allocation Review for Each Participant Plan	At Least Every Three Years

The Board may hire investment managers to implement its objectives. These managers will be given specific tactical roles within the overall strategic investment plan. Depending on their assignments, the managers may be judged on some or all of the following: (1) consistency of philosophy, style and key personnel, (2) performance relative to an appropriate index or proxy group, and (3) ability to add incremental value after costs. The Board and staff shall monitor performance and supervise all fund managers.

In determining the appropriate level of risk, the Board considers, in addition to its fiduciary obligations and statutory requirements, each entity's purpose and characteristics, financial condition, liquidity needs, sources and level of contributions, income and general business conditions. Based upon these many factors, the Board identifies whether a more aggressive or more conservative approach is warranted, on an individual plan-by-plan basis. Performance is calculated using the time-weighted rate of return methodology based on market rate of return.

## **Investment Section**

### Investment Background, Philosophy, and Objectives

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#### **INVESTMENT OBJECTIVES**

*“The Board, at its annual meeting...shall review, establish and modify, if necessary, the investment objectives of the individual participant plans, as incorporated in the investment policy statements of the respective trusts so as to provide for the financial security of the trust funds giving consideration to the following: (1) Preservation of Capital; (2) Diversification; (3) Risk Tolerance; (4) Rate of Return; (5) Stability; (6) Turnover; (7) Liquidity; and (8) Reasonable Costs of Fees.” [West Virginia Code §12-6-11(a)(5)]*

#### **PARTICIPANT PLANS**

The Board’s objective is to manage the Participant Plans’ moneys in an efficient and economical manner, managing risk as it seeks to achieve the specific goals set out in each Participant Plan’s investment program.



**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**EQUITY POOL**

**OBJECTIVES**

The main objective for the Equity Pool is to provide for long-term growth for all participants. The Equity Pool is comprised of separate strategic asset classes which, when taken in aggregate, enable adequate diversification. Separate investment pools have been established for each investment style or to comply with specific legal and accounting requirements. The strategic asset classes, the Neutral Target allocations to additional sub-components of the strategic asset classes, as well as the approved Allocation Ranges within which the Allocation Committee can operate, are outlined below:

Category	Strategic Allocation	Allocation Range
U.S. Equity	25.0%	+/- 5% (20% to 30%)
International Equity	25.0%	+/- 5% (20% to 30%)
Equity Pool	50.0%	+/- 5% (45% to 55%)

*Note: Each Participant Plan has its own unique Strategic Allocation. The above example is for clarification purposes only.*

Category	Neutral Target*	Allocation Range
U.S. Large Cap vs. U.S. Non-Large Cap	Large = 1 minus Non-Large Non-Large = Russell 2500/Russell 3000	0.5 to 2.5 times benchmark Sum must equal 100
U.S. Non-Large Value vs. U.S. Non-Large Growth	Value vs. Growth Percentage in Russell 2500	0.5 to 2.5 times benchmark Sum must equal 100
International Large vs. International Small vs. Emerging Markets	Large vs. Small vs. Emerging Percentage in MSCI ACWI ex U.S. (IMI)	0.5 to 2.5 times benchmark Sum must equal 100

*\* The Neutral Target is established based on the listed indices and is reset, subject to Allocation Committee decisions, based on these index weights every June 30.*

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**EQUITY POOL**  
(Continued)

**MANAGEMENT STRUCTURE**

The equity pools are managed by the following firms, in accordance with a particular investment style.

Manager	Style
<b>Large Cap Domestic Equity Pool</b>	
State Street Global Advisors	Index Core
INTECH Investment Management, LLC	Quantitative Core
<b>Non-Large Cap Domestic Equity Pool</b>	
Westfield Capital Management	Growth at a Reasonable Price
AJO	Relative Value
<b>International Qualified and International Nonqualified Pools</b>	
<i>Developed Markets</i>	
Silchester International Investors	All Country, Value
<b>International Equity Pool</b>	
<i>Developed Markets</i>	
LSV Asset Management	All Country, Relative Value
<i>Small Capitalization</i>	
Oberweis Asset Management, Inc.	All Country, Growth
Acadian Asset Management, LLC	All Country, Quantitative Value
<i>Emerging Markets</i>	
Brandes Investment Partners, L.P.	Emerging Market, Value
Axiom International Investors, LLC	Emerging Market, Growth at a Reasonable Price

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements are prepared for each of the equity pools and are available at [WVIMB.org](http://WVIMB.org). Financial Highlights for each pool are presented below.

Composite	Individual Pools per Audited Financial Statements	
U.S. Large Cap	Large Cap Domestic Equity Pool	
U.S. Non-Large Cap	Non-Large Cap Domestic Equity Pool	
International	International Qualified Pool	
	International Nonqualified Pool	
	International Equity Pool	
<b>Condensed Statement of Assets and Liabilities</b>		
	Large Cap Domestic Equity	Non-Large Cap Domestic Equity
Investments	\$ 3,712,069	\$ 943,382
Payable upon return of securities loaned	(186,571)	(212,486)
Cash	1,105	-
Receivable for investments sold	27,663	8,773
Payable for investments purchased	(11,118)	(19,685)
Other assets and liabilities	3,039	648
Net position - June 30, 2017	\$ 3,546,187	\$ 720,632

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**EQUITY POOL**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000's)**

<b>Condensed Statement of Assets and Liabilities</b>	<b>International Qualified</b>	<b>International Nonqualified</b>	<b>International Equity</b>
Investments	\$ 1,453,466	\$ 201,808	\$ 3,175,097
Payable upon return of securities loaned	-	-	(108,173)
Cash	-	-	42,020
Receivable for investments sold	-	-	37,666
Payable for investments purchased	-	-	(3,982)
Foreign currency contracts	-	-	(58)
Other assets and liabilities	(65)	(9)	6,923
Net position - June 30, 2017	<u>\$ 1,453,401</u>	<u>\$ 201,799</u>	<u>\$ 3,149,493</u>

<b>Investments</b>	<b>Large Cap Domestic Equity</b>		<b>Non-Large Cap Domestic Equity</b>	
	<b>Fair Value</b>	<b>Percent of Securities</b>	<b>Fair Value</b>	<b>Percent of Securities</b>
Domestic equities sector exposure:				
Basic Materials	\$ 98,449	2.7%	\$ 49,180	5.2%
Capital Goods	403,514	10.9	124,511	13.2
Communications Services	53,873	1.5	276	0.0
Consumer Discretionary	350,618	9.4	89,479	9.5
Consumer Staples	287,449	7.7	22,633	2.4
Energy	227,440	6.1	20,757	2.2
Financial Services	775,110	20.9	206,966	22.0
Health Care	388,116	10.5	95,270	10.1
Technology	723,435	19.5	89,440	9.5
Utilities	182,819	4.9	19,067	2.0
Total domestic equities	<u>3,490,823</u>	<u>94.1</u>	<u>717,579</u>	<u>76.1</u>
Futures	(65)	0.0	-	0.0
Money market mutual funds	34,740	0.9	13,317	1.4
Investments made with cash collateral for securities loaned	186,571	5.0	212,486	22.5
Total	<u>\$ 3,712,069</u>	<u>100.0%</u>	<u>\$ 943,382</u>	<u>100.0%</u>

<b>Investments</b>	<b>International Qualified</b>		<b>International Nonqualified</b>	
	<b>Fair Value</b>	<b>Percent of Securities</b>	<b>Fair Value</b>	<b>Percent of Securities</b>
Investments in other funds	\$ 1,453,466	100.0%	\$ 201,808	100.0%

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**EQUITY POOL**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000's)**

Investments	International Equity	
	Fair Value	Percent of Securities
International equities country exposure:		
Australia	\$ 86,903	2.7%
Brazil	155,266	4.9
Canada	116,557	3.7
Cayman Islands	153,639	4.8
China	125,576	4.0
France	139,812	4.4
Germany	123,394	3.9
Hong Kong	72,800	2.3
India	99,172	3.1
Japan	371,418	11.7
Korea	218,630	6.9
Mexico	74,751	2.4
Russia	96,465	3.0
Switzerland	111,774	3.5
Taiwan	103,104	3.2
United Kingdom	260,111	8.2
All others (none greater than 2%)	719,246	22.7
Total international equities	3,028,618	95.4
Money market mutual fund	38,306	1.2
Investments made with cash collateral for securities loaned	108,173	3.4
<b>Total</b>	<b>\$ 3,175,097</b>	<b>100.0%</b>

**Progression of Net Position**

	Large Cap Domestic Equity	Non-Large Cap Domestic Equity
Net position - June 30, 2016	\$ 3,291,790	\$ 782,111
Net increase from operations	535,675	150,695
Distributions to unitholders	-	(81,349)
Net decrease from unit transactions	(281,278)	(130,825)
Net position - June 30, 2017	\$ 3,546,187	\$ 720,632

**Progression of Net Position**

	International Qualified	International Nonqualified	International Equity
Net position - June 30, 2016	\$ 1,207,977	\$ 141,306	\$ 2,856,546
Net decrease from operations	295,004	35,444	718,428
Net increase (decrease) from unit transactions	(49,580)	25,049	(425,481)
Net position - June 30, 2017	\$ 1,453,401	\$ 201,799	\$ 3,149,493

## Investment Section

### Investment Pool Objectives, Financial Highlights, and Performance

#### EQUITY POOL (Continued)

#### INVESTMENT PERFORMANCE (in \$000s)

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of investment advisor fees.

Period	Large Cap Domestic Equity		Non-Large Cap Domestic Equity	
	Actual	S&P 500	Actual	Russell 2500
One-year	17.0%	17.9%	22.1%	19.9%
Three-year	9.8%	9.6%	5.3%	6.9%
Five-year	14.7%	14.6%	13.7%	14.1%
Ten-year	7.4%	7.2%	7.3%	7.4%

Period	International Qualified		International Nonqualified		International Equity	
	Actual	MSCI EAFE	Actual	MSCI EAFE	Actual	MSCI ACWI ex U.S. (IMI)*
One-year	24.6%	20.8%	24.4%	20.8%	26.3%	21.0%
Three-year	4.9%	1.6%	4.7%	1.6%	2.2%	1.6%
Five-year	13.1%	9.2%	12.8%	9.2%	8.6%	8.0%
Ten-year	6.9%	1.5%	6.6%	1.5%	1.9%	1.7%

\*Prior to January 2014, the International Equity Pool index was the MSCI ACWI ex U.S. (Standard).

#### Large Cap Domestic Equity

Ten Largest Holdings	Fair Value
Apple Inc	\$ 112,753
Microsoft Corporation	72,177
Alphabet Inc	58,175
Amazon.com Inc	49,465
Johnson & Johnson	48,021
Facebook Inc	46,441
JP Morgan Chase & Co	45,019
Exxon Mobil Corporation	43,925
Berkshire Hathaway Inc	39,361
Bank of America Corporation	34,910

#### Non-Large Cap Domestic Equity

Ten Largest Holdings	Fair Value
Steris PLC	\$ 9,448
Six Flags Entertainment Group	8,263
Jazz Pharmaceuticals PLC	8,256
Lennox International Inc.	7,988
Axalta Coating Systems Ltd	7,933
Total System Services Inc	7,519
TransUnion	7,251
Summit Materials Inc	7,204
Vail Resorts Inc	7,216
CoStar Group Inc	7,024

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**EQUITY POOL**  
(Continued)

**LARGEST HOLDINGS (continued in \$000s)**

<b>International Qualified</b>	
Largest Holdings	Fair Value
Silchester International Investors International Value Equity Group Trust	\$ 1,453,466

<b>International Nonqualified</b>	
Largest Holdings	Fair Value
Silchester International Investors International Value Equity Trust	\$ 201,808

<b>International Equity</b>	
Ten Largest Holdings	Fair Value
Samsung Electronics Co Ltd	\$ 49,647
Lukoil PJSC - ADR	33,721
Tencent Holdings Ltd	27,539
Taiwan Semiconductor - ADR	25,699
Alibaba Group Holding - ADR	25,376
Sanofi-Synthelabo SA	24,466
KT&G Corporation	21,421
Cemex SAB de CV - ADR	21,327
Nippon Telegraph & Telephone	21,120
Shinhan Financial Group	20,006

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The Equity Pool's expenses for the year, divided by the average net position, are as follows:

<b>Expense Ratios (in basis points)</b>	Large Cap Domestic Equity	Non-Large Cap Domestic Equity	International Qualified	International Nonqualified	International Equity
Investment advisor fees	4.9	5.7	51.8	61.4	59.2
Trustee fees	0.0*	0.0*	0.0*	0.0*	0.0*
Custodian bank fees	0.3	0.6	N/A	N/A	5.5
Management fees	2.7	2.7	2.7	2.7	2.7
Fiduciary bond fees	0.0*	0.0*	0.0*	0.0*	0.0*
Professional service fees	0.5	0.5	0.5	0.5	0.5
<b>Total</b>	<b>8.4</b>	<b>9.5</b>	<b>55.0</b>	<b>64.6</b>	<b>67.8</b>

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**EQUITY POOL**  
**(Continued)**

**EXPENSES (continued)**

**Trading Costs**

	Large Cap Domestic Equity	Non-Large Cap Domestic Equity	International Equity	Total
Net commission costs (in \$000s)	\$ 1,106	\$ 990	\$ 2,679	\$ 4,775
Domestic equity commission rate (cents per share)	2.1	1.4		
International equity commission rate (basis points per dollar volume)			9.9	

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**SHORT-TERM FIXED INCOME POOL**

**OBJECTIVES**

The Short-Term Fixed Income Pool was created to maintain sufficient liquidity to meet the daily disbursements requested by the Plans and to invest any contributions until the time the money is transferred to other asset classes without sustaining capital losses and while earning a small return above inflation. The Short-Term Fixed Income Pool is structured as a commingled fund where the goal is a stable dollar value per share, thus preserving principal. The risk factor on this pool is low and managed through numerous maturity restrictions, diversification guidelines, and credit limits. The participants are paid on an income basis that includes interest income net of expenses.

**MANAGEMENT STRUCTURE**

The Short-Term Fixed Income Pool is managed by JPMorgan Investment Advisors, Inc.

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the Short-Term Fixed Income Pool are available at WVIMB.org. Financial Highlights are presented below.

**Condensed Statement of Assets and Liabilities**

Investments	\$ 218,063
Cash	1
Other assets and liabilities, net	(29)
Net position - June 30, 2017	<u>\$ 218,035</u>

**Investments**

	Fair Value	Percent of Securities
Commercial paper	\$ 36,775	16.9%
Repurchase agreement	50,000	22.9
U.S. government agency bonds	88,415	40.5
U.S. Treasury bond	42,873	19.7
Total	<u>\$ 218,063</u>	<u>100.0%</u>

**Progression of Net Position**

Net position - June 30, 2016	\$ 270,965
Net increase from operations	772
Distributions to unitholders	(855)
Net decrease from unit transactions	(52,847)
Net position - June 30, 2017	<u>\$ 218,035</u>

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**SHORT-TERM FIXED INCOME POOL**  
(Continued)

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of investment advisor fees.

Period	Actual	Citigroup 90 Day Treasury Bill*
One-year	0.5%	0.5%
Three-year	0.3%	0.2%
Five-year	0.2%	0.2%
Ten-year	0.7%	0.6%

\*Prior to January 2014, the Short-Term Fixed Income Pool index was the Citigroup 90 Day Treasury Bill plus 15 basis points.

**LARGEST HOLDINGS (in \$000s)**

Short-Term Fixed Income	
Ten Largest Holdings	Fair Value
Repurchase Agreement, 0.8%, 6/1/2017 22.9%	\$ 50,000
Federal Home Loan Bank, Zero Coupon, 7/3/2017	48,995
Federal Home Loan Bank, Zero Coupon, 7/7/2017	18,622
United States Treasury, Zero Coupon, 9/14/2017	14,136
Federal Home Loan Bank, Zero Coupon, 8/2/2017	12,239
United States Treasury, Zero Coupon, 9/28/2017	9,975
United States Treasury, Zero Coupon, 7/6/2017	7,399
United States Treasury, Zero Coupon, 9/7/2017	6,366
Federal Home Loan Bank, Zero Coupon, 7/13/2017	5,688
United States Treasury, Zero Coupon, 7/27/2017	4,997

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The Short-Term Fixed Income Pool's expenses for the year, divided by the average net position, are as follows:

Expense Ratios (in basis points)	
Investment advisor fees	5.0
Trustee fees	0.0*
Custodian bank fees	0.6
Management fees	2.8
Fiduciary bond fees	0.0*
Professional service fees	0.6
Total	9.0

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**FIXED INCOME POOL**

**OBJECTIVES**

The main objectives for the Fixed Income Pool are to generate investment income, provide stability, and enhance diversification, but not at the expense of total return. Separate investment pools have been established for particular investment styles or to comply with specific accounting requirements. The strategic asset class, the Neutral Target allocation to the sub-component of the strategic asset class, as well as the approved Allocation Ranges within which the Allocation Committee can operate, are outlined below:

Category	Strategic Allocation	Allocation Range
Core Fixed Income	--	--
Total Return Fixed Income	--	--
Fixed Income Pool	20.0%	+/- 5% (15% to 25%)

*Note: Each Participant Plan has its own unique Strategic Allocation. The above example is for clarification purposes only.*

Neutral Target	Allocation Range
50% Total Return Fixed Income	+/- 20% (30% to 70%)
50% Core Fixed Income	+/- 20% (30% to 70%)

**MANAGEMENT STRUCTURE**

The fixed income pools are managed by the following firms, in accordance with a particular investment style.

Manager	Style
<b>Total Return Fixed Income Pool</b>	
Western Asset Management Company	Core Plus Fixed Income
Dodge & Cox	Core Plus Fixed Income
Franklin Templeton Investments	Emerging Markets Fixed Income
<b>Core Fixed Income Pool</b>	
JPMorgan Investment Advisors, Inc.	Core Fixed Income

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements are prepared for each of the fixed income pools and are available at WVIMB.org. Financial Highlights for each pool are presented below.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**FIXED INCOME POOL**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

<b>Condensed Statement of Assets and Liabilities</b>	<b>Total Return Fixed Income</b>	<b>Core Fixed Income</b>
Investments	\$ 2,526,202	\$ 1,095,675
Payable upon return of securities loaned	(202,650)	(102,144)
Cash	20,197	181
Receivable for investments sold	20,479	405
Payable for investments purchased	(46,623)	(52)
Other assets and liabilities	4,729	2,007
Net position - June 30, 2017	<u>\$ 2,322,334</u>	<u>\$ 996,072</u>

<b>Investments</b>	<b>Total Return Fixed Income</b>		<b>Core Fixed Income</b>	
	<b>Fair Value</b>	<b>Percentage of Securities</b>	<b>Fair Value</b>	<b>Percentage of Securities</b>
Common stock	\$ 14	0.0%	\$ -	0.0%
Corporate asset backed issues	37,112	1.5	102,422	9.3
Corporate CMO	46,766	1.9	42,328	3.9
Corporate preferred security	10,436	0.4	-	0.0
Foreign asset backed issues	17,436	0.7	3,446	0.3
Foreign corporate bonds	285,298	11.3	52,706	4.8
Foreign currency forward contracts	117	0.0	-	0.0
Foreign government bonds	244,812	9.7	7,218	0.7
Futures contracts	6,054	0.2	-	0.0
Investments in other funds	319,061	12.6	-	0.0
Investments made with cash collateral for securities loaned	202,650	8.0	102,144	9.3
Money market mutual fund	63,965	2.5	18,950	1.7
Municipal bonds	47,351	1.9	9,013	0.8
Option contracts purchased	2,098	0.1	-	0.0
Option contracts written	(538)	0.0	-	0.0
Swaps	4,999	0.2	-	0.0
U.S. corporate bonds	460,676	18.2	226,894	20.8
U.S. government agency bonds	11,630	0.5	22,596	2.1
U.S. government agency CMO	55,661	2.2	125,346	11.4
U.S. government agency MBS	306,449	12.1	166,711	15.2
U.S. Treasury issues	404,155	16.0	215,901	19.7
Total	<u>\$ 2,526,202</u>	<u>100.0%</u>	<u>\$ 1,095,675</u>	<u>100.0%</u>

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**FIXED INCOME POOL**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

<b>Progression of Net Position</b>	<b>Total Return Fixed Income</b>	<b>Core Fixed Income</b>
Net position - June 30, 2016	\$ 2,143,909	\$ 993,047
Net increase from operations	139,147	333
Distributions to unitholders	(64,391)	(29,917)
Net increase from unit transactions	103,669	32,609
Net position - June 30, 2017	<u>\$ 2,322,334</u>	<u>\$ 996,072</u>

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of investment advisor fees.

Period	Total Return Fixed Income		Core Fixed Income	
	Actual	Barclays Capital Universal*	Actual	Barclays Capital U.S. Aggregate Bond
One-year	6.7%	0.9%	0.1%	(3.0)%
Three-year	3.4%	2.8%	3.0%	2.5%
Five-year	4.1%	2.7%	2.8%	2.2%
Ten-year	5.1%	4.6%	N/A	N/A

\* Prior to April 2008, the Total Return Fixed Income Pool index was a custom index.

**LARGEST HOLDINGS (in \$000s)**

<b>Total Return Fixed Income</b>	
Ten Largest Holdings	Fair Value
Western Asset Structured Product Opportunities, LLC	\$ 84,238
Western Asset Floating Rate High Income Fund, LLC	61,376
Western Asset Opportunistic Structured Securities Portfolio, LLC	54,560
United States Treasury, 1.875%, 3/31/2022	53,211
Western Asset Emerging Markets Corporate Credit Portfolio, LLC	48,339
United States Treasury, 3.0%, 2/15/2047	44,352
Western Asset Opportunistic Asian Securities Portfolio, LLC	33,202
United States Treasury, 2.0%, 12/31/2021	32,987
Western Asset Mortgage Backed Securities Portfolio, LLC	31,287
United States Treasury, 1.75%, 5/31/202	29,824

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**FIXED INCOME POOL**  
**(Continued)**

**LARGEST HOLDINGS (continued in \$000s)**

<b>Core Fixed Income</b>	
<b>Ten Largest Holdings</b>	<b>Fair Value</b>
United States Treasury, 5.5%, 8/15/2028	\$ 15,756
United States Treasury, Zero Coupon, 2/15/2027	13,321
Citigroup Global Markets Inc, 1.1%, 7/3/2017	12,484
United States Treasury, Zero Coupon, 5/15/2034	11,531
RBC Dominion Securities Inc, 1.08%, 7/3/2017	11,345
Societe Generale, 1.31%, 7/3/2017	10,868
RFCSP Strip Principal, Zero Coupon, 7/15/2020	10,038
United States Treasury, Zero Coupon, 5/15/2020	9,300
United States Treasury, Zero Coupon, 11/15/2032	8,260
United States Treasury, Zero Coupon, 11/15/2033	7,812

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The Fixed Income Pools' expenses for the operating period, divided by the average net position, are as follows:

<b>Expense Ratios (in basis points)</b>	<b>Total Return Fixed Income</b>	<b>Core Fixed Income</b>
Investment advisor fees	22.4	13.1
Trustee fees	0.0*	0.0*
Custodian bank fees	0.8	0.7
Management fees	2.7	2.7
Fiduciary bond fees	0.0*	0.0*
Professional service fees	0.5	0.5
<b>Total</b>	<b>26.4</b>	<b>17.0</b>

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**TIPS POOL**

**OBJECTIVES**

The objectives for the TIPS Pool are to enhance diversification, mitigate the risk of inflation, generate investment income, and to provide a relatively stable investment.

**MANAGEMENT STRUCTURE**

The TIPS Pool is managed by State Street Global Advisors.

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the TIPS Pool are available at WVIMB.org. Financial Highlights are presented below.

**Condensed Statement of Assets and Liabilities**

Investments	\$ 337,671
Payable upon return of securities lending	(10,677)
Receivable for investments sold	26,041
Payable for investments purchased	(25,925)
Other assets and liabilities	1,073
Net position - June 30, 2017	<u>\$ 328,183</u>

**Investments**

	Fair Value	Percent of Securities
Investments made with cash collateral for securities loaned	\$ 10,677	3.2%
Money market mutual fund	128	0.0
U.S. Treasury inflation protected issues	326,866	96.8
Total	<u>\$ 337,671</u>	<u>100.0%</u>

**Progression of Net Position**

Net position - June 30, 2016	\$ 388,573
Net decrease from operations	(1,828)
Net decrease from unit transactions	(58,562)
Net position - June 30, 2017	<u>\$ 328,183</u>

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of investment advisor fees.

Period	Actual	Barclays Capital U.S. TIPS
One-year	(0.6)%	(0.6)%
Three-year	0.6%	0.6%
Five-year	0.3%	0.3%

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**TIPS POOL**  
**(Continued)**

**LARGEST HOLDINGS (in \$000s)**

Ten Largest Holdings	Fair Value
United States Treasury, 0.125%, 4/15/2019	\$ 17,437
United States Treasury, 0.625%, 1/15/2024	14,566
United States Treasury, 0.375%, 7/15/2023	14,487
United States Treasury, 0.125%, 1/15/2023	14,382
United States Treasury, 0.375%, 7/15/2025	14,024
United States Treasury, 0.125%, 1/15/2022	13,981
United States Treasury, 0.125%, 7/15/2024	13,863
United States Treasury, 0.625%, 7/15/2021	12,998
United States Treasury, 0.625%, 1/15/2026	12,808
United States Treasury, 1.125%, 1/15/2021	12,407

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The TIPS Pool's expenses for the operating period, divided by the average net position, are as follows:

<b>Expense Ratios (in basis points)</b>	
Investment advisor fees	2.6
Trustee fees	0.0*
Custodian bank fees	0.4
Management fees	2.7
Fiduciary bond fees	0.0*
Professional service fees	0.5
Total	6.2

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**SPECIAL PURPOSE POOL**

**OBJECTIVES**

The Board operates one special purpose pool: **TRS ANNUITY POOL**

**HISTORY (in \$000s)**

The Pool held an investment contract issued by the Variable Annuity Life Insurance Company (VALIC) strictly for the benefit of the Teachers' Retirement System (TRS). On December 10, 2008, the IMB assumed responsibility for this investment as part of the restructuring of the Teachers' Defined Contribution (TDC) plan, a separate retirement plan administered solely by the Consolidated Public Retirement System, whereby certain TDC participants elected to transfer the ownership of their individual TDC retirement accounts to the TRS in exchange for current participation in the TRS defined benefit plan. The final amount transferred under the contract was \$248,293.

The IMB initially requested the immediate redemption of the entire balance but VALIC denied the request, claiming the amounts were subject to withdrawal restrictions. Effective April 23, 2009, the IMB, while reserving its rights under the contract, executed the appropriate forms with VALIC to elect to withdraw funds under the Five Year Equal Annual Installment method. By making this election the guaranteed minimum annual yield of 4.5 percent became the fixed rate for this contract. The first four withdrawals of \$55,058 each occurred on May 4, 2009, 2010, 2011 and 2012. The final withdrawal of \$55,191 occurred on May 8, 2013. On that date, all remaining income, net of all management fees, was distributed to TRS and all units of ownership in the Pool were redeemed.

In response to VALIC's denial to allow the IMB to liquidate the contract in its entirety, the IMB sued VALIC. A three-judge arbitration panel issued its decision on April 28, 2017, and no recovery was awarded to the IMB. A notice of appeal has been filed with the West Virginia Supreme Court of Appeals. There are ongoing legal fees associated with this litigation and these expenses are accrued to the Pool. The funding for the payment of these expenses results from contributions by the TRS into the TRS Annuity Pool. No other management fees are charged to the Pool and none have been charged since the final withdrawal on May 8, 2013. Once this matter is finalized the TRS Annuity Pool will be closed.

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the TRSA are available at [WVIMB.org](http://WVIMB.org). Financial Highlights are presented below.

**Condensed Statement of Assets and Liabilities**

Assets	\$	-
Accrued expenses		(135)
Net position - June 30, 2017	<u>\$</u>	<u>(135)</u>

**Progression of Net Position**

Net position - June 30, 2016	\$	(135)
Net decrease from operations		(1,006)
Net increase from capital transactions		1,006
Net position - June 30, 2017	<u>\$</u>	<u>(135)</u>

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**PRIVATE EQUITY POOL**

**OBJECTIVES**

The objectives for the Private Equity Pool are to provide for long-term growth of its participants' assets and risk-reduction through diversification.

The Private Equity Pool is comprised of the following categories and target range allocations as of June 30, 2017:

Category	Target Range
Corporate Finance	90-100%
Venture Capital	0-10%
U.S.	80-100%
Non-U.S.	0-20%

**MANAGEMENT STRUCTURE**

The selection of investments in the Private Equity Pool is made by the Pool's subcommittee which includes the Executive Director/Chief Investment Officer, the Chief Financial Officer/Chief Operating Officer, the Senior Investment Officer, and two members selected from the Board. Investment recommendations are jointly made by the Private and Public Equity Investment Officer and Franklin Park Associates, LLC, the investment consultant to the subcommittee.

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the Private Equity Pool are available at WVIMB.org. Financial Highlights are presented below.

**Condensed Statement of Assets and Liabilities**

Investments	\$ 1,623,630
Other assets and liabilities	3,393
Net position - June 30, 2017	<u>\$ 1,627,023</u>

**Investments**

	Fair Value	Percent of Securities
Investment in other fund	\$ 312,661	19.3%
Money market mutual fund	35,764	2.2
Private equity partnerships	1,275,205	78.5
Total	<u>\$ 1,623,630</u>	<u>100.0%</u>

**Progression of Net Position**

Net position - June 30, 2016	\$ 1,436,298
Net increase from operations	269,923
Net decrease from unit transactions	(79,198)
Net position - June 30, 2017	<u>\$ 1,627,023</u>

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**PRIVATE EQUITY POOL**  
**(Continued)**

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of external investment management and/or partnership fees and expenses.

Period	Actual	Russell 3000 plus 300 basis points*
One-year	19.7%	N/A
Three-year	13.7%	N/A
Five-year	13.9%	17.9%

*\*Prior to January 2014, the Private Equity Pool index was the S&P 500 plus 500 basis points.*

**LARGEST HOLDINGS (in \$000s)**

Ten Largest Holdings	Fair Value
State Street Global Advisors Russell 3000 Index Non-Lending Fund	\$ 312,661
Clearlake Capital III, L.P.	63,626
Hellman & Friedman Capital Partners VII, L.P.	57,608
Thoma Bravo Fund XI, L.P.	51,447
Castlelake III, L.P.	49,009
Franklin Park Venture Fund Series 2011, L.P.	40,541
JFL Equity Investors III, L.P.	39,893
Clearlake Capital IV, L.P.	38,678
H.I.G. Bayside Debt & LBO Fund II, L.P.	37,211
TA XI, L.P.	35,429

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The Private Equity Pool's expenses for the year, divided by the average net position, are as follows:

<b>Expense Ratio (in basis points)</b>	
Investment advisor fees	0.4
Trustee fees	0.0*
Custodian bank fees	0.0*
Management fees	2.7
Fiduciary bond fees	0.0*
External fees/Fund closing costs	1.5
Professional service fees	6.1
<b>Total</b>	<b>10.7</b>

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**REAL ESTATE POOL**

**OBJECTIVES**

The objectives for the Real Estate Pool are to reduce risk through diversification and to generate long-term growth of participants' assets.

The Real Estate Pool is comprised of three categories. The target range allocations as of June 30, 2017, are as follows:

Category	Target	Target Range
Core	50%	+/- 20% (30% to 70%)
Value-Added	30%	+/- 20% (10% to 50%)
Opportunistic	20%	+/- 10% (10% to 30%)

**MANAGEMENT STRUCTURE**

The selection of investments in the Real Estate Pool is made by the Pool's subcommittee which includes the Executive Director/Chief Investment Officer, the Chief Financial Officer/Chief Operating Officer, Private and Public Equity Investment Officer, and two members selected from the Board. Investment recommendations are jointly made by the Fixed Income and Real Estate Investment Officer and Courtland Partners, Ltd, the investment consultant to the subcommittee. The public real estate investments are managed by the following firms, in accordance with a particular investment style.

Manager	Style
CBRE Clarion Securities, LLC	Global Real Estate Investment Securities
Security Capital Research & Management Inc.	U.S. Debt and Equity Real Estate Securities

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the Real Estate Pool are available at [WVIMB.org](http://WVIMB.org). Financial Highlights are presented below.

**Condensed Statement of Assets and Liabilities**

Investments	\$ 1,642,471
Payable upon return of securities loaned	(15,004)
Fund distributions receivable	6,884
Receivable for investments sold	1,117
Payable for investments purchased	(754)
Other assets and liabilities	5,325
Net position - June 30, 2017	<u>\$ 1,640,039</u>

**Investments**

	Fair Value	Percent of Securities
Corporate bonds	\$ 5,256	0.3%
Equity securities	125,231	7.6
Investments made with cash collateral for securities loaned	15,004	0.9
Money market mutual fund	40,335	2.5
Private real estate partnerships and funds	1,456,645	88.7
Total	<u>\$ 1,642,471</u>	<u>100.0%</u>

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**REAL ESTATE POOL**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

**Progression of Net Position**

Net position - June 30, 2016	\$ 1,514,946
Net increase from operations	126,343
Net decrease from unit transactions	(1,250)
Net position - June 30, 2017	<u>\$ 1,640,039</u>

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of external investment management and/or partnership fees and expenses.

Period	Actual	NCREIF Property Index plus 100 basis points
One-year	8.4%	N/A
Three-year	10.0%	N/A
Five-year	10.2%	11.7%

**LARGEST HOLDINGS (in \$000s)**

Ten Largest Holdings	Fair Value
RREEF America REIT II, Inc.	\$ 214,632
Invesco Core Real Estate - U.S.A., L.P.	203,091
UBS Trumbull Property Fund	145,550
UBS Trumbull Property Income Fund	104,314
Harrison Street Core Property Fund, L.P.	99,517
Blackstone RE Partners Europe IV, L.P.	51,511
DRA Growth & Income Fund VIII, LLC	46,370
ABR Chesapeake Investors IV, L.P.	37,911
CIM VI-1, LLC	36,406
Kennedy Wilson Real Estate Fund V, L.P.	35,200

**A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).**

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The Real Estate Pool's expenses for the year, divided by the average net position, are as follows:

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**REAL ESTATE POOL**  
**(Continued)**

**EXPENSES (continued)**

<b>Expense Ratio (in basis points)</b>	
Investment advisor fees	5.8
Trustee fees	0.0*
Custodian bank fees	0.6
Management fees	2.7
Fiduciary bond fees	0.0*
External fees/Fund closing costs	28.4
Professional service fees	3.5
Total	<u>41.0</u>

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**HEDGE FUND POOL**

**OBJECTIVES**

The main objective for the Hedge Fund Pool is to reduce risk through diversification of participants' assets. Secondly, the Hedge Fund Pool should provide for long-term growth of its participants' assets.

The Hedge Funds are comprised of the following strategic categories and target range allocations as of June 30, 2016:

Category	Target Range	Allocation Range
<b>Core</b>		
Relative Value	30-40%	25-55%
Event Driven	15-25%	10-40%
Long-Short Equity	15-25%	10-40%
Directional	10-20%	5-25%
<b>Supplemental</b>		
Long Biased	5-15%	0-20%
Private Equity	0-3%	0-5%
Private Credit	0-3%	0-5%
Real Assets	0-3%	0-5%

**MANAGEMENT STRUCTURE**

The selection of investments in the Hedge Fund Pool is made by the Pool's subcommittee which includes the Executive Director/Chief Investment Officer, the Chief Financial Officer/Chief Operating Officer, the Fixed Income and Real Estate Investment Officer, and two members selected from the Board. Investment recommendations are jointly made by the Senior Investment Officer and Albourne America, LLC, the investment consultant to the subcommittee.

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the Hedge Fund Pool are available at WVIMB.org. Financial Highlights are presented below.

**Condensed Statement of Assets and Liabilities**

Investments	\$ 1,809,911
Investment funds redeemed	15,921
Other assets and liabilities	(74)
Net position - June 30, 2017	<u>\$ 1,825,758</u>

Investments	Fair Value	Percent of Securities
Hedge funds	\$ 1,809,889	100.0%
Money market mutual fund	22	0.0
Hedge funds	<u>\$ 1,809,911</u>	<u>100.0%</u>

**Progression of Net Position**

Net position - June 30, 2016	\$ 1,598,277
Net increase from operations	90,559
Net increase from unit transactions	136,922
Net position - June 30, 2017	<u>\$ 1,825,758</u>

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**HEDGE FUND POOL**  
(Continued)

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of external investment management and/or partnership fees and expenses.

Period	Actual	HFRI FoF plus 100 basis points*
One-year	5.7%	7.5%
Three-year	2.2%	2.6%
Five-year	5.1%	3.3%

\* Prior to January 2014, the Hedge Fund index was LIBOR plus 400 basis points.

**LARGEST HOLDINGS**

Ten Largest Holdings	Fair Value
CQS Diversified Fund (SPC) Ltd. SPA II	\$ 117,571
Double Black Diamond, Ltd.	110,551
Davidson Kempner International, Ltd.	109,182
HBK Multi-Strategy Offshore Fund, Ltd.	106,483
Pine River Fund, Ltd.	95,829
MW Eureka Fund	85,738
Farallon COI II Holdings	83,696
Hudson Bay International Fund, Ltd.	80,778
Bridgewater Pure Alpha Ltd.	80,637
PFM Diversified Offshore Fund	77,057

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as custodian bank fees and some professional service fees, and an allocated share of other expenses. The Hedge Fund Pool's expenses for the year, divided by the average net position, are as follows:

<b>Expense Ratio (in basis points)</b>	
Trustee fees	0.0*
Custodian bank fees	0.0*
Management fees	2.7
Fiduciary bond fees	0.0*
Professional service fees	3.1
<b>Total</b>	<b>5.8</b>

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

**OPPORTUNISTIC INCOME POOL**

**OBJECTIVES**

The objectives for the Opportunistic Income Pool are to enhance the diversification and stability of the portfolio, while generating a higher level of income than generally available in the public fixed income markets.

**MANAGEMENT STRUCTURE**

The Opportunistic Income Pool is managed by the following firms, in accordance with a particular investment style.

Manager	Style
Angelo, Gordon & Co.	Direct Lending
TCW Asset Management Company	Direct Lending

**FINANCIAL HIGHLIGHTS (in \$000s)**

Audited financial statements for the Opportunistic Income Pool are available at [WVIMB.org](http://WVIMB.org). Financial Highlights are presented below.

**Condensed Statement of Net Position**

Investments	\$ 304,494
Other assets and liabilities	16
Net position - June 30, 2017	\$ 304,510

**Investments**

	Fair Value	Percent of Securities
Direct lending funds	\$ 245,902	80.8%
Money market mutual fund	58,592	19.2
Total	\$ 304,494	100.0%

**Progression of Net Position**

Net position - June 30, 2016	\$ 114,246
Net increase from operations	12,553
Net increase from unit transactions	177,711
Net position - June 30, 2017	\$ 304,510

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of investment advisor fees.

Period	Actual	Credit Suisse Leveraged Loan plus 200 basis points
One-year	4.8%	10.0%

**Investment Section**  
Investment Pool Objectives, Financial Highlights, and Performance

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**OPPORTUNISTIC INCOME POOL**  
**(Continued)**

**LARGEST HOLDINGS**

Largest Holdings	Fair Value
WV Direct Lending, LLC	\$ 153,959
AG Mountain Laurel Direct Lending Fund, L.P.	91,943

**EXPENSES**

The IMB charges each investment pool for its direct investment-related expenses, such as investment advisor fees, custodian bank fees, and some professional service fees, and an allocated share of other expenses. The Opportunistic Income Pool's expenses for the operating period, divided by the average net position, are as follows:

**Expense Ratios (in basis points)**

Trustee fees	0.0*
Custodian bank fees	0.1
Management fees	2.8
Fiduciary bond fees	0.0*
Professional service fees	0.5
Total	3.4

\* Expense Ratio rounds to less than 0.1 basis points.

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM**

**HISTORY**

The Public Employees' Retirement System (PERS) was created in 1961.

**LIQUIDITY NEEDS**

PERS is expected to have modest liquidity needs of approximately 1.0 percent to 2.0 percent per year for the foreseeable future.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Reduce the unfunded liability while maintaining adequate liquidity to satisfy benefit payments and not subjecting PERS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for PERS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$19,000,000*	

\* *IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from PERS.*

\*\* *The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.*

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$ 5,597,558
Contributions	202,236
Withdrawals	(362,900)
Net	(160,664)
Investment income	53,273
Net appreciation	821,713
June 30, 2017	\$ 6,311,880

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 1,314,918	20.9%
Non-Large Cap Domestic	265,878	4.2
International Qualified	619,041	9.8
International Equity	1,161,510	18.4
Short-Term Fixed Income	12,781	0.2
Total Return Fixed Income*	626,141	9.9
Core Fixed Income*	267,966	4.2
Private Equity	660,702	10.5
Real Estate	657,834	10.4
Hedge Fund	601,483	9.5
Opportunistic Income	123,626	2.0
<b>Total</b>	<b>\$ 6,311,880</b>	<b>100.0%</b>

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.8%	7.5%
Three-year	6.4%	7.5%
Five-year	9.9%	7.5%
Ten-year	6.0%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

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**TEACHERS' RETIREMENT SYSTEM**

**HISTORY**

The Teachers' Retirement System (TRS) was created in 1941. It was closed to new members in 1991, but reopened to first-time hires as of July 1, 2005. Employees hired from 1991 through June 30, 2005, joined the Teachers' Defined Contribution Plan (TDC). In the spring of 2008, more than 78 percent of the participants in the Teachers' Defined Contribution Plan elected to transfer their TDC account balance to TRS and become participants in TRS. This transfer occurred in July 2008.

**LIQUIDITY NEEDS**

TRS has a net negative cash flow position, and will likely continue to have substantial liquidity needs of at least 10 percent per year.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Reduce the unfunded liability while maintaining adequate liquidity to satisfy benefit payments and not subjecting TRS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for TRS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$35,000,000*	

*\* IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from TRS.*

*\*\* The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.*

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**TEACHERS' RETIREMENT SYSTEM**  
(Continued)

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$	6,513,312
Contributions		480,292
Withdrawals		(729,000)
Net		(248,708)
Investment income		60,398
Net appreciation		934,591
June 30, 2017	\$	7,259,593

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 1,478,485	20.3%
Non-Large Cap Domestic	301,980	4.2
International Qualified	710,479	9.8
International Equity	1,304,818	18.0
Short-Term Fixed Income	114,834	1.6
Total Return Fixed Income*	701,802	9.7
Core Fixed Income*	298,234	4.1
TRS Annuity	(135)	0.0
Private Equity	750,422	10.3
Real Estate	769,812	10.6
Hedge Fund	688,374	9.5
Opportunistic Income	140,488	1.9
Total	\$ 7,259,593	100.0%

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.7%	7.5%
Three-year	6.3%	7.5%
Five-year	9.9%	7.5%
Ten-year	5.7%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**STATE POLICE DEATH, DISABILITY, AND RETIREMENT FUND**

**HISTORY**

The State Police Death, Disability and Retirement Fund (SPDDRF) was created in 1925.

**LIQUIDITY NEEDS**

SPDDRF is now a closed plan and is expected to experience an increasingly negative cash flow position in the near future.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Reduce the unfunded liability while maintaining adequate liquidity to satisfy benefit payments and not subjecting SPDDRF to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for SPDDRF. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$3,800,000*	

\* IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from SPDDRF.

\*\* The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$ 578,762
Contributions	19,090
Withdrawals	(43,898)
Net	(24,808)
Investment income	5,355
Net appreciation	82,439
June 30, 2017	\$ 641,748

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

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**STATE POLICE DEATH, DISABILITY, AND RETIREMENT FUND**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 130,580	20.4%
Non-Large Cap Domestic	26,793	4.2
International Qualified	62,649	9.8
International Equity	113,961	17.8
Short-Term Fixed Income	17,560	2.7
Total Return Fixed Income*	58,980	9.2
Core Fixed Income*	25,902	4.0
Private Equity	65,707	10.2
Real Estate	67,657	10.5
Hedge Fund	59,671	9.3
Opportunistic Income	12,288	1.9
<b>Total</b>	<b>\$ 641,748</b>	<b>100.0%</b>

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.8%	7.5%
Three-year	6.4%	7.5%
Five-year	9.9%	7.5%
Ten-year	6.0%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**STATE POLICE RETIREMENT SYSTEM**

**HISTORY**

The State Police Retirement System (SPRS) was created in 1994.

**LIQUIDITY NEEDS**

SPRS is expected to be in a positive net cash flow position for the foreseeable future.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Reduce the unfunded liability while maintaining adequate liquidity to satisfy benefit payments and not subjecting SPRS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for SPRS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$75,000*	

**\* IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from SPRS.**

**\*\* The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.**

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$ 138,127
Contributions	6,516
Withdrawals	(504)
Net	6,012
Investment income	1,407
Net appreciation	20,937
June 30, 2017	\$ 166,483

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

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**STATE POLICE RETIREMENT SYSTEM**  
**(Continued)**

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 34,932	21.1%
Non-Large Cap Domestic	6,994	4.2
International Qualified	15,853	9.5
International Equity	30,915	18.6
Short-Term Fixed Income	891	0.5
Total Return Fixed Income*	17,330	10.4
Core Fixed Income*	7,355	4.4
Private Equity	17,288	10.4
Real Estate	16,668	10.0
Hedge Fund	15,016	9.0
Opportunistic Income	3,241	1.9
<b>Total</b>	<b>\$ 166,483</b>	<b>100.0%</b>

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.8%	7.5%
Three-year	6.4%	7.5%
Five-year	9.9%	7.5%
Ten-year	6.0%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**DEPUTY SHERIFFS' RETIREMENT SYSTEM**

**HISTORY**

The Deputy Sheriffs' Retirement System (DSRS) was created in 1998.

**LIQUIDITY NEEDS**

DSRS currently has positive net cash flows.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Preserve the current well-funded position while not subjecting DSRS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for DSRS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$250,000*	

*\*IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from DSRS.*

*\*\* The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.*

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$ 171,949
Contributions	6,134
Withdrawals	(5,899)
Net	235
Investment income	1,691
Net appreciation	25,591
June 30, 2017	\$ 199,466

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**DEPUTY SHERIFFS' RETIREMENT SYSTEM**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 42,054	21.5%
Non-Large Cap Domestic	8,450	4.2
International Qualified	19,537	9.8
International Equity	36,601	18.4
Short-Term Fixed Income	661	0.3
Total Return Fixed Income*	20,308	10.2
Core Fixed Income*	8,686	4.4
Private Equity	20,805	10.4
Real Estate	20,039	10.0
Hedge Fund	18,431	9.2
Opportunistic Income	3,894	2.0
<b>Total</b>	<b>\$ 199,466</b>	<b>100.4%</b>

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.8%	7.5%
Three-year	6.4%	7.5%
Five-year	9.9%	7.5%
Ten-year	6.0%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**JUDGES' RETIREMENT SYSTEM**

**HISTORY**

The Judges' Retirement System (JRS) was created in 1949.

**LIQUIDITY NEEDS**

JRS currently has slightly negative net cash flows.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Reduce the unfunded liability while maintaining adequate liquidity to satisfy benefit payments and not subjecting JRS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for JRS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$500,000*	

*\* IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from JRS.*

*\*\* The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.*

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$ 167,178
Contributions	772
Withdrawals	(4,265)
Net	(3,493)
Investment income	1,618
Net appreciation	24,653
June 30, 2017	\$ 189,956

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**JUDGES' RETIREMENT SYSTEM**  
(Continued)

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 40,196	21.0%
Non-Large Cap Domestic	8,075	4.3
International Qualified	18,525	9.8
International Equity	35,068	18.5
Short-Term Fixed Income	439	0.2
Total Return Fixed Income*	19,046	10.0
Core Fixed Income*	8,157	4.3
Private Equity	19,859	10.5
Real Estate	19,130	10.1
Hedge Fund	17,742	9.3
Opportunistic Income	3,719	2.0
<b>Total</b>	<b>\$ 189,956</b>	<b>100.0%</b>

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.9%	7.5%
Three-year	6.4%	7.5%
Five-year	9.9%	7.5%
Ten-year	6.0%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

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**EMERGENCY MEDICAL SERVICES RETIREMENT SYSTEM**

**HISTORY**

The Emergency Medical Services Retirement System (EMSRS) was created by the *Emergency Medical Services Retirement System Act* effective January 1, 2008, under *West Virginia Code §16-5V-4*. EMSRS members with benefits earned in the Public Employees' Retirement System (PERS) transferred their full membership and benefits under PERS to EMSRS on the effective date.

**LIQUIDITY NEEDS**

EMSRS is expected to be in a positive net cash flow position for the foreseeable future.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Maintain adequate liquidity to satisfy benefit payments while not subjecting EMSRS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for EMSRS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocation**
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash (included in Fixed Income above)	\$75,000*	

\* *IMB Staff has authority to change the cash allocation plus or minus 10 percent, as necessary, in consultation with the appropriate representative(s) from EMSRS.*

\*\* *The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.*

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**EMERGENCY MEDICAL SERVICES RETIREMENT SYSTEM  
(Continued)**

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$	58,844
Contributions		2,900
Withdrawals		(795)
Net		2,105
Investment income		595
Net appreciation		8,911
June 30, 2017	\$	70,455

**Asset Allocation**

	Amount	Percent of Total
Large Cap Domestic	\$ 14,838	21.0%
Non-Large Cap Domestic	2,971	4.2
International Qualified	6,708	9.5
International Equity	13,092	18.6
Short-Term Fixed Income	297	0.4
Total Return Fixed Income*	7,241	10.3
Core Fixed Income*	3,074	4.4
Private Equity	7,335	10.4
Real Estate	7,068	10.0
Hedge Fund	6,457	9.2
Opportunistic Income	1,374	2.0
Total	\$ 70,455	100.0%

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

	Actual	Target
One-year	15.8%	7.5%
Three-year	6.4%	7.5%
Five-year	9.9%	7.5%

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**MUNICIPAL POLICE OFFICERS AND FIREFIGHTERS RETIREMENT SYSTEM**

**HISTORY**

Municipal Police Officers and Firefighters Retirement System (MPFRS) was created in 2010 for the purpose of providing retirement benefits for municipal police officers and paid professional firefighters hired into covered employment by participating municipalities on or after January 1, 2010.

**LIQUIDITY NEEDS**

There are no anticipated liquidity needs at this time.

**INVESTMENT OBJECTIVES**

The investment objectives are as follows:

- Exceed the actuarial interest rate assumption of 7.5 percent per annum, net of fees.
- Maintain adequate liquidity to satisfy benefit payments while not subjecting MPFRS to an undue level of risk.

**ASSET ALLOCATION**

Based upon a determination of the appropriate risk tolerance, the Board adopted the following broad asset allocation guidelines for the assets managed for MPFRS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Policy Allocation	Strategic Allocation
Domestic Equity	30.0%	27.5%
International Equity	30.0%	27.5%
Private Equity	0.0%	10.0%
Fixed Income	40.0%	15.0%
Opportunistic Income	0.0%	0.0%
Hedge Fund	0.0%	10.0%
Real Estate	0.0%	10.0%
Cash	\$0*	

*\* IMB Staff has authority to change the cash target up to 5 percent, as necessary, in consultation with the appropriate representative(s) from MPFRS.*

*\*\* The Base and Strategic Allocations to opportunistic income are 0 percent, but the Allocation Committee has the authority to make a Range Allocation of up to 5 percent to this asset class.*

**FINANCIAL HIGHLIGHTS (in \$000s)**

**Progression of Plan Balance**

June 30, 2016	\$ 3,080
Contributions	1,700
Withdrawals	(10)
Net	1,690
Investment income	40
Net appreciation	565
June 30, 2017	\$ 5,375

**Investment Section**  
Individual Retirement System Asset Allocation and Performance

**MUNICIPAL POLICE OFFICERS AND FIREFIGHTERS RETIREMENT SYSTEM  
(Continued)**

**FINANCIAL HIGHLIGHTS (continued in \$000s)**

Asset Allocation	Amount	Percent of Total
Large Cap Domestic	\$ 1,085	20.2%
Non-Large Cap Domestic	210	3.9
International Qualified	463	8.6
International Equity	958	17.8
Short-Term Fixed Income	306	5.7
Total Return Fixed Income*	540	10.0
Core Fixed Income*	230	4.3
Private Equity	528	9.8
Real Estate	510	9.5
Hedge Fund	445	8.3
Opportunistic Income	100	1.9
<b>Total</b>	<b>\$ 5,375</b>	<b>100.0%</b>

\* Balances include the distribution declared by the pool on the last day of the month and reinvested to the participant's account on the first day of the following month.

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology based on market rate of return. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of fees.

Period	Actual	Target
One-year	15.7%	7.5%
Three-year	6.2%	7.5%
Five-year	9.4%	7.5%



# ACTUARIAL SECTION



## **Actuarial Section**

### Overview

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The Actuarial Section of the comprehensive annual financial report provides information related to the actuarial valuations prepared for each of the pension plans for funding purposes. Other schedules provide information regarding the required contributions, benefits, and funded status of the plans.

Effective with the adoption of GASB 67 for the fiscal year ended June 30, 2014, each of the pension plans has an actuarial valuation prepared for funding purposes and a separate actuarial valuation prepared for financial reporting purposes. The actuarial valuations included in this section of the comprehensive annual financial report have been prepared for funding purposes and have been prepared as of July 1, 2016, the beginning of the plan year. The actuarial valuations prepared for financial reporting purposes have been prepared as of June 30, 2017, the end of the plan year, and were the source of much of the actuarial information in the Financial Section.

The actuarial methods and assumptions used to prepare the actuarial valuations for funding purposes and for financial reporting purposes are nearly identical. The primary difference is in the asset valuation method for the Public Employees Retirement System (PERS). For financial reporting purposes, the fair value of the PERS assets as of the end of the fiscal year is used. For funding purposes, a four year smoothing of the actuarial gain or loss on PERS asset returns each year is used.



January 31, 2018

West Virginia Public Employees' Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members,

We performed the annual actuarial valuation of the West Virginia Public Employees' Retirement System (PERS) as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy. The valuation was based on membership data as of June 30, 2016, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board.

The tables presented for PERS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2016 valuation report dated March 31, 2017. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

This report presents fairly the actuarial position of the West Virginia Public Employees' Retirement System as of July 1, 2016, in accordance with Actuarial Standards of Practice (ASOPs) applied on a basis consistent with that of the preceding valuation. In my opinion, the assumptions used in preparing the liabilities and costs are individually reasonable with respect to PERS experience and represent my best estimate of anticipated future experience of PERS. The assumptions were developed in accordance with the guidance set forth in applicable Actuarial Standards of Practice, including ASOPs 27 and 35. In particular, the mortality assumptions were developed in accordance with the

recommendation that an appropriate margin for future improvement in mortality beyond the measurement date be included.

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need for and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent's prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC

*David L. Driscoll*

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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

**SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

**Valuation Date:** July 1, 2016

**Funding Method and Basis for Assumptions**

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on date of hire.

Experience studies are performed at least once in every 5-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the experience study covering the period from July 1, 2009, to June 30, 2014. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

**Interest Rate and Expenses**

The valuation interest assumption is 7.50% per annum, with no loading for system expenses.

**Salary Scales**

Salary scales are used for the assumed increase in salary. Projected salary increases for State and Nonstate employees range from 3.00% to 6.00% per year. Assumed increases in salary for sample ages are as follows:

**Salary Scales**

Age	State	Nonstate
30	4.10%	4.60%
40	3.60%	4.10%
50	3.10%	3.85%
60	3.00%	3.35%

**Mortality**

The mortality tables are as follows:

- Pre-retirement males: 100% of RP-2000 Non-Annuitant table, projected with Scale AA on a fully generational basis
- Pre-retirement females: 100% of RP-2000 Non-Annuitant table, projected with Scale AA on a fully generational basis
- Post-retirement healthy males: 110% of RP-2000 Healthy Annuitant table, projected with Scale AA on a fully generational basis
- Post-retirement healthy females: 101% of RP-2000 Healthy Annuitant table, projected with Scale AA on a fully generational basis
- Disabled males: 96% of RP-2000 Disabled Annuitant table, projected with Scale AA on a fully generational basis
- Disabled females: 107% of RP-2000 Disabled Annuitant table, projected with Scale AA on a fully generational basis

**ACTUARIAL SECTION**  
Public Employees' Retirement System

**Withdrawal from Service**

Specific tables have been created to reflect withdrawal rates. All withdrawals are assumed to result in refund of contributions if non-vested or a deferred annuity if vested. The liability for a refund of contributions for nonactive non-vested members as of the valuation date is assumed to be 60% of the total employee contribution balance of such members. Sample withdrawal rates are as follows:

**Withdrawal Rates**

State (less than 1 year)		
Age	Male	Female
30	0.26975	0.25415
40	0.20930	0.20020
50	0.16380	0.17160
60	0.15015	0.14300

**Withdrawal Rates**

State (1 to 2 years)		
Age	Male	Female
30	0.23100	0.22000
40	0.16800	0.15000
50	0.12375	0.12500
60	0.11250	0.11250

**Withdrawal Rates**

State (2 to 3 years)		
Age	Male	Female
30	0.18200	0.17500
40	0.13000	0.12500
50	0.08800	0.12500
60	0.06600	0.09375

**Withdrawal Rates**

State (3 to 4 years)		
Age	Male	Female
30	0.15600	0.15120
40	0.10400	0.10080
50	0.07800	0.08820
60	0.05200	0.06300

**Withdrawal Rates**

State (4 to 5 years)		
Age	Male	Female
30	0.12600	0.11250
40	0.10500	0.08750
50	0.07000	0.07188
60	0.03500	0.05000

**Withdrawal Rates**

State (greater than 5 years)		
Age	Male	Female
30	0.08400	0.08800
40	0.04800	0.04500
50	0.03120	0.03500
60	0.02400	0.01750

**Withdrawal Rates**

Nonstate (less than 1 year)		
Age	Male	Female
30	0.30360	0.25070
40	0.24840	0.21850
50	0.19320	0.17250
60	0.15180	0.13800

**Withdrawal Rates**

Nonstate (1 to 2 years)		
Age	Male	Female
30	0.24480	0.21850
40	0.18720	0.18975
50	0.13200	0.13000
60	0.12000	0.11000

**Withdrawal Rates**

Nonstate (2 to 3 years)		
Age	Male	Female
30	0.17600	0.17765
40	0.12650	0.13300
50	0.09000	0.10925
60	0.08000	0.09025

**Withdrawal Rates**

Nonstate (3 to 4 years)		
Age	Male	Female
30	0.16940	0.15500
40	0.11000	0.13000
50	0.08800	0.10000
60	0.06600	0.08000

**ACTUARIAL SECTION**  
Public Employees' Retirement System

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**Withdrawal from Service (continued)**

**Withdrawal Rates**

Nonstate (4 to 5 years)		
Age	Male	Female
30	0.12000	0.14820
40	0.10800	0.10260
50	0.07920	0.07980
60	0.05040	0.05700

**Withdrawal Rates**

Nonstate (greater than 5 years)		
Age	Male	Female
30	0.08910	0.09000
40	0.05400	0.05850
50	0.04000	0.03500
60	0.02000	0.02000

**Disablement Rates**

Sample rates of disablement are as follows:

**Disability Rates**

State and Nonstate		
Age	Male	Female
30	0.00027	0.00039
40	0.00102	0.00073
50	0.00439	0.00225
60	0.00675	0.00488

**Retirement Rates**

The retirement rates are as follows:

**Retirement Rates**

State and Nonstate	
Age	Rates
55	0.25
56	0.15
57	0.15
58	0.15
59	0.15
60	0.12
61	0.15
62	0.25
63	0.18
64	0.18
65	0.22
66	0.20
67	0.20
68	0.20
69	0.20
70+	1.00

**Family Composition**

It is assumed that 85% of males and 80% of females are married, with husbands 3 years older than wives. Remarriage rates are not used.

**Accrual of Future Service**

It is assumed that active members will accrue 1 year of service for each future year of employment.

**Noncontributory Service Loadings**

Noncontributory service for active members is estimated from member's contributory service by adjusting the present value of benefits projected from contributory service alone. The assumed service leads are as follows:

	Tier 1	Tier 2
• Male - State	10.400%	7.000%
• Male - Nonstate	10.000%	7.500%
• Female - State	2.800%	0.300%
• Female - Nonstate	2.475%	0.275%

**Asset Valuation Method**

4-year 25% level smoothing of actuarial gain or (loss) on trust fund return:

- Implemented over 4 years, prospectively commencing July 1, 2009 for the experience for the trust year ending June 30, 2009.
- Actuarial gain or (loss) on assets is calculated as the difference between the expected return under valuation assumptions based on the smoothed Actuarial Value of Assets and the actual trust fund return.
- Actuarial gain or (loss) is recognized at 25% of the original amount each year until fully recognized in the fourth year.
- Total accumulated deferred gain or (loss) amounts are used to adjust the reported Market Value of Assets to determine the Actuarial Value of Assets.

**System Contributions**

Both employee and employer contributions to the System are assumed to be paid in the middle of the year.

**ACTUARIAL SECTION**  
Public Employees' Retirement System

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	36,150	\$ 1,414,585,000	\$ 39,131	1.5%	513
6/30/2015	36,122	1,392,113,000	38,539	1.0%	512
6/30/2014	36,413	1,389,089,000	38,148	0.6%	513
6/30/2013	36,637	1,389,850,000	37,936	0.3%	511
6/30/2012	36,573	1,382,647,000	37,805	3.2%	510
6/30/2011	36,254	1,327,717,000	36,623	0.2%	511
6/30/2010	35,977	1,315,441,000	36,563	2.5%	512
6/30/2009	35,717	1,274,485,000	35,683	3.9%	510
6/30/2008	35,491	1,219,388,000	34,358	3.5%	504
6/30/2007	35,873	1,191,130,000	33,204	2.2%	497

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 5,888,558	\$ 6,615,406	\$ 726,848	89.0%	\$1,414,585	51.4%
7/1/2015	5,565,081	6,412,587	847,506	86.8%	1,392,113	60.9%
7/1/2014	5,208,828	6,271,827	1,062,999	83.1%	1,389,089	76.5%
7/1/2013	4,709,530	5,911,263	1,201,733	79.7%	1,389,850	86.5%
7/1/2012	4,452,395	5,735,775	1,283,380	77.6%	1,382,647	92.8%
7/1/2011	4,322,668	5,515,252	1,192,584	78.4%	1,327,717	89.8%
7/1/2010	3,974,609	5,325,830	1,351,221	74.6%	1,315,441	102.7%
7/1/2009	3,930,701	4,930,158	999,457	79.7%	1,274,485	78.4%
7/1/2008	3,939,059	4,677,027	737,968	84.2%	1,219,388	60.5%
7/1/2007	4,293,296	4,426,051	132,755	97.0%	1,191,130	11.1%

**Solvency Test (in thousands)**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 442,113	\$ 3,806,345	\$ 2,366,948	\$ 5,888,558	100.0%	100.0%	69.3%
6/30/2015	426,634	3,636,257	2,349,696	5,565,081	100.0%	100.0%	63.9%
6/30/2014	449,533	3,299,873	2,325,221	5,208,828	100.0%	100.0%	62.8%
6/30/2013	451,604	3,137,477	2,322,182	4,709,530	100.0%	100.0%	48.2%
6/30/2012	449,893	2,949,168	2,336,714	4,452,395	100.0%	100.0%	45.1%
6/30/2011	434,454	2,792,236	2,288,562	4,322,668	100.0%	100.0%	47.9%
6/30/2010	432,007	2,593,949	2,299,874	3,974,609	100.0%	100.0%	41.2%
6/30/2009	426,936	2,338,871	2,164,351	3,930,701	100.0%	100.0%	53.8%
6/30/2008	410,799	2,189,262	2,076,966	3,939,059	100.0%	100.0%	64.5%
6/30/2007	405,476	2,050,544	1,970,031	4,293,296	100.0%	100.0%	93.3%

**ACTUARIAL SECTION**  
Public Employees' Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	1,687	\$ 21,059,900	(1,073)	\$ 11,122,718	26,293	\$ 382,576,974	2.7%	\$ 14,551
2015	1,806	34,274,051	(1,058)	12,142,200	25,679	372,639,792	6.0%	14,511
2014	1,664	31,294,049	(938)	9,203,018	24,931	351,455,484	5.6%	14,097
2013	1,725	31,593,996	(980)	9,613,212	24,205	332,761,008	6.6%	13,748
2012	1,589	27,609,382	(922)	7,997,833	23,460	312,198,792	6.2%	13,308
2011	1,673	31,250,302	(920)	7,834,867	22,793	294,084,936	7.7%	12,902
2010	1,438	25,365,630	(897)	7,382,382	22,040	273,012,324	6.6%	12,387
2009	1,509	26,578,560	(922)	7,186,068	21,499	256,026,485	7.0%	11,909
2008	1,356	24,449,168	(958)	7,351,692	20,912	239,172,379	6.7%	11,437
2007	1,373	23,721,486	(885)	6,811,456	20,514	224,224,742	7.0%	10,930

**Changes in Unfunded Actuarial Liability**

Unfunded Actuarial Liability, June 30, 2016	<u>\$ 847,506,000</u>
Expected increase from amortization method	(16,636,000)
Increase from expected contributions below actuarial rates	(38,454,000)
Investment experience (smoothed)	(55,996,000)
Liability experience (including transfers)	(9,572,000)
Changes in assumptions	<u>-</u>
Unfunded Actuarial Liability, June 30, 2017	<u>\$ 726,848,000</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



260 Franklin Street  
Suite 500  
Boston, MA 02110

January 31, 2018

West Virginia Teachers' Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia Teachers' Retirement System (TRS) as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy.

The valuation was based on membership data as of June 30, 2016, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board.

The tables presented for TRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2016 valuation report dated March 31, 2017. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

This report presents fairly the actuarial position of the West Virginia Teachers' Retirement System as of July 1, 2016, in accordance with Actuarial Standards of Practice (ASOPs) applied on a basis consistent with that of the preceding valuation. In my opinion, the assumptions used in preparing the liabilities and costs are individually reasonable with respect to TRS experience and represent my best estimate of anticipated future experience of TRS. The assumptions were developed in accordance with the guidance set forth in applicable Actuarial Standards of Practice, including ASOPs 27 and 35.

In particular, the mortality assumptions were developed in accordance with the recommendation that an appropriate margin for future improvement in mortality beyond the measurement date be included.

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on a market value of assets basis. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent's prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC

*David L. Driscoll*

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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

**SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

**Valuation Date:** July 1, 2016

**Funding Method and Basis for Assumptions**

The valuation is prepared under the Entry Age Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on adjusted date of hire (i.e. valuation date minus known past service).

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the experience study covering the period from July 1, 2010, to June 30, 2015. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

**Interest Rate and Expenses**

The valuation interest assumption is 7.5% per annum, with no loading for plan expenses.

**Salary Scales**

Projected salary increases are in the following ranges by group, with an underlying inflation rate of 3.0%:

Group	Range of Projected Salary Increases
Teachers	3.00% - 6.00%
Non-Teachers	3.00% - 6.50%

A sample of salaries from the salary scales is as follows:

**Salary Scales**

Age	Teachers	Non-Teachers and State
30	5.571%	5.579%
40	4.714%	4.842%
50	3.857%	4.105%
60	3.353%	3.368%

**Pre-Retirement Mortality**

RP-2000 Non-Annuitant table, projected with Scale AA on a fully generational basis.

**Post-Retirement Mortality**

The mortality tables used are as follows:

- Healthy males 97% of RP-2000 Healthy Annuitant table, projected with Scale AA on a fully generational basis
- Healthy females 94% of RP-2000 Healthy Annuitant table, projected with Scale AA on a fully generational basis
- Disabled males 96% of RP-2000 Disabled Annuitant table, projected with Scale AA on a fully generational basis
- Disabled females 101% of RP-2000 Disabled Annuitant table, projected with Scale AA on a fully generational basis

**ACTUARIAL SECTION**  
**Teachers' Retirement System**

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**Withdrawal from Service**

Withdrawal rates are assumed to cease upon eligibility for retirement. All withdrawal is assumed to result in refund of contributions if non-vested or a deferred annuity if vested. Sample withdrawal rates are as follows:

**Withdrawal Rates**

Teachers (less than 1 year)		
Age	Male	Female
30	0.19571	0.19571
40	0.25286	0.25286
50	0.31000	0.31000
60	0.35000	0.35000

**Withdrawal Rates**

Teachers (1 to 2 years)		
Age	Male	Female
30	0.12978	0.10314
40	0.11875	0.09457
50	0.10772	0.08600
60	0.10000	0.08000

**Withdrawal Rates**

Teachers (2 to 3 years)		
Age	Male	Female
30	0.06850	0.07400
40	0.06500	0.05400
50	0.06500	0.05000
60	0.06500	0.05000

**Withdrawal Rates**

Teachers (3 to 4 years)		
Age	Male	Female
30	0.06000	0.05133
40	0.04000	0.05000
50	0.03000	0.05000
60	0.03000	0.05000

**Withdrawal Rates**

Teachers (4 to 5 years)		
Age	Male	Female
30	0.04930	0.05400
40	0.04030	0.03401
50	0.03130	0.02250
60	0.02500	0.02250

**Withdrawal Rates**

Teachers (greater than 5 years)		
Age	Male	Female
30	0.02400	0.02400
40	0.01904	0.01600
50	0.01200	0.00800
60	0.01600	0.01200

**Withdrawal Rates**

Non-Teachers and State (less than 1 year)		
Age	Male	Female
30	0.15600	0.21450
40	0.13200	0.18150
50	0.10800	0.14850
60	0.08400	0.11550

**Withdrawal Rates**

Non-Teachers and State (1 to 2 years)		
Age	Male	Female
30	0.11000	0.11988
40	0.08000	0.07200
50	0.06000	0.05400
60	0.05000	0.04500

**Withdrawal Rates**

Non-Teachers and State (2 to 3 years)		
Age	Male	Female
30	0.09440	0.09520
40	0.06240	0.06160
50	0.04000	0.04480
60	0.04000	0.04480

**Withdrawal Rates**

Non-Teachers and State (3 to 4 years)		
Age	Male	Female
30	0.06000	0.06732
40	0.05000	0.03600
50	0.05000	0.03510
60	0.05000	0.04050

**Withdrawal from Service (continued)**

Withdrawal Rates			Withdrawal Rates		
Non-Teachers and State (4 to 5 years)			Non-Teachers and State (greater than 5 years)		
Age	Male	Female	Age	Male	Female
30	0.03750	0.05625	30	0.03507	0.03122
40	0.03450	0.03375	40	0.02363	0.01750
50	0.03450	0.02250	50	0.01688	0.01316
60	0.03450	0.01688	60	0.01500	0.01400

**Disablement Rates**

A sample of disablement rates follows:

Disability Rates		
Age	Male	Female
30	0.00080	0.00064
40	0.00200	0.00160
50	0.00407	0.00301
60	0.00560	0.00704

**Retirement Rates**

A schedule of retirement rates follows:

Age	Teachers		Non-Teachers & State	
	Male	Female	Male	Female
54	0.000	0.000	0.000	0.000
55	0.250	0.275	0.300	0.200
56	0.175	0.175	0.200	0.175
57	0.175	0.200	0.175	0.150
58	0.200	0.200	0.150	0.150
59	0.200	0.200	0.150	0.175
60	0.200	0.250	0.150	0.175
61	0.250	0.200	0.150	0.175
62	0.350	0.275	0.350	0.250
63	0.250	0.250	0.250	0.200
64	0.250	0.250	0.175	0.200
65	0.400	0.300	0.300	0.300
66	0.300	0.350	0.225	0.250
67	0.250	0.300	0.225	0.225
68	0.250	0.300	0.225	0.225
69	0.250	0.300	0.225	0.225
70+	1.000	1.000	1.000	1.000

**Accrual of Future Service**

It is assumed that all active members will accrue 1 year of service for each future year of employment.

**Non-Contributory Service Loadings**

The load factor assumptions for non-contributory service (military, parochial or out-of-state teaching, transferred PERS service, and unused sick leave) are as follows:

Group	Male		Female	
	Tier 1	Tier 2	Tier 1	Tier 2
Teachers	7.75%	0.50%	4.50%	0.00%
Non-Teachers	4.50%	0.50%	3.25%	0.00%

**Family Composition**

It is assumed that 85% of males and 80% of females are married, with husbands 3 years older than wives. Remarriage rates are not used.

**Asset Valuation Method**

4 year 25% level smoothing of actuarial gain or (loss) on trust fund return:

- Implemented over 4 years, prospectively commencing July 1, 2016 for the experience for the trust year ending June 30, 2016.
- Actuarial gain or (loss) on assets is calculated as the difference between the expected return under valuation assumptions based on the smoothed Actuarial Value of Assets and the actual trust fund return.
- Actuarial gain or (loss) is recognized at 25% of the original amount each year until fully recognized in the fourth year.
- Total accumulated deferred gain or (loss) amounts are used to adjust the reported Market Value of Assets to determine the Actuarial Value of Assets.

**Plan Contribution**

Both employee and employer contributions to the plan are assumed to be paid in the middle of the year.

**ACTUARIAL SECTION**  
Teachers' Retirement System

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	35,811	\$ 1,505,080,000	\$ 42,028	-0.5%	84
6/30/2015	35,788	1,511,271,000	42,228	1.8%	84
6/30/2014	35,724	1,481,786,000	41,479	-1.1%	84
6/30/2013	35,593	1,493,515,000	41,961	-0.5%	84
6/30/2012	35,807	1,510,083,000	42,173	0.4%	84
6/30/2011	35,855	1,505,749,000	41,996	-0.2%	82
6/30/2010	35,670	1,500,761,000	42,073	0.2%	82
6/30/2009	35,701	1,499,232,000	41,994	4.9%	82
6/30/2008	35,219	1,409,437,000	40,019	-5.7%	82
6/30/2007	19,529	828,939,000	42,447	4.2%	82

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 6,936,281	\$ 10,604,279	\$ 3,667,998	65.4%	\$ 1,505,080	243.7%
7/1/2015	6,803,089	10,310,652	3,507,563	66.0%	1,511,271	232.1%
7/1/2014	6,682,093	10,098,693	3,416,600	66.2%	1,481,786	230.6%
7/1/2013	5,751,101	9,930,335	4,179,234	57.9%	1,493,515	279.8%
7/1/2012	5,144,397	9,712,582	4,568,185	53.0%	1,510,082	302.5%
7/1/2011	5,074,665	9,445,148	4,370,483	53.7%	1,505,749	290.3%
7/1/2010	4,143,540	8,904,312	4,760,772	46.5%	1,500,761	317.2%
7/1/2009	3,554,771	8,607,869	5,053,098	41.3%	1,499,232	337.0%
7/1/2008	4,133,883	8,268,578	4,134,695	50.0%	1,409,437	293.4%
7/1/2007	3,665,993	7,142,711	3,476,718	51.3%	828,939	419.4%

**Solvency Test (in thousands)**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees & Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 793,540	\$ 7,333,565	\$ 2,477,174	\$ 6,936,281	100.0%	83.8%	0.0%
6/30/2015	808,969	6,976,345	2,525,338	6,803,089	100.0%	85.9%	0.0%
6/30/2014	776,002	6,651,706	2,670,985	6,682,093	100.0%	88.8%	0.0%
6/30/2013	764,280	6,264,695	2,901,360	5,751,101	100.0%	79.6%	0.0%
6/30/2012	754,285	5,806,955	3,151,342	5,144,397	100.0%	75.6%	0.0%
6/30/2011	739,997	5,438,589	3,266,562	5,074,665	100.0%	79.7%	0.0%
6/30/2010	687,828	4,877,284	3,339,200	4,143,540	100.0%	70.9%	0.0%
6/30/2009	677,365	4,511,170	3,419,334	3,554,771	100.0%	63.8%	0.0%
6/30/2008	630,240	4,219,349	3,418,989	4,133,883	100.0%	83.0%	0.0%
6/30/2007	302,347	3,985,211	2,855,153	3,665,993	100.0%	84.4%	0.0%

**ACTUARIAL SECTION**  
Teachers' Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	1,796	\$ 38,461,963	(1,094)	\$ 32,304,726	35,440	\$ 749,139,456	0.8%	\$ 21,138
2015	1,942	55,067,119	(1,204)	17,480,491	34,738	742,982,219	5.4%	21,388
2014	2,054	59,887,492	(1,061)	13,218,744	34,000	704,665,714	6.6%	20,725
2013	2,210	65,333,080	(1,116)	14,090,125	33,007	661,061,157	8.0%	20,028
2012	1,850	52,405,063	(980)	11,142,482	31,913	611,964,828	7.1%	19,176
2011	2,039	55,816,157	(1,123)	11,685,848	31,043	571,566,916	8.0%	18,412
2010	1,952	50,384,790	(1,070)	11,288,029	30,127	529,400,876	8.0%	17,572
2009	1,766	43,023,575	(1,043)	10,606,309	29,245	490,013,124	6.9%	16,755
2008	1,625	41,174,835	(1,143)	10,880,080	28,522	458,291,496	6.4%	16,068
2007	1,756	42,148,636	(1,105)	10,597,790	28,040	430,694,400	7.6%	15,360

**Changes in Unfunded Actuarial Liability**

Unfunded Actuarial Liability, June 30, 2016	<u>\$ 3,507,563,000</u>
Expected increase from amortization method	(76,622,000)
Increase from expected contributions below actuarial rates	21,267,000
Investment experience	130,784,000
Liability experience (including transfers)	(110,079,000)
Change in assumption	<u>195,085,000</u>
Unfunded Actuarial Liability, June 30, 2017	<u>\$ 3,667,998,000</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.

January 31, 2018

West Virginia Department of Public Safety Death, Disability and Retirement Fund  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia Department of Public Safety Death, Disability and Retirement Fund (Plan A) as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy.

The valuation was based on membership data as of June 30, 2016, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board.

The tables presented for Plan A in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2016 valuation report dated March 31, 2017. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

This report presents fairly the actuarial position of Plan A as of July 1, 2016, in accordance with Actuarial Standards of Practice (ASOPs) applied on a basis consistent with that of the preceding valuation. In my opinion, the assumptions used in preparing the liabilities and costs are individually reasonable with respect to Plan A experience and represent my best estimate of anticipated future experience of Plan A. The assumptions were developed in accordance with the guidance set forth in applicable Actuarial Standards of Practice, including ASOPs 27 and 35. In particular, the mortality

assumptions were developed in accordance with the recommendation that an appropriate margin for future improvement in mortality beyond the measurement date be included.

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on a market value of assets basis. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent’s prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC

*David L. Driscoll*

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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

**SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

**Valuation Date:** July 1, 2016

**Funding Method and Basis for Assumptions**

The valuation is prepared under the Entry Age Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on date of hire.

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the experience study covering the period from July 1, 2006, to June 30, 2011. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

**Interest Rate and Expenses**

The valuation interest assumption is 7.50% per annum, with no loading for plan expenses.

**Pre-Retirement Mortality**

The male and female RP-2000 Non-Annuitant Mortality Tables, projected to 2020 with Scale BB. It is assumed that 70% of deaths of members in service are duty-related.

**Post-Retirement Mortality**

Post-retirement mortality tables are as follows:

Healthy: RP-2000 Healthy Annuitants, projected to 2025 with Scale BB

Disabled: RP-2000 Healthy Annuitants, projected to 2025 with Scale BB, set forward 1 year

**Salary Scales**

Compensation is assumed to increase 5.00% per year for the first 2 years of service, 4.50% for the next 3 years, 4.00% for the next 5 years, and 3.25% per year thereafter. The inflation rate is 3.00%.

**Withdrawal from Service**

Withdrawal rates cease once an employee is eligible for normal retirement. A sample of withdrawal rates follows:

Age	Rate of Withdrawal
20	0.0267
30	0.0190
40	0.0114
50	0.0038

**Disablement Rates**

A sample of disablement rates, which cease once an employee is eligible for normal retirement, are as follows:

Age	Rate of Disablement	Type of Disability	Probability
20	0.0005	Duty-Related Full	0.25
30	0.0020	Duty-Related Partial	0.60
40	0.0060	Nonduty-Related	0.15
50	0.0040		

**Family Composition**

It is assumed that 90% of all members are married, with husbands 3 years older than their wives. Re-marriage rates are not used.

**Accrual of Future Service**

Active members are assumed to accrue 1 year of service for each future year of employment.

**Non-Contributory Service**

A 14.5% load is applied to the retirement liability for active members to represent additional benefit service credit at retirement as a result of the conversion of annual leave, sick leave, and additional credit for military service.

**Retirement Rates**

70% of members are assumed to retire when first eligible for unreduced benefits at the earlier of age 50 and 20 years of service or any age and 25 years of service. An active member who has already attained eligibility for normal retirement has a 20% probability of retiring each year thereafter with 100% retiring on or after attainment of age 55.

**Asset Valuation Method**

Assets for valuation purposes are included at Market Value.

**Plan Contributions**

Both employee and employer contributions are assumed to be paid in the middle of the year.

**ACTUARIAL SECTION**  
State Police, Death, Disability, and Retirement System

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	42	\$ 2,985,000	\$ 71,071	8.0%	1
6/30/2015	52	3,422,000	65,808	0.8%	1
6/30/2014	74	4,829,000	65,257	7.9%	1
6/30/2013	99	5,988,000	60,485	-3.6%	1
6/30/2012	108	6,779,000	62,769	4.3%	1
6/30/2011	133	8,001,000	60,158	-1.3%	1
6/30/2010	147	8,960,000	60,952	-2.7%	1
6/30/2009	163	10,215,000	62,669	4.2%	1
6/30/2008	173	10,400,000	60,116	4.4%	1
6/30/2007	191	10,997,000	57,576	5.5%	1

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 578,798	\$ 729,051	\$ 150,253	79.4%	\$ 2,985	5,033.6%
7/1/2015	607,339	717,362	110,023	84.7%	3,422	3,215.2%
7/1/2014	601,077	698,400	97,323	86.1%	4,829	2,015.4%
7/1/2013	520,322	679,931	159,609	76.5%	5,988	2,665.5%
7/1/2012	477,345	663,341	185,996	72.0%	6,779	2,743.7%
7/1/2011	481,994	606,245	124,251	79.5%	8,001	1,552.9%
7/1/2010	404,444	590,729	186,285	68.5%	8,960	2,079.1%
7/1/2009	362,927	573,579	210,652	63.3%	10,215	2,062.2%
7/1/2008	459,182	547,623	88,441	83.9%	10,400	850.4%
7/1/2007	513,009	527,393	14,384	97.3%	10,997	130.8%

**Solvency Test**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 1,000,237	\$ 687,180,000	\$ 40,870,763	\$ 578,798,000	100.0%	84.1%	0.0%
6/30/2015	1,136,880	669,771,000	46,454,120	607,339,000	100.0%	90.5%	0.0%
6/30/2014	1,652,310	634,008,000	62,739,690	601,077,000	100.0%	94.5%	0.0%
6/30/2013	2,211,930	595,963,000	83,968,000	520,322,000	100.0%	87.0%	0.0%
6/30/2012	2,721,870	579,033,000	84,586,130	477,345,000	100.0%	82.1%	0.0%
6/30/2011	3,420,540	504,876,000	97,948,460	481,994,000	100.0%	94.8%	0.0%
6/30/2010	4,001,490	484,787,000	101,940,510	404,444,000	100.0%	82.7%	0.0%
6/30/2009	4,806,360	461,645,000	107,127,640	362,927,000	100.0%	77.8%	0.0%
6/30/2008	5,580,810	440,958,000	101,084,190	459,182,000	100.0%	100.0%	12.5%
6/30/2007	6,243,840	419,082,000	102,067,160	513,009,000	100.0%	100.0%	85.9%

**ACTUARIAL SECTION**  
State Police, Death, Disability, and Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	23	\$ 877,188	(22)	\$ 877,888	747	\$ 41,969,733	0.1%	\$ 56,184
2015	35	2,346,469	(14)	739,302	746	41,970,433	6.7%	56,261
2014	34	1,921,276	(14)	435,906	725	39,349,335	7.5%	54,275
2013	16	1,089,846	(21)	751,139	705	36,589,971	3.7%	51,901
2012	27	1,873,579	(6)	172,507	710	35,281,042	8.8%	49,692
2011	22	1,496,421	(17)	478,013	689	32,429,754	5.2%	47,068
2010	30	1,971,032	(15)	547,180	684	30,824,823	6.6%	45,066
2009	21	1,328,897	(14)	426,804	669	28,920,348	5.9%	43,229
2008	16	890,947	(5)	142,622	662	27,304,928	6.0%	41,246
2007	17	1,003,174	(11)	200,559	651	25,762,801	5.2%	39,574

**Changes in Unfunded Actuarial Liability**

Unfunded Actuarial Liability, June 30, 2016	<u>\$ 110,023,000</u>
Expected increase from amortization method	(7,712,000)
Increase from expected contributions below actuarial rates	3,724,000
Investment experience	45,799,000
Liability experience (including transfers)	(1,581,000)
Change in assumption	<u>-</u>
Unfunded Actuarial Liability, June 30, 2017	<u>\$ 150,253,000</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



260 Franklin Street  
Suite 500  
Boston, MA 02110

January 31, 2018

West Virginia State Police Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia State Police Retirement System (Plan B) as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy.

The valuation was based on membership data as of June 30, 2016, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board.

The tables presented for Plan B in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2016 valuation report dated March 31, 2017. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

This report presents fairly the actuarial position of Plan B as of July 1, 2016, in accordance with Actuarial Standards of Practice (ASOPs) applied on a basis consistent with that of the preceding valuation. In my opinion, the assumptions used in preparing the liabilities and costs are individually reasonable with respect to Plan B experience and represent my best estimate of anticipated future experience of Plan B. The assumptions were developed in accordance with the guidance set forth in applicable Actuarial Standards of Practice, including ASOPs 27 and 35. In particular, the mortality

assumptions were developed in accordance with the recommendation that an appropriate margin for future improvement in mortality beyond the measurement date be included.

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on a market value of assets basis. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent’s prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC

*David L. Driscoll*

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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

**SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

**Valuation Date:** July 1, 2016

**Funding Method and Basis for Assumptions**

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry age is based on date of hire.

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on an experience study covering the period from July 1, 2006, to June 30, 2011. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

**Interest Rate and Expenses**

The valuation interest assumption is 7.50% per annum, with no loading for plan expenses.

**Pre-Retirement Mortality**

The male and female RP-2000 Non-Annuitant tables, projected to 2020 with Scale BB. It is assumed that 70% of deaths of members in service are duty-related.

**Post-Retirement Mortality**

Post-retirement mortality tables are as follows:

Healthy: RP-2000 Healthy Annuitant tables, projected to 2025 with Scale BB

Disabled: RP-2000 Healthy Annuitant tables, projected to 2025 with Scale BB, set forward 1 year

**Salary Scales**

Compensation is assumed to increase 5.00% per year for the first 2 years of service, 4.50% for the next 3 years, 4.00% for the next 5 years, and 3.25% per year thereafter. The inflation rate is 3.00%.

**Withdrawal from Service**

Withdrawal rates cease once an employee is eligible for normal retirement. A sample of withdrawal rates follows:

Age	Rate of Withdrawal
20	0.0760
30	0.0542
40	0.0240
50	0.0114

**Disablement Rates**

No disablements are assumed to occur after the later of age 55 and the age first eligible for retirement. A sample of disablement rates follows:

Age	Rate of Disablement	Type of Disability	Probability
20	0.0005	Duty-Related Full	0.25
30	0.0020	Duty-Related Partial	0.60
40	0.0060	Nonduty-Related	0.15
50	0.0040		

**Family Composition**

It is assumed that 90% of members are married, with husbands 3 years older than their wives. Re-marriage rates are not used.

**Accrual of Future Service**

It is assumed that active members will accrue one year of service for each future year of employment.

**Non-Contributory Service**

It is assumed that state troopers at retirement will have a 14.5% increase over contributory service added for all sources.

**Retirement Rates**

70% of members are assumed to retire when first eligible for unreduced benefits at the earlier of age 50 and 25 years of service or age 52 and 20 years of service. An active member who has already attained eligibility for normal retirement has a 20% probability of retiring each year thereafter with 100% retiring on or after attainment of age 55.

**Asset Valuation Method**

Assets for valuation purposes are included at Market Value.

**Plan Contributions**

Plan Contributions, both employee and employer, are assumed to be paid in the middle of the year.

**ACTUARIAL SECTION**  
State Police Retirement System

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	611	\$ 31,530,000	\$ 51,604	1.4%	1
6/30/2015	625	31,792,000	50,867	2.7%	1
6/30/2014	597	29,574,000	49,538	-0.2%	1
6/30/2013	558	27,701,000	49,643	1.5%	1
6/30/2012	556	27,670,000	48,887	3.4%	1
6/30/2011	523	24,725,000	47,275	-0.4%	1
6/30/2010	498	23,635,000	47,460	0.1%	1
6/30/2009	472	22,382,000	47,419	6.4%	1
6/30/2008	455	20,285,000	44,582	6.2%	1
6/30/2007	449	18,850,000	41,982	14.0%	1

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 138,569	\$ 145,326	\$ 6,757	95.3%	\$ 31,530	21.4%
7/1/2015	131,678	130,132	(1,546)	101.2%	31,792	-4.9%
7/1/2014	120,572	114,314	(6,258)	105.5%	29,574	-21.2%
7/1/2013	96,092	101,503	5,411	94.7%	27,701	19.5%
7/1/2012	78,735	89,558	10,823	87.9%	27,670	39.1%
7/1/2011	70,756	79,036	8,280	89.5%	24,725	33.5%
7/1/2010	52,735	69,171	16,436	76.2%	23,635	69.5%
7/1/2009	40,321	61,628	21,307	65.4%	22,382	95.2%
7/1/2008	41,564	51,388	9,824	80.9%	20,285	48.4%
7/1/2007	40,350	40,786	436	98.9%	18,850	2.3%

**Solvency Test**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 35,130,726	\$ 13,601,000	\$ 96,594,274	\$ 138,569,000	100.0%	100.0%	93.0%
6/30/2015	31,732,200	11,150,000	87,249,800	131,678,000	100.0%	100.0%	101.8%
6/30/2014	30,240,720	9,763,000	74,310,280	120,572,000	100.0%	100.0%	108.4%
6/30/2013	31,283,070	8,776,000	61,443,930	96,092,000	100.0%	100.0%	91.2%
6/30/2012	32,246,890	7,702,000	49,609,110	78,735,000	100.0%	100.0%	78.2%
6/30/2011	30,712,110	6,674,000	41,649,890	70,756,000	100.0%	100.0%	80.1%
6/30/2010	30,016,350	6,695,000	32,459,650	52,735,000	100.0%	100.0%	49.4%
6/30/2009	28,706,730	5,351,000	27,570,270	40,321,000	100.0%	100.0%	22.7%
6/30/2008	24,440,160	4,449,000	22,498,840	41,564,000	100.0%	100.0%	56.3%
6/30/2007	25,036,800	2,732,000	13,017,200	40,350,000	100.0%	100.0%	96.7%

**ACTUARIAL SECTION**  
State Police Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	4	\$ 171,345	(1)	\$ 30,260	24	\$ 811,212	11.3%	\$ 33,801
2015	2	87,512	-	-	21	729,127	15.4%	34,720
2014	-	-	-	-	19	632,053	7.0%	33,266
2013	2	94,333	(1)	30,101	19	590,653	15.3%	31,087
2012	1	32,336	-	-	18	512,124	14.7%	28,451
2011	-	-	-	-	17	446,525	0.7%	26,266
2010	4	176,822	(1)	17,920	17	443,482	22.5%	26,087
2009	2	45,048	-	-	14	361,932	34.4%	25,852
2008	4	101,750	-	-	12	269,376	62.2%	22,448
2007	1	33,043	-	-	8	166,056	26.1%	20,757

**Changes in Unfunded Actuarial Liability**

Funded in excess of Actuarial Liability, June 30, 2016	\$ <u>(1,546,000)</u>
Expected increase from amortization method	(116,000)
Increase from expected contributions below actuarial rates	(413,000)
Investment experience	10,274,000
Liability experience (including transfers)	(1,442,000)
Change in assumption	<u>-</u>
Unfunded Actuarial Liability, June 30, 2017	\$ <u>6,757,000</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.

January 31, 2018

West Virginia Deputy Sheriffs' Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

An annual actuarial valuation of Deputy Sheriffs' Retirement System (DSRS) was prepared as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy. Results of this valuation were provided to us by the West Virginia Consolidated Public Retirement Board and developed under the supervision of Harry W. Mandel, a member of the American Academy of Actuaries who served as Board Actuary. We relied upon the work of Mr. Mandel and his staff, and have not independently verified or reviewed these results.

The assumptions used in the valuation were selected by the West Virginia Consolidated Public Retirement Board on the basis of experience studies and recommendations prepared by the Board Actuary. We believe that the assumptions used to calculate the liabilities are reasonable for the purposes of this report, in view of assumptions used to calculate liabilities for related systems. However, we did not make an in-depth investigation of their suitability for the purpose of this measurement.

The tables presented for DSRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in the July 1, 2016 valuation report dated January 11, 2017 that was provided to us by the Board Actuary. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. For DSRS, assets are valued at market for actuarial purposes. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent's prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC



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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

## **SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

### **Actuarial Valuation Date**

The actuarial valuation is completed as of the first day of the plan year, July 1, 2016. Actuarial calculations verify the adequacy of the expected funding for the fiscal year corresponding to the plan year. The valuation is completed for the July 1 through June 30 plan year.

### **Actuarial Cost Method**

The valuation is completed applying the Entry Age Cost Method with Aggregate Normal Cost. The Actuarial Accrued Liability and the Normal Cost are determined on a level percentage of aggregate payroll funding basis.

Under the method, the Actuarial Accrued Liability is determined on an individual basis as a level percentage of payroll for each member. Inactive liabilities are valued on an accrued benefit basis.

The Total Normal Cost percentage of payroll requirement is calculated by dividing the excess of the Actuarial Present Value of Future benefits over the Actuarial Accrued Liability on an aggregate basis by the aggregate Present Value of Future Compensation for all active members. The Employer Normal Cost Percentage is calculated by subtracting the member contribution rate from the Total Normal Cost Percentage. The Employer Normal Cost is the Employer Normal Cost Percentage multiplied by the expected payroll for the valuation year.

### **Asset Valuation Method**

Trust Fund assets are valued at the reported market value of assets as of the actuarial valuation date. The market value includes accrued amounts as reflected in the annual accounting for the Trust Fund.

### **Amortization Method for Funding**

The funding target for DSRS is that the Unfunded Actuarial Accrued Liabilities are fully amortized by the end of fiscal year 2029. Amortization payments are calculated in the aggregate to remain a level percentage of future expected DSRS payroll determined on an open group projected payroll basis.

### **Interest Return and Discount Rate**

The interest rate assumption is a net return rate of 7.50% annually, net of investment and administrative expenses. The rate is applied to the interest return on Trust Fund assets as well as the discount rate on future expected benefit payments.

### **Healthy Life Mortality Rates**

Active members mortality use the RP-2000 Non-Annuitant Mortality Table with mortality improvements projected to 2020 by Scale BB, with separate rates used for males and females. The projection year reflects additional law enforcement profession related mortality risks.

Retired members' and their beneficiaries' mortality is the RP-2000 Healthy Annuitant Mortality Table with mortality improvements projected to 2025 by Scale BB, with separate rates used for males and females.

### **Disability Retirees Mortality Rates**

Members receiving disability retirement benefits mortality is the RP-2000 Healthy Annuitant Mortality Table projected to 2025 by Scale BB, set forward 1 year and with separate rates used for males and females.

**Salary Scale**

An annual salary increase rate of 5.0% in each of the first two years of service, decreasing to 4.5% for years three through five, 4.0% for years six through ten years and 3.5% for all years of service in excess of the first ten years.

**Payroll Growth Rate**

The total annual payroll for the active membership is assumed to increase at 3.5% per year for salary increase growth plus 1.5% per year for membership growth resulting in a total annual growth of 5.0%. This open group growth rate is applied in determining the percentage of payroll amortization requirements under the targeted DSRS funding of the UAAL by the end of Fiscal Year 2029. This growth rate includes projected newly hired deputy sheriffs and is an open group payroll projection rate.

**Withdrawal Rates**

Withdrawal rates predict termination of employment prior to unreduced retirement eligibility. A sample of withdrawal rates by age are:

Age	Rate of Withdrawal
30	0.0880
40	0.0528
50	0.0176
55	0.0000

**Disability Rates**

Disability rates predict an active member becoming disabled prior to unreduced retirement eligibility. A sample of disability rates by age are:

Age	Rate of Withdrawal
30	0.0020
40	0.0060
50	0.0040
51+	0.0040

**Disability Rates - Type of Disability**

It is assumed that members eligible for unreduced retirement will elect retirement prior to becoming disabled. It is also assumed that retired members will not become disabled following retirement due to duty related causes incurred prior to retirement.

Disability retirement benefits vary by type of disability. Disability retirements are assumed to break down in the following types:

Duty Related Full Disability	50%
Duty Related Partial Disability	25%
Non-Duty Full Disability	20%
Non-Duty Partial Disability	5%

### **Marriage Rate and Composition**

In determining the value of pre-retirement spousal death benefits, it is assumed that 90% of all members will be married at death. Males are assumed to be three years older than their female spouse.

### **Accrual of Future Service**

Employment as a deputy sheriff is considered a full time professional position. All active members are assumed to complete sufficient hours to accrue one year of service in each future year of employment.

### **Non-Contributory Service Credits for Military Service and Unused Leave at Retirement**

At Normal or Early retirement, a member is assumed to be granted 1.25 additional years of service for benefits due to allowable military service, plus 1.50 additional years for unused annual leave and/or unused sick leave for a total of 2.75 additional years.

### **Retirement Rates**

Members who become eligible for unreduced retirement benefits prior to age 65 are assumed to have a 20% probability of retiring in the year they first become eligible. For years following the year of first eligibility and prior to attaining age 65, an additional 20% are assumed to retire each year. At 65, 100% of remaining members are assumed to retire.

Members who become eligible for unreduced retirement benefits on or after the attainment of age 65 are assumed to retire in the year they first become eligible.

### **Plan Contributions**

Member and employer contributions are calculated as a percentage of total members' payroll. Amounts are deposited to the Trust Fund on a monthly basis. For interest calculation purposes, all amounts are treated as being deposited on an average of half way through the Plan year.

### **Fee Contributions under Section 7-14E-2**

A portion of fees generated by each sheriff department for reports are contributed to the DSRS Trust Fund. Fees are deposited throughout the year. For interest calculation purposes they are treated as being deposited on an average of half way through the Plan year.

Fees are estimated based upon historical amounts contributed to the Trust Fund. Total deposits for last year were \$467,000. For the purposes of analyzing the adequacy of total funding for DSRS in meeting the DSRS funding target, an average annual fee income of \$510,000 has been assumed to continue in this and all future years.

**ACTUARIAL SECTION**  
Deputy Sheriff Retirement System

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	1,042	\$ 51,004,000	\$ 48,948	2.1%	55
6/30/2015	1,024	49,081,000	47,931	3.0%	55
6/30/2014	1,002	46,634,000	46,541	2.1%	55
6/30/2013	990	45,106,000	45,562	2.3%	53
6/30/2012	979	43,583,000	44,518	0.2%	52
6/30/2011	954	42,366,000	44,409	3.5%	51
6/30/2010	958	41,109,000	42,911	1.7%	51
6/30/2009	926	39,067,000	42,189	3.1%	51
6/30/2008	913	37,366,000	40,927	5.6%	49
6/30/2007	893	34,605,000	38,751	5.0%	48

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 172,626	\$ 191,839	\$ 19,213	90.0%	\$ 51,004	37.7%
7/1/2015	171,358	188,243	16,885	91.0%	49,081	34.4%
7/1/2014	162,748	180,677	17,929	90.1%	46,634	38.4%
7/1/2013	135,756	169,260	33,504	80.2%	45,106	74.3%
7/1/2012	117,526	157,007	39,481	74.9%	43,583	90.6%
7/1/2011	113,574	149,462	35,888	76.0%	42,366	84.7%
7/1/2010	92,692	139,638	46,946	66.4%	41,109	114.2%
7/1/2009	78,220	129,204	50,984	60.5%	39,067	130.5%
7/1/2008	89,852	119,738	29,885	75.0%	37,366	80.0%
7/1/2007	93,983	109,726	15,743	85.7%	34,605	45.5%

**Solvency Test**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, & Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 33,449,900	\$ 91,305,000	\$ 67,084,100	\$ 172,626,000	100.0%	100.0%	71.4%
6/30/2015	33,449,880	87,709,000	67,084,120	171,358,000	100.0%	100.0%	74.8%
6/30/2014	31,801,390	84,203,000	64,672,610	162,748,000	100.0%	100.0%	72.3%
6/30/2013	30,881,010	77,437,000	60,941,990	135,756,000	100.0%	100.0%	45.0%
6/30/2012	30,037,300	71,406,000	55,563,700	117,526,000	100.0%	100.0%	28.9%
6/30/2011	32,663,715	65,464,000	51,334,285	113,574,000	100.0%	100.0%	30.1%
6/30/2010	31,989,920	61,890,000	45,758,080	92,692,000	100.0%	98.7%	0.0%
6/30/2009	30,591,925	59,534,000	39,078,075	78,220,000	100.0%	86.8%	0.0%
6/30/2008	27,768,140	52,756,000	39,213,860	89,852,000	100.0%	100.0%	23.8%
6/30/2007	25,389,160	44,387,000	39,949,840	93,983,000	100.0%	100.0%	60.6%

**ACTUARIAL SECTION**  
Deputy Sheriff Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	12	\$ 297,072	(8)	\$ 170,848	343	\$ 8,172,422	3.2%	\$ 23,826
2015	31	914,923	(9)	194,873	339	7,917,528	10.5%	23,356
2014	26	853,364	(8)	149,532	317	7,168,032	8.3%	22,612
2013	28	784,788	(12)	204,814	299	6,616,848	7.7%	22,130
2012	11	308,172	-	-	283	6,144,074	4.5%	21,711
2011	15	375,268	(3)	83,944	272	5,878,382	4.5%	21,612
2010	13	292,812	(1)	17,194	260	5,624,509	6.2%	21,633
2009	32	843,276	(11)	264,193	248	5,296,624	11.5%	21,357
2008	33	793,778	(3)	47,990	227	4,749,716	16.4%	20,924
2007	15	429,466	(1)	26,338	197	4,080,498	8.9%	20,713

Changes in Unfunded Actuarial Liability	
Unfunded Actuarial Liability, June 30, 2016	<u>\$ 16,885,000</u>
Expected increase from amortization method	(314,000)
Expected increase from contributions below actuarial rates	(2,922,000)
Investment experience	13,453,000
Liability experience (including transfers)	(7,889,000)
Changes in assumptions	<u>-</u>
Unfunded Actuarial Liability, June 30, 2017	<u>\$ 19,213,000</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.





260 Franklin Street  
Suite 500  
Boston, MA 02110

January 31, 2018

West Virginia Judges' Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia Judges' Retirement System (JRS) as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy.

The valuation was based on membership data as of June 30, 2016, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board.

The tables presented for JRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2016 valuation report dated March 31, 2017. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

This report presents fairly the actuarial position of Judges' Retirement System as of July 1, 2016, in accordance with Actuarial Standards of Practice (ASOPs) applied on a basis consistent with that of the preceding valuation. In my opinion, the assumptions used in preparing the liabilities and costs are individually reasonable with respect to Judges' Retirement System experience and represent my best estimate of anticipated future experience of the System. The assumptions were developed in accordance with the guidance set forth in applicable Actuarial Standards of Practice, including ASOPs

27 and 35. In particular, the mortality assumptions were developed in accordance with the recommendation that an appropriate margin for future improvement in mortality beyond the measurement date be included.

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on a market value of assets basis. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent's prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC

*David L. Driscoll*

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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

## SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

**Valuation Date:** July 1, 2016

### **Funding Method and Basis for Assumptions**

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on date of hire. Active liabilities include amounts calculated for judges currently participating in the Public Employees' Retirement System (PERS) who may in the future transfer into the Judges' Retirement System (JRS) with an adjustment for the anticipated transfer of required member contributions.

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the experience study covering the period from July 1, 2006, to June 30, 2011. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

### **Interest Rate and Expenses**

The valuation interest assumption is 7.50% per annum, with no loading for plan expenses.

### **Salary Scale**

4.25% annually from the current valuation date. Increases are assumed to be delayed, occurring every few years. Missed increases are assumed to be made up at the CPI-U inflation rate for such missed year not less than 0%, but not more than the 3.0% inflation rate assumption. The valuation year salary scale increase of 4.25% is adjusted to include the missed inflation increases at the end of the valuation year. The most recent pay increase occurred at July 1, 2011.

### **Automatic Cost-of-Living Increases to Pensions**

Pensions for judges appointed or elected prior to July 2, 2005 are assumed to increase at the same time as active salaries increase, and by the same percentage.

### **Post-Retirement Mortality**

Post-retirement mortality tables are as follows:

Healthy: RP-2000 Healthy Annuitant tables, projected to 2025 with Scale BB

Disabled: RP-2000 Healthy Annuitant tables, projected to 2025 with Scale BB, set forward 1 year

### **Pre-Retirement Mortality**

No pre-retirement mortality is assumed due to the small number of active members.

### **Withdrawal from Service**

No withdrawal is assumed due to the small number of active members.

### **Retirement Rates and Service**

For those eligible to retire prior to age 65, 5% are assumed to retire each year through age 64 with 100% retiring at age 65. For those first eligible at age 65 or later, 100% are assumed to retire when they become eligible.

### **Transfers from PERS**

It is assumed that all judges in PERS who earn sufficient service to vest under JRS will join JRS. Liabilities for potential transfers from PERS are included in this valuation and are calculated as if the judge had always been a member of JRS. Accumulated member contributions under PERS are treated as an offset to plan liabilities for valuation purposes. The shortfall of PERS accumulated member contributions versus the amount they would have contributed under the plan had they always been a participant under JRS is recognized in the development of the normal cost.

### **Family Composition**

All judges are assumed to be married. Where spousal data is not available, it is assumed that male judges are five years older than their spouses and female judges are five years younger than their spouses. Surviving children's benefits were not explicitly valued.

### **Asset Valuation Method**

Assets for valuation purposes are included at Market Value.

### **Plan Contributions**

Plan contributions, both employee and employer, are assumed to be paid in the middle of the year.

**ACTUARIAL SECTION**  
Judges' Retirement System

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	72	\$ 9,122,000	\$ 126,694	0.0%	1
6/30/2015	70	8,870,000	126,714	0.0%	1
6/30/2014	73	9,248,000	126,685	0.0%	1
6/30/2013	70	8,870,000	126,714	0.1%	1
6/30/2012	70	8,860,000	126,571	0.0%	1
6/30/2011	70	8,860,000	126,571	8.8%	1
6/30/2010	71	8,256,000	116,282	1.4%	1
6/30/2009	71	8,140,000	114,648	-1.5%	1
6/30/2008	71	8,261,000	116,352	0.0%	1
6/30/2007	71	8,261,000	116,352	0.0%	1
6/30/2006	69	8,029,000	116,362	0.0%	1

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 167,194	\$ 107,774	\$ (59,420)	155.1%	\$ 9,122	-651.4%
7/1/2015	170,152	\$ 107,125	(63,027)	158.8%	8,870	-710.6%
7/1/2014	165,239	106,029	(59,210)	155.8%	9,248	-640.2%
7/1/2013	141,476	105,739	(35,737)	133.8%	8,870	-402.9%
7/1/2012	126,265	98,115	(28,150)	128.7%	8,860	-317.7%
7/1/2011	124,583	95,591	(28,992)	130.3%	8,860	-327.2%
7/1/2010	102,814	96,008	(6,806)	107.1%	8,256	-82.4%
7/1/2009	88,310	93,185	4,875	94.8%	8,140	59.9%
7/1/2008	100,186	97,965	(2,221)	102.3%	8,261	-26.9%
7/1/2007	104,127	96,018	(8,109)	108.4%	8,261	-98.2%

**Solvency Test**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees & Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 4,052,626	\$ 53,847,000	\$ 49,874,374	\$ 167,194,000	100.0%	100.0%	219.1%
6/30/2015	4,007,010	53,805,000	\$ 49,312,990	170,152,000	100.0%	100.0%	227.8%
6/30/2014	4,690,799	49,709,000	51,629,201	165,239,000	100.0%	100.0%	214.7%
6/30/2013	4,534,056	52,408,000	48,796,944	141,476,000	100.0%	100.0%	173.2%
6/30/2012	6,729,965	48,319,000	43,066,035	126,265,000	100.0%	100.0%	165.4%
6/30/2011	6,908,063	48,143,000	40,539,937	124,583,000	100.0%	100.0%	171.5%
6/30/2010	7,170,009	48,116,000	40,721,991	102,814,000	100.0%	100.0%	100.0%
6/30/2009	7,023,660	49,555,000	36,606,340	88,310,000	100.0%	100.0%	86.7%
6/30/2008	5,999,595	41,887,000	50,078,405	100,186,000	100.0%	100.0%	104.4%
6/30/2007	6,448,155	44,809,000	44,760,845	104,127,000	100.0%	100.0%	118.1%

**ACTUARIAL SECTION**  
Judges' Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	-	\$ -	(1)	\$ 72,573	54	\$ 4,382,047	-0.4%	\$ 81,149
2015	-	-	(4)	289,800	55	4,397,505	4.8%	79,955
2014	-	-	(4)	289,800	53	4,195,905	-6.0%	79,168
2013	2	189,000	-	-	57	4,461,705	4.4%	78,276
2012	-	-	(1)	87,199	55	4,272,705	0.0%	77,686
2011	-	-	-	-	56	4,272,705	6.9%	76,298
2010	1	72,533	(3)	196,813	56	3,995,663	-4.1%	71,351
2009	9	774,607	-	-	58	4,165,281	21.2%	71,815
2008	-	-	(4)	283,040	49	3,435,891	-8.5%	70,120
2007	-	-	-	-	53	3,754,892	1.2%	70,847

**Changes in Unfunded Actuarial Liability**

Funded in excess of Actuarial Liability, June 30, 2016	<u>\$ (63,027,000)</u>
Expected increase from amortization method	(4,727,000)
Expected increase from contributions below actuarial rates	(30,000)
Investment experience	12,899,000
Liability experience (including transfers)	(4,535,000)
Change in assumption	<u>-</u>
Funded in excess of Actuarial Liability, June 30, 2017	<u>\$ (59,420,000)</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



260 Franklin Street  
Suite 500  
Boston, MA 02110

January 31, 2018

West Virginia Emergency Medical Services Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

An annual actuarial valuation of Emergency Medical Services Retirement System (EMSRS) was prepared as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy. Results of this valuation were provided to us by the West Virginia Consolidated Public Retirement Board and developed under the supervision of Harry W. Mandel, a member of the American Academy of Actuaries who served as Board Actuary. We relied upon the work of Mr. Mandel and his staff, and have not independently verified or reviewed these results.

The assumptions used in the valuation were selected by the West Virginia Consolidated Public Retirement Board on the basis of experience studies and recommendations prepared by the Board Actuary. We believe that the assumptions used to calculate the liabilities are reasonable for the purposes of this report, in view of assumptions used to calculate liabilities for related systems. However, we did not make an in-depth investigation of their suitability for the purpose of this measurement.

The tables presented for EMSRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in the July 1, 2016 valuation report dated January 25, 2017 that was provided to us by the Board Actuary. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. For EMSRS, assets are valued at market for actuarial purposes. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent’s prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC



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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

## **SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

### **Actuarial Valuation Date**

The initial actuarial valuation was completed on the effective date of the plan, January 1, 2008. Subsequent fiscal year valuations are completed each July 1 for the July 1 through June 30 year. This valuation was completed as of July 1, 2016.

### **Actuarial Cost Method**

The valuation is completed applying the Entry Age Normal Cost Method with Aggregate Normal Cost determination. The Actuarial Accrued Liability and the Normal Cost are determined on a level percentage of aggregate expected future payroll basis.

The Actuarial Accrued Liability is determined on an individual basis as a level percentage of expected payroll for each member. Inactive liabilities are valued on an accrued benefit basis.

The Total Normal Cost percentage of payroll requirement is calculated by dividing the excess of the Actuarial Present Value of Future benefits over the Actuarial Accrued Liability on an aggregate basis by the aggregate Present Value of Future Compensation for all active members. The Employer Normal Cost Percentage is calculated by subtracting the member contribution rate from the Total Normal Cost Percentage. The Employer Normal Cost is the Employer Normal Cost Percentage multiplied by the expected payroll for the valuation year.

### **Asset Valuation Method**

Trust Fund assets are valued at the reported market value of assets reported by the West Virginia Investment Management Board for the Trust Fund as of the actuarial valuation date. The market value includes accrued amounts as reflected in the annual accounting for the Trust Fund and included in the CPRB annual report.

### **Amortization Method for Funding**

The funding target for EMSRS is an Actuarial Required Contribution equal to the Employer Normal Cost plus amortization of the UAAL. The initial UAAL and subsequent experience through June 30, 2028 is to be fully amortized over 30 years from July 1, 2008 through June 30, 2038. Amortization payments are calculated as a level dollar amount each year over the remainder of the initial 30 year period. Experience on and after June 30, 2028 is amortized as a separate amortization item over 10 years from its determination.

Contributions in excess of the ARC, if any, shall be applied to improve the funded percentage of EMSRS until an actuarially acceptable funding level has been attained.

### **Interest Return and Discount Rate**

The interest rate assumption is a net return rate of 7.50% annually, net of investment and administrative expenses. The rate is applied for both the net investment return expected to be earned on Trust Fund assets and the discount rate on expected future benefit payments.

### **Healthy Life Mortality Rates (Modified July 1, 2013)**

Active members' mortality use the RP-2000 Non-Annuitant Table projected to 2020 by Scale BB. Inactive, regular retiree and beneficiary members' mortality use the RP-2000 Healthy Annuitant Mortality Table projected to 2025 by Scale BB, with separate rates used for males and females.

**Disability Retirees Mortality Rates (Modified July 1, 2013)**

Members receiving disability retirement benefits use the RP-2000 Healthy Annuitants Mortality Table projected to 2025 by Scale BB, set forward of 1 year and with separate rates used for males and females.

**Salary Scale (Modified July 1, 2013)**

Annual salary increases are assumed by age on a unisex basis. Sample annual salary increases are as follows:

Age	Rate
Under 31	4.75%
40	4.00%
50	3.75%
60	3.50%

**Payroll Growth Rate**

Total annual payroll for the active membership is assumed to increase at 3.0% annually. This growth rate includes projected new hires and is an open group payroll projection rate. This open group growth rate is applied in certain projections contained in the actuarial valuation report tables. The rate does not impact EMSRS liabilities nor the ARC.

**Withdrawal Rates (Modified July 1, 2013)**

Withdrawal rates predict termination of employment prior to unreduced retirement eligibility. A sample of unisex rates by age are:

Age	Rate
30	0.0950
40	0.0650
50	0.0400
55	0.0000

**Disability Rates (Modified July 1, 2013)**

Disability rates predict an active member becoming disabled prior to unreduced retirement eligibility. A sample of disability rates by age and sex are:

Age	Males	Females
30	0.00030	0.00060
40	0.00113	0.00113
50	0.00488	0.00225
51+	0.00525	0.00285

It is assumed that members eligible for unreduced retirement will elect retirement prior to becoming disabled. It is also assumed that retired members will not become disabled following retirement due to duty related causes incurred prior to retirement.

Disability retirement benefits vary by duty and non-duty causes. Disability retirements are assumed to occur in the following percentages:

Duty Related Disability 50% Non-Duty Disability 50%

### **Marriage Rate and Composition**

In determining the value of pre-retirement spousal death benefits, it is assumed that 80% of all members will be married at death. Males are assumed to be three years older than their female spouse.

### **Cause of Death for Death Benefits**

Deaths from active employment are assumed to be from duty related causes 25% of the time with non- duty causes accounting for the remaining 75%.

### **Accrual of Future Service**

EMSRS employment is considered a full time professional position. All active members are assumed to complete sufficient hours to accrue one year of service in each future year of employment.

### **Non-Contributory Service Credits for Military Service and Unused Leave at Retirement**

At Normal or Early retirement, members are assumed to convert a part of their unused sick leave to additional retirement service credits. In addition, allowable military service credits are expected to be claimed for qualifying members. It is assumed that male members will be credited with an additional 7% of their contributory service credits and female members will be credited with an additional 1.75% of their contributory service credits.

### **Retirement Rates**

Members who become eligible for unreduced retirement benefits prior to age 65 are assumed to have a 30% probability of retiring in the year they first become eligible. For years following the year of first eligibility and prior to attaining age 65, an additional 20% are assumed to retire each year. At 65, 100% of remaining members are assumed to retire.

Members who first become eligible for unreduced retirement benefits on or after the attainment of age 65 are assumed to retire in the year they first become eligible.

### **Plan Contributions**

Member and employer contributions are calculated as a percentage of total members' payroll. Amounts are deposited to the Trust Fund on a monthly basis. For interest calculation purposes, all amounts are treated as being deposited on an average of half way through the Plan year.

**ACTUARIAL SECTION**  
Emergency Medical Services Retirement System

The EMSRS was established January 2008.

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay	Number of Employers
6/30/2016	586	\$ 26,992,000	\$ 46,061	0.7%	14
6/30/2015	568	25,963,000	45,710	3.4%	14
6/30/2014	546	24,145,000	44,222	2.6%	14
6/30/2013	523	22,548,000	43,113	0.2%	13
6/30/2012	494	21,263,000	43,043	2.4%	12
6/30/2011	535	22,488,000	42,034	3.3%	12
6/30/2010	525	21,362,000	40,690	2.2%	12
6/30/2009	511	20,338,000	39,800	7.9%	12
6/30/2008	475	17,525,000	36,895	100.0%	11

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2016	\$ 58,868	\$ 66,635	\$ 7,767	88.3%	\$ 26,992	28.8%
7/1/2015	56,938	60,287	3,349	94.4%	25,963	12.9%
7/1/2014	53,647	56,459	2,812	95.0%	24,145	11.6%
7/1/2013	42,903	50,950	8,047	84.2%	22,548	35.7%
7/1/2012	35,483	44,148	8,665	80.4%	21,263	40.8%
7/1/2011	32,366	39,225	6,859	82.5%	22,488	30.5%
7/1/2010	23,662	31,503	7,841	75.1%	21,362	36.7%
7/1/2009	17,173	29,969	9,796	63.7%	20,338	48.2%
7/1/2008	15,675	21,207	5,532	73.9%	17,525	31.6%
1/1/2008	14,323	19,492	5,169	73.5%	17,181	30.1%

**Solvency Test**

Valuation Date	Aggregate Accrued Liabilities for			Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, & Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 17,869,010	\$ 26,181,000	\$ 22,584,990	\$ 58,868,000	100.0%	100.0%	65.6%
6/30/2015	17,394,145	22,687,000	20,205,855	56,938,000	100.0%	100.0%	83.4%
6/30/2014	16,157,820	19,879,000	20,422,180	53,647,000	100.0%	100.0%	86.2%
6/30/2013	15,015,760	15,401,000	20,533,240	42,903,000	100.0%	100.0%	60.8%
6/30/2012	13,417,080	10,034,000	20,696,920	35,483,000	100.0%	100.0%	58.1%
6/30/2011	14,357,945	6,666,000	18,201,055	32,366,000	100.0%	100.0%	62.3%
6/30/2010	13,615,555	1,341,000	16,546,445	23,662,000	100.0%	100.0%	52.6%
6/30/2009	13,025,995	1,413,000	12,530,005	17,173,000	100.0%	100.0%	21.8%
6/30/2008	10,803,500	143,000	10,260,500	15,675,000	100.0%	100.0%	46.1%

**ACTUARIAL SECTION**  
Emergency Medical Services Retirement System

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**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	10	\$ 265,750	-	\$ -	81	\$ 2,097,036	16.1%	\$ 25,889
2015	15	394,335	-	\$ -	71	1,805,868	24.6%	25,435
2014	11	255,922	-	-	56	1,449,168	23.4%	25,878
2013	11	304,129	-	-	45	1,174,004	43.3%	26,089
2012	14	232,740	-	-	34	819,312	53.9%	24,097
2011	20	433,704	-	-	20	532,236	100.0%	26,612
2010	-	-	-	-	-	-	0.0%	-
2009	-	-	-	-	-	-	0.0%	-

**Changes in Unfunded Actuarial Liability**

Unfunded Actuarial Liability, June 30, 2016	<u>\$ 3,349,000</u>
Expected increase from amortization method	(48,000)
Increase from expected contributions below actuarial rates	(1,415,000)
Investment experience	4,375,000
Liability experience (including transfers)	1,506,000
Changes in assumptions	<u>-</u>
Unfunded Actuarial Liability, June 30, 2017	<u>\$ 7,767,000</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.





260 Franklin Street  
Suite 500  
Boston, MA 02110

January 31, 2018

West Virginia Municipal Police and Fire Retirement System  
West Virginia Consolidated Public Retirement Board  
4101 MacCorkle Avenue, SE  
Charleston, WV 25304

Dear Board Members:

An annual actuarial valuation of Municipal Police and Fire Retirement System (MPFRS) was prepared as of July 1, 2016. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if the expected contributions will be sufficient to meet or exceed the System's long term funding policy. Results of this valuation were provided to us by the West Virginia Consolidated Public Retirement Board and developed under the supervision of Harry W. Mandel, a member of the American Academy of Actuaries who served as Board Actuary. We relied upon the work of Mr. Mandel and his staff, and have not independently verified or reviewed these results.

The assumptions used in the valuation were selected by the West Virginia Consolidated Public Retirement Board on the basis of experience studies and recommendations prepared by the Board Actuary. We believe that the assumptions used to calculate the liabilities are reasonable for the purposes of this report, in view of assumptions used to calculate liabilities for related systems. However, we did not make an in-depth investigation of their suitability for the purpose of this measurement.

The tables presented for MPFRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in the July 1, 2016 valuation report dated January 5, 2017 that was provided to us by the Board Actuary. These tables include:

**Financial Section**

- Schedules of Contributions

**Actuarial Section**

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Schedule of Funding Progress
- Changes in Unfunded Actuarial Liability

Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. For MPFRS, assets are valued at market for actuarial purposes. The funded ratio presented is appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Conduent does not intend to benefit and assumes no duty or liability to other parties who receive this work. Use of this report for any other purposes or by anyone other than the Consolidated Public Retirement Board and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. No one may make any representations or warranties based on any statements or conclusions contained in this report without Conduent's prior written consent.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Conduent HR Consulting, LLC



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David L. Driscoll, FSA, EA, MAAA, FCA  
Principal, Consulting Actuary

## **SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS**

### **Actuarial Valuation Date**

The initial actuarial valuation was completed on July 1, 2010, the first fiscal year with active members following the January 1, 2010 effective date. Subsequent valuations are completed each July 1 and this valuation was performed as of July 1, 2016.

### **Actuarial Cost Method**

The valuation is completed applying the Entry Age Normal Cost Method with Aggregate Normal Cost determination. The Actuarial Accrued Liability and the Normal Cost are determined on a level percentage of aggregate expected future payroll.

Under the method, the Actuarial Accrued Liability is determined on an individual basis as a level percentage of expected compensation for each member. Inactive liabilities are valued on an accrued benefit basis.

The Total Normal Cost percentage of payroll requirement is calculated by dividing the excess of the Actuarial Present Value of Future benefits over the Actuarial Accrued Liability on an aggregate basis by the aggregate Present Value of Future Compensation for all active members. The Employer Normal Cost Percentage is calculated by subtracting the member contribution rate from the Total Normal Cost Percentage. The Employer Normal Cost is the Employer Normal Cost Percentage multiplied by the expected payroll for the valuation year.

### **Asset Valuation Method**

Trust Fund assets are valued at the reported market value of assets reported by the Investment Management Board for the Trust Fund as of the actuarial valuation date. The market value includes accrued amounts as reflected in the annual accounting for the Trust Fund and included in the CPRB annual report.

### **Amortization Method for Funding**

The funding target (the ARC) for MPFRS is equal to the Employer Normal Cost plus amortization of the UAAL. The initial UAAL was to be fully amortized over 30 years from July 1, 2010. Amortization payments were calculated as a level dollar amount each year over the 30 year period. Experience at July 1, 2016 demonstrates that the AAL was fully funded and that amortization for an UAAL component does not apply.

Contributions in excess of the ARC, if any, shall be applied to improve the funded percentage of MPFRS until an actuarially acceptable funding level has been attained.

### **Interest Return and Discount Rate**

The interest rate and return rate assumption is 7.50% annually, net of investment and administrative expenses. This rate is applied for both the net interest return expected to be earned on Trust Fund assets and the annual discount rate on expected future benefit payments.

### **Healthy Life Mortality Rates (Effective July 1, 2013)**

Active members' mortality use the RP-2000 Non-annuitant Mortality Table projected to 2020 by Scale BB, with separate rates used for males and females. Retired members' mortality use the RP-2000 Healthy Annuitant Mortality Table projected to 2025 by Scale BB, with separate rates used for males and females.

**Disability Retirees Mortality Rates (Effective July 1, 2013)**

Members receiving disability retirement benefits mortality use the RP-2000 Healthy Annuitant Mortality Table projected to 2025 by Scale BB, set forward 1 year, with separate rates used for males and females.

**Salary Scale (Modified July 1, 2013)**

Annual salary increases are assumed by age on a unisex basis with sample annual salary increases as follows:

Age	Rate
Under 31	4.75%
40	4.00%
50	3.75%
60	3.50%

**Payroll Growth Rate**

Total annual payroll for the active membership is assumed to increase at 3.0% annually. This growth rate is applied in certain projections contained in the actuarial valuation report tables. The rate does not impact MPFRS liabilities nor the ARC. The growth rate was set based on current limited employer participation in MPFRS. The growth rate will need to be increased if additional employers begin participating in MPFRS.

**Withdrawal Rates (Modified July 1, 2013)**

Withdrawal rates predict termination of employment prior to unreduced retirement eligibility. A sample of unisex rates by age are:

Age	Rate
30	0.0950
40	0.0650
50	0.0400
55	0.0000

**Disability Rates (Adopted July 1, 2013)**

Disability rates predict an active member becoming disabled prior to unreduced retirement eligibility. A sample of disability rates by age and sex are:

Age	Males	Females
30	0.00200	0.00220
40	0.00600	0.00600
50	0.00400	0.00400
51+	0.00400	0.00400

It is assumed that members eligible for unreduced retirement will elect retirement prior to becoming disabled. It is also assumed that retired members will not become disabled following retirement due to duty related causes incurred prior to retirement.

Disability retirement benefits vary by duty and non-duty causes. Disability retirements are assumed to occur in the following percentages:

Duty Related Disability	75%
Non-Duty Disability	25%

**Marriage Rate and Composition (Modified July 1, 2013)**

In determining the value of pre-retirement spousal death benefits, it is assumed that 90% of all members will be married at death. Males are assumed to be three years older than their female spouse.

**Cause of Death for Death Benefits**

Deaths from active employment are assumed to be from duty related causes 25% of the time with non- duty causes accounting for the remaining 75%.

**Accrual of Future Service**

MPFRS employment is considered a full time professional position. All active members are assumed to complete sufficient hours to accrue one year of service in each future year of employment.

**Non-Contributory Service Credits for Military Service**

At Normal retirement, qualifying members are assumed to claim up to 2 allowable military service years as additional retirement service credits. It is assumed that male members will be credited with an additional 2.0% of their contributory service credits and female members will be credited with an additional 0.5% of their contributory service credits.

**Retirement Rates (Modified July 1, 2013)**

Members who become eligible for unreduced retirement benefits prior to age 65 are assumed to have a 20% probability of retiring in the year they first become eligible. For years following the year of first eligibility and prior to attaining age 65, an additional 20% are assumed to retire each year. At 65, 100% of remaining members are assumed to retire.

Members who first become eligible for unreduced retirement benefits on or after the attainment of age 65 are assumed to retire in the year they first become eligible.

**Plan Contributions**

Member and employer contributions are calculated as a percentage of total members' payroll. Amounts are deposited to the Trust Fund on a monthly basis. For interest calculation purposes, all amounts are treated as being deposited on an average of half way through the Plan year.

**ACTUARIAL SECTION**  
Municipal Police Officers & Firefighters' Retirement System

The MPFRS was established January 2010.

**Schedule of Active Member Valuation Data**

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
6/30/2016	191	\$ 7,898,000	\$ 41,351	5.6%
6/30/2015	140	5,483,000	39,164	2.1%
6/30/2014	97	3,784,000	39,010	2.2%
6/30/2013	48	1,833,000	38,188	6.7%
6/30/2012	27	966,000	35,778	-6.1%
6/30/2011	9	343,000	38,111	9.8%
6/30/2010	6	208,000	34,703	100.0%

**Schedule of Funding Progress (in thousands)**

Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a)/c)
7/1/2016	\$ 3,082	\$ 1,909	\$ (1,173)	161.4%	\$ 7,898	-14.9%
7/1/2015	2,046	1,116	(930)	183.3%	5,483	-17.0%
7/1/2014	1,201	568	(633)	211.4%	3,784	-16.7%
7/1/2013	529	264	(265)	200.4%	1,833	-14.5%
7/1/2012	202	90	(112)	224.4%	966	-11.6%
7/1/2011	65	23	(42)	282.6%	343	-12.2%
7/1/2010	3	4	1	79.7%	208	0.3%

**Solvency Test**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, Beneficiaries	(3) Active Members (Employer Financed Portions)		(1)	(2)	(3)
6/30/2016	\$ 5,687,520	\$ 106,000	\$ (3,884,520)	\$ 3,082,000	54.2%	0.0%	0.0%
6/30/2015	3,952,755	61,000	(2,897,755)	2,046,000	51.8%	0.0%	0.0%
6/30/2014	2,727,480	35,000	(2,194,480)	1,201,000	44.0%	0.0%	0.0%
6/30/2013	1,328,720	19,000	(1,083,720)	529,000	39.8%	0.0%	0.0%
6/30/2012	665,380	4,000	(579,380)	202,000	30.4%	0.0%	0.0%
6/30/2011	238,850	6,000	(221,850)	65,000	27.2%	0.0%	0.0%
6/30/2010	144,665	0	(141,127)	3,000	2.1%	0.0%	0.0%

**ACTUARIAL SECTION**  
Municipal Police Officers & Firefighters' Retirement System

**Schedule of Retirees and Beneficiaries Added and Removed**

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowance
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	-	-	-	-	-	-	0.0%	-
2015	-	-	-	-	-	-	0.0%	-
2014	-	-	-	-	-	-	0.0%	-
2013	-	-	-	-	-	-	0.0%	-
2012	-	-	-	-	-	-	0.0%	-
2011	-	-	-	-	-	-	0.0%	-
2010	-	-	-	-	-	-	0.0%	-

**Changes in Unfunded Actuarial Liability**

Funded in excess of Actuarial Liability, June 30, 2016	<u>\$ (930,000)</u>
Expected increase from amortization method	(70,000)
Increase from expected contributions below actuarial rates	(227,000)
Investment experience	174,000
Liability experience (including transfers)	(120,000)
Changes in assumptions	<u>-</u>
Funded in excess of Actuarial Liability, June 30, 2017	<u>\$ (1,173,000)</u>

**Schedule of Contributions**

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Comprehensive Annual Financial Report.

**Plan Provisions**

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



# **STATISTICAL SECTION**



The statistical section of the comprehensive annual financial report provides information to the reader to assist in understanding the information in the financial statements, note disclosures, and required supplementary information regarding the Retirement Systems' overall financial health. The information in this section is obtained from comprehensive annual financial reports and other internal sources.

### **Financial Trends**

These schedules contain trend information to help the reader understand how the Retirement Systems' financial performance has changed over time.

- Additions by Source, Deductions by Type, and Changes in Plan Net Position
- Benefit by Type

### **Retirees and Beneficiaries**

These schedules provide information concerning the retirees and beneficiaries receiving benefits.

- Retired Members by Type of Benefit
- Average Monthly Benefit Payments

### **Participating Units**

This schedule provides information concerning units participating in the various Retirement Systems.

- Largest Employers



**STATISTICAL SECTION**

**Additions by Source, Deductions by Type, and Change in Plan Net Position**

**Public Employees Retirement System**  
(in thousands)

Additions				
Fiscal Year	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 63,578	\$ 165,676	\$ 875,090	\$ 1,031
2016	62,801	186,770	(6,827)	297
2015	61,838	189,947	219,329	17
2014	60,899	194,728	864,023	50
2013	60,943	187,866	565,355	16
2012	59,200	191,012	46,122	1,859
2011	57,714	160,493	757,302	1,030
2010	56,974	139,284	518,862	1,128
2009	56,360	131,143	(619,017)	4,118
2008	53,958	125,992	(276,789)	3,308

Deductions					
Fiscal Year	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	Total Change In Plan Net Position
2017	\$ 402,213	\$ (110)	\$ 4,989	\$ 10,566	\$ 687,717
2016	382,577	(123)	4,886	11,877	(156,176)
2015	363,495	(265)	4,785	10,669	92,447
2014	342,683	(83)	4,695	10,929	761,476
2013	322,731	112	4,593	10,413	476,331
2012	304,263	(96)	4,505	10,844	(21,323)
2011	284,587	(368)	4,403	9,880	678,037
2010	265,263	(188)	4,340	8,515	438,318
2009	248,770	(56)	4,257	10,422	(690,789)
2008	232,807	14,263	4,188	9,448	(354,237)

**STATISTICAL SECTION**

Additions by Source, Deductions by Type, and Change in Plan Net Position

**Teachers' Defined Benefit Retirement System**  
(in thousands)

Fiscal Year	Additions			
	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 91,503	\$ 451,447	\$ 995,095	\$ 2,822
2016	95,177	423,195	(18,403)	3,918
2015	94,694	490,640	255,988	3,460
2014	90,612	514,248	1,003,180	3,775
2013	91,818	486,783	654,696	4,007
2012	91,976	482,236	46,118	38,874
2011	87,697	501,103	828,928	60,569
2010	103,706	417,403	533,448	39,818
2009	115,925	368,330	(575,596)	41,963
2008	52,916	368,883	(271,361)	3,625

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	
2017	\$ 780,030	\$ (149)	\$ 4,582	\$ 9,028	\$ 747,376
2016	749,139	133	4,507	10,364	(260,256)
2015	710,833	262	4,432	8,006	121,249
2014	668,923	265	4,348	7,287	930,992
2013	618,628	(35)	4,276	7,731	606,704
2012	577,427	53	4,209	7,783	69,732
2011	535,010	418	4,130	7,614	931,125
2010	494,230	62	4,067	7,247	588,769
2009*	463,528	(698,268)	3,964	5,143	176,255
2008	434,285	436	3,071	3,748	(287,477)

\* See discussion later in this section of transfers of Teachers' Defined Contribution Retirement System members to the Teachers' Defined Benefit Retirement System as permitted by the West Virginia legislature.

**STATISTICAL SECTION****Additions by Source, Deductions by Type, and Change in Plan Net Position****State Police Death, Disability, and Retirement System**  
(in thousands)

Fiscal Year	Additions				
	Member Contributions	Employer Contributions	Investment Income	Other Income	
2017	\$ 362	\$ 17,319	\$ 87,793	\$ 847	
2016	320	13,977	(1,229)	594	
2015	445	21,668	22,866	861	
2014	545	26,218	90,872	739	
2013	628	16,312	60,742	811	
2012	724	1,207	4,381	22,767	
2011	833	1,389	82,228	24,356	
2010	909	1,514	57,836	10,655	
2009	968	1,688	(72,882)	1,917	
2008	989	1,701	(33,920)	3,656	

Fiscal Year	Deductions					Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds		
2017	\$ 43,325	\$ -	\$ 46	\$ -	\$ -	62,950
2016	41,969	-	53	-	-	(28,360)
2015	39,708	-	51	-	-	6,081
2014	37,566	-	53	-	-	80,755
2013	35,464	-	52	-	-	42,977
2012	33,631	-	50	47	-	(4,649)
2011	31,206	-	50	-	-	77,550
2010	29,347	-	50	-	-	41,517
2009	27,823	-	51	72	-	(96,255)
2008	26,202	-	51	-	-	(53,827)

**STATISTICAL SECTION**

**Additions by Source, Deductions by Type, and Change in Plan Net Position**

**State Police Retirement System**  
(in thousands)

Fiscal Year	Additions			
	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 3,634	\$ 3,657	\$ 22,346	\$ -
2016	3,755	3,724	91	-
2015	3,609	4,060	4,972	-
2014	3,630	4,049	17,756	-
2013	3,517	4,193	10,495	-
2012	3,375	4,544	824	79
2011	3,065	4,570	11,222	126
2010	3,005	3,396	6,476	143
2009	2,594	2,594	(6,107)	176
2008	2,339	2,339	(2,834)	-

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	
2017	\$ 957	\$ -	\$ 64	\$ 497	\$ 28,119
2016	811	-	47	260	6,452
2015	633	-	45	418	11,545
2014	682	-	43	230	24,480
2013	577	-	42	229	17,357
2012	477	-	39	327	7,979
2011	443	-	37	482	18,021
2010	369	-	35	202	12,414
2009	298	-	34	168	(1,243)
2008	232	-	32	366	1,214

**STATISTICAL SECTION**

Additions by Source, Deductions by Type, and Change in Plan Net Position

**Deputy Sheriffs Retirement System**  
(in thousands)

Additions					
Fiscal Year	Member Contributions	Employer Contributions	Investment Income	Other Income	
2017	\$ 4,166	\$ 5,917	\$ 27,282	\$ 433	
2016	4,306	6,071	(64)	494	
2015	4,068	5,972	6,534	506	
2014	3,908	5,977	24,438	556	
2013	3,731	5,704	15,344	522	
2012	3,567	5,431	1,253	534	
2011	3,505	4,221	19,072	542	
2010	3,335	4,053	12,446	549	
2009	3,160	3,962	(13,580)	555	
2008	3,006	3,724	(6,354)	553	

Deductions					
Fiscal Year	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	Total Change In Plan Net Position
2017	\$ 8,957	\$ -	\$ 102	\$ 1,186	\$ 27,553
2016	8,187	-	101	611	1,908
2015	7,554	-	96	817	8,613
2014	6,955	(2)	97	839	26,990
2013	6,316	-	91	664	18,230
2012	5,985	-	86	762	3,952
2011	5,714	-	85	659	20,882
2010	5,327	-	81	503	14,472
2009	5,018	-	48	633	(11,602)
2008	4,434	-	74	552	(4,131)

**STATISTICAL SECTION**

**Additions by Source, Deductions by Type, and Change in Plan Net Position**

**Judges Retirement System**  
(in thousands)

Fiscal Year	Additions			
	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 372	\$ 747	\$ 26,270	\$ -
2016	383	739	(175)	-
2015	413	2,845	6,525	-
2014	474	2,456	25,263	-
2013	688	2,422	16,381	-
2012	706	3,954	1,251	-
2011	622	3,954	21,214	-
2010	649	3,954	14,034	-
2009	748	6,034	(14,927)	-
2008	736	6,034	(7,035)	-

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	
2017	\$ 4,510	\$ 12	\$ 6	\$ 99	\$ 22,762
2016	4,382	-	27	47	(3,509)
2015	4,244	-	6	69	5,464
2014	4,374	(32)	7	81	23,763
2013	4,351	(77)	6	-	15,211
2012	4,274	(51)	6	-	1,682
2011	4,014	-	7	-	21,769
2010	3,937	103	7	86	14,504
2009	3,719	5	7	-	(11,876)
2008	3,669	-	7	-	(3,941)

**STATISTICAL SECTION**

Additions by Source, Deductions by Type, and Change in Plan Net Position

**Emergency Medical Services Retirement System\***

(in thousands)

Fiscal Year	Additions			
	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 2,314	\$ 2,859	\$ 9,506	\$ -
2016	2,222	2,744	18	1
2015	2,071	2,607	2,144	-
2014	2,077	2,442	7,874	1
2013	1,902	2,308	4,682	1
2012	1,838	2,272	361	-
2011	1,894	2,264	5,109	45
2010	1,772	2,190	2,704	29
2009	1,749	2,030	(2,154)	-
2008	722	917	(621)	-

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	
2017	\$ 2,201	\$ -	\$ 53	\$ 575	\$ 11,850
2016	1,953	-	49	605	2,378
2015	1,600	-	46	666	4,510
2014	1,290	(140)	42	459	10,743
2013	1,000	-	38	435	7,420
2012	651	-	39	664	3,117
2011	237	(43)	38	376	8,704
2010	-	-	35	171	6,489
2009	-	(28)	28	127	1,498
2008	-	(14,673)	-	16	15,675

\*The EMSRS was established in January 2008.

**STATISTICAL SECTION**

Additions by Source, Deductions by Type, and Change in Plan Net Position

**Municipal Police Officers & Firefighters Retirement System\***  
(in thousands)

Fiscal Year	Additions			
	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 846	\$ 846	\$ 606	\$ -
2016	644	644	28	-
2015	417	417	66	-
2014	279	279	125	-
2013	151	151	32	-
2012	72	72	4	-
2011	31	31	-	-
2010	2	1	-	-
2009	-	-	-	-
2008	-	-	-	-

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	
2017	\$ -	\$ -	\$ 14	\$ 79	\$ 2,205
2016	-	-	11	34	1,271
2015	-	-	7	49	844
2014	-	-	3	7	673
2013	-	-	2	5	327
2012	-	-	1	10	137
2011	-	-	-	-	62
2010	-	-	-	-	3
2009	-	-	-	-	-
2008	-	-	-	-	-

\*The MPFRS was established in January 2010.

**STATISTICAL SECTION****Additions by Source, Deductions by Type, and Change in Plan Net Position****Teachers' Defined Contribution Retirement System**  
(in thousands)

Fiscal Year	Additions			
	Member Contributions	Employer Contributions	Investment Income	Other Income
2017	\$ 6,971	\$ 10,510	\$ 49,571	\$ 980
2016	6,438	11,401	3,542	87
2015	6,504	11,194	15,530	354
2014	6,632	10,284	51,102	258
2013	6,861	11,236	37,681	261
2012	7,008	11,749	4,119	397
2011	6,755	12,817	40,593	256
2010	6,932	10,129	22,139	6
2009	6,250	10,342	(29,743)	-
2008	34,110	52,982	(28,072)	-

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Service Transfer to (from)	Administrative Expenses	Refunds	
2017	\$ -	\$ 247	\$ 1,288	\$ 18,432	\$ 48,065
2016	-	(10)	1,417	16,046	4,015
2015	-	3	1,064	15,552	16,963
2014	-	(8)	1,072	15,949	51,263
2013	-	-	836	13,644	41,559
2012	-	94	687	12,155	10,337
2011	-	(7)	437	11,286	48,705
2010	-	23	891	6,164	32,128
2009	-	698,347	986	6,480	(718,964)
2008	-	(26)	2,625	17,598	38,823

The TDCRS is a multiple employer defined contribution retirement system, which is a money purchase pension plan covering primarily full-time employees of the State's 55 county public school systems, the State Department of Education, and the Schools for the Deaf and Blind who were hired between July 1, 1991 and June 30, 2005. TDCRS benefits depend solely on amounts contributed to the plan plus investment earnings. TDCRS closed participation to new members effective June 30, 2005.

In 2008, the West Virginia Legislature provided an opportunity for members of the TDCRS to elect to transfer to the West Virginia Teachers' Retirement System (TRS). The transfer occurred on July 1, 2008 and a total of 15,152 TDCRS members transferred to TRS.

**STATISTICAL SECTION**  
Benefits by Type

The following schedules provide information on the benefits provided by type of benefit for each plan.

**Public Employees Retirement System**  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 337,735	\$ 31,400	\$ 31,944	\$ 990	\$ 9,580
2016	320,608	30,223	31,868	1,317	10,177
2015	297,192	28,795	30,480	1,123	9,653
2014	279,512	27,880	29,933	803	10,013
2013	261,647	26,821	29,157	1,161	9,175
2012	250,134	25,781	23,348	1,170	9,674
2011	232,491	24,651	27,445	952	8,982
2010	215,378	23,664	26,221	1,263	7,216
2009	201,606	22,459	24,705	1,255	9,167
2008	187,608	21,483	23,716	751	8,697

**Teachers' Retirement System**  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 723,090	\$ 29,482	\$ 26,576	\$ 2,095	\$ 6,976
2016	693,736	27,591	26,292	4,231	5,834
2015	647,647	25,230	25,847	3,910	5,078
2014	606,990	24,327	25,183	2,418	5,666
2013	560,392	23,148	24,692	3,564	5,250
2012	531,367	22,121	23,939	3,109	4,674
2011	490,536	21,306	23,168	4,167	3,447
2010	451,233	20,568	22,429	4,145	3,102
2009	421,789	19,927	21,812	2,877	2,266
2008	394,064	19,157	21,064	2,562	1,186

**State Police Death, Disability, and Retirement System**  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 32,401	\$ 3,436	\$ 7,486	\$ -	\$ -
2016	31,574	3,092	7,352	-	-
2015	29,994	2,320	7,148	-	-
2014	28,252	2,209	6,888	-	-
2013	26,656	2,044	6,685	-	-
2012	25,475	1,891	6,265	-	47
2011	23,398	1,765	6,043	-	-
2010	21,917	1,551	5,879	-	-
2009	20,897	1,388	5,538	-	72
2008	19,849	1,300	5,053	-	-

**STATISTICAL SECTION**  
Benefits by Type

**State Police Retirement System**  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 425	\$ 199	\$ 329	\$ -	\$ 534
2016	344	153	317	-	238
2015	319	21	292	-	418
2014	316	22	290	-	230
2013	266	48	243	8	220
2012	243	26	207	-	*
2011	226	50	187	-	1
2010	150	34	185	-	*
2009	105	39	153	-	*
2008	90	34	109	-	*

\* - under \$500,000

**Deputy Sheriffs Retirement System**  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 6,987	\$ 380	\$ 1,493	\$ 235	\$ 940
2016	6,468	342	1,333	43	563
2015	5,954	271	1,219	-	821
2014	5,397	261	1,137	75	900
2013	5,028	250	976	-	669
2012	4,818	201	966	43	719
2011	4,635	175	904	35	624
2010	4,325	139	863	-	503
2009	4,031	100	887	90	543
2008	3,616	53	812	33	519

**Judges Retirement System**  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 3,710	\$ 800	\$ -	\$ -	\$ 99
2016	3,453	955	-	-	47
2015	3,284	866	47	-	86
2014	3,299	969	95	-	81
2013	3,181	1,060	95	-	-
2012	3,098	1,056	121	-	-
2011	3,115	899	-	-	-
2010	3,065	872	-	-	86
2009	2,890	828	-	-	-
2008	2,815	854	-	-	-

**STATISTICAL SECTION**

Benefits by Type

**Emergency Medical Services Retirement System\***  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ 1,782	\$ 20	\$ 399	\$ -	\$ 575
2016	1,618	20	282	-	640
2015	1,279	20	261	-	665
2014	1,019	22	228	11	446
2013	760	22	173	38	404
2012	517	13	121	32	632
2011	237	-	24	-	376
2010	-	-	-	-	171
2009	-	-	-	52	75
2008	-	-	-	-	16

\*The EMSRS was established in January 2008.

**Municipal Police Officers & Firefighters Retirement System\*\***  
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2017	\$ -	\$ -	\$ -	\$ -	\$ 79
2016	-	-	-	-	34
2015	-	-	-	-	49
2014	-	-	-	-	10
2013	-	-	-	2	2
2012	-	-	-	-	10
2011	-	-	-	-	-
2010	-	-	-	-	-

\*The MPFRS was established in January 2010.

**STATISTICAL SECTION**  
Retired Members by Type of Benefit

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**Public Employees Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	13,561	9,151	2,390	2,020	6,724	4,878	1,959	-
1,001 - 2,000	8,672	6,917	724	1,031	4,554	2,835	1,283	-
2,001 - 3,000	3,464	3,209	164	91	1,850	1,040	574	-
3,001 - 4,000	1,227	1,186	25	16	654	323	250	-
4,001 - 5,000	443	426	15	2	216	136	91	-
Over 5,000	292	264	15	13	196	56	40	-
<b>Totals</b>	<b>27,659</b>	<b>21,153</b>	<b>3,333</b>	<b>3,173</b>	<b>14,194</b>	<b>9,268</b>	<b>4,197</b>	<b>-</b>

Type of Retirement  
A - Service  
B - Survivor Benefit  
C - Disability

Option  
Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**Teachers' Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	10,874	7,835	1,455	1,584	6,925	2,519	1,430	-
1,001 - 2,000	11,011	9,635	627	749	6,922	2,529	1,560	-
2,001 - 3,000	8,315	7,975	211	129	5,313	1,646	1,356	-
3,001 - 4,000	3,986	3,921	52	13	2,681	600	705	-
4,001 - 5,000	1,325	1,311	14	-	983	143	199	-
Over 5,000	671	648	18	5	505	65	101	-
<b>Totals</b>	<b>36,182</b>	<b>31,325</b>	<b>2,377</b>	<b>2,480</b>	<b>23,329</b>	<b>7,502</b>	<b>5,351</b>	<b>-</b>

Type of Retirement  
A - Service  
B - Survivor Benefit  
C - Disability

Option  
Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**STATISTICAL SECTION**  
Retired Members by Type of Benefit

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**State Police Death, Disability, and Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	14	9	-	5	4	10	-	-
1,001 - 2,000	58	9	33	16	5	53	-	-
2,001 - 3,000	68	29	26	13	6	62	-	-
3,001 - 4,000	68	44	13	11	9	59	-	-
4,001 - 5,000	143	117	15	11	8	135	-	-
Over 5,000	408	326	8	74	46	362	-	-
<b>Totals</b>	<b>759</b>	<b>534</b>	<b>95</b>	<b>130</b>	<b>78</b>	<b>681</b>	<b>-</b>	<b>-</b>

Type of Retirement

A - Service  
B - Survivor Benefit  
C - Disability

Option

Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**State Police Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	1	1	-	-	-	1	-	-
1,001 - 2,000	4	-	1	3	-	4	-	-
2,001 - 3,000	6	4	1	1	-	6	-	-
3,001 - 4,000	4	2	1	1	-	4	-	-
4,001 - 5,000	12	7	2	3	-	12	-	-
Over 5,000	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>27</b>	<b>14</b>	<b>5</b>	<b>8</b>	<b>-</b>	<b>27</b>	<b>-</b>	<b>-</b>

Type of Retirement

A - Service  
B - Survivor Benefit  
C - Disability

Option

Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**STATISTICAL SECTION**  
Retired Members by Type of Benefit

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**Deputy Sheriffs Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement				Option Selected		
		A	B	C	Maximum	Opt-1	Opt-2	Other
\$ 1 - 1,000	42	29	10	4	12	22	6	2
1,001 - 2,000	156	118	14	22	53	71	32	-
2,001 - 3,000	132	95	2	21	52	50	28	2
3,001 - 4,000	36	24	-	6	14	16	6	-
4,001 - 5,000	12	7	-	2	8	2	2	-
Over 5,000	6	3	-	1	6	-	-	-
<b>Totals</b>	<b>384</b>	<b>276</b>	<b>26</b>	<b>56</b>	<b>145</b>	<b>161</b>	<b>74</b>	<b>4</b>

Type of Retirement

A - Service  
B - Survivor Benefit  
C - Disability

Option

Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**Judges Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	-	-	-	-	-	-	-	-
1,001 - 2,000	-	-	-	-	-	-	-	-
2,001 - 3,000	-	-	-	-	-	-	-	-
3,001 - 4,000	2	-	2	-	-	-	2	-
4,001 - 5,000	15	-	15	-	-	-	15	-
Over 5,000	42	39	3	-	-	-	42	-
<b>Totals</b>	<b>59</b>	<b>39</b>	<b>20</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>59</b>	<b>-</b>

Type of Retirement

A - Service  
B - Survivor Benefit  
C - Disability

Option

Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**STATISTICAL SECTION**  
Retired Members by Type of Benefit

**Emergency Medical Services Retirement System**

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	11	10	-	1	10	-	1	-
1,001 - 2,000	29	26	1	1	17	11	1	-
2,001 - 3,000	26	21	-	3	18	6	2	-
3,001 - 4,000	14	9	-	3	10	2	2	-
4,001 - 5,000	6	3	-	1	4	2	-	-
Over 5,000	2	-	-	1	2	-	-	-
<b>Totals</b>	<b>88</b>	<b>69</b>	<b>1</b>	<b>10</b>	<b>61</b>	<b>21</b>	<b>6</b>	<b>-</b>

Type of Retirement  
A - Service  
B - Survivor Benefit  
C - Disability

Option  
Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

**Municipal Police Officers & Firefighters Retirement System\***

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Maximum	Option Selected		
		A	B	C		Opt-1	Opt-2	Other
\$ 1 - 1,000	-	-	-	-	-	-	-	-
1,001 - 2,000	-	-	-	-	-	-	-	-
2,001 - 3,000	-	-	-	-	-	-	-	-
3,001 - 4,000	-	-	-	-	-	-	-	-
4,001 - 5,000	-	-	-	-	-	-	-	-
Over 5,000	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

Type of Retirement  
A - Service  
B - Survivor Benefit  
C - Disability

Option  
Maximum - Life Annuity  
Opt-1 - 100% Joint Survivorship  
Opt-2 - 50% Joint Survivorship  
Other

\* This System was established in January 2010.

**STATISTICAL SECTION**

## Largest Employers

**Public Employees Retirement System**

Units	2017	2016	2015
1) Unit	State of West Virginia	State of West Virginia	State of West Virginia
Number of Active Members	24,462	23,732	21,407
Percent of Active Members	66.45%	65.65%	60.70%
Total Active Members	36,812	36,150	35,267

Units	2014	2013	2012
1) Unit	State of West Virginia	State of West Virginia	State of West Virginia
Number of Active Members	23,076	24,268	23,971
Percent of Active Members	65.69%	66.35%	66.12%
Total Active Members	35,127	36,573	36,254

Units	2011	2010	2009
1) Unit	State of West Virginia	State of West Virginia	State of West Virginia
Number of Active Members	23,971	23,758	23,463
Percent of Active Members	66.12%	66.04%	65.69%
Total Active Members	36,254	35,977	35,717

Units	2008
1) Unit	State of West Virginia
Number of Active Members	23,222
Percent of Active Members	65.43%
Total Active Members	35,491

**STATISTICAL SECTION**

Largest Employers

**Teachers Retirement System**

	2017	2016	2015	2014
1) Unit	Kanawha County Board of Education			
Number of Active Members	3,367	3,314	3,262	3,277
Percent of Active Members	9.21%	9.40%	9.16%	9.31%
2) Unit	Berkeley County Board of Education			
Number of Active Members	2,311	2,171	2,190	2,247
Percent of Active Members	6.32%	6.16%	6.15%	6.31%
3) Unit	Wood County Board of Education	Wood County Board of Education	Raleigh County Board of Education	Wood County Board of Education
Number of Active Members	1,635	1,576	1,575	1,603
Percent of Active Members	4.47%	4.47%	4.48%	4.56%
4) Unit	Raleigh County Board of Education	Cabell County Board of Education	Wood County Board of Education	Raleigh County Board of Education
Number of Active Members	1,573	1,543	1,564	1,512
Percent of Active Members	4.30%	4.38%	4.44%	4.30%
5) Unit	Cabell County Board of Education	Raleigh County Board of Education	Cabell County Board of Education	Cabell County Board of Education
Number of Active Members	1,570	1,540	1,502	1,422
Percent of Active Members	4.29%	4.37%	4.27%	4.04%
6) Unit	Harrison County Board of Education			
Number of Active Members	1,475	1,454	1,450	1,392
Percent of Active Members	4.03%	4.12%	3.69%	3.96%
7) Unit	Monongalia County Board of Education			
Number of Active Members	1,401	1,303	1,298	1,288
Percent of Active Members	3.83%	3.70%	3.69%	3.66%
8) Unit	Mercer County Board of Education			
Number of Active Members	1,193	1,187	1,209	1,162
Percent of Active Members	3.26%	3.37%	3.44%	3.30%
9) Unit	Putnam County Board of Education	Putnam County Board of Education	Jefferson County Board of Education	Jefferson County Board of Education
Number of Active Members	1,070	1,063	1,072	1,021
Percent of Active Members	2.93%	3.01%	3.05%	2.90%
10) Unit	Jefferson County Board of Education	Jefferson County Board of Education	Putnam County Board of Education	Putnam County Board of Education
Number of Active Members	1,070	1,032	1,022	1,021
Percent of Active Members	2.93%	2.93%	2.90%	2.90%
Total Active Members	36,565	35,262	35,410	35,189

**STATISTICAL SECTION**

Largest Employers

**Teachers Retirement System (Continued)**

	2013	2012	2011	2010
1) Unit	Kanawha County Board of Education			
Number of Active Members	3,254	3,549	3,507	3,477
Percent of Active Members	9.14%	9.91%	9.78%	9.75%
2) Unit	Berkeley County Board of Education			
Number of Active Members	2,092	2,109	2,097	2,068
Percent of Active Members	5.88%	5.89%	5.85%	5.80%
3) Unit	Wood County Board of Education			
Number of Active Members	1,558	1,689	1,677	1,689
Percent of Active Members	4.44%	4.72%	4.68%	4.74%
4) Unit	Raleigh County Board of Education			
Number of Active Members	1,446	1,561	1,482	1,487
Percent of Active Members	4.12%	4.36%	4.13%	4.17%
5) Unit	Cabell County Board of Education			
Number of Active Members	1,401	1,486	1,399	1,421
Percent of Active Members	3.99%	4.15%	3.90%	3.98%
6) Unit	Harrison County Board of Education			
Number of Active Members	1,393	1,432	1,402	1,397
Percent of Active Members	3.97%	4.00%	3.91%	3.92%
7) Unit	Monongalia County Board of Education			
Number of Active Members	1,251	1,443	1,399	1,388
Percent of Active Members	3.56%	4.03%	3.90%	3.89%
8) Unit	Mercer County Board of Education			
Number of Active Members	1,177	1,271	1,119	1,116
Percent of Active Members	3.35%	3.55%	3.12%	3.13%
9) Unit	Jefferson County Board of Education	Marion County Board of Education	Marion County Board of Education	Marion County Board of Education
Number of Active Members	1,004	1,061	1,058	1,052
Percent of Active Members	2.86%	2.96%	2.95%	2.95%
10) Unit	Putnam County Board of Education			
Number of Active Members	1,000	1,060	1,058	1,051
Percent of Active Members	2.85%	2.96%	2.95%	2.95%
Total Active Members	35,593	35,807	35,855	35,670

**STATISTICAL SECTION****Largest Employers****Teachers Retirement System (Continued)**

Units	2009	2008
1) Unit	Kanawha County Board of Education	Kanawha County Board of Education
Number of Active Members	3,480	3,468
Percent of Active Members	9.75%	9.85%
2) Unit	Berkeley County Board of Education	Berkeley County Board of Education
Number of Active Members	2,070	2,057
Percent of Active Members	5.80%	5.84%
3) Unit	Wood County Board of Education	Wood County Board of Education
Number of Active Members	1,677	1,662
Percent of Active Members	4.70%	4.72%
4) Unit	Raleigh County Board of Education	Raleigh County Board of Education
Number of Active Members	1,490	1,487
Percent of Active Members	4.17%	4.22%
5) Unit	Cabell County Board of Education	Cabell County Board of Education
Number of Active Members	1,432	1,433
Percent of Active Members	4.01%	4.07%
6) Unit	Harrison County Board of Education	Harrison County Board of Education
Number of Active Members	1,392	1,391
Percent of Active Members	3.90%	3.95%
7) Unit	Monongalia County Board of Education	Monongalia County Board of Education
Number of Active Members	1,389	1,377
Percent of Active Members	3.89%	3.95%
8) Unit	Mercer County Board of Education	Mercer County Board of Education
Number of Active Members	1,119	1,115
Percent of Active Members	3.13%	3.17%
9) Unit	Marion County Board of Education	Marion County Board of Education
Number of Active Members	1,051	1,048
Percent of Active Members	2.94%	2.98%
10) Unit	Putnam County Board of Education	Putnam County Board of Education
Number of Active Members	1,047	1,044
Percent of Active Members	2.93%	2.96%
Total Active Members	35,701	35,219

In July 2008, 15,152 members of the Teachers Defined Contribution Retirement System transferred to the Teachers Defined Benefit Retirement System.

**STATISTICAL SECTION**

## Largest Employers

**State Police Death, Disability, and Retirement System**

Units	2017	2016	2015
1) Unit	State of West Virginia	State of West Virginia	State of West Virginia
Number of Active Members	41	41	51
Percent of Active Members	100.00%	100.00%	100.00%

Units	2014	2013	2012
1) Unit	State of West Virginia	State of West Virginia	State of West Virginia
Number of Active Members	73	99	108
Percent of Active Members	100.00%	100.00%	100.00%

Units	2011	2010	2009
1) Unit	State of West Virginia	State of West Virginia	State of West Virginia
Number of Active Members	133	147	163
Percent of Active Members	100.00%	100.00%	100.00%

Units	2008
1) Unit	State of West Virginia
Number of Active Members	173
Percent of Active Members	100.00%

**STATISTICAL SECTION**

Largest Employers

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**State Police Retirement System**

Units	2017	2016	2015	2014	2013
1) Unit	State of West Virginia				
Number of Active Members	602	604	624	596	558
Percent of Active Members	100.00%	100.00%	100.00%	100.00%	100.00%

Units	2012	2011	2010	2009	2008
1) Unit	State of West Virginia				
Number of Active Members	556	523	498	472	455
Percent of Active Members	100.00%	100.00%	100.00%	100.00%	100.00%

**STATISTICAL SECTION**  
Largest Employers

**Deputy Sheriffs Retirement System**

Units	2017	2016	2015	2014
1) Unit	Kanawha County	Kanawha County	Kanawha County	Kanawha County
Number of Active Members	99	94	97	97
Percentage of Active Members	8.98%	9.29%	9.64%	9.90%
2) Unit	Berkeley County	Berkeley County	Berkeley County	Berkeley County
Number of Active Members	60	56	52	53
Percentage of Active Members	5.44%	5.53%	5.31%	5.41%
3) Unit	Harrison County	Harrison County	Harrison County	Harrison County
Number of Active Members	52	48	48	48
Percentage of Active Members	4.71%	4.74%	4.77%	4.90%
4) Unit	Raleigh County	Raleigh County	Raleigh County	Cabell County
Number of Active Members	47	43	41	38
Percentage of Active Members	4.26%	4.25%	4.08%	3.88%
5) Unit	Cabell County	Putnam County	Putnam County	Putnam County
Number of Active Members	43	41	40	37
Percentage of Active Members	3.90%	4.05%	3.98%	3.78%
6) Unit	Monongalia County	Cabell County	Monongalia Co	Raleigh County
Number of Active Members	42	37	38	37
Percentage of Active Members	3.81%	3.66%	3.78%	3.78%
7) Unit	Putnam County	Monongalia County	Cabell County	Monongalia County
Number of Active Members	42	37	37	34
Percentage of Active Members	3.81%	3.66%	3.68%	3.47%
8) Unit	Wood County	Fayette County	Wood County	Wood County
Number of Active Members	38	34	33	33
Percentage of Active Members	3.45%	3.36%	3.28%	3.37%
9) Unit	Ohio County	Ohio County	Fayette County	Fayette County
Number of Active Members	36	33	31	31
Percentage of Active Members	3.26%	3.26%	3.08%	3.16%
10) Unit	Fayette County	Wood County	Marion County	Ohio County
Number of Active Members	35	33	31	31
Percentage of Active Members	3.17%	3.26%	3.08%	3.16%
Total Active Members	1,103	1,012	1,006	980

**STATISTICAL SECTION**  
Largest Employers

**Deputy Sheriffs Retirement System (Continued)**

Units	2013	2012	2011	2010
1) Unit	Kanawha County	Kanawha County	Kanawha County	Kanawha County
Number of Active Members	103	101	102	101
Percentage of Active Members	10.40%	10.32%	10.42%	10.54%
2) Unit	Berkeley County	Berkeley County	Berkeley County	Berkeley County
Number of Active Members	56	58	55	54
Percentage of Active Members	5.66%	5.92%	5.77%	5.64%
3) Unit	Harrison County	Harrison County	Harrison County	Harrison County
Number of Active Members	46	48	44	42
Percentage of Active Members	4.65%	4.90%	4.61%	4.38%
4) Unit	Cabell County	Cabell County	Putnam County	Cabell County
Number of Active Members	43	43	44	41
Percentage of Active Members	4.34%	4.39%	4.61%	4.28%
5) Unit	Putnam County	Monongalia Co	Raleigh County	Raleigh County
Number of Active Members	42	42	42	39
Percentage of Active Members	4.24%	4.29%	4.40%	4.07%
6) Unit	Raleigh County	Putnam County	Cabell County	Monongalia County
Number of Active Members	42	40	41	36
Percentage of Active Members	4.24%	4.09%	4.30%	3.76%
7) Unit	Monongalia Co	Raleigh County	Wood County	Putnam County
Number of Active Members	39	40	39	36
Percentage of Active Members	3.94%	4.09%	4.09%	3.76%
8) Unit	Wood County	Wood County	Monongalia County	Wood County
Number of Active Members	38	37	36	36
Percentage of Active Members	3.84%	3.78%	3.77%	3.76%
9) Unit	Fayette County	Fayette County	Fayette County	Fayette County
Number of Active Members	34	34	35	31
Percentage of Active Members	3.43%	3.47%	3.67%	3.24%
10) Unit	Ohio County	Ohio County	Ohio County	Ohio County
Number of Active Members	33	29	28	26
Percentage of Active Members	3.33%	2.96%	3.67%	2.92%
Total Active Members	990	979	954	958

**STATISTICAL SECTION**  
Largest Employers

**Deputy Sheriffs Retirement System (Continued)**

Units	2009	2008
1) Unit	Kanawha County	Kanawha County
Number of Active Members	97	93
Percentage of Active Members	10.48%	10.19%
2) Unit	Berkeley County	Berkeley County
Number of Active Members	54	47
Percentage of Active Members	5.83%	5.15%
3) Unit	Cabell County	Raleigh County
Number of Active Members	39	41
Percentage of Active Members	4.21%	4.49%
4) Unit	Raleigh County	Putnam County
Number of Active Members	39	35
Percentage of Active Members	4.21%	3.83%
5) Unit	Harrison County	Cabell County
Number of Active Members	36	34
Percentage of Active Members	3.89%	3.72%
6) Unit	Monongalia County	Harrison County
Number of Active Members	35	33
Percentage of Active Members	3.78%	3.61%
7) Unit	Putnam County	Monongalia County
Number of Active Members	35	32
Percentage of Active Members	3.78%	3.50%
8) Unit	Wood County	Wood County
Number of Active Members	33	30
Percentage of Active Members	3.56%	3.29%
9) Unit	Fayette County	Fayette County
Number of Active Members	31	28
Percentage of Active Members	3.35%	3.07%
10) Unit	Greenbrier County	Greenbrier County
Number of Active Members	26	26
Percentage of Active Members	2.81%	2.85%
Total Active Members	926	913

**STATISTICAL SECTION**  
Largest Employers

**Judges Retirement System**

Units	2017	2016	2015
1) Unit	West Virginia Judiciary	West Virginia Judiciary	West Virginia Judiciary
Number of Active Members	43	36	43
Percent of Active Members	100.00%	100.00%	100.00%

Units	2014	2013	2012
1) Unit	West Virginia Judiciary	West Virginia Judiciary	West Virginia Judiciary
Number of Active Members	50	50	50
Percent of Active Members	100.00%	100.00%	100.00%

Units	2011	2010	2009
1) Unit	West Virginia Judiciary	West Virginia Judiciary	West Virginia Judiciary
Number of Active Members	50	53	54
Percent of Active Members	100.00%	100.00%	100.00%

Units	2008
1) Unit	West Virginia Judiciary
Number of Active Members	60
Percent of Active Members	100.00%

**STATISTICAL SECTION**

## Largest Employers

**Emergency Medical Services Retirement System**

Units	2017	2016	2015
1) Unit	Kanawha County Emergency Ambulance	Kanawha County Emergency Ambulance	Kanawha County Emergency Ambulance
Number of Active Members	216	192	192
Percent of Active Members	31.91%	33.28%	34.59%
2) Unit	Cabell County EMS	Cabell County EMS	Cabell County EMS
Number of Active Members	120	108	109
Percent of Active Members	17.73%	18.72%	19.64%
3) Unit	Boone County Ambulance Authority		
Number of Active Members	49		
Percent of Active Members	7.24%		
Total Active Members	676	577	555

Units	2014	2013	2012
1) Unit	Kanawha County Emergency Ambulance	Kanawha County Emergency Ambulance	Kanawha County Emergency Ambulance
Number of Active Members	182	192	187
Percent of Active Members	34.27%	36.71%	37.85%
2) Unit	Cabell County EMS	Cabell County EMS	Cabell County EMS
Number of Active Members	108	118	113
Percent of Active Members	20.34%	22.56%	22.87%
3) Unit			
Number of Active Members			
Percent of Active Members			
Total Active Members	531	523	494

Units	2011	2010	2009
1) Unit	Kanawha County Emergency Ambulance	Kanawha County Emergency Ambulance	Kanawha County Emergency Ambulance
Number of Active Members	193	184	174
Percent of Active Members	36.07%	35.05%	33.86%
2) Unit	Cabell County EMS	Cabell County EMS	Cabell County EMS
Number of Active Members	115	101	87
Percent of Active Members	21.50%	19.24%	17.03%
3) Unit			
Number of Active Members			
Percent of Active Members			
Total Active Members	535	525	511

**STATISTICAL SECTION**

Largest Employers

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**Emergency Medical Services Retirement System  
(Continued)**

<b>Units</b>	<b>2008</b>
1) Unit	Kanawha County Emergency Ambulance
Number of Active Members	154
Percent of Active Members	32.42%
2) Unit	Cabell County EMS
Number of Active Members	72
Percent of Active Members	15.16%
3) Unit	Harrison County EMS
Number of Active Members	36
Percent of Active Members	7.58%
Total Active Members	475

This plan was established in January 2008.

**STATISTICAL SECTION**

**Largest Employers**

**Municipal Police Officers and Firefighters Retirement System**

<b>Units</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
1) Unit	City of Charleston Police	City of Charleston Police	City of Huntington Police
Number of Active Members	57	47	30
Percent of Active Members	22.01%	24.87%	21.43%
2) Unit	City of Huntington Police	City of Huntington Police	City of Charleston Police
Number of Active Members	40	39	26
Percent of Active Members	15.44%	20.63%	18.57%
3) Unit	City of Charleston Fire	City of Charleston Fire	City of Charleston Fire
Number of Active Members	39	36	24
Percent of Active Members	15.06%	19.05%	17.14%
Total Active Members	259	189	140

<b>Units</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>
1) Unit	City of Huntington Police	City of Huntington Police	City of Huntington Police
Number of Active Members	44	27	12
Percent of Active Members	46.81%	56.25%	44.44%
2) Unit	City of Charleston Police	City of Charleston Police	City of Charleston Police
Number of Active Members	34	18	7
Percent of Active Members	36.17%	37.50%	25.93%
Total Active Members	94	48	27

<b>Units</b>	<b>2011</b>	<b>2010</b>
1) Unit	City of Huntington Police	City of Huntington Police
Number of Active Members	9	6
Percent of Active Members	100.00%	100.00%
2) Unit		
Number of Active Members		
Percent of Active Members		
Total Active Members	6	

This plan was established January 2010.

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

The following schedules provide information on the average monthly benefit payments. These schedules exclude participants retiring with a reduced early retirement benefit with less than 10 years service. Due to the nature, design and resulting limitations of our recently retired computerized benefit system, the data for the final average salary for retirees is not available. At the end of the second quarter of 2017, a new modern benefit system was implemented. The final average salary information will be available prospectively starting with fiscal year ending June 30, 2018.

**Public Employees Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 548	\$ 764	\$ 1,070	\$ 1,456	\$ 2,299
Number of active retirees	4,512	4,049	4,448	4,295	6,902
<b>2016</b>					
Average monthly benefit	\$ 531	\$ 743	\$ 1,037	\$ 1,392	\$ 2,274
Number of active retirees	4,471	3,998	4,309	4,176	6,484
<b>2015</b>					
Average monthly benefit	\$ 522	\$ 733	\$ 1,019	\$ 1,386	\$ 2,204
Number of active retirees	4,438	3,934	4,296	4,107	6,390
<b>2014</b>					
Average monthly benefit	\$ 547	\$ 760	\$ 1,055	\$ 1,440	\$ 2,281
Number of active retirees	4,245	3,770	4,165	3,993	6,258
<b>2013</b>					
Average monthly benefit	\$ 529	\$ 741	\$ 1,033	\$ 1,404	\$ 2,231
Number of active retirees	4,147	3,727	4,085	3,857	5,943
<b>2012</b>					
Average monthly benefit	\$ 497	\$ 698	\$ 983	\$ 1,333	\$ 2,156
Number of active retirees	4,048	3,653	3,885	3,658	5,367
<b>2011</b>					
Average monthly benefit	\$ 466	\$ 665	\$ 935	\$ 1,271	\$ 2,066
Number of active retirees	3,945	3,599	3,749	3,394	4,714
<b>2010</b>					
Average monthly benefit	\$ 454	\$ 648	\$ 909	\$ 1,242	\$ 2,028
Number of active retirees	3,926	3,553	3,653	3,302	4,398
<b>2009</b>					
Average monthly benefit	\$ 436	\$ 627	\$ 889	\$ 1,214	\$ 1,979
Number of active retirees	3,924	3,529	3,564	3,170	4,123
<b>2008</b>					
Average monthly benefit	\$ 423	\$ 608	\$ 866	\$ 1,180	\$ 1,983
Number of active retirees	3,939	3,547	3,500	3,042	3,832

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

**Teachers Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 475	\$ 719	\$ 1,048	\$ 1,488	\$ 2,572
Number of active retirants	2,476	3,199	4,674	5,383	18,717
<b>2016</b>					
Average monthly benefit	\$ 443	\$ 692	\$ 1,021	\$ 1,437	\$ 2,486
Number of active retirants	2,402	3,191	4,605	5,359	17,974
<b>2015</b>					
Average monthly benefit	\$ 432	\$ 668	\$ 1,004	\$ 1,414	\$ 2,453
Number of active retirants	2,352	3,187	4,728	5,351	17,680
<b>2014</b>					
Average monthly benefit	\$ 452	\$ 695	\$ 1,026	\$ 1,446	\$ 2,481
Number of active retirants	2,224	3,020	4,575	5,200	17,445
<b>2013</b>					
Average monthly benefit	\$ 434	\$ 667	\$ 1,008	\$ 1,404	\$ 2,409
Number of active retirants	2,192	3,038	4,601	5,116	16,775
<b>2012</b>					
Average monthly benefit	\$ 395	\$ 622	\$ 957	\$ 1,322	\$ 2,244
Number of active retirants	2,138	3,003	4,629	4,873	15,154
<b>2011</b>					
Average monthly benefit	\$ 368	\$ 588	\$ 909	\$ 1,246	\$ 2,082
Number of active retirants	2,132	3,077	4,580	4,577	13,642
<b>2010</b>					
Average monthly benefit	\$ 355	\$ 578	\$ 886	\$ 1,217	\$ 2,011
Number of active retirants	2,149	3,129	4,539	4,496	12,976
<b>2009</b>					
Average monthly benefit	\$ 346	\$ 564	\$ 868	\$ 1,192	\$ 1,948
Number of active retirants	2,153	3,182	4,501	4,396	12,402
<b>2008</b>					
Average monthly benefit	\$ 339	\$ 554	\$ 849	\$ 1,162	\$ 1,877
Number of active retirants	2,267	3,257	4,460	4,308	11,772
<b>2007</b>					
Average monthly benefit	\$ 335	\$ 543	\$ 827	\$ 1,139	\$ 1,806
Number of active retirants	2,358	3,318	4,425	4,216	11,099

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

**State Police Death, Disability, and Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 5,307	\$ 5,356	\$ 4,332	\$ 5,069	\$ 5,707
Number of active retirants	29	27	105	450	83
<b>2016</b>					
Average monthly benefit	\$ 5,276	\$ 5,262	\$ 4,109	\$ 4,747	\$ 5,466
Number of active retirants	29	27	103	449	84
<b>2015</b>					
Average monthly benefit	\$ 5,224	\$ 4,965	\$ 3,910	\$ 4,574	\$ 5,277
Number of active retirants	30	27	111	446	85
<b>2014</b>					
Average monthly benefit	\$ 5,202	\$ 5,097	\$ 3,870	\$ 4,611	\$ 5,153
Number of active retirants	24	22	89	423	86
<b>2013</b>					
Average monthly benefit	\$ 5,001	\$ 4,913	\$ 3,705	\$ 4,433	\$ 4,951
Number of active retirants	24	22	91	405	88
<b>2012</b>					
Average monthly benefit	\$ 4,383	\$ 4,267	\$ 3,313	\$ 4,085	\$ 4,549
Number of active retirants	25	23	92	379	91
<b>2011</b>					
Average monthly benefit	\$ 4,078	\$ 4,208	\$ 3,067	\$ 3,768	\$ 4,437
Number of active retirants	25	25	97	353	90
<b>2010</b>					
Average monthly benefit	\$ 4,060	\$ 4,198	\$ 2,993	\$ 3,584	\$ 4,270
Number of active retirants	25	25	96	346	89
<b>2009</b>					
Average monthly benefit	\$ 3,807	\$ 3,735	\$ 2,909	\$ 3,425	\$ 4,118
Number of active retirants	26	22	97	344	90
<b>2008</b>					
Average monthly benefit	\$ 3,649	\$ 3,489	\$ 2,805	\$ 3,285	\$ 3,929
Number of active retirants	25	20	93	335	93

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

**State Police Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 3,537	\$ 3,683	\$ 3,031	\$ 2,953	\$ 3,998
Number of active retirants	3	4	3	7	2
<b>2016</b>					
Average monthly benefit	\$ 3,489	\$ 3,718	\$ 3,015	\$ 3,058	\$ 3,998
Number of active retirants	3	3	3	2	2
<b>2015</b>					
Average monthly benefit	\$ 3,468	\$ 4,130	\$ 3,034	\$ 3,058	\$ 4,469
Number of active retirants	3	2	2	2	1
<b>2014</b>					
Average monthly benefit	\$ 2,601	\$ 4,131	\$ 3,034	\$ 3,058	\$ 4,469
Number of active retirants	4	2	2	2	1
<b>2013</b>					
Average monthly benefit	\$ 2,575	\$ 4,091	\$ 3,004	\$ 3,044	\$ 4,469
Number of active retirants	4	2	2	2	1
<b>2012</b>					
Average monthly benefit	\$ 2,525	\$ 2,453	\$ 2,957	\$ 3,044	\$ 4,469
Number of active retirants	4	1	2	2	1
<b>2011</b>					
Average monthly benefit	\$ 2,500	\$ -	\$ 2,781	\$ 3,044	\$ 4,469
Number of active retirants	4	0	1	2	1
<b>2010</b>					
Average monthly benefit	\$ 2,475	\$ -	\$ 2,754	\$ 3,189	\$ -
Number of active retirants	4	0	1	1	0
<b>2009</b>					
Average monthly benefit	\$ 1,842	\$ -	\$ 1,708	\$ -	\$ -
Number of active retirants	3	0	3	0	0
<b>2008</b>					
Average monthly benefit	\$ -	\$ -	\$ 1,159	\$ -	\$ 1,823
Number of active retirants	0	0	2	0	3

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

**Deputy Sheriffs Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 1,535	\$ 1,537	\$ 1,645	\$ 1,810	\$ 2,549
Number of active retirants	18	29	67	105	135
<b>2016</b>					
Average monthly benefit	\$ 1,479	\$ 1,541	\$ 1,613	\$ 1,757	\$ 2,487
Number of active retirants	16	26	64	98	129
<b>2015</b>					
Average monthly benefit	\$ 1,428	\$ 1,503	\$ 1,570	\$ 1,729	\$ 2,424
Number of active retirants	14	25	62	95	121
<b>2014</b>					
Average monthly benefit	\$ 1,333	\$ 1,533	\$ 1,579	\$ 1,789	\$ 2,456
Number of active retirants	15	24	64	94	124
<b>2013</b>					
Average monthly benefit	\$ 1,333	\$ 1,581	\$ 1,521	\$ 1,750	\$ 2,412
Number of active retirants	15	25	58	90	113
<b>2012</b>					
Average monthly benefit	\$ 1,238	\$ 1,501	\$ 1,453	\$ 1,685	\$ 2,265
Number of active retirants	10	23	54	80	104
<b>2011</b>					
Average monthly benefit	\$ 1,150	\$ 1,435	\$ 1,420	\$ 1,694	\$ 2,203
Number of active retirants	8	22	44	76	95
<b>2010</b>					
Average monthly benefit	\$ 1,219	\$ 1,431	\$ 1,379	\$ 1,713	\$ 2,189
Number of active retirants	7	22	42	72	90
<b>2009</b>					
Average monthly benefit	\$ 1,324	\$ 1,439	\$ 1,434	\$ 1,666	\$ 2,133
Number of active retirants	7	22	36	69	80
<b>2008</b>					
Average monthly benefit	\$ 1,446	\$ 1,387	\$ 1,392	\$ 1,611	\$ 2,123
Number of active retirants	7	19	32	59	70

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

**Judges Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 4,200	\$ 5,581	\$ 6,841	\$ 7,363	\$ 7,265
Number of active retirants	1	25	20	8	5
<b>2016</b>					
Average monthly benefit	\$ 4,200	\$ 5,600	\$ 6,847	\$ 7,442	\$ 7,265
Number of active retirants	1	26	17	8	5
<b>2015</b>					
Average monthly benefit	\$ 4,200	\$ 5,607	\$ 6,864	\$ 7,789	\$ 7,265
Number of active retirants	1	26	15	8	5
<b>2014</b>					
Average monthly benefit	\$ 4,200	\$ 5,713	\$ 7,257	\$ 7,953	\$ 7,265
Number of active retirants	1	23	15	8	5
<b>2013</b>					
Average monthly benefit	\$ 4,200	\$ 5,861	\$ 7,213	\$ 7,964	\$ 7,265
Number of active retirants	1	26	14	7	5
<b>2012</b>					
Average monthly benefit	\$ 4,200	\$ 5,690	\$ 7,288	\$ 7,964	\$ 7,269
Number of active retirants	1	29	14	7	4
<b>2011</b>					
Average monthly benefit	\$ -	\$ 5,342	\$ 6,536	\$ 7,302	\$ 6,331
Number of active retirants	0	31	16	6	3
<b>2010</b>					
Average monthly benefit	\$ -	\$ 5,302	\$ 6,724	\$ 7,302	\$ 6,331
Number of active retirants	0	31	16	6	3
<b>2009</b>					
Average monthly benefit	\$ -	\$ 5,525	\$ 6,558	\$ 7,302	\$ 3,867
Number of active retirants	0	29	11	6	1
<b>2008</b>					
Average monthly benefit	\$ -	\$ 5,529	\$ 6,558	\$ 7,302	\$ 5,558
Number of active retirants	0	33	11	6	2

**STATISTICAL SECTION**  
Average Monthly Benefit Payments

**Emergency Medical Services Retirement System**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30 & over
<b>2017</b>					
Average monthly benefit	\$ 1,933	\$ 1,528	\$ 1,948	\$ 2,535	\$ 3,173
Number of active retirants	12	15	20	21	10
<b>2016</b>					
Average monthly benefit	\$ 1,874	\$ 1,596	\$ 2,012	\$ 2,274	\$ 3,176
Number of active retirants	10	12	18	17	10
<b>2015</b>					
Average monthly benefit	\$ 1,812	\$ 1,632	\$ 2,027	\$ 2,104	\$ 3,189
Number of active retirants	10	10	16	16	8
<b>2014</b>					
Average monthly benefit	\$ 1,830	\$ 1,775	\$ 2,114	\$ 2,308	\$ 3,057
Number of active retirants	10	10	16	17	9
<b>2013</b>					
Average monthly benefit	\$ 2,030	\$ 1,547	\$ 2,076	\$ 2,315	\$ 2,939
Number of active retirants	8	6	14	13	8
<b>2012</b>					
Average monthly benefit	\$ 1,281	\$ 1,580	\$ 2,164	\$ 2,132	\$ 2,521
Number of active retirants	4	6	7	6	5
<b>2011</b>					
Average monthly benefit	\$ 840	\$ 1,712	\$ 1,945	\$ 1,611	\$ 3,102
Number of active retirants	1	2	2	5	4

This plan was established in January 2008.

**Municipal Police Officers & Firefighters Retirement System**

The MPFRS was established in January 2010 and has no benefits or retirees to report.

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