

West Virginia Consolidated Public Retirement Board

Pension Trust Funds of the State of West Virginia

(A Component Unit of the State of West Virginia)

2019

Comprehensive Annual Financial Report

Serving Those Who Serve West Virginia



Fiscal Years Ended June 30, 2019 and June 30, 2018

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, 2019 and 2018

The West Virginia Consolidated Public Retirement Board Administers the Following Retirement Systems:

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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WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD

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Introductory Section



2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT
For the Fiscal Years Ended June 30, 2019 and June 30, 2018

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Certificate of Achievement for Excellence in
Financial Reporting





EXECUTIVE DIRECTOR
Jeffrey E. Fleck

Consolidated Public Retirement Board

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BOARD CHAIRMAN
David L. Wyantt

December 18, 2019

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, 2019. This report provides detail information on the performance of the nine retirement systems administered by WVCPRB, including:

- Public Employees Retirement System (PERS)
- Teachers Retirement System (TRS)
- Teachers Defined Contribution Retirement System (TDCRS)
- State Police Death, Disability Retirement System (SPDDRS)
- State Police Retirement System (SPRS)
- Deputy Sheriffs Retirement System (DSRS)
- Judges Retirement System (JRS)
- Emergency Medical Service Retirement System (EMSRS)
- Municipal Police Officers & Firefighters System (MPFRS).

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, SPRS, DSRS, JRS, EMRS, and MPFRS 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 West Virginia 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, TDCRS, SPDDRS, SPRS, DSRS, JRS, EMRS, and MPFRS 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 2019 and 2018. Also, an analysis of significant variances between fiscal years 2019 and 2018 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, 2019, the funded ratios increased (based on actuarial valuations completed as of July 1, 2018) for 6 of the 8 of the defined benefit plans administered by the WVCPRB. The funding status for fiscal year 2019 and 2018 for the 8 defined benefit plans, a follows:

	<u>June 30, 2019</u>	<u>June 30, 2018</u>	<u>Increase (Decrease)</u>
PERS	92.9%	91.5%	1.4%
TRS	69.6%	67.1%	2.5%
SPDDRS	90.4%	86.7%	3.7%
SPRS	101.8%	98.1%	3.7%
DSRS	92.1%	98.8%	-6.7%
JRS	185.5%	174.4%	11.1%
EMSRS	104.9%	99.4%	5.5%
MPFRS	168.3%	186.7%	-18.4%

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 2019, primarily due to both an increase in the fair market value of the investments and the income they produced. The total investment assets at June 30, 2019 and 2018 were (in thousands):

Investment Activity (Continued)

	June 30, 2019	June 30, 2018	Increase (Decrease)
PERS	\$ 6,895,386	\$ 6,718,698	\$ 176,688
TRS	7,836,784	7,691,788	144,996
SPDDRS	689,819	682,799	7,020
SPRS	207,102	188,912	18,190
DSRS	232,576	219,368	13,208
JRS	212,653	204,484	8,169
EMSRS	84,650	78,921	5,729
MPFRS	11,090	7,842	3,248
TDCRS	549,650	515,304	34,346
	<u>\$ 16,719,710</u>	<u>\$ 16,308,116</u>	<u>\$ 411,594</u>

Interest and dividend income and the associated investment yields for fiscal years ended June 30, 2019 and 2018, were (in thousands):

	Fiscal Year Ended June 30, 2019			Fiscal Year Ended June 30, 2018			Increase (Decrease)		
	Interest & Dividends	Change in Fair Market Value	Yield	Interest & Dividends	Change in Fair Market Value	Yield	Interest & Dividends	Change in Fair Market Value	Yield
PERS	\$ 472	\$ 392,707	5.94%	\$ 27,434	\$ 578,869	9.75%	\$ (26,962)	\$ (186,162)	-3.81%
TRS	939	443,722	5.93%	31,047	657,226	9.74%	(30,108)	(213,504)	-3.81%
SPDDRS	86	38,088	5.78%	2,707	58,232	9.83%	(2,621)	(20,144)	-4.05%
SPRS	14	11,716	6.11%	758	15,545	9.61%	(744)	(3,829)	-3.50%
DSRS	9	13,191	6.01%	889	18,472	9.69%	(880)	(5,281)	-3.68%
JRS	9	12,076	5.97%	828	17,545	9.77%	(819)	(5,469)	-3.80%
EMSRS	4	4,770	6.03%	318	6,549	9.64%	(314)	(1,779)	-3.61%
MPFRS	4	607	6.72%	28	519	8.86%	(24)	88	-2.14%
TDCRS	15,762	19,158	8.32%	18,630	22,817	8.57%	(2,868)	(3,659)	-0.25%

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 complement 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, 2019. 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, 2018. 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.

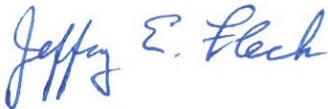
A Certificate of Achievement is valid for a period of one year only. We believe that our current comprehensive annual financial report continues to meet the Certificate of Achievement Program’s requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

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, EMRS, 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, EMRS, MPFRS and TDCRS systems.

Sincerely,

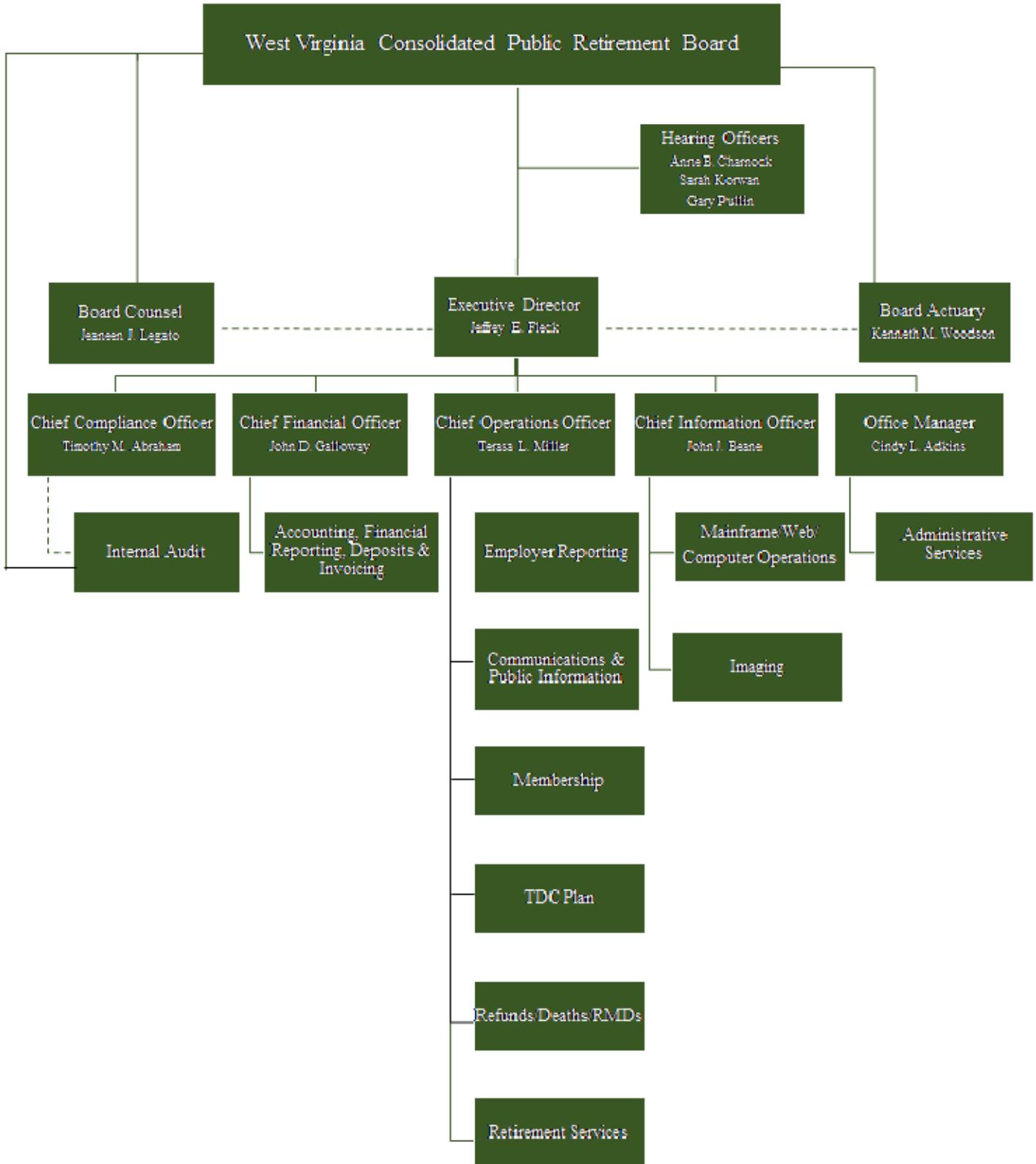


Jeffery E. Fleck
Executive Director



John D. Galloway
Chief Financial Office

INTRODUCTORY SECTION
Organization Chart



INTRODUCTORY SECTION
Board of Trustees

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
Administration Cabinet Secretary - Allan L. McVey
William A. Barker, Jr.
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

West Virginia Consolidated Public Retirement Board

Administrative Staff

Executive Director - Jeffrey E. Fleck
Executive Assistant – Nancy D. Butcher
Chief Operating Officer/Deputy Director - Terasa L. Miller
Chief Financial Officer – John D. Galloway
Administrative Services Manager - Cindy L. Adkins
Contract Legal Counsel - Jeaneen J. Legato
Accounting Manager - Lori A. Cottrill
Membership Manager - Vicki L. Sutton
Retirement Services Manager – Lisa M. Trump
Employer Reporting Manager – Caroline R. Brady
TDCRS Manager - Paula M. Vanhorn
Refunds/Deaths/RMDs Manager – Sharon L. Whittaker
Compliance Officer – Timothy M. Abraham
Chief IT/Information Officer - John J. Beane

Advisors

Bowles, Rice, LLP, Attorneys
Buck Global, LLC, Consulting Actuary
West Virginia Investment Management Board, Investment Manager
Suttle & Stalnaker, PLLC, Independent Certified Public Accountants



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, 2018

Christopher P. Morill

Executive Director/CEO



Public Pension Coordinating Council

**Public Pension Standards Award
For Funding and Administration
2019**

Presented to

West Virginia Consolidated Public Retirement Board

In recognition of meeting professional standards for
plan funding and administration as
set forth in the Public Pension Standards.

Presented by the Public Pension Coordinating Council, a confederation of

National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

A handwritten signature in cursive script that reads "Alan H. Winkle".

Alan H. Winkle
Program Administrator



Financial Section



2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT *For the Fiscal Years Ended June 30, 2019 and June 30, 2018*

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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) and fund of the West Virginia Consolidated Public Retirement Board (the Board), component unit of the State of West Virginia, as of and for the year ended June 30, 2019 and 2018, 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, 2019 and 2018, 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.

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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, 2019 and 2018, 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 23 through 28, 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 86 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that 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 presented for purposes of additional analysis and is 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
December 18, 2019

FINANCIAL SECTION

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, 2019 and June 30, 2018. 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, 2019 was 16.81 billion, increasing over \$423.74 million (2.59%) from the plan net position restricted for pensions at June 30, 2018. The net position restricted for pensions of the Board at June 30, 2018 was \$16.39 billion, increasing over \$968.80 million (6.28%) from the net position restricted for pensions at June 30, 2017. The net position restricted for pensions is held in trust to meet future benefit obligations.
- Contribution revenue for fiscal year 2019 totaled approximately \$853.31 million, an increase of 0.61% compared to fiscal year 2018. Contribution revenue for fiscal year 2018 totaled \$848.12 million, an increase of 1.85% compared to fiscal year 2017. The fluctuations from 2018 to 2019 were due to changes in the employer contribution rates and changes in the retirement systems' membership.
- Net investment income for fiscal years 2019 and 2018 were approximately \$953.33 million and \$1.46 billion, respectively.
- Total benefits, refunds, and forfeitures paid for fiscal year 2019 were approximately \$1.374 billion, an increase of 3.39% over fiscal year 2018 total benefits, refunds, and forfeitures paid of \$1.329 billion, which was an increase of 3.63% over fiscal year 2017.

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.

FINANCIAL SECTION

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, 2019, the WV CPRB had net position restricted for pensions of approximately \$16.81 billion, an increase of over \$423.74 million (2.59%) from \$16.39 billion at June 30, 2018. This followed the fiscal year 2018 increase of approximately \$968.8 million (6.28%) from the approximately \$15.42 billion of net position restricted for pensions as of June 30, 2017. 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)

	June 30, 2019	June 30, 2018	FY19-18 Percentage Change	June 30, 2017	FY18-17 Percentage Change
<u>ASSETS</u>					
Cash	\$ 4,193	\$ 6,164	-31.98%	\$ 5,315	15.97%
Investments at fair value	16,719,710	16,308,116	2.52%	15,315,786	6.48%
Contributions receivable	33,420	34,258	-2.45%	40,711	-15.85%
Participant loans receivable	1,799	2,385	-24.57%	2,477	-3.71%
Appropriation receivable	35,000	-	100.00%	-	-
Miscellaneous revenue receivable	202	257	-21.40%	500	-48.60%
Due from State of West Virginia	25,000	45,000	-44.44%	65,000	-30.77%
	<u>16,819,324</u>	<u>16,396,180</u>	2.58%	<u>15,429,789</u>	6.26%
<u>LIABILITIES</u>					
Accrued expenses and other payables	<u>4,428</u>	<u>5,026</u>	-11.90%	<u>7,432</u>	-32.37%
Net position restricted for pensions	<u>\$ 16,814,896</u>	<u>\$ 16,391,154</u>	2.59%	<u>\$ 15,422,357</u>	6.28%

FINANCIAL SECTION

MANAGEMENT'S DISCUSSION AND ANALYSIS
(Unaudited)

ANALYSIS OF ADDITIONS AND DEDUCTIONS TO NET POSITION RESTRICTED FOR PENSIONS

Contributions to WV CPRB increased approximately \$5.20 million (0.61%) compared to fiscal year 2018. With the decrease in investment income of approximately \$505.08 million for fiscal year 2019 compared to investment income for fiscal year 2018, the overall decrease in revenues for 2019 was -21.63% compared to revenues for fiscal year 2018.

Contributions to the WV CPRB for fiscal year 2018 increased by approximately \$15.39 million (1.85%) over contributions for fiscal year 2017. With the decrease of net investment income of approximately \$635.1 million for fiscal year 2018 compared to investment income for fiscal year 2017, the overall decrease in revenues for 2018 was -21.15% compared to revenue for fiscal year 2017.

Total benefits, refunds, and forfeitures paid during the year ended June 30, 2019 were approximately \$1.37 billion, an increase of 3.39% over fiscal year 2018 total benefits, refunds, and forfeitures paid. Total benefits and refunds paid during the year ended June 30, 2018 were approximately \$1.33 billion, an increase of 3.63% over fiscal year 2017. The increase in benefit expenses for each year is attributed to more retirees receiving benefits during the fiscal years. Total refunds paid increased approximately \$4.41 million (11.92%) in fiscal year 2019 from fiscal year 2018. Total refunds paid had decreased approximately \$3.43 million (-8.49%) in fiscal year 2018 over fiscal year 2017.

Administrative expenses for the year ended June 30, 2019 were approximately \$14.30 million, an decrease of 0.03% from fiscal year 2018 administrative expenses. Administrative expenses for the year ended June 30, 2018 were approximately \$14.30 million, an increase of 28.33% over fiscal year 2017 administrative expenses. The increase each year was primarily due to budgetary increases deemed necessary for several expense areas, namely staff across the board pay raises in 2019 and the new Line of Business software implemented during 2018 and 2017.

FINANCIAL SECTION

MANAGEMENT'S DISCUSSION AND ANALYSIS
(Unaudited)

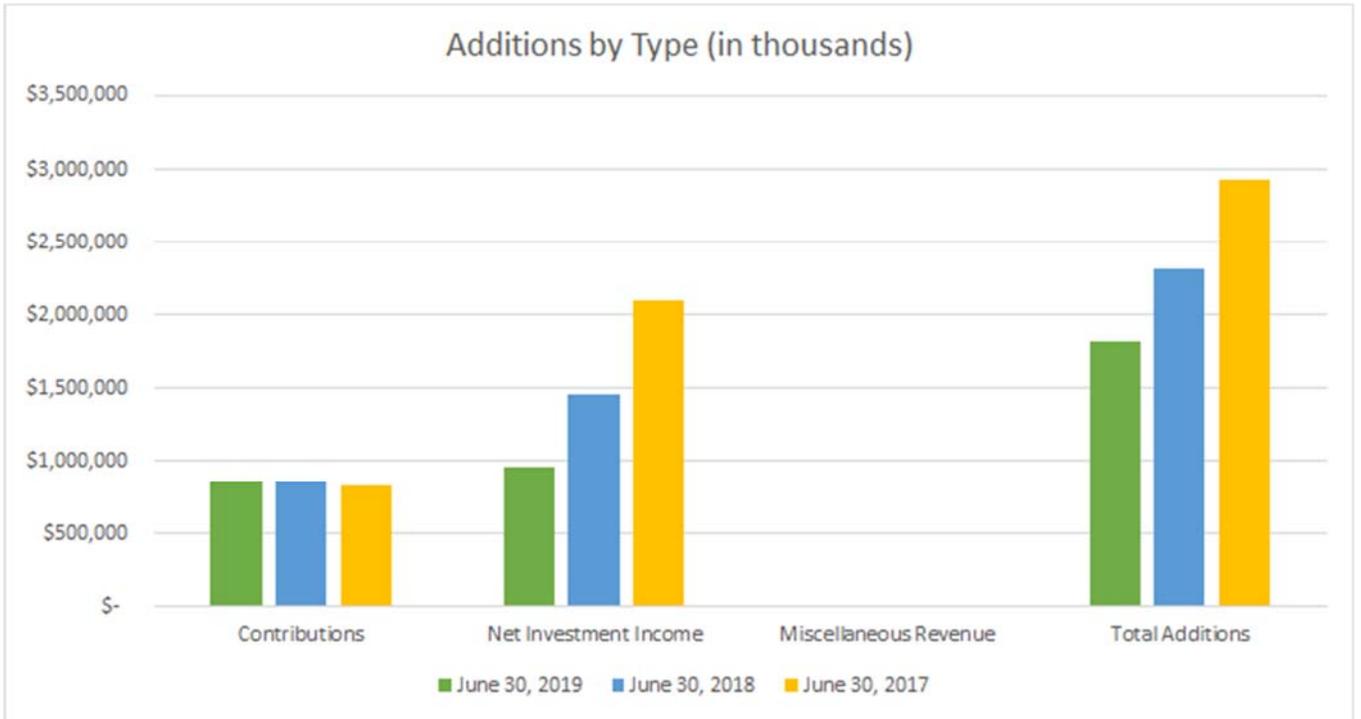
CONDENSED CHANGES IN FIDUCIARY NET POSITION (in thousands)

	<u>2019</u>	<u>2018</u>	FY19-18 Percentage Change	<u>2017</u>	FY18-17 Percentage Change
Additions:					
Contributions:					
Member contributions	\$ 182,634	\$ 172,258	6.02%	\$ 173,746	-0.86%
Employer contributions	<u>670,677</u>	<u>675,859</u>	-0.77%	<u>658,978</u>	2.56%
Total contributions	<u>853,311</u>	<u>848,117</u>	0.61%	<u>832,724</u>	1.85%
Investment income:					
Net increase (decrease) in fair value of investments	936,035	1,375,774	-31.96%	1,954,392	-29.61%
Investment income	<u>17,299</u>	<u>82,639</u>	-79.07%	<u>139,167</u>	-40.62%
Net investment income	<u>953,334</u>	<u>1,458,413</u>	-34.63%	<u>2,093,559</u>	-30.34%
Other income	<u>5,573</u>	<u>5,739</u>	-2.89%	<u>6,113</u>	-6.12%
Total additions	<u>1,812,218</u>	<u>2,312,269</u>	-21.63%	<u>2,932,396</u>	-21.15%
Deductions and transfers:					
Benefit expense	1,332,737	1,292,143	3.14%	1,242,193	4.02%
Refunds of contributions/withdrawals	41,442	37,028	11.92%	40,462	-8.49%
Administrative expense	<u>14,297</u>	<u>14,301</u>	-0.03%	<u>11,144</u>	28.33%
Total deductions and transfers	<u>1,388,476</u>	<u>1,343,472</u>	3.35%	<u>1,293,799</u>	3.84%
Net increase (decrease) in net position	423,742	968,797	-56.26%	1,638,597	-40.88%
Net position restricted for pensions:					
Beginning of year	<u>16,391,154</u>	<u>15,422,357</u>	6.28%	<u>13,783,760</u>	11.89%
End of year	<u>\$ 16,814,896</u>	<u>\$ 16,391,154</u>	2.59%	<u>\$ 15,422,357</u>	6.28%

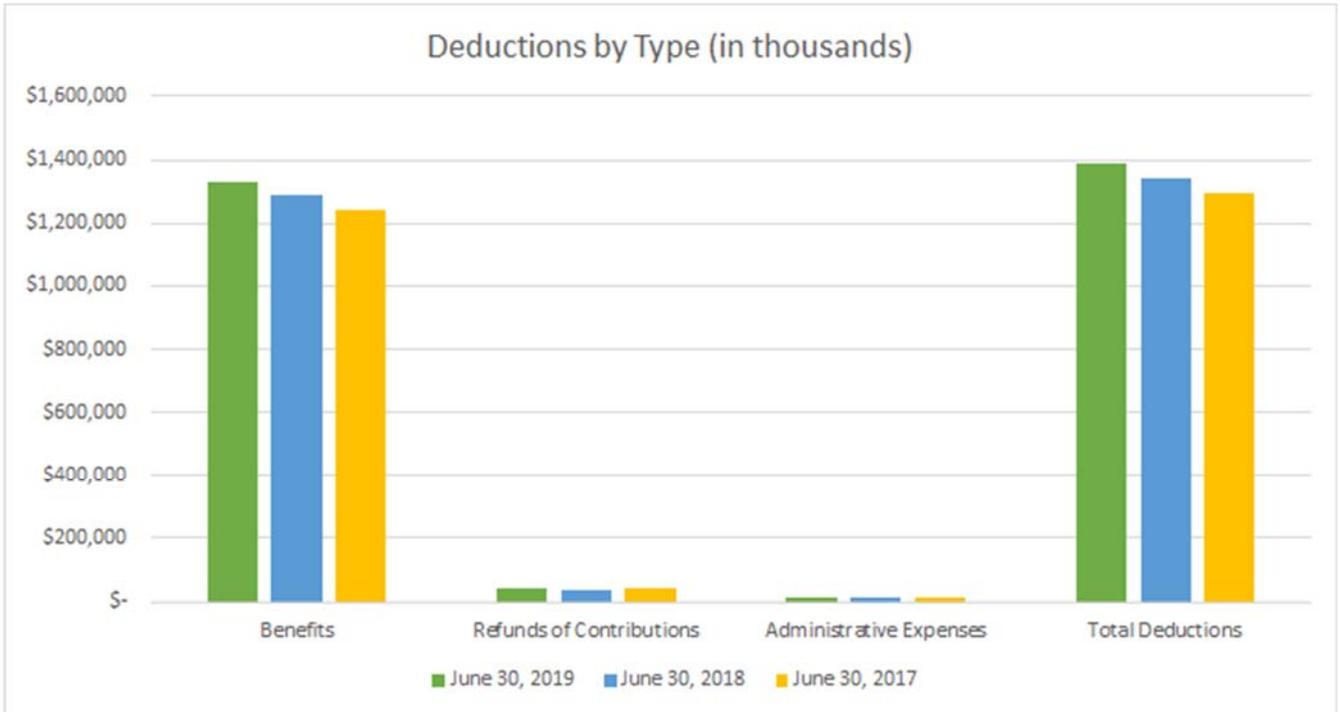
FINANCIAL SECTION

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

ADDITIONS BY TYPE (in thousands)



DEDUCTIONS BY TYPE (in thousands)



FINANCIAL SECTION

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% 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 investment return for all retirement plans for fiscal 2019 was 6.0% which is below our 7.5% target rate. In aggregate, the funds have a five-year annualized rate of return of 7.0% which is below the 7.5% long term expectation. The 10-year annualized rate of return is above our target of 7.5% at 10.1%.

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.

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board
Statements of Fiduciary Net Position - Pension Funds
(In Thousands)
June 30, 2019

	Public Employees' 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	
	\$		\$		\$		\$		\$		\$		\$		\$			\$
ASSETS																		
Cash	61		10		1									4		4,117		4,193
Investments at fair value:																		
Mutual funds	-		-		-		-		-		-		-	-		291,905		291,905
Collective investment trusts	-		-		-		-		-		-		-	-		109,124		109,124
Guaranteed investment contract (contract value)	-		-		-		-		-		-		-	-		148,621		148,621
Domestic equity	1,698,197		1,918,351		166,807		51,197		52,616		20,815		2,649		-	3,968,242		3,968,242
International qualified	558,010		629,522		55,557		15,573		17,016		6,517		622		-	1,301,140		1,301,140
International equity	1,214,443		1,363,648		116,454		37,428		37,276		15,187		2,085		-	2,827,690		2,827,690
Private markets	1,796,476		2,031,952		179,589		52,265		59,667		21,526		2,643		-	4,199,191		4,199,191
Total return fixed income	576,580		641,299		54,351		18,227		18,134		7,431		981		-	1,337,138		1,337,138
Core fixed income	249,812		277,315		23,511		7,908		7,852		3,220		425		-	578,781		578,781
Hedge fund	787,712		890,570		77,231		23,542		24,296		9,616		1,213		-	1,840,721		1,840,721
Short term fixed income	14,156		84,127		16,319		962		390		338		472		-	117,157		117,157
Total investments at fair value	6,895,386		7,836,784		689,819		207,102		212,653		84,650		11,090		549,650	16,719,710		16,719,710
Contributions receivable	5,157		25,559		-		-		-		323		201		1,411	33,420		33,420
Participants loans receivable	-		1,494		-		305		-		-		-		-	1,799		1,799
Appropriation receivable	-		35,000		-		-		-		-		-		-	35,000		35,000
Miscellaneous revenue receivable	50		-		-		9		-		-		2		141	202		202
Due from State of West Virginia	25,000		-		-		-		-		-		-		-	25,000		25,000
Total assets	6,925,654		7,898,847		689,820		207,102		212,653		84,973		11,297		555,319	16,819,324		16,819,324
LIABILITIES AND PLAN NET POSITION																		
Liabilities:																		
Accrued expenses and other payables	200		108		-		-		-		4		-		4,116	4,428		4,428
Net position restricted for pensions	6,925,454		7,898,739		689,820		207,102		212,653		84,969		11,297		551,203	16,814,896		16,814,896

The Accompanying Notes Are An Integral
Part of These Financial Statements

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board
Statements of Fiduciary Net Position - Pension Funds
(In Thousands)
June 30, 2018

	Public Employees' Retirement System		State Police Death, Disability and Retirement System		State Police Deputy Sheriff Retirement System		Judges' Retirement System		Emergency Medical Services Retirement System		Municipal Police Officers & Firefighters Retirement System		Teachers' Defined Contribution Retirement System		Total				
	\$		\$		\$		\$		\$		\$		\$						
ASSETS																			
Cash	415	\$	851	\$	4	\$	3	\$	78	\$	4	\$	37	\$	7	\$	4,765	\$	6,164
Investments at fair value:																			
Mutual funds	-		-		-		-		-		-		-		-		-		274,245
Collective investment trusts	-		-		-		-		-		-		-		-		-		101,792
Guaranteed investment contract (contract value)	-		-		-		-		-		-		-		-		-		139,267
Domestic equity	1,695,976		1,915,121		166,354		47,529		55,237		51,654		19,737		1,924		-		3,953,552
International qualified	570,269		642,773		58,103		15,855		18,732		17,640		6,658		634		-		1,330,664
International equity	1,113,987		1,260,306		107,614		31,312		36,109		33,487		13,050		1,281		-		2,597,146
Private markets	1,677,031		1,893,364		165,045		46,707		54,410		50,898		19,524		1,884		-		3,908,863
Total return fixed income	637,623		714,138		61,259		18,235		21,079		19,426		7,629		747		-		1,480,136
Core fixed income	278,378		310,183		26,667		7,933		9,174		8,491		3,334		326		-		644,486
Hedge fund	741,999		837,944		72,848		20,757		24,149		22,542		8,667		840		-		1,729,746
TRIS annuity	-		(130)		-		-		-		-		-		-		-		(130)
Short term fixed income	3,435		118,089		24,909		584		478		346		322		206		-		148,369
Total investments at fair value	6,718,698		7,691,788		682,799		188,912		219,368		204,484		78,921		7,842		515,304		16,308,116
Contributions receivable	5,558		26,023		-		-		751		-		343		227		1,356		34,258
Participants loans receivable	-		2,070		-		-		315		-		-		-		-		2,385
Miscellaneous revenue receivable	23		-		-		-		4		-		1		1		228		257
Due from State of West Virginia	45,000		-		-		-		-		-		-		-		-		45,000
Total assets	6,769,694		7,720,732		682,803		188,915		220,516		204,488		79,302		8,077		521,653		16,396,180
LIABILITIES AND PLAN NET POSITION																			
Liabilities:																			
Accrued expenses and other payables	140		123		-		-		2		-		-		-		4,761		5,026
Net position restricted for pensions	6,769,554		7,720,609		682,803		188,915		220,514		204,488		79,302		8,077		516,892		16,391,154

The Accompanying Notes Are An Integral Part of These Financial Statements

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board
 Statements of Changes in Fiduciary Net Position - Pension Funds
 (In Thousands)
 Year Ended June 30, 2019

	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	\$ 70,357	\$ 93,219	\$ 110	\$ 3,905	\$ 4,846	\$ 331	\$ 2,302	\$ 1,438	\$ 6,126	\$ 182,634									
Employer contributions	147,031	126,971	180	4,556	6,705	779	2,844	1,438	10,204	300,708									
Other statutorily required contributions	-	319,554	-	-	-	-	-	-	-	319,554									
Other contributions - appropriations	-	35,000	15,415	-	-	-	-	-	-	50,415									
Total contributions	217,388	574,744	15,705	8,461	11,551	1,110	5,146	2,876	16,330	853,311									
Investment income:																			
Net increase (decrease) in fair value of investments	392,707	443,722	38,088	11,716	13,191	12,076	4,770	607	19,158	936,035									
Investment income	472	939	86	14	9	9	4	4	15,762	17,299									
Net investment income (loss)	393,179	444,661	38,174	11,730	13,200	12,085	4,774	611	34,920	953,334									
Other income	763	3,446	752	-	479	-	-	38	95	5,573									
Total additions	611,330	1,022,851	54,631	20,191	25,230	13,195	9,920	3,525	51,345	1,812,218									
Deductions and transfers:																			
Benefit expenses	436,965	827,539	47,551	1,473	11,338	4,846	2,989	36	-	1,332,737									
Forfeitures	-	-	-	-	-	-	-	-	1,113	1,113									
Refunds of contributions/withdrawals	11,782	10,769	-	471	602	87	1,187	262	15,169	40,329									
Transfers to (from) plans	(232)	174	-	-	-	86	-	(28)	-	-									
Administrative expenses	6,915	6,239	63	60	145	11	77	35	752	14,297									
Total deductions and transfers	455,430	844,721	47,614	2,004	12,085	5,030	4,253	305	17,034	1,388,476									
Net increase (decrease) in plan net position	155,900	178,130	7,017	18,187	13,145	8,165	5,667	3,220	34,311	423,742									
Net position restricted for pensions:																			
Beginning of year:	6,769,554	7,720,609	682,803	188,915	220,514	204,488	79,302	8,077	516,892	16,391,154									
End of year	\$ 6,925,454	\$ 7,898,739	\$ 689,820	\$ 207,102	\$ 233,659	\$ 212,653	\$ 84,969	\$ 11,297	\$ 551,203	\$ 16,814,896									

The Accompanying Notes Are An Integral Part of These Financial Statements

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board
Statements of Changes in Fiduciary Net Position - Pension Funds
(In Thousands)
Year Ended June 30, 2018

	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	\$ 65,150	\$ 89,128	\$ 186	\$ 3,621	\$ 4,416	\$ 364	\$ 2,231	\$ 1,087	\$ 6,075	\$ 172,258
Employer contributions	152,541	124,515	154	4,205	6,194	735	2,765	1,089	11,664	303,862
Other statutorily required contributions	-	312,684	-	-	-	-	-	-	-	312,684
Other contributions - appropriations	-	34,638	24,675	-	-	-	-	-	-	59,313
Total contributions	217,691	560,965	25,015	7,826	10,610	1,099	4,996	2,176	17,739	848,117
Investment income:										
Net increase (decrease) in fair value of investments	578,869	657,226	58,232	15,545	18,472	17,545	6,549	519	22,817	1,375,774
Investment income	27,434	31,047	2,707	758	889	828	318	28	18,630	82,639
Net investment income (loss)	606,303	688,273	60,939	16,303	19,361	18,373	6,867	547	41,447	1,458,413
Other income	1,497	3,046	691	-	471	-	-	-	34	5,739
Total additions	825,491	1,252,284	86,645	24,129	30,442	19,472	11,863	2,723	59,220	2,312,269
Deductions and transfers:										
Benefit expenses	421,936	806,511	45,529	1,186	9,614	4,765	2,582	20	-	1,292,143
Forfeitures	-	-	-	-	-	-	-	-	1,530	1,530
Refunds of contributions/withdrawals	12,248	9,591	-	656	997	167	1,071	125	10,643	35,498
Administrative expenses	6,850	6,035	61	60	137	8	73	23	1,054	14,301
Total deductions and transfers	441,034	822,137	45,590	1,902	10,748	4,940	3,726	168	13,227	1,343,472
Net increase (decrease) in plan net position	384,457	430,147	41,055	22,227	19,694	14,532	8,137	2,555	45,993	968,797
Net position restricted for pensions:										
Beginning of year	6,385,097	7,290,462	641,748	166,688	200,820	189,956	71,165	5,522	470,899	15,422,357
End of year	6,769,554	7,720,609	682,803	188,915	220,514	204,488	79,302	8,077	516,892	16,391,154

The Accompanying Notes Are An Integral Part of These Financial Statements

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements Years Ended June 30, 2019 and 2018

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 - 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 Retirement).

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.

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements Years Ended June 30, 2019 and 2018

1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

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.

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 - TRS and DSRS allow 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.

Allowance for Doubtful Accounts - The Board evaluates all receivables for collectibility based on historical collectibility experience, the ability of payee to perform, and such other factors which, in the Board's judgment, require consideration in estimating doubtful accounts.

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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

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.

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION

Membership in the plans consisted of the following as of July 1, 2018 and 2017, the date of the annual actuarial valuation:

As of July 1, 2018:

	<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	27,568	36,394	759	33	403	58	102	1
Terminated members entitled to benefits but not yet receiving them	4,626	3,169	4	17	114	-	61	2
Terminated nonvested members	19,474	5,251	1	125	246	2	221	97
Active members	34,765	33,174	20	570	1,050	74	577	332
Total	<u>86,433</u>	<u>77,988</u>	<u>784</u>	<u>745</u>	<u>1,813</u>	<u>134</u>	<u>961</u>	<u>432</u>

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	27,053	35,964	744	27	383	57	89	-
Terminated members entitled to benefits but not yet receiving them	4,301	2,767	3	11	116	2	67	-
Terminated nonvested members	17,752	4,165	1	125	231	2	185	90
Active members	36,094	34,318	39	595	1,018	75	608	217
Total	<u>85,200</u>	<u>77,214</u>	<u>787</u>	<u>758</u>	<u>1,748</u>	<u>136</u>	<u>949</u>	<u>307</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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Defined Benefit Plans

Public Employees' Retirement System (PERS)

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:

	June 30, 2019	June 30, 2018
West Virginia state agencies	124	130
Cities and towns	101	114
Counties	55	55
Special districts	361	347
	641	646

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. For all employees hired after July 1, 2015, qualification for normal retirement is age 62 with 10 years of 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 10 years of 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, 2016, newly hired members contribute 6% of annual earnings. State and non-state governmental employers' contribution rates were 10.0% and 11.0% of covered employees' annual earnings for fiscal years ending June 30, 2019 and 2018, respectively. 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, 2019 and 2018, were (in thousands):

	2019	2018
State	\$ 97,977	\$ 99,772
Non-State	49,054	52,769
	\$ 147,031	\$ 152,541

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Teachers' Retirement System (TRS)

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 81 employers and one non-employer contributing entity participating in TRS as of June 30, 2019.

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.

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. 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. For all employees hired after July 1, 2015, this requirement increases to age 64 with 10 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 elected to transfer to TRS effective July 1, 2008. 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 \$319,554,175 and \$312,683,886 were made through the State's school aid formula during the years ended June 30, 2019 and 2018, respectively. Certain additional contributions of approximately \$35,000,000 and \$34,638,000 were made during the years ended June 30, 2019 and 2018, respectively, representing extra appropriations to reduce the unfunded liability.

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements Years Ended June 30, 2019 and 2018

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

State Police Death, Disability and Retirement System (SPDDRS)

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.

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 \$15,415,000 and \$24,675,000 were made during the years ended June 30, 2019 and 2018, 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 (SPRS)

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 14.0% and 12.0% of covered employees' annual base salary for fiscal years ending June 30, 2019 and 2018, respectively.

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.

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Deputy Sheriff Retirement System (DSRS)

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, 2019.

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

1. Member in covered employment, with attainment of at least age 50 with age plus service equal to 70 or greater
2. Member 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. Attained 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.

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 base salary during both the years ended June 30, 2019 and 2018. 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 (JRS)

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 upon termination of service prior to normal retirement 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 upon termination of service prior to normal retirement provided the member completes 16 years of service of which 14 years of service are as a sitting judge or justice.

FINANCIAL SECTION

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements Years Ended June 30, 2019 and 2018

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Judges' Retirement System (JRS) continued

The annual benefit paid to judges and justices on the bench 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 on the bench 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 17 employers participating in EMSRS as of June 30, 2019.

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
2.0% x FAS x Years of Service for years 21-25
1.0% x FAS x Years of Service for years 26-30

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Emergency Medical Services Retirement System (EMSRS) continued

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 431 participating members as of June 30, 2019. 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 32 employers participating in MPFRS as of June 30, 2019.

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

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.

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Defined Contribution Plan

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, the Schools for the Deaf and Blind, and the Marshall University Research Corporation 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, 2018 and 2017 and rolled forward to June 30, 2019 and 2018, respectively, using the actuarial assumptions and methods described in the *Actuarial Assumptions and Methods* section of this note.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

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, 2019 and 2018 were as follows (in thousands):

As of June 30, 2019:	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability (Asset)	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
PERS	\$ 7,140,467	\$ 6,925,454	\$ 215,013	96.99%
TRS	10,873,910	7,898,739	2,975,171	72.64%
SPDDRS	762,838	689,820	73,018	90.43%
SPRS	218,293	207,102	11,191	94.87%
DSRS	253,755	233,659	20,096	92.08%
JRS	115,950	212,653	(96,703)	183.40%
EMSES	80,427	84,969	(4,542)	105.65%
MPFRS	6,712	11,297	(4,585)	168.31%

As of June 30, 2018:	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability (Asset)	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
PERS	\$ 7,027,806	\$ 6,769,554	\$ 258,252	96.33%
TRS	10,842,866	7,720,609	3,122,257	71.20%
SPDDRS	749,080	682,803	66,277	91.15%
SPRS	188,909	188,915	(6)	100.00%
DSRS	215,146	220,514	(5,368)	102.50%
JRS	114,828	204,488	(89,660)	178.08%
EMSES	77,628	79,302	(1,674)	102.16%
MPFRS	4,379	8,077	(3,698)	184.45%

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

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, 2019:

<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>
Domestic Equity	27.5%	5.8%	1.60%
International Equity	27.5%	7.7%	2.12%
Fixed Income	15.0%	3.3%	0.50%
Real Estate	10.0%	6.1%	0.61%
Private Equity	10.0%	8.8%	0.88%
Hedge Funds	10.0%	4.4%	0.44%
Total	<u>100.00%</u>		6.15%
Inflation (CPI)			<u>2.00%</u>
			<u>8.15%</u>

Discount Rate

The discount rate used to measure the total pension liability was 7.5% for all defined benefit plans for fiscal years 2019 and 2018. 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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Discount Rate (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, 2019 and 2018, respectively (in thousands):

	Total Net Pension Liability (Asset)		
	1% Decrease	Current	1% Increase
	(6.5)%	Discount Rate (7.5)%	(8.5)%
As of June 30, 2019:			
PERS	\$ 1,001,547	\$ 215,013	\$ (450,346)
TRS	4,060,828	2,975,191	2,046,502
SPDDRS	169,591	73,018	(6,019)
SPRS	48,969	11,191	(19,103)
DSRS	55,239	20,096	(8,870)
JRS	(84,091)	(96,703)	(107,410)
EMSRS	7,398	(4,542)	(14,234)
MPFRS	(2,852)	(4,585)	(5,882)
	Total Net Pension Liability (Asset)		
	1% Decrease	Current	1% Increase
	(6.5)%	Discount Rate (7.5)%	(8.5)%
As of June 30, 2018:			
PERS	\$ 1,040,033	\$ 258,252	\$ (403,124)
TRS	4,214,475	3,122,257	2,188,490
SPDDRS	162,878	66,277	(12,570)
SPRS	33,729	(6)	(27,000)
DSRS	24,555	(5,368)	(30,020)
JRS	(76,829)	(89,660)	(100,511)
EMSRS	10,166	(1,674)	(11,238)
MPFRS	(2,518)	(3,698)	(4,575)

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, 2019 and 2018, respectively, for each defined benefit pension plan:

	Annual Money Weighted Rate of Return	
	2019	2018
PERS	5.94%	9.75%
TRS	5.93%	9.74%
SPDDRS	5.78%	9.83%
SPRS	6.11%	9.61%
DSRS	6.01%	9.69%
JRS	5.97%	9.77%
EMS	6.03%	9.64%
MPFRS	6.72%	8.86%

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods

Significant assumptions used in the actuarial valuations are as follows:

PERS	June 30, 2019	June 30, 2018
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		
State	3.1 - 5.3%	3.0 - 4.6%
Nonstate	3.35 - 6.5%	3.35 - 6.0%
Inflation rate	3.00%	3.00%
Discount rate	7.50%	7.50%
Mortality rates	Active-100% of Pub-2010 General Employees table, below-median, headcount weighted, projected with scale MP-2018 Retired healthy males-108% of Pub-2010 General Retiree Male table, below-median, headcount weighted, projected with scale MP-2018 Retired healthy females-122% of Pub-2010 Annuitant, Scale AA fully generational General Retiree Female table, below-median, headcount weighted, projected with scale MP-2018 Disabled males-118% of Pub-2010 General / Teachers Disabled Male table, below-median, headcount weighted, projected with scale MP-2018 Disabled females-118% of Pub-2010 General / Teachers Disabled Female table, below-median, headcount weighted, projected with scale MP-2018	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 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	2.28 - 45.63%	1.75 - 35.10%
Non-state	2.00 - 35.88%	2.00 - 35.88%
Disability rates	0.005 - 0.540%	0.007 - .675%
Retirement rates	12% - 100%	12% - 100%
Date range in most recent experience study	2013-2018	2009-2014

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

TRS	June 30, 2019	June 30, 2018
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		
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 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	0.80% - 35.00%	0.80% - 35.00%
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

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

SPDDRS	June 30, 2019	June 30, 2018
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	4.00%	4.00%
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 – 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
Withdrawal rates	0.08 - 2.67%	0.08 - 2.67%
Disability rates	0.04 - 0.60%	0.04 - 0.60%
Retirement rates	25 - 100%	25 - 100%
Date range in most recent experience study	2011 - 2016	2011 - 2016

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

SPRS	June 30, 2019	June 30, 2018
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	4.00%	4.00%
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 – 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
Withdrawal rates:	0.23 - 5.70%	0.23 - 5.70%
Disability rates	0.04 - 0.60%	0.04 - 0.60%
Retirement rates	20% - 100%	20% - 100%
Date range in most recent experience study	2011 - 2016	2011 - 2016

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

DSRS	June 30, 2019	June 30, 2018
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 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 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 – 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 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
Withdrawal rates:	4.00% - 12.32%	4.00% - 12.32%
Disability rates	0.04 - 0.60%	0.04 - 0.60%
Retirement rates	16% - 100%	16% - 100%
Date range in most recent experience study	2011 - 2016	2011 - 2016

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

JRS	June 30, 2019	June 30, 2018
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 Male Retirees – 103% of RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Healthy female Retirees – RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Disabled – RP-2014 Healthy Annuitant tables; rolled back to 2006, Projected with Scale MP- 2016 fully generational	Active - N/A Healthy Male Retirees – 103% of RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Healthy female Retirees – RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Disabled – RP-2014 Healthy Annuitant tables; rolled back to 2006, Projected with Scale MP- 2016 fully generational
Withdrawal rates:	-	-
Disability rates	-	-
Retirement rates	5% - 100%	5% - 100%
Date range in most recent experience study	2011 - 2016	2011 - 2016

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

EMSRS	June 30, 2019	June 30, 2018
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 – 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
Withdrawal rates:	6.00% - 28.00%	6.00% - 28.00%
Disability rates	0.04 - 0.60%	0.04 - 0.60%
Retirement rates	25% - 100%	25% - 100%
Date range in most recent experience study	2011 - 2016	2011 - 2016

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

<u>MPFRS</u>	<u>June 30, 2019</u>	<u>June 30, 2018</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	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 – 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
Withdrawal rates:	3.00% - 28.00%	3.00% - 28.00%
Disability rates	0.04 - 0.60%	0.04 - 0.60%
Retirement rates	25% - 100%	25% - 100%
Date range in most recent experience study	2011 - 2016	2011 - 2016

4 - FAIR VALUE MEASUREMENTS

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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

4 - FAIR VALUE MEASUREMENTS (Continued)

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 WVIMB, for the Board's defined benefit plans, and the WVIMB 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, 2019:

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 WVIMB's annual financial statements for the underlying investments within the fair value hierarchy.

The following is a summary of the investments held by WVIMB for each plan as of June 30, 2019 and 2018 (in thousands) which are all measured at NAV and not within the fair value hierarchy:

June 30, 2019:	PERS	TRS	SPDDRS	SPRS	DSRS	JRS	EMSRS	MPFRS	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Domestic equity	1,698,197	1,918,351	166,807	51,197	57,610	52,616	20,815	2,649	N/A	Daily	Daily
International qualified	558,010	629,522	55,557	15,573	18,323	17,016	6,517	622	N/A	Daily	Daily
International equity	1,214,443	1,363,648	116,454	37,428	41,169	37,276	15,187	2,085	N/A	Daily	Daily
Private markets	1,796,476	2,031,952	179,589	52,265	59,667	55,073	21,526	2,643	N/A	Daily	Daily
Total return fixed income	576,580	641,299	54,351	18,227	20,135	18,134	7,431	981	N/A	Daily	Daily
Core fixed income	249,812	277,315	23,511	7,908	8,738	7,852	3,220	425	N/A	Daily	Daily
TRS annuity	787,712	890,570	77,231	23,542	26,541	24,296	9,616	1,213	N/A	Daily	Daily
Short term fixed income	14,156	84,127	16,319	962	393	390	338	472	N/A	Daily	Daily
Total investments (a)	\$ 6,895,386	\$ 7,836,784	\$ 689,819	\$ 207,102	\$ 232,576	\$ 212,653	\$ 84,650	\$ 11,090			

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

4 - FAIR VALUE MEASUREMENTS (Continued)

June 30, 2018:	<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>
Domestic equity	1,695,976	1,915,121	166,354	47,529	55,237	51,654	19,737	1,924	N/A	Daily	Daily
Large cap equity	570,269	642,773	58,103	15,855	18,732	17,640	6,658	634	N/A	Daily	Daily
International qualified	1,113,987	1,260,306	107,614	31,312	36,109	33,487	13,050	1,281	N/A	Daily	Daily
International equity	1,677,031	1,893,364	165,045	46,707	54,410	50,898	19,524	1,884	N/A	Daily	Daily
Private markets	637,623	714,138	61,259	18,235	21,079	19,426	7,629	747	N/A	Daily	Daily
Total return fixed income	278,378	310,183	26,667	7,933	9,174	8,491	3,334	326	N/A	Daily	Daily
Core fixed income	741,999	837,944	72,848	20,757	24,149	22,542	8,667	840	N/A	Daily	Daily
TRS annuity	0	(130)	0	0	0	0	0	0	N/A	Daily	Daily
Short term fixed income	3,435	118,089	24,909	584	478	346	322	206	N/A	Daily	Daily
Total investments (a)	<u>\$ 6,718,698</u>	<u>\$ 7,691,788</u>	<u>\$ 682,799</u>	<u>\$ 188,912</u>	<u>\$ 219,368</u>	<u>\$ 204,484</u>	<u>\$ 78,921</u>	<u>\$ 7,842</u>			

(a) - see note 5 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, 2019 and 2018. Classification within the fair value hierarchy table is based on the lowest level of any input that is significant to the fair value measurement (in thousands).

	Fair Value at June 30, 2019			
	Total	Level 1	Level 2	Level 3
Investments in the fair value hierarchy				
Mutual funds	\$ 291,905	\$ 291,905	\$ -	\$ -
Total assets in the fair value hierarchy	291,905	\$ 291,905	\$ -	\$ -
Investments measured at net asset value				
Collective investment trusts	109,124			
	109,124			
Investments at fair value	<u>\$ 401,029</u>			
	Fair Value at June 30, 2018			
	Total	Level 1	Level 2	Level 3
Investments in the fair value hierarchy				
Mutual funds	\$ 274,245	\$ 274,245	\$ -	\$ -
Total assets in the fair value hierarchy	274,245	\$ 274,245	\$ -	\$ -
Investments measured at net asset value				
Collective investment trusts	101,792			
	101,792			
Investments at fair value	<u>\$ 376,037</u>			

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

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, 2019, and 2018, respectively (in thousands). There are no participant redemption restrictions for these investments.

	Fair Value		Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
	2019	2018		2019 and 2018	
Collective investments trusts funds (b)	\$ 109,124	\$ 101,792	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 WVIMB 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 WVIMB. The WVIMB invests plan assets in accordance with West Virginia Code and policies established by the WVIMB. Individual defined benefit plan assets are invested by the WVIMB in the various WVIMB 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:

Domestic Equity

The Pool's objective is to exceed, net of external investment management fees, the Russel 3000 Stock Index over three to five year periods. Assets are managed by AJO, BlackRock, INTECH Investment Management, LLC, and Westfield Capital Management.

Credit Risk

The Pool's money market mutual fund and investments made with cash collateral for securities lending are exposed to credit risk. The money market mutual fund has the highest credit rating. Credit risk from securities lending collateral investments are limited by required 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 WVIMB reviews available ratings from Standard & Poor's and Moody's. The weighted average maturity for investments made with cash collateral for securities loaned is not to exceed 90 days. The following table provides the credit ratings indicative of the greatest degree of risk of the Pool's securities lending collateral investments as of June 30, 2019 and 2018 (in thousands).

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**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS

Domestic Equity (continued)

Rating	Fair Value	
	2019	2018
AAA / A-1	\$ 33,117	\$ 47,082
AA	151,145	5,064
A	5,340	5,288
BBB	2,428	7,219
B	226	-
Not applicable	50,048	110,807
Total securities lending collateral	<u>\$ 242,304</u>	<u>\$ 175,460</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, 2019 and 2018, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2019 and 2018, 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 WVIMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the WVIMB's custodian in the name of the WVIMB. All remaining securities are held by the WVIMB's custodian in the name of the WVIMB.

Interest Rate Risk

The Pool is exposed to interest rate risk from its money market mutual fund investment and from investments made with cash collateral for securities loaned. As of June 30, 2019 and 2018, the money market mutual fund had a weighted average maturity (WAM) of 43 days and 39 days, respectively. The WAM for securities lending collateral was 2 days.

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, 2019 and 2018, was \$1,301,531,000 and \$1,330,940,000, 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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

International Equity

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

The Pool's money market mutual fund and investments made with cash collateral for securities lending are exposed to credit risk. The money market mutual fund has the highest credit rating. At June 30, 2019, securities lending collateral investments consisted of time deposits and repurchase agreements. Credit risk from securities lending collateral investments 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 WVIMB reviews available ratings from Standard & Poor's and Moody's. The following table provides the credit ratings indicative of the greatest degree of risk of the Pool's securities lending collateral investments as of June 30, 2019 (in thousands).

Rating	Fair Value
AAA / A-1	\$ 9,678
AA	44,168
A	1,560
BBB	710
B	66
Not applicable	14,625
Total securities lending collateral	<u>\$ 70,807</u>

The following table provides the credit ratings indicative of the greatest degree of risk of the Pool's securities lending collateral investments as of June 30, 2018 (in thousands).

Rating	Fair Value
AAA / A-1	\$ 20,359
AA	2,190
A	2,287
BBB	3,122
B	-
Not applicable	47,916
Total securities lending collateral	<u>\$ 75,874</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, 2019 and 2018, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2019 and 2018, 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 WVIMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the WVIMB's custodian in the name of the WVIMB. All remaining securities are held by the WVIMB's custodian in the name of the WVIMB.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

International Equity (continued)

Interest Rate Risk

The Pool is exposed to interest rate risk from its money market mutual fund investment and from investments made with cash collateral for securities loaned. As of June 30, 2019 and 2018, the money market mutual fund had a weighted average maturity (WAM) of 43 days and 39 days, respectively. The WAM for securities lending collateral investments is not to exceed 90 days. The WAM for securities lending collateral was 1 day.

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, 2019 are as follows (in thousands):

Currency	Investments	Cash	Foreign Currency Spot Contracts	Total
Australian Dollar	\$ 126,545	\$ 975	\$ -	\$ 127,520
Brazil Real	135,983	682	(2)	136,663
British Pound	284,807	2,169	(2)	286,974
Canadian Dollar	125,313	2,518	-	127,831
Chilean Peso	6,037	-	-	6,037
Danish Krone	4,586	-	-	4,586
Egyptian Pound	926	-	-	926
Emirati Dirham	1,689	10	-	1,699
Euro Currency Unit	463,116	6,782	3	469,901
Hong Kong Dollar	365,906	2,136	-	368,042
Hungarian Forint	11,477	41	-	11,518
Indian Rupee	89,501	946	-	90,447
Indonesian Rupiah	41,637	38	-	41,675
Israeli Shekel	17,395	31	-	17,426
Japanese Yen	380,550	2,595	-	383,145
Malaysian Ringgit	19,851	290	-	20,141
Mexican Peso	55,332	486	-	55,818
New Taiwan Dollar	91,450	553	-	92,003
New Zealand Dollar	553	50	-	603
Norwegian Krone	20,433	463	-	20,896
Pakistan Rupee	1,413	-	-	1,413
Philippine Peso	17,899	4	-	17,903
Polish Zloty	1,027	1,570	-	2,597
Qatari Riyal	756	51	-	807
Singapore Dollar	21,213	540	-	21,753
South African Rand	44,180	448	-	44,628
South Korean Won	201,839	2,128	(1)	203,966
Swedish Krona	71,775	2,166	-	73,941
Swiss Franc	95,408	42	-	95,450
Thailand Baht	60,524	(3)	-	60,521
Turkish Lira	21,677	293	-	21,970
Total	<u>\$ 2,780,798</u>	<u>\$ 28,004</u>	<u>\$ (2)</u>	<u>\$ 2,808,800</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 \$414,535.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

International Equity (continued)

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, 2018 are as follows (in thousands):

Currency	Investments	Cash	Foreign Currency Spot Contract	Total
Australian Dollar	\$ 90,582	\$ 1	\$ -	\$ 90,583
Brazil Real	98,891	494	(20)	99,365
British Pound	275,749	493	115	276,357
Canadian Dollar	110,687	226	-	110,913
Chilean Peso	4,661	-	-	4,661
Czech Koruna	3,051	-	-	3,051
Danish Krone	19,525	9	1	19,535
Egyptian Pound	1,733	-	-	1,733
Emirati Dirham	-	10	-	10
Euro Currency	434,429	4,008	80	438,517
Hong Kong Dollar	356,625	5,338	(1)	361,962
Hungarian Forint	6,907	28	-	6,935
Indian Rupee	79,014	12,993	-	92,007
Indonesian Rupiah	15,318	93	-	15,411
Israeli Shekel	12,605	27	-	12,632
Japanese Yen	402,074	5,651	(40)	407,685
Malaysian Ringgit	28,119	1,284	(2)	29,401
Mexican Peso	47,526	140	-	47,666
New Taiwan Dollar	100,384	855	-	101,239
New Zealand Dollar	357	5	-	362
Norwegian Krone	25,384	307	(4)	25,687
Pakistan Rupee	2,949	-	-	2,949
Philippine Peso	6,761	5,082	-	11,843
Polish Zloty	4,150	73	(34)	4,189
Qatari Riyal	1,249	40	-	1,289
Singapore Dollar	15,955	207	2	16,164
South African Rand	46,338	10	(55)	46,293
South Korean Won	209,540	1,846	(1)	211,385
Swedish Krona	39,199	129	1	39,329
Swiss Franc	85,297	62	6	85,365
Thailand Baht	53,440	2	(9)	53,433
Turkish Lira	24,459	16	(6)	24,469
Total	<u>\$ 2,602,958</u>	<u>\$ 39,429</u>	<u>\$ 33</u>	<u>\$ 2,642,420</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 \$337,370.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

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 90 day Treasury Bill Index.

Credit Risk

The WVIMB 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 WVIMB reviews available ratings from Standard & Poor's, Moody's, and Fitch, and reports the rating indicative of the greatest degree of risk. All of the Pool's investments had the highest credit rating as of June 30, 2019 and 2018.

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, 2019 and 2018, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2019 and 2018, 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 WVIMB. All remaining investments are held by the WVIMB's custodian in the name of the WVIMB.

Interest Rate Risk

The WAM of the investments in 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 the WAM for the different asset types in the Pool as of June 30, 2019 and 2018 (Carrying Value in thousands):

Investment Type	2019		2018	
	WAM (days)	Carrying Value	WAM (days)	Carrying Value
Commercial paper	-	\$ -	26	\$ 22,171
Repurchase agreements	1	45,000	2	40,000
U.S. Government agency bonds	10	91,095	46	106,794
U.S. Treasury bonds	16	49,955	79	49,326
Total investments	9	\$ 186,050	43	\$ 218,291

Foreign currency risk

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

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

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, Franklin Templeton Investments, and Western Asset Management Company 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

The WVIMB 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 WVIMB reviews the ratings from Standard & Poor's, Moody's, and Fitch, and reports the rating indicative of the greatest degree of risk. The money market mutual fund has the highest credit rating. The following table provides credit rating for the Pool's fixed income investments as of June 30, 2019 and 2018 (in thousands):

Rating	Fair Value	
	2019	2018
AAA	\$ 14,485	\$ 22,196
AAA	685,964	889,097
A	105,271	104,870
BBB	553,241	587,744
BB	320,377	314,638
B	204,230	296,262
CCC	13,962	12,274
CC	-	3,716
C	-	403
D	1,050	3,982
Withdrawn	7,324	85
Not rated	55,807	38,996
Total fixed income investments	<u>\$ 1,961,711</u>	<u>\$ 2,274,263</u>

At June 30, 2019 and 2018, securities lending collateral investments consisted of time deposits and repurchase agreements. Credit risk from securities lending collateral investments are 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 IMB reviews available ratings from Standard & Poor's and Moody's. The IMB discloses the ratings of the securities underlying the repurchase agreements. The following table provides the credit ratings indicative of the greatest degree of risk of the Pool's securities lending collateral investments as of June 30, 2019 and 2018 (in thousands):

Rating	Fair Value	
	2019	2018
AAA / A-1	\$ 12,154	\$ 41,003
AA	55,470	4,410
A	1,960	4,605
BBB	891	6,287
B	83	-
Not rated	18,368	96,503
Total securities lending collateral	<u>\$ 88,926</u>	<u>\$ 152,808</u>

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Total Return Fixed Income (continued)

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, 2019 and 2018, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2019 and 2018, 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 WVIMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the WVIMB's custodian in the name of the WVIMB. Investments in commingled funds are held in an account in the name of the WVIMB. All remaining securities are held by the WVIMB's custodian in the name of the WVIMB.

Interest Rate Risk

The Pool is exposed to interest rate risk from its fixed income investments, money market mutual fund investment, and certain investments made with cash collateral for securities loaned. As of June 30, 2019 and 2018, the money market mutual fund had a weighted average maturity (WAM) of 43 days and 39 days, respectively. The WAM for securities lending collateral investments is not to exceed 90 days. As of June 30, 2019 and 2018, the WAM for securities lending collateral was 1 day and 2 days, respectively.

The WVIMB 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 following table provides the weighted average effective duration for the various asset types in the Pool as of June 30, 2019 and 2018 (in thousands):

Investment Type	2019		2018	
	Fair Value	Effective Duration (years)	Fair Value	Effective Duration (years)
Commingled bond funds	\$ 214,489	2.9	\$ 304,379	2.5
Corporate ABS residual	3,835	1.9	5,487	2.8
Corporate asset backed issues	72,659	(0.1)	36,072	0.9
Corporate CMO	40,069	1.1	71,666	1.0
Foreign asset backed issues	27,005	1.0	19,588	1.6
Foreign corporate bonds	271,117	5.4	296,352	5.6
Foreign government bonds	317,462	5.1	263,976	5.3
Municipal bonds	34,254	9.9	44,629	9.6
Repurchase agreements	8,000	0.0	10,000	0.0
Short term investments	6,083	0.0	-	0.0
U.S corporate bonds	402,522	7.0	401,582	6.9
U.S. Government agency bonds	9,464	0.2	2,721	1.3
U.S. Government agency CMO	57,221	1.1	51,608	1.4
U.S. Government agency CMO interest-only	5,786	4.8	5,664	2.8
U.S. government agency MDS	293,479	1.8	326,082	3.7
U.S. government agency TBA	106	1.4	8,974	6.4
U.S. Treasury bonds	157,216	15.6	407,697	8.5
U.S. Treasury inflation protected security	40,944	20.6	17,786	17.2
Total fixed income investments	<u>\$ 1,961,711</u>		<u>\$ 2,274,263</u>	

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Total Return Fixed Income (continued)

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, 2019 and 2018, the Pool held \$500,160,000 and \$525,141,000 of these securities, respectively. This represents approximately 25 and 23 percent of the value of the Pool's securities, respectively.

Foreign Currency Risk

The Pool has foreign fixed income, foreign equity investments, and cash that is denominated in foreign currencies and are exposed to foreign currency risks. The Pool also has foreign denominated derivative instruments. Additionally, the Pool has indirect exposure to foreign currency risk through its ownership interests in certain of the commingled debt funds. At June 30, 2019 and 2018, approximately \$32,063,000, or 15 percent and \$84,695,000, or 28 percent, respectively, of the commingled investment pools hold substantially all of their investments in securities denominated in foreign currencies. This represents approximately 3 percent of the value of the Pool's securities. The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2019, are as follows (in thousands):

Currency	Foreign Fixed Income	Foreign Equity Investments	Cash	Total
Argentine Peso	\$ 8,380	\$ -	\$ 1,503	\$ 9,883
Australian Dollar	-	-	1,704	1,704
Belarusian Ruble	2,048	-	-	2,048
Brazil Real	47,752	-	24	47,776
British Pound	-	-	2,988	2,988
Canadian Dollar	-	-	1,141	1,141
Colombian Peso	5,209	-	-	5,209
Deutsche Mark	1,013	-	-	1,013
Dominican Peso	3,801	-	-	3,801
Egyptian Pound	2,104	-	126	2,230
Euro Currency Unit	5,967	-	12,929	18,896
Georgian Lari	1,796	-	-	1,796
Ghana Cedi	2,469	-	-	2,469
Indonesian Rupiah	2,779	-	-	2,779
Japanese Yen	51,443	-	6,077	57,520
Kazakhstani Tenge	1,841	-	-	1,841
Kenyan Shilling	3,171	-	-	3,171
Mexican Peso	44,765	-	1,943	46,708
New Zealand Dollar	-	-	791	791
Peruvian Nuevo Sol	1,846	-	-	1,846
Russian Ruble	28,094	-	1,796	29,890
South African Rand	6,726	14	2	6,742
Swedish Krona	-	-	483	483
Turkish Lira	3,190	-	-	3,190
Uruguayan Peso	7,479	-	-	7,479
Total foreign denominated investments	<u>\$ 231,873</u>	<u>\$ 14</u>	<u>\$ 31,507</u>	<u>\$ 263,394</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 was \$412,136,000.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

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, 2018, are as follows (in thousands):

Currency	Investments	Cash	Total	Percent of Total Investments and Cash
Argentine Peso	\$ 8,328	\$ -	\$ 824	\$ 9,152
Azerbaihani Manat	640	-	-	640
Brazil Real	26,048	-	12	26,060
Colombian Peso	5,376	-	-	5,376
Deutsche Mark	1,390	-	-	1,390
Dominican Peso	1,771	-	-	1,771
Egyptian Pound	3,671	-	1,129	4,800
Euro Currency Unit	-	-	9,688	9,688
British Pound	-	-	1,174	1,174
Georgian Lari	2,085	-	-	2,085
Ghana Cedi	2,758	-	-	2,758
Indonesian Rupiah	1,756	-	-	1,756
Indian Rupee	581	-	-	581
Japanese Yen	50,279	-	194	50,473
Kenyan Shilling	2,784	-	-	2,784
Kazakhstani Tenge	1,758	-	-	1,758
Mexican Peso	41,777	-	3,600	45,377
New Zealand Dollar	-	-	797	797
Peruvian Nuevo Sol	1,726	-	-	1,726
Russian Ruble	27,247	-	-	27,247
Swedish Krona	-	-	1,021	1,021
Turkish Lira	3,916	-	-	3,916
Ugandan Shilling	736	-	-	736
Uruguayan Peso	8,218	-	-	8,218
South African Rand	6,174	14	-	6,188
Total foreign denominated investments	<u>\$ 199,019</u>	<u>\$ 14</u>	<u>\$ 18,439</u>	<u>\$ 217,472</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 was \$406,421,000.

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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Core Fixed Income (continued)

Credit Risk

The WVIMB 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 WVIMB reviews available ratings from Standard & Poor's, Moody's, and Fitch, and reports the rating indicative of the greatest degree of risk. The money market mutual fund has the highest credit rating. The following table provides credit ratings for the Pool's fixed income investments as of June 30, 2019 and 2018 (in thousands):

Rating	Fair Value	
	2019	2018
AAA	\$ 61,950	\$ 54,135
AAA	518,002	609,075
A	93,012	129,011
BBB	141,310	169,116
BB	10,003	10,953
B	600	1,877
CCC	562	1,091
C	-	4
D	146	193
Withdrawn	3,013	325
Not rated	45,328	51,231
Total fixed income investments	<u>\$ 873,926</u>	<u>\$ 1,027,011</u>

At June 30, 2019 and 2018, securities lending collateral investments consisted of time deposits and repurchase agreements. Credit risk from securities lending collateral investments are 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 WVIMB reviews available ratings from Standard & Poor's and Moody's. The WVIMB discloses the ratings of the securities underlying the repurchase agreements. The following table provides the credit ratings indicative of the greatest degree of risk of the Pool's securities lending collateral investments as of June 30, 2019 and 2018 (in thousands):

Rating	2019	2018
AAA / A-1	\$ 7,859	\$ 20,620
AA	35,868	2,218
A	1,267	2,316
BBB	576	3,162
B	54	-
Not rated	11,877	48,528
Total securities lending collateral	<u>\$ 57,501</u>	<u>\$ 76,844</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, 2019 and 2018, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2019 and 2018, 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 WVIMB. Securities on loan are collateralized to a minimum of 102 percent and the collateral is held by the WVIMB's custodian in the name of the WVIMB. All remaining securities are held by the WVIMB's custodian in the name of the WVIMB.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Core Fixed Income (continued)

Interest Rate Risk

The Pool is exposed to interest rate risk from its fixed income investments, money market mutual fund investment, and investments made with cash collateral for securities loaned. As of June 30, 2019 and 2018, the money market mutual fund has a weighted average maturity (WAM) of 43 days and 39 days, respectively. The WAM for securities lending collateral investments is not to exceed 90 days. As of June 30, 2019 and 2018, the WAM for securities lending collateral was 1 day and 2 days, respectively.

The WVIMB 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 considers 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 following table provides the weighted average effective duration for the Pool's fixed income investments as of June 30, 2019 and 2018 (Fair Value in thousands):

Investment Type	2019		2018	
	Fair Value	Effective Duration (years)	Fair Value	Effective Duration (years)
Corporate asset backed issues	\$ 122,361	1.6	\$ 137,199	2.0
Corporate CMO	33,139	3.2	39,165	3.2
Corporate CMO interest-only	303	(2.8)	396	(6.5)
Corporate CMO principal-only	74	3.5	107	3.3
Foreign asset backed issues	2,698	3.3	3,499	3.6
Foreign corporate bonds	59,221	5.8	64,249	5.4
Foreign government bonds	3,125	8.0	5,887	8.2
Municipal bonds	10,261	13.0	9,007	12.9
U.S. corporate bonds	165,080	7.7	205,614	6.5
U.S. Government agency bonds	5,257	1.2	18,746	2.2
U.S. Government agency CMO	109,465	4.7	104,772	4.3
U.S. Government agency CMO interest-only	2,153	12.7	2,337	15.8
U.S. Government agency CMO principal-only	5,062	6.2	5,683	6.7
U.S. Government agency MBS	150,176	4.4	176,391	4.3
U.S. Treasury bonds	205,102	9.1	253,524	8.8
U.S. Treasury inflation protected security	449	1.9	435	2.2
Total fixed income investmetns	<u>\$ 873,926</u>		<u>\$ 1,027,011</u>	

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, 2019 and 2018, the Pool held \$425,431 and \$469,549 of these securities, respectively. This represents approximately 49 percent and 46 percent of the value of the Pool's fixed income securities, respectively.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Core Fixed Income (continued)

Foreign Currency Risk

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

Private Markets Pool

The objective of the Pool is 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 and to provide for long-term growth of participants' assets and risk-reduction through diversification.

Credit Risk

The Pool is exposed to credit risk from its fixed income investments, money market mutual fund investment, investments in unrated opportunistic income funds, and certain investments made with cash collateral for securities loaned. The WVIMB limits the exposure to credit risk in the Pool by maintaining at least an average rating of investment grade as defined by a nationally recognized statistical rating organization. The WVIMB reviews available ratings from Standard & Poor's and Moody's, and reports the rating indicative of the greatest degree of risk. The money market mutual fund has the highest credit rating. Credit risk associated with the unrated opportunistic income funds are limited by requiring that underlying fund holdings are at least 90 percent collateralized by one or more assets of the issuer.

The following table provides credit ratings for the Pool's fixed income investments as of June 30, 2019 and 2018 (in thousands):

Rating	Fair Value	
	2019	2018
BBB	\$ 13,257	\$ 7,162
BB	1,591	440
B	511	-
Total fixed income investments	<u>\$ 15,359</u>	<u>\$ 7,602</u>

Credit risk from securities lending collateral investments are 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 WVIMB reviews available ratings from Standard & Poor's and Moody's, and reports the rating indicative of the greatest degree of risk. The following table provides the credit ratings for the Pool's securities lending collateral investments as of June 30, 2019 and 2018 (in thousands):

Rating	Fair Value	
	2019	2018
AAA	\$ 860	\$ 2,854
AA	3,922	307
A	139	321
BBB	63	438
B	6	-
Not applicable	1,299	6,716
Total securities lending collateral	<u>\$ 6,289</u>	<u>\$ 10,636</u>

Concentration of Credit Risk

The Pool's investments in alternative investment funds might be indirectly exposed to concentration of credit risk.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Private Markets Pool (continued)

Custodial Credit Risk

At June 30, 2019 and 2018, 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 WVIMB. Securities on loan are collateralized to a minimum of 102 percent for U.S. Dollar denominated loans and 105 percent for foreign denominated loans, and the collateral is held by the WVIMB's custodian in the name of the WVIMB. All remaining securities, except for the alternative investments, are held by the WVIMB's custodian in the name of the WVIMB. The alternative investments might be indirectly exposed to custodial credit risk.

Interest Rate Risk

The Pool is exposed to interest rate risk through its investments in U.S. corporate bonds, opportunistic income funds, securities lending collateral investments, and a money market mutual fund. The WVIMB monitors interest rate risk of U.S. corporate bonds by evaluating the effective duration. 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. As of June 30, 2019 and 2018, the effective duration for U.S. corporate bonds was 5.0 years and 3.2 years, respectively. The WVIMB manages interest rate risk of the opportunistic income funds by requiring at least 80 percent of the opportunistic income fund holdings that mature in more than one year to have variable or floating interest rate structures. As of June 30, 2019 and 2018, the money market mutual fund has a weighted average maturity (WAM) of 43 days and 39 days, respectively. The WAM for securities lending collateral investments is not to exceed 90 days. As of June 30, 2019 and 2018, the WAM for securities lending collateral was 1 day and 2 days, respectively.

Foreign Currency Risk

The Pool holds foreign common stock, real estate limited partnerships and funds, and cash that is denominated in foreign currencies and exposed to foreign currency risks. The investments in private equity partnerships and opportunistic income funds might be indirectly exposed to foreign currency risk.

The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2019, are as follows (in thousands):

Currency	Foreign Common Stock	Real Estate Limited Partnerships and Funds	Cash	Total
Australian Dollar	\$ 3,826	\$ -	\$ -	\$ 3,826
British Pound	3,959	-	-	3,959
Canadian Dollar	1,611	19,398	-	21,009
Euro Currency Unit	6,966	74,751	-	81,717
Hong Kong Dollar	7,371	-	-	7,371
Japanese Yen	9,835	-	25	9,860
Norwegian Krone	368	-	-	368
Singapore Dollar	2,126	-	-	2,126
Swedish Krona	2,893	-	-	2,893
Total foreign denominated investments	38,955	94,149	25	133,129
U.S. Dollar	858	1,629,556	7,095	1,637,509
Total	<u>\$ 39,813</u>	<u>\$ 1,723,705</u>	<u>\$ 7,120</u>	<u>\$ 1,770,638</u>

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Private Markets Pool (continued)

The amounts at fair value (in U.S. dollars) of investments and cash denominated in foreign currencies as of June 30, 2018, are as follows (in thousands):

Currency	Foreign Common Stock	Real Estate Limited Partnerships and Funds	Cash	Total
Australian Dollar	\$ 3,643	\$ -	\$ -	\$ 3,643
British Pound	4,305	-	-	4,305
Canadian Dollar	1,331	11,466	1	12,798
Euro Currency Unit	6,729	67,304	-	74,033
Hong Kong Dollar	6,656	-	-	6,656
Japanese Yen	7,581	-	22	7,603
Norwegian Krone	327	-	-	327
Singapore Dollar	1,812	-	-	1,812
Swedish Krona	2,509	-	-	2,509
Total foreign denominated investments	34,893	78,770	23	113,686
U.S. Dollar	1,542	1,543,530	3,063	1,548,135
Total	<u>\$ 36,435</u>	<u>\$ 1,622,300</u>	<u>\$ 3,086</u>	<u>\$ 1,661,821</u>

Hedge Fund

The Pool was established to hold the WVIMB's investments in hedge funds. The primary performance benchmark is the Hedge Fund Research, Inc. Fund of Funds Composite Index plus 100 basis points. Albourne America, LLC has been retained by the WVIMB to provide consulting services for this investment strategy.

The Pool holds shares in hedge funds and shares of a money market mutual 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, 2019 and 2018, 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.

FINANCIAL SECTION

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

5 - INVESTMENTS (Continued)

Investments and Deposits – TDCRS (continued)

Concentration of Credit Risk

As of June 30, 2019 and 2018, the TDCRS has investment balances with the following issuers which were greater than 5% of the total investment balance of the TDCRS (in thousands):

	2019	2018
Western Asset Core Plus Bond A	\$ 30,010	\$ 28,518
Valic Fixed Annuity Option	148,621	139,268
Great West Secure Foundation Balanced	42,160	41,563
Putnam Equity income	49,048	45,117
T. Rowe Price Blue Chip Growth	83,601	78,684
Van guard Large Cap Index	51,659	50,678
Other (less than 5% individually)	144,551	131,476
	\$ 549,650	\$ 515,304

Custodial Credit Risk

As of June 30, 2019 and 2018, the TDCRS held no securities that were subject to custodial credit risk.

Concentration of Credit Risk - Cash Deposits

At June 30, 2019 and 2018 TDCRS had \$3,738,000 and \$4,487,000 on deposit with the West Virginia State Treasurer's Office and \$379,000 and \$278,000 in depository accounts with financial institutions, respectively. The deposits with financial institutions, which had a bank balance of \$379,000 and \$278,000 are either insured by the Federal Deposit Insurance Corporation or collateralized with securities held in TDCRS' name by its agent.

Interest Rate Risk

As of June 30, 2019, 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	\$ 291,905	\$ 291,905	\$ -	\$ -
Collective Investment Trusts	109,124	109,124	-	-
Guaranteed Investment Contract	148,621	148,621	-	-
Total	\$ 549,650	\$ 549,650	\$ -	\$ -

Interest Rate Risk

As of June 30, 2018, 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	\$ 274,245	\$ 274,245	\$ -	\$ -
Collective Investment Trusts	101,792	101,792	-	-
Guaranteed Investment Contract	139,267	139,267	-	-
Total	\$ 515,304	\$ 515,304	\$ -	\$ -

Foreign Currency Risk

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

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

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 at June 30, 2019 and 2018 was \$148,621,000 and \$139,267,000, respectively.

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 \$25,000,000 and \$45,000,000 at June 30, 2019 and 2018, 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.

**West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements
Years Ended June 30, 2019 and 2018**

10 - NEW ACCOUNTING PRONOUNCEMENTS

Newly Adopted Statements Issued by the Governmental Accounting Standards Board

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. The adoption of this GASB statement had no impact on the June 30, 2019 financial statements.

Recent Statements Issued by the Governmental Accounting Standards Board

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.

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.

The GASB issued Statement No. 90, *Majority Equity Interests—An Amendment of GASB Statements No. 14 and No. 61*, to improve the consistency and comparability of reporting a government's majority equity interest in a legally separate organization and to improve the relevance of financial statement information for certain component units. This statement is effective for fiscal year 2020, and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 91, *Conduit Debt Obligations*, to provide a single method of reporting conduit debt obligations by issuers and eliminate diversity in practice associated with (1) commitments extended by issuers, (2) arrangements associated with conduit debt obligations, and (3) related note disclosures. 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					
	2019	2018	2017	2016	2015	2014	2019	2018	2017	2016	2015	2014
Total pension liability:												
Service cost	\$ 121,228	\$ 124,019	\$ 124,129	\$ 123,073	\$ 137,207	\$ 132,500	\$ 141,472	\$ 146,797	\$ 153,006	\$ 149,857	\$ 146,798	\$ 147,149
Interest	519,350	504,275	490,075	475,335	456,022	440,022	792,389	786,313	780,855	753,418	744,455	730,912
Differences between actual and expected experience	(26,020)	16,954	(1,271)	674	152,277	-	(69,708)	(19,576)	(52,290)	45,210	(36,005)	-
Change in benefit terms	2,500	-	-	-	-	-	5,200	-	-	-	-	-
Assumption changes	(55,650)	-	-	-	(89,556)	-	-	-	-	195,343	-	-
Benefit payments	(448,747)	(434,184)	(412,779)	(394,454)	(374,164)	(353,611)	(838,309)	(816,102)	(789,058)	(759,503)	(718,838)	(676,210)
Net change in total pension liability	112,661	211,064	200,154	204,628	281,786	218,911	31,044	97,432	92,513	384,325	136,410	201,851
Total pension liability, beginning	7,027,806	6,816,742	6,616,588	6,411,960	6,130,174	5,911,263	10,842,866	10,745,434	10,652,921	10,268,596	10,132,186	9,930,335
Total pension liability, ending (a)	7,140,467	7,027,806	6,816,742	6,616,588	6,411,960	6,130,174	10,873,910	10,842,866	10,745,434	10,652,921	10,268,596	10,132,186
Plan fiduciary net position:												
Contributions - employer	147,031	152,541	165,676	186,867	189,947	194,728	481,986	471,837	451,447	426,678	490,640	141,840
Contributions - member	70,357	65,150	64,599	62,982	61,838	60,899	92,759	89,128	91,503	95,177	94,694	90,612
Other statutorily required contributions	-	-	-	-	-	-	-	-	-	-	-	321,553
Other contributions - appropriations	-	-	-	-	-	-	-	-	-	-	-	50,855
Net investment income	393,179	606,303	875,090	(6,827)	219,329	864,023	444,661	688,273	994,989	(18,402)	255,988	1,003,180
Benefit payments	(448,747)	(434,184)	(412,779)	(394,454)	(374,164)	(353,611)	(838,309)	(816,102)	(789,058)	(759,503)	(718,838)	(676,210)
Administrative expense	(6,915)	(6,850)	(4,989)	(4,887)	(4,785)	(4,695)	(6,239)	(6,035)	(4,582)	(4,507)	(4,432)	(4,348)
Other	995	1,497	120	142	282	132	3,272	3,046	3,077	302	3,197	3,510
Net change in plan fiduciary net position	155,900	384,457	687,717	(156,177)	92,447	761,476	178,130	430,147	747,376	(260,255)	121,249	930,992
Plan fiduciary net position, beginning	6,769,554	6,385,097	5,697,470	5,853,556	5,761,109	4,999,633	7,720,609	7,290,462	6,543,087	6,803,342	6,682,093	5,751,101
Prior period adjustment	-	-	(90)	91	-	-	-	-	(1)	-	-	-
Plan fiduciary net position, beginning, as restated	6,769,554	6,385,097	5,697,380	5,853,647	5,761,109	4,999,633	7,720,609	7,290,462	6,543,086	6,803,342	6,682,093	5,751,101
Plan fiduciary net position, ending (b)	6,925,454	6,769,554	6,385,097	5,697,470	5,853,556	5,761,109	7,898,739	7,720,609	7,290,462	6,803,342	6,682,093	6,682,093
Net pension liability, ending (a) - (b)	\$ 215,013	\$ 258,252	\$ 431,645	\$ 919,118	\$ 558,404	\$ 369,065	\$ 2,975,171	\$ 3,122,257	\$ 3,454,972	\$ 4,109,834	\$ 3,465,254	\$ 3,450,093
Plan fiduciary net position as a percentage of total pension liability	96.99%	96.33%	93.67%	86.11%	91.29%	93.98%	72.64%	71.20%	67.85%	61.42%	66.25%	65.95%
Covered-employee payroll	1,388,662	1,430,577	1,414,584	1,392,113	1,373,129	1,389,850	1,404,586	1,457,143	1,505,080	1,511,271	1,481,786	1,493,515
Net pension liability as a percentage of covered-employee payroll	15.48%	18.05%	30.51%	66.02%	40.67%	26.55%	211.82%	214.27%	229.55%	271.95%	233.86%	231.00%

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
 (Continued)

	SPDDRS					SPRS						
	2019	2018	2017	2016	2015	2014	2019	2018	2017	2016	2015	2014
Total pension liability:												
Service cost	\$ 540	\$ 931	\$ 1,071	\$ 1,263	\$ 1,774	\$ 2,215	\$ 7,456	\$ 7,617	\$ 6,827	\$ 6,750	\$ 6,337	\$ 5,890
Interest	54,438	54,004	53,131	51,913	50,748	49,778	14,654	13,496	11,410	10,113	9,024	8,021
Differences between actual and expected experience	6,331	(2,218)	47	6,283	4,344	-	(3,513)	(3,610)	(765)	1,636	(201)	-
Change in benefit terms	-	-	-	-	-	-	12,731	-	-	-	-	-
Assumption changes	-	-	1,961	-	-	-	-	-	11,192	-	-	-
Benefit payments	(47,551)	(45,529)	(43,325)	(41,969)	(39,708)	(37,565)	(1,944)	(1,842)	(1,454)	(1,071)	(1,051)	(913)
Net change in total pension liability	13,758	7,188	12,885	17,490	17,158	14,428	29,384	15,661	27,210	17,428	14,109	12,998
Total pension liability, beginning	749,080	741,892	729,007	711,517	694,359	679,931	188,909	173,248	146,038	128,610	114,501	101,503
Total pension liability, ending (a)	762,838	749,080	741,892	729,007	711,517	694,359	218,293	188,909	173,248	146,038	128,610	114,501
Plan fiduciary net position:												
Contributions - employer	15,595	24,829	17,155	13,977	21,668	1,072	4,556	4,205	3,657	3,887	4,060	4,049
Contributions - member	110	186	362	320	445	545	3,905	3,621	3,634	3,755	3,609	3,630
Other statutorily required contributions	-	-	-	-	-	25,146	-	-	-	-	-	-
Other contributions - appropriations	-	-	-	-	-	-	-	-	-	-	-	-
Net investment income	38,174	60,939	87,793	(1,230)	22,866	90,872	11,730	16,303	22,346	91	4,972	17,756
Benefit payments	(47,551)	(45,529)	(43,325)	(41,969)	(39,708)	(37,566)	(1,944)	(1,842)	(1,454)	(1,071)	(1,051)	(912)
Administrative expense	(63)	(61)	(45)	(48)	(51)	(53)	(60)	(60)	(64)	(47)	(45)	(43)
Other	752	691	847	590	861	739	-	-	-	(163)	-	-
Net change in plan fiduciary net position	7,017	41,055	62,787	(28,360)	6,081	80,755	18,187	22,227	28,119	6,452	11,545	24,480
Plan fiduciary net position, beginning	682,803	641,585	578,798	607,158	601,077	520,322	188,915	166,688	138,569	132,117	120,572	96,092
Prior period adjustment	-	163	-	-	-	-	-	-	-	-	-	-
Plan fiduciary net position, beginning, as restated	682,803	641,748	578,798	607,158	601,077	520,322	188,915	166,688	138,569	132,117	120,572	96,092
Plan fiduciary net position, ending (b)	689,820	682,803	641,585	578,798	607,158	601,077	207,102	188,915	166,688	138,569	132,117	120,572
Net pension liability, ending (a) - (b)	\$ 73,018	\$ 66,277	\$ 100,307	\$ 150,209	\$ 104,359	\$ 93,282	\$ 11,191	\$ (6)	\$ 6,560	\$ 7,469	\$ (3,507)	\$ (6,071)
Plan fiduciary net position as a percentage of total pension liability	90.43%	91.15%	86.48%	79.40%	85.33%	86.57%	94.87%	100.00%	96.21%	94.89%	102.73%	105.30%
Covered-employee payroll	1,527	2,963	3,181	3,713	5,120	5,988	30,938	32,291	31,582	31,792	29,574	27,701
Net pension liability as a percentage of covered-employee payroll	4781.79%	2236.82%	3153.32%	4045.49%	2038.26%	1557.82%	36.17%	-0.02%	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

(In Thousands)
 Fiscal years Ending June 30
 (Continued)

	DSRS					JRS						
	2019	2018	2017	2016	2015	2014	2019	2018	2017	2016	2015	2014
Total pension liability:												
Service cost	\$ 7,436	\$ 7,084	\$ 7,386	\$ 5,979	\$ 5,887	\$ 5,716	\$ 2,406	\$ 2,587	\$ 2,466	\$ 2,681	\$ 2,812	\$ 2,819
Interest	16,246	15,476	15,556	14,509	13,612	12,612	8,608	8,539	8,521	8,478	8,458	7,978
Differences between actual and expected experience	2,697	(1,370)	(10,162)	1,530	946	-	(4,959)	(6,054)	(6,101)	(5,813)	(6,506)	-
Change in benefit terms	24,170	-	-	-	-	-	-	-	-	-	-	-
Assumption changes	-	-	(3,174)	-	-	-	-	962	-	-	-	-
Benefit payments	(11,940)	(10,611)	(10,143)	(8,785)	(8,371)	(7,791)	(4,933)	(4,932)	(4,609)	(4,429)	(4,313)	(4,455)
Net change in total pension liability	38,609	10,579	(537)	13,233	12,074	10,537	1,122	1,102	277	917	451	6,342
Total pension liability, beginning	215,146	204,567	205,104	191,871	179,797	169,260	114,828	113,726	113,449	112,532	112,081	105,739
Total pension liability, ending (a)	253,755	215,146	204,567	205,104	191,871	179,797	115,950	114,828	113,726	113,449	112,532	112,081
Plan fiduciary net position:												
Contributions - employer	6,705	6,194	5,922	6,071	5,972	5,977	779	735	739	739	2,845	2,456
Contributions - member	4,846	4,416	4,163	4,306	4,068	3,908	331	364	372	401	413	474
Other statutorily required contributions	-	-	-	-	-	-	-	-	-	-	-	-
Other contributions - appropriations	-	-	-	-	-	-	-	-	-	-	-	-
Net investment income	13,200	19,361	27,282	(44)	6,534	24,438	12,085	18,373	26,270	(175)	6,525	25,263
Benefit payments	(11,940)	(10,611)	(10,143)	(8,785)	(8,371)	(7,794)	(4,933)	(4,932)	(4,609)	(4,429)	(4,313)	(4,455)
Administrative expense	(145)	(137)	(102)	(102)	(95)	(97)	(11)	(8)	(6)	(6)	(6)	(7)
Other	479	471	431	463	505	558	(86)	-	(4)	(39)	-	32
Net change in plan fiduciary net position	13,145	19,694	27,553	1,909	8,613	26,990	8,165	14,532	22,762	(3,509)	5,464	23,763
Plan fiduciary net position, beginning	220,514	200,820	173,268	171,359	162,746	135,756	204,488	189,956	167,194	170,703	165,239	141,476
Prior period adjustment	-	-	(1)	-	-	-	-	-	-	-	-	-
Plan fiduciary net position, beginning, as restated	220,514	200,820	173,267	171,359	162,746	135,756	204,488	189,956	167,194	170,703	165,239	141,476
Plan fiduciary net position, ending (b)	233,659	220,514	200,820	173,268	171,359	162,746	212,653	204,488	189,956	167,194	170,703	165,239
Net pension liability, ending (a) - (b)	\$ 20,096	\$ (5,368)	\$ 3,747	\$ 31,836	\$ 20,512	\$ 17,051	\$ (96,703)	\$ (89,660)	\$ (76,230)	\$ (53,745)	\$ (58,171)	\$ (53,158)
Plan fiduciary net position as a percentage of total pension liability	92.08%	102.50%	98.17%	84.48%	89.31%	90.52%	183.40%	178.08%	167.03%	147.37%	151.69%	147.43%
Covered-employee payroll	53,676	49,915	51,004	49,081	46,634	45,106	9,374	9,500	9,122	8,870	9,248	8,870
Net pension liability as a percentage of covered-employee payroll	37.44%	-10.75%	7.35%	64.86%	43.99%	37.80%	-1031.61%	-943.79%	-835.67%	-605.92%	-629.01%	-599.30%

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

Year Ended June 30	Actuarially		Contribution		Actual
	Determined	Actual	Deficiency	Covered	Contributions as a % of Covered
	Contribution	Contribution	(Excess)	Payroll	Payroll
PERS					
2019	\$ 115,775	\$ 147,031	\$ (31,256)	\$ 1,388,662	10.59 %
2018	124,363	152,541	(28,178)	1,430,577	10.66
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
TRS (1)					
2019	\$ 433,203	\$ 481,986	\$ (48,783)	\$ 1,404,586	34.32 %
2018	443,800	471,837	(28,037)	1,457,143	32.38
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
SPDDRS (2)					
2019	\$ 15,162	\$ 15,595	\$ (433)	\$ 1,527	1,021.28 %
2018	24,675	24,829	(154)	2,963	837.97
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
SPRS					
2019	\$ 4,180	\$ 4,556	\$ (376)	\$ 30,938	14.73 %
2018	4,726	4,205	521	32,291	13.02
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
DSRS (3)					
2019	\$ 5,390	\$ 6,705	\$ (1,315)	\$ 53,676	12.49 %
2018	2,681	6,194	(3,513)	49,915	12.41
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

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

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

Year Ended June 30	Actuarially	Actual	Contribution	Covered	Actual
	Determined		Deficiency		Contributions as a % of Covered
	Contribution	Contribution	(Excess)	Payroll	Payroll
JRS					
2019	\$ 779	\$ 779	\$ -	\$ 9,374	8.31 %
2018	735	735	-	9,500	7.74
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
EMSRs					
2019	\$ 1,190	\$ 2,844	\$ (1,654)	\$ 26,024	10.93 %
2018	1,053	2,765	(1,712)	27,421	10.08
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
MPFRS (4)					
2019	\$ 510	\$ 1,438	\$ (928)	\$ 15,132	9.50 %
2018	324	1,089	(765)	10,448	10.42
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 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 Code Section 15-2-26 – Payments to members for court attendance and mileage; rewards for apprehending wanted persons; fees for traffic accidents reports and photographs; fees from 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 from performing certain services (adult private employer 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 MPFRS do not have ten years of data available.

FINANCIAL SECTION

WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD
REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULES OF INVESTMENT RETURNS

	Annual Return*									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
PERS	5.94%	9.75%	15.82%	-0.1%	3.9%	17.9%	13.1%	1.1%	20.7%	16.0%
TRS	5.93%	9.74%	15.70%	-0.1%	4.0%	17.9%	13.0%	1.0%	20.5%	15.2%
SPDDRS	5.78%	9.83%	15.71%	0.0%	4.0%	17.9%	13.1%	1.1%	20.9%	16.1%
SPRS	6.11%	9.61%	15.86%	-0.1%	4.0%	17.9%	13.0%	1.0%	20.5%	16.0%
DSRS	6.01%	9.69%	15.83%	-0.1%	4.0%	17.9%	13.0%	1.1%	20.7%	16.0%
JRS	5.97%	9.77%	15.88%	-0.1%	4.0%	18.0%	13.0%	1.1%	20.7%	16.0%
EMSRS	6.03%	9.64%	15.87%	-0.1%	4.0%	17.9%	13.0%	0.9%	20.8%	15.7%
MPFRS	6.72%	8.86%	15.72%	-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 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, 2018 and rolled forward to June 30, 2019 using the actuarial assumptions and methods described in Note 3 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, 2018 using the actuarial assumptions and methods as follows:

	PERS	TRS	SPDDRS	SPRS
Actuarial cost method	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost
Asset valuation method	Market value	Market value	Market value	Market value
Amortization method	Level dollar	Level dollar	Level dollar	Level dollar
Amortization period	Through FY 2035	Through FY 2034	Through FY 2025	Through FY 2026
Actuarial assumptions:				
Investment rate of return	7.50%	7.50%	7.50%	7.50%
Projected salary increases:				
PERS:				
State	3.10% - 5.30%	-	-	-
Nonstate	3.35% - 6.50%	-	-	-
TRS:				
Teachers	-	3.00% - 6.00%	-	-
Non Teachers	-	3.00% - 6.50%	-	-
Other plans			4.00%	4.00%
Inflation rate	3.00%	3.00%	3.00%	3.00%
Mortality rates	Active: Pub-2010 General Employees table, below-median, headcount weighted, projected with scale MP-2018 Retired: Healthy males: 108% of 2010 General Retiree Male table, below-median, headcount weighted, projected with scale MP-2018 Healthy females: 122% of Pub-2010 General Retiree Female table, below-median, headcount weighted, projected with scale MP-2018 Disabled males: 118% of Pub-2010 General / Teachers Disabled Male table, below median, headcount weighted, projected with scale MP-2018 Disabled females: 117% of Pub-2010 General / Teachers Disabled Female table, below median, headcount weighted, projected with scale MP-2018	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-2014 Non-Annuitant (sex-distinct), scale MP-2016 fully generational Retired: Healthy males: 103% RP-2014 Healthy Annuitant table, rolled back to 2006, scale MP-2016 fully generational Healthy females: 100% RP-2014 Healthy Annuitant table, rolled back to 2006, scale MP-2016 fully generational Disabled Males: 100% RP-2014 Male Disabled Annuitant table, scale MP-2016 fully generational Disabled Females: 100% RP-2014 Female Disabled Annuitant table, scale MP-2016 fully generational	Active: RP-2014 Non-Annuitant (sex-distinct), scale MP-2016 fully generational Retired: Healthy males: 103% RP-2014 Healthy Annuitant table, rolled back to 2006, scale MP-2016 fully generational Healthy females: 100% RP-2014 Healthy Annuitant table, rolled back to 2006, scale MP-2016 fully generational Disabled Males: 100% RP-2014 Male Disabled Annuitant table, scale MP-2016 fully generational Disabled Females: 100% RP-2014 Female Disabled Annuitant table, scale MP-2016 fully generational
Withdrawal rates	State: 2.28% - 45.63% Non-state: 2.50% - 35.88%	Teachers: 0.8% - 35.0% Non-teachers: 1.316% - 24.750%	0.08% - 2.67%	0.23% - 5.70%
Disability rates	0.005% - 0.540%	0.008% - 0.704%	0.04%-0.60%	0.04% - 0.60%
Retirement rates	12%-100%	15% - 100%	25%- 100%	20% - 100%
Date range in most recent experience study/review	2013-2018	2010-2015	2011-2016	2011-2016

See Independent Auditors Report

WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD
NOTES TO REQUIRED SUPPLEMENTARY INFORMATION

1 - ACTUARIAL ASSUMPTIONS AND METHODS (continued)

	DSRS	JRS	EMSRS	MPFRS
Actuarial cost method	Entry age normal cost	Entry age normal cost	Entry age normal cost	Entry age normal cost
Asset valuation method	Market value	Market value	Market value	Market value
Amortization method	Level dollar	Level dollar	Level dollar	Level dollar
Amortization period	Through FY 2029	-	Through FY 2038	-
Actuarial assumptions: Investment rate of return	7.50%	7.50%	7.50%	7.50%
Projected salary increases:				
PERS:				
State	-	-	-	-
Nonstate	-	-	-	-
TRS:				
Teachers	-	-	-	-
Non Teachers	-	-	-	-
Other plans	5.0% per year for the first 2 years of service; 4.5% for the next 3 years of service; 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%
Mortality rates	Active: RP-2014 Non-Annuitant (sex -distinct), scale MP-2016 fully generational Retired: Healthy males: 103% RP-2014 Healthy Annuitant table, rolled back to 2006, scale MP-2016 fully generational Healthy females: 100% RP-2014 Healthy Annuitant table, rolled back to 2006, scale MP-2016 fully generational Disabled: 100% RP-2014 Disabled Annuitant table, rolled back to 2006, scale MP-2016 fully generational	Active: None Retired: Healthy Male Retirees: 103% of RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Healthy female Retirees: RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Disabled: RP-2014 Healthy Annuitant tables; rolled back to 2006, Projected with Scale MP-2016 fully generational	Active: RP-2014 Non-Annuitant (sex -distinct), scale MP-2016 fully generational Retired: Healthy Male Retirees: 103% of RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Healthy female Retirees: RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Disabled Males: 100% RP-2014 Male Disabled Annuitant table, scale MP-2016 fully generational Disabled Females: 100% RP-2014 Female Disabled Annuitant table, scale MP-2016 fully generational	Active: RP-2014 Non-Annuitant (sex -distinct), scale MP-2016 fully generational Retired: Healthy Male Retirees: 103% of RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Healthy female Retirees: RP-2014 Healthy Annuitant tables, rolled back to 2006, Projected with Scale MP-2016 fully generational Disabled Males: 100% RP-2014 Male Disabled Annuitant table, scale MP-2016 fully generational Disabled Females: 100% RP-2014 Female Disabled Annuitant table, scale MP-2016 fully generational
Withdrawal rates	4.00% - 12.32%	0%	6.00% - 28.00%	3.00% - 28.00%
Disability rates	0.04% - 0.60%	0%	0.04% - 0.60%	0.04% - 0.60%
Retirement rates	16% - 100%	5% - 100%	25% - 100%	25% - 100%
Date range in most recent experience study/review	2011-2016	2011-2016	2011-2016	2011-2016

See Independent Auditors Report

WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD
NOTES TO REQUIRED SUPPLEMENTARY INFORMATION

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

WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD
SUPPLEMENTARY INFORMATION
SCHEDULE OF ADMINISTRATIVE EXPENSES

Years Ended June 30, 2019 and 2018
(in thousands)

	2019	2018
Salaries	\$ 4,299	\$ 3,824
Employee Benefits	1,145	1,257
Occupancy	458	364
Computer Services	1,418	880
Legal	182	162
External Actuarial Services	200	301
Accounting and Auditing	279	450
Thrid Party Administrator's Fees*	626	403
Disability Exams	71	101
Office Expense	202	215
Postage	120	136
Depreciation	3,847	4,312
Insurance	38	35
Travel	36	19
Miscellaneous	19	15
	<u>\$ 12,940</u>	<u>\$ 12,474</u>
 Administrative Fees Collected from the Retirement Systems	 <u>\$ 14,295</u>	 <u>\$ 14,301</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

FINANCIAL SECTION

WEST VIRGINIA CONSOLIDATED PUBLIC RETIREMENT BOARD
SUPPLEMENTARY INFORMATION
SCHEDULE OF PAYMENTS TO CONSULTANTS

The following were the payments to consultants for the year ended June 30, 2019:

Legal:

Bowles Rice, LLP	\$ 64,093
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Actuary:

Conduent Human Resources Services	\$ 165,277
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Audit:

Suttle & Stalnaker, PLLC	\$ 114,000
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Investment Section



2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT

For the Fiscal Years Ended June 30, 2019 and June 30, 2018

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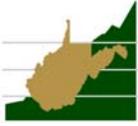
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December 16, 2019

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, 2019.

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 fiscal year ending June 30, 2019, started well with continued evidence of economic growth and expectations for the abatement of trade tensions between the U.S. and China. U.S. equity markets were off to a good start. By the second quarter of the fiscal year, however, the weight of successive rate hikes along with unresolved trade issues and weak growth in international markets brought expectations down resulting in a dramatic pull back in equity markets, especially in the U.S. halfway through the fiscal year, markets were down across the board. However, all the turmoil led the Federal Reserve to reconsider its upward bias on rates. That, and what appeared to be constructive developments on the trade front, seemed to calm the markets in the third quarter of the fiscal year with a snap back in equity markets to reverse the downturn in the December quarter. Meanwhile, the Federal Reserves' sensitivity to weakening growth boosted fixed income markets, especially long dated U.S. treasuries. As the fiscal year ended. U.S. growth appeared to stabilize while the Fed appeared to be signaling a rate cut. This helped to shore up the capital markets even though China/U.S. trade tensions continued to fester. Meanwhile, the yield curve inverted, potentially signaling a recession in the not too distant future. Debate continues to swirl on that topic, so the end of the current economic cycle may not yet be at hand. For the fiscal year. U.S. stocks were up 9.0 percent (Russell 3000). International stocks by comparison, were only up 0.8 percent (MSCI AC World ex U.S. IMI). Fixed income ended up being the relative star of the year returning 8.1 percent (Bloomberg Barclays U.S. Universal Bond).

The IMB experienced relative underperformance in all the major asset classes in fiscal year in 2019. The IMB's U.S. public equity portfolio returned 7.5 percent but fell short of its benchmark (Russell 3000) by 1.5 percent. International public equity was a significant detractor returning (1.0) percent and falling short of its benchmark (MSCI AC World ex U.S. IMI) by 1.8 percent. The fixed income portfolio contributed positively to the portfolio returning 7.7 percent, but it also fell short of its benchmark (Bloomberg Barclays U.S. Universal Bond) by 0.4 percent. Performance measurement of private market assets, which include private equity and a majority of the IMB's real estate portfolio, is fraught with measurement issues, so it is less meaningful over shorter time periods. Regardless, the private equity portfolio returned 20.9 percent and the real estate portfolio returned 7.3 percent. The hedge fund portfolio, which is intended to be a diversifying component of the entire portfolio, returned 2.6 percent, which was above its benchmark (HFRI FOF plus 1 percent) by 0.4 percent. The opportunistic income composite out performed its policy index by 1.4 percent (Credit Suisse Leveraged Loan plus 2 percent) returning 7.5 percent for the year.

Defined benefit pension plans make up approximately 80 percent of the IMB's total assets under management. For general comparison purposes, the IMB uses 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, 2019, the return for PERS was 6.0 percent, net of expenses, for the fiscal year. Of greater significance is the longer-term performance. In that regard, over the ten-year period ending June 30, 2019, the 1MB's annualized return was 10.2 percent versus the base portfolio benchmark of 8.5 percent. This difference 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, 2019, were essentially identical to PERS. Since asset allocations are virtually the same for each plan, any differences in the returns for the various pension 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. The Wildlife Endowment Fund and the West Virginia Retiree Health Benefit Trust Fund have similar asset allocations to the defined benefit pension plans, and both returned 6.1 percent.

With regard to employment security assets, the reader will note a significant difference in returns from defined benefit plans. This is, primarily, a function of differences in the time horizon and liquidity needs, which vary quite significantly by plan. This leads to a wide divergence in the respective plans' allocations to various asset classes. The returns for employment security assets for the fiscal year ending June 30, 2019, ranged from 4.4 percent for the Workers' Compensation Uninsured Employer Fund to 4.9 percent for the Workers' Compensation Old Fund. The 1MB manages assets for other state entities as well. Specific data on the returns and objectives of all Participant Plans may be found in the pages that follow.

As an investor, the IMB's capacity to generate a 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 attainable over very long time periods. That being said, the state of the capital markets will make it very difficult to achieve that rate in the near term. As one looks out over the horizon, there are many concerns. The current economic expansion has been one of the longest on record. China has become the major rival to the U.S. creating geopolitical tensions with far-reaching ramifications. Meanwhile, the disparity between the haves and have-nots in society has spawned a global wave of populism threatening the underpinnings of an economic order that has, despite its faults, raised unprecedented numbers out of poverty across the globe. Nevertheless, the future is unknowable. The IMB's portfolio is built for the long-term, seeking return from risky assets, while diversifying to reduce risk. The IMB will continue to monitor its portfolio, 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 long-term growth. The staff looks forward to helping trustees meet the challenges as fiscal year 2020 unfolds.

Sincerely,

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

Craig Slaughter, JD, CFA

Executive Director



INVESTMENT SECTION

Investment Background, Philosophy, and Objectives

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

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

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:

Agenda Item	Review Schedule
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

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 IMB’s objective is to manage the Participant Plans’ monies 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

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, and their sub-components, 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	Neutral Target*	Allocation Range
Domestic vs. International	Domestic vs. International Percentage in MSCI ACWI (IMI)	0.5 to 2.5 times benchmark Sum must equal 100
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 break 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.*

MANAGEMENT STRUCTURE

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

Manager	Style
Domestic Equity Pool	
BlackRock	Index Core
INTECH Investment Management, LLC	Quantitative Core
Westfield Capital Management	Growth at a Reasonable Price
AJO	Relative Value
International Qualified and International Nonqualified Pools	
<i>Developed Markets</i>	
Silchester International Investors	All Country, Value
International Equity Pool	
<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

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

EQUITY POOL (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

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

Composite	Individual Pools per Audited Financial Statements
Domestic	Domestic Equity Pool
International	International Qualified Pool
	International Nonqualified Pool
	International Equity Pool

Condensed Statement of Net position

	Domestic Equity	International Qualified	International Nonqualified	International Equity
Investments	\$ 4,889,897	\$ 1,301,531	\$ 210,181	\$ 3,291,170
Payable upon return of securities loaned	(242,304)	-	-	(70,807)
Cash	17	-	-	29,022
Receivable for investments sold	28,000	-	-	7,107
Payable for investments purchased	(87,364)	-	-	(8,951)
Other assets and liabilities	1,743	(56)	(9)	15,796
Net position - June 30, 2019	<u>\$ 4,589,989</u>	<u>\$ 1,301,475</u>	<u>\$ 210,172</u>	<u>\$ 3,263,337</u>

Investments

Domestic Equity

	Fair Value	Percent of Securities
Domestic equities sector exposure:		
Basic Materials	\$ 58,251	1.2 %
Communications Services	199,449	4.1
Consumer Discretionary	264,940	5.4
Consumer Staples	116,068	2.4
Energy	146,400	3.0
Financial Services	502,212	10.2
Health Care	399,167	8.2
Industrials	346,283	7.1
Real Estate	99,814	2.0
Technology	417,347	8.5
Utilities	132,177	2.7
Total domestic equities	<u>2,682,108</u>	<u>54.8</u>
Commingled equity fund	1,937,293	39.6
Money market mutual funds	27,792	0.6
Securities lending collateral	242,304	5.0
Total	<u>\$ 4,889,497</u>	<u>100.0% %</u>

Investments

	International Qualified		International Nonqualified	
	Fair Value	Percent of Securities	Fair Value	Percent of Securities
Commingled equity funds	\$ 1,301,531	100.0%	\$ 210,181	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	\$ 126,522	3.9 %
Brazil	174,568	5.4
Canada	125,740	3.9
China	307,614	9.5
France	139,513	4.3
Germany	108,327	3.3
Hong Kong	132,161	4.1
India	89,501	2.8
Japan	380,773	11.7
Korea	201,783	6.2
Mexico	77,917	2.4
Russia	109,632	3.4
Sweden	71,775	2.2
Switzerland	95,078	2.9
Taiwan	117,172	3.6
United Kingdom	286,662	8.8
All others (none greater than 2%)	649,577	20.0
Total international equities	3,194,315	98.3
Money market mutual fund	26,048	0.8
Securities lending collateral	29,022	0.9
Total	\$ 3,249,385	100.0 %

Progression of Net Position	Domestic Equity	International Qualified	International Nonqualified	International Equity
Net position - June 30, 2018	\$ 4,564,593	\$ 1,330,884	\$ 215,408	\$ 2,986,828
Net investment income (loss)	339,725	(29,807)	(5,300)	(16,730)
Net increase (decrease) from unit transactions	(314,329)	398	64	293,239
Net position - June 30, 2019	\$ 4,589,989	\$ 1,301,475	\$ 210,172	\$ 3,263,337

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	Domestic Equity		International Qualified		International Nonqualified		International Equity	
	Actual	Russell 3000	Actual	MSCI EAFE	Actual	MSCI EAFE	Actual	MSCI ACWI ex U.S. (IMI)*
One-year	7.5%	9.0%	-2.2%	1.6%	-2.4%	1.6%	-0.5%	0.8%
Three-year	13.4%	14.0%	9.2%	9.7%	9.0%	9.7%	10.3%	9.7%
Five-year	9.8%	10.2%	3.8%	2.7%	3.6%	2.7%	2.5%	2.7%
Ten-year	14.7%	14.7%	9.7%	7.4%	9.5%	7.4%	7.9%	7.1%
Twenty-year	7.2%	6.3%	9.7%	4.5%	9.4%	4.5%	5.4%	5.0%

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

Domestic Equity	
Ten Largest Holdings	Fair Value
BlackRock Equity Index Fund B Lendable	\$ 1,937,693
Microsoft Corporation, Common Stock	61,508
Apple Inc, Common Stock	59,348
Amazon.com Inc, Common Stock	44,936
MasterCard Inc, Common Stock	30,702
Boeing Company, Common Stock	25,253
Adobe Systems Inc, Common Stock	23,880
Visa Inc, Common Stock	23,712
Anthem Inc, Common Stock	20,829
NextEra Energy Inc, Common Stock	20,494

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

EQUITY POOL (Continued)

LARGEST HOLDINGS (continued in \$000s)

International Qualified	
Largest Holdings	Fair Value
Silchester International Investors International Value Equity Group Trust	\$ 1,301,531

International Nonqualified	
Largest Holdings	Fair Value
Silchester International Investors International Value Equity Group Trust	\$ 210,172

International Equity	
Ten Largest Holdings	Fair Value
Samsung Electronics Co Ltd, Common Stock	\$ 46,827
Roche Holding AG, Common Stock	40,423
Alibaba Group Holding Ltd, ADR	34,286
Tencent Holdings Ltd, Common Stock	34,021
Taiwan Semiconductor, ADR	27,627
Total SA, Common Stock	24,617
Enel SpA, Common Stock	24,552
China Mobile (Hong Kong) Ltd, Common Stock	23,333
Sanofi-Synthelabo SA, Common Stock	22,355
Nippon Telegraph & Telephone, Common Stock	20,913

A complete listing of the investments in each pool is available at 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:

Expense Ratios (in basis points)	Domestic Equity	International Qualified	International Nonqualified	International Equity
Investment advisor fees	3.9	51.3	58.4	53.0
Trustee fees	0.0*	0.0*	0.0*	0.0*
Custodian bank fees	0.2	N/A	N/A	5.7
Management fees	2.5	2.5	2.5	2.6
Fiduciary bond fees	0.0*	0.0*	0.0*	0.0*
Professional service fees	0.5	0.5	0.5	0.5
Total	7.1	54.3	61.4	61.8

* Expense Ratio rounds to less than 0.1 basis points.

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

EQUITY POOL (Continued)

EXPENSES (continued)

Trading Costs	Domestic Equity	International Equity	Total
Net commission costs (in \$000s)	\$ 1,383	\$ 3,026	\$ 4,409
Domestic equity commission rate (cents per share)	1.4	-	-
International equity commission rate (basis points per dollar volume)	-	9.8	-

INVESTMENT SECTION

Investment Pool, Objectives, Financial Highlights, and Performance

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 Net Position

Investments	\$	186,050
Cash		1
Other assets and liabilities, net		(21)
Net position - June 30, 2019	\$	<u>186,030</u>

Investments

	Fair Value	Percent of Securities
Repurchase agreement	\$ 45,000	24.2 %
U.S. government agency bonds	91,095	49.0
U.S. Treasury bonds	49,955	26.8
Total	\$ 186,050	<u>100.0 %</u>

Progression of Net Position

Net position - June 30, 2018	\$	218,269
Net investment income		3,351
Distributions to unitholders		(3,351)
Net decrease from unit transaction		(32,239)
Net position - June 30, 2019	\$	<u>186,030</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	2.2%	2.3%
Three-year	1.4%	1.4%
Five-year	0.9%	0.8%
Ten-year	0.5%	0.5%
Twenty-year	1.9%	1.9%

*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
Federal Home Loan Bank Discount Note, Due 7/1/2019	\$ 82,656
United States Treasury Bill, Due 7/16/2019	49,955
Repurchase Agreement, 2.48%, Due 7/1/2019	45,000
Federal Home Loan Mort Corp Discount Note, Due 10/1/2019	8,444

A complete listing of the investments in each pool is available at 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	0.7
Management fees	2.7
Fiduciary bond fees	0.0 *
Professional service fees	0.5
Total	8.9

* Expense Ratio rounds to less than 0.1 basis points.

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% Core Fixed Income	Minimum 20% to Maximum 70%
70% Total Return Fixed Income	Minimum 30% to Maximum 80%
	Sum must equal 100% of the Fixed Income allocation

MANAGEMENT STRUCTURE

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

Manager	Style
Total Return Fixed Income Pool	
Western Asset Management Company	Core Plus Fixed Income
Dodge & Cox	Core Plus Fixed Income
Franklin Templeton Investments	Emerging Markets Fixed Income
Core Fixed Income Pool	
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.

Condensed Statement of Net Position	Total Return	Core Fixed
	Fixed Income	Income
Investments	\$ 2,101,768	\$ 987,113
Investment derivatives and security sold short	(24,213)	-
Payable upon return of securities loaned	(88,926)	(57,501)
Cash	59,932	-
Receivable for investments sold	232,231	34,969
Payable for investments purchased	(77,220)	(375)
Other asses and liabilities	15,921	4,002
Net position - June 30, 2019	<u>\$ 2,219,493</u>	<u>\$ 968,208</u>

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

FIXED INCOME POOL (Continued)

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

Investments	Total Return Fixed Income		Core Fixed Income	
	Fair Value	Percentage of Securities	Fair Value	Percentage of Securities
Commingled debt funds	\$ 214,489	10.3 %	\$ -	0.0 %
Corporate asset backed issues	76,494	3.7	122,361	12.4
Corporate CMO	40,069	1.9	33,516	3.4
Corporate preferred security	9,979	0.5	-	0.0
Foreign asset backed issues	27,005	1.3	2,698	0.3
Foreign corporate bonds	271,117	13.0	59,221	6.0
Foreign currency forward contracts	(1,979)	(0.1)	-	0.0
Foreign equity investments	14	0.0	-	0.0
Foreign government bonds	317,462	15.3	3,125	0.3
Futures contracts	(5,514)	(0.3)	-	0.0
Money market mutual fund	41,138	2.0	55,686	5.6
Municipal bonds	34,254	1.6	10,261	1.0
Option contracts purchased	1,088	0.1	-	0.0
Option contracts written	(1,154)	(0.1)	-	0.0
Repurchase agreement	8,000	0.4	-	0.0
Securities lending collateral	88,926	4.3	57,501	5.8
Short term investments	6,083	0.3	-	0.0
Swaps	(16,654)	(0.8)	-	0.0
U.S. corporate bonds	402,522	19.5	165,080	16.8
U.S. government agency bonds	9,464	0.5	5,257	0.5
U.S. government agency CMO	63,007	3.0	116,680	11.8
U.S. government agency MBS	293,585	14.1	150,176	15.2
U.S. Treasury issues	198,160	9.5	205,551	20.9
Total	\$ 2,077,555	100.0 %	\$ 987,113	100.0 %

Progression of Net Position

	Total Return Fixed Income	Core Fixed Income
Net position - June 30, 2018	\$ 2,365,474	\$ 1,042,010
Net investment income	162,191	78,372
Net decrease from unit transactions	(308,172)	(152,174)
Net position - June 30, 2019	\$ 2,219,493	\$ 968,208

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

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	Total Return Fixed Income		Core Fixed Income	
	Actual	Bloomberg Barclays U.S. Universal Bond*	Actual	Bloomberg Barclays U.S. Aggregate Bond
One-year	7.5%	8.1%	8.3%	7.9%
Three-year	4.9%	2.8%	2.7%	2.3%
Five-year	3.6%	3.2%	3.4%	3.0%
Ten-year	5.6%	4.4%	4.6%	3.9%
Twenty-year	6.1%	5.2%	N/A	N/A

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

LARGEST HOLDINGS (in \$000s)

Core Fixed Income	
Ten Largest Holdings	Fair Value
United States Treasury Note, 2 1/8% Due 12/31/2021	\$ 27,170
United States Treasury Note, 2 1/8% Due 3/31/2024	18,901
United States Treasury Bond, 2 1/4% Due 8/15/2046	17,955
United States Treasury Note, 2 1/8% Due 2/29/2024	11,923
United States Treasury STRIPS, Due 11/15/2033	8,721
United States Treasury Principal Strips, Due 11/15/2041	7,733
Hyundai Auto Receivables Series 2017-A Class C, 2.53% Due 11/15/2023	7,225
United States Treasury STRIPS, Due 8/15/2034	6,821
CPS Auto Trust Series 2018-C Class C, 3.68% Due 6/17/2024	6,779
United States Treasury STRIPS, Due 5/15/2043	6,412

A complete listing of the investments in each pool is available at www.wvimb.org.

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

FIXED INCOME POOL

(Continued)

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:

Expense Ratios (in basis points)	Total Return Fixed Income	Core Fixed Income
Investment advisor fees	22.0	11.3
Trustee fees	0.0 *	0.0 *
Custodian bank fees	0.9	0.7
Management fees	2.5	2.5
Fiduciary bond fees	0.0 *	0.0 *
Professional service fees	0.5	0.5
Total	25.9	15.0

* Expense Ratio rounds to less than 0.1 basis points.

Total Return Fixed Income

Ten Largest Holdings	Fair Value
Western Asset Structured Product Opportunities, LLC	\$ 54,449
Western Asset Emerging Markets Corporate Credit Portfolio, LLC	40,068
Western Asset Floating Rate High Income Fund, LLC	39,764
United States Treasury Bond, 2 7/8% Due 8/15/2045	32,761
SLM Student Loan Trust Series 2006-8 Class A6, Flt % Due 1/25/2041	29,619
Federal National Mortgage Assn Pool # MA3334, 4 1/2% Due 4/1/2048	28,149
Western Asset Opportunistic Asian Securities Portfolio, LLC	27,381
United States Treasury Note, 2 1/8% Due 5/31/2026	26,694
Western Asset Mortgage Backed Securities Portfolio, LLC	25,059
Student Loan Marketing Assn Series 2005-3 Class A6, Flt % Due 4/25/2040	23,610

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

PRIVATE MARKETS POOL

OBJECTIVES

The objective of the Private Markets Pool is 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 and to provide for long-term growth of participants' assets and risk-reduction through diversification. The Private Markets Pool is comprised of the private equity, real estate, and opportunistic income strategies.

The private equity strategy is comprised of the following categories and target range allocations as of June 30, 2019:

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

The real estate strategy is comprised of three categories. The target range allocations as of June 30, 2019, 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%)

The opportunistic income strategy is to invest in a broad spectrum of non-traditional income oriented assets.

MANAGEMENT STRUCTURE

The selection of investments in the Private Markets Pool are approved by the Board of Trustees or by its established committees.

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 Net Position	
Investments	\$ 4,453,602
Payable upon return of securities loaded	(6,289)
Cash	7,120
Fund distributions receivable	9,227
Receivable for investments sold	8,911
Payable for investments purchased	(15)
Other assets and liabilities	(451)
Net position - June 30, 2019	<u>\$ 4,472,105</u>

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

PRIVATE MARKETS POOL (Continued)

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

Investments	Percent of	
	Fair Value	Securities
Corporate bonds	\$ 7,602	0.2 %
Equity investments	317,676	7.7
Money market mutual fund	202,780	4.9
Opportunistic income funds	428,343	10.3
Private equity partnerships	1,562,388	37.6
Private real estate partnerships and funds	1,622,300	39.1
Securities lending collateral	10,636	0.2
Total	\$ 4,151,725	100.0 %

Progression of Net Position

Net position - June 30, 2018	\$ 4,151,500
Net investment income	509,919
Net decrease from unit transactions	(189,314)
Net position - June 30, 2019	\$ 4,472,105

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	Private Equity		Real Estate		Opportunistic Income	
	Actual	Russell 3000 plus 300 basis points*	Actual	NCREIF Property Index plus 100 basis points	Actual	Credit Suisse Leveraged Loan plus 200 basis points
One -year	20.9%	N/A	7.3%	N/A	7.5%	6.2%
Three-year	20.6%	N/A	8.4%	N/A	5.8%	7.5%
Five-year	16.6%	13.2%	9.3%	10.1%	N/A	N/A
Ten-year	16.2%	18.3%	5.9%	9.5%	N/A	N/A

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

LARGEST HOLDINGS (in \$000s)

Ten Largest Holdings	Fair Value
RREEF America REIT II, Inc.	\$ 244,460
Invesco Core Real Estate - U.S.A., L.P.	231,587
WV Direct Lending, LLC	184,319
UBS Trumbull Property Fund	154,756
Harrison Street Core Property Fund, L.P.	142,228
AG Mountain Laurel Direct Lending Fund, L.P.	131,406
UBS Trumbull Property Income Fund	117,205
Claros Mortgage Trust, Inc.	99,703
Franklin Park Venture Fund Series 2011, L.P.	80,961
BlackRock Russell 3000 Index Fund B	80,475

A complete listing of the investments in each pool is available at www.wvimbo.org.

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance

PRIVATE MARKETS POOL (Continued)

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 Market Pool's expenses for the year, divided by the average net position, are as follows:

Expense Ratio (in basis points)	
Investment advisor fees	2.4
Trustee fees	0.0 *
Custodian bank fees	0.2
Management fees	2.5
Fiduciary bond fees	0.0 *
External fees/Fund closing costs	19.0
Professional service fees	3.9
Total	<u>28.0</u>

* Expense Ratio rounds to less than 0.1 basis points.

INVESTMENT SECTION

Investment Pool Objectives, Financial Highlights, and Performance



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, 2019:

Category	Target Range	Allocation Range
Core		
Relative Value	30-40%	25-55%
Event Driven	15-25%	10-40%
Long-Short Equity	15-25%	10-40%
Directional	10-20%	5-25%
Supplemental		
Long Biased	3-12%	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 are approved by the IMB Hedge Fund 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 Net Position

Investments	\$ 2,082,274
Advance on investments in hedge funds	210,000
Investment funds redeemed	79,582
Other assets and liabilities	177
Net position - June 30, 2019	<u>\$ 2,372,033</u>

Investments

	Fair Value	Percent of Securities
Hedge funds	\$ 2,081,618	100.0%
Money market mutual fund	656	0.0
Total	<u>\$ 2,082,274</u>	<u>100.0%</u>

Progression of Net Position

Net position - June 30, 2018	\$ 2,240,158
Net investment income	56,192
Net increase from unit transactions	75,683
Net position - June 30, 2019	<u>\$ 2,372,033</u>

INVESTMENT SECTION

Individual 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. 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	2.6%	2.2%
Three-year	4.9%	5.3%
Five-year	3.1%	3.2%
Ten-year	5.2%	3.8%

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

LARGEST HOLDINGS

Ten Largest Holdings	Fair Value
Hudson Bay International Fund	\$ 135,046
HBK Multi-Strategy Offshore	131,025
CQS Diversified Fund (SPC) Ltd	129,458
Farallon COI II Holdings	122,167
Davidson Kempner International	118,411
Marshall Wace Eureka Fund	109,291
Tenor Opportunity Fund, Ltd.	107,781
Caxton Global Investments Ltd	106,410
KLS Diversified Fund Ltd.	103,439
Carlson Capital DB Diamond Ltd	97,296

A complete listing of the investments in each pool is available at 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:

Expense Ratio (in basis points)	
Trustee fees	0.0 *
Custodian bank fees	0.0 *
Management fees	2.5
Fiduciary bond fees	0.0 *
Professional service fees	2.8
Total	<u>5.3</u>

* 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
Equity	60.0 %	55.0 %
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 %

INVESTMENT SECTION
Individual Retirement System Asset Allocation and Performance

PUBLIC EMPLOYEES' RETIREMENT SYSTEM
(Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$ 6,718,698
Contributions	162,761
Withdrawals	(379,252)
Net	<u>(216,491)</u>
Investment income	472
Net appreciation	392,707
June 30, 2019	<u><u>\$ 6,895,386</u></u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 1,698,197	24.6 %
International Qualified	558,010	8.1
International Equity	1,214,443	17.6
Short-Term Fixed Income	14,156	0.2
Total Return Fixed Income	576,580	8.4
Core Fixed Income	249,812	3.6
Private Markets	1,796,476	26.1
Hedge Fund	787,712	11.4
Total	<u><u>\$ 6,895,386</u></u>	<u>100.0 %</u>

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.0%	7.5%
Three-year	10.4%	7.5%
Five-year	7.0%	7.5%
Ten-year	10.2%	7.5%
Twenty-year	6.8%	7.5%

INVESTMENT SECTION
Individual Retirement System Asset Allocation and Performance

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 (TDCRS). In the spring of 2008, more than 78 percent of the participants in the Teachers' Defined Contribution Plan elected to transfer their TDCRS 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
Equity	60.0%	55.0%
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%

INVESTMENT SECTION

Individual Retirement System Asset Allocation and Performance

TEACHERS' RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$	7,691,788
Contributions		452,139
Withdrawals		(751,759)
Net		<u>(299,620)</u>
Investment income		939
Net appreciation		443,772
June 30, 2019	\$	<u>7,836,784</u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 1,918,351	24.5 %
International Qualified	629,522	8.0
International Equity	1,363,648	17.4
Short-Term Fixed Income	84,127	1.1
Total Return Fixed Income	641,299	8.2
Core Fixed Income	277,315	3.5
Private Markets	2,031,952	25.9
Hedge Fund	890,570	11.4
Total	<u>\$ 7,836,784</u>	<u>100.0 %</u>

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.0%	7.5%
Three-year	10.4%	7.5%
Five-year	6.9%	7.5%
Ten-year	10.1%	7.5%
Twenty-year	6.7%	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.

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 ALLOCATION

Asset Class	Base Allocation	Strategic Allocation
Equity	60.0%	55.0%
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%

Investment Section

Individual Retirement System Asset Allocation and Performance

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

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$	682,799
Contributions		16,293
Withdrawals		(47,447)
Net		<u>(31,154)</u>
Investment income		86
Net appreciation		38,088
June 30, 2019	<u>\$</u>	<u>689,819</u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 166,807	24.1 %
International Qualified	55,557	8.1
International Equity	116,454	16.9
Short-Term Fixed Income	16,319	2.4
Total Return Fixed Income	54,351	7.9
Core Fixed Income	23,511	3.4
Private Markets	179,589	26.0
Hedge Fund	77,231	11.2
Total	<u>\$ 689,819</u>	<u>100.0 %</u>

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	5.9%	7.5%
Three-year	10.4%	7.5%
Five-year	6.9%	7.5%
Ten-year	10.2%	7.5%
Twenty-year	6.9%	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
Equity	60.0%	55.0%
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%

INVESTMENT SECTION
Individual Retirement System Asset Allocation and Performance

**STATE POLICE RETIREMENT SYSTEM
(Continued)**

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$	188,912
Contributions		6,925
Withdrawals		(465)
Net		<u>6,460</u>
investment income		14
Net appreciation		11,716
June 30, 2019	\$	<u><u>207,102</u></u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 51,197	24.7 %
International Qualified	15,573	7.5
International Equity	37,428	18.1
Short-Term Fixed Income	962	0.5
Total Return Fixed Income	18,227	8.8
Core Fixed Income	7,908	3.8
Private Markets	52,265	25.2
Hedge Fund	23,542	11.4
Total	<u><u>\$ 207,102</u></u>	<u><u>100.0 %</u></u>

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.0%	7.5%
Three-year	10.4%	7.5%
Five-year	7.0%	7.5%
Ten-year	10.1%	7.5%
Twenty-year	6.8%	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	Base Allocation	Strategic Allocation
Equity	60.0%	55.0%
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%

INVESTMENT SECTION
Individual Retirement System Asset Allocation and Performance

DEPUTY SHERIFFS' RETIREMENT SYSTEM
(Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$	219,368
Contributions		5,480
Withdrawals		(5,454)
Net		26
Investment income		9
Net appreciation		13,173
June 30, 2019	\$	232,576

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 57,610	24.6 %
International Qualified	18,323	7.9
International Equity	41,170	17.7
Short-Term Fixed Income	393	0.2
Total Return Fixed Income	20,135	8.7
Core Fixed Income	8,738	3.8
Private Markets	59,666	25.7
Hedge Fund	26,541	11.4
Total	\$ 232,576	100.0 %

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.0%	7.5%
Three-year	10.4%	7.5%
Five-year	69.0%	7.5%
Ten-year	10.2%	7.5%
Twenty-year	6.8%	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
Equity	60.0%	55.0%
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%

Investment Section
Individual Retirement System Asset Allocation and Performance

JUDGES' RETIREMENT SYSTEM
(Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$	204,484
Contributions		820
Withdrawals		(4,736)
Net		(3,916)
Investment income		9
Net appreciation		12,076
June 30, 2019	\$	<u>212,653</u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 52,616	24.8 %
International Qualified	17,016	8.0
International Equity	37,276	17.5
Short-Term Fixed Income	390	0.2
Total Return Fixed Income	18,134	8.5
Core Fixed Income	7,852	3.7
Private Markets	55,073	25.9
Hedge Fund	24,296	11.4
Total	\$ 212,653	100.0 %

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.0%	7.5%
Three-year	10.5%	7.5%
Five-year	7.0%	7.5%
Ten-year	10.2%	7.5%
Twenty-year	6.8%	7.5%

INVESTMENT SECTION

Individual Retirement System Asset Allocation and Performance

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
Equity	60.0%	55.0%
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%

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, 2018	\$	78,921
Contributions		1,806
Withdrawals		(851)
Net		<u>955</u>
Investment income		4
Net appreciation		4,770
June 30, 2019	\$	<u>84,650</u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 20,815	24.6 %
International Qualified	6,517	7.7
International Equity	15,187	17.9
Short-Term Fixed Income	338	0.4
Total Return Fixed Income	7,431	8.8
Core Fixed Income	3,220	3.8
Private Markets	21,526	25.4
Hedge Fund	9,616	11.4
Total	<u>\$ 84,650</u>	<u>100.0 %</u>

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.0%	7.5%
Three-year	10.4%	7.5%
Five-year	6.9%	7.5%
Ten-year	10.1%	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	Base Allocation	Strategic Allocation
Equity	60.0%	55.0%
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%

INVESTMENT SECTION

Individual Retirement System Asset Allocation and Performance

MUNICIPAL POLICE OFFICERS AND FIREFIGHTERS RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2018	\$	7,843
Contributions		2,711
Withdrawals		(75)
Net		<u>2,636</u>
Investment income		4
Net appreciation		607
June 30, 2019	\$	<u>11,090</u>

Asset Allocation

	Amount	Percent of Total
Domestic Equity	\$ 1,925	23.9 %
International Qualified	634	5.6
International Equity	1,281	18.8
Short-Term Fixed Income	206	4.4
Total Return Fixed Income	747	8.8
Core Fixed Income	326	3.8
Private Markets	1,884	23.8
Hedge Fund	840	10.9
Total	\$ 7,843	100.0 %

INVESTMENT PERFORMANCE

The IMB calculates total rates of return using the time-weighted rate of return methodology. 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	6.1%	7.5%
Three-year	10.2%	7.5%
Five-year	6.8%	7.5%

Actuarial Section



2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT

For the Fiscal Years Ended June 30, 2019 and June 30, 2018

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Actuarial Section

Overview

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, 2018, the beginning of the plan year. The actuarial valuations prepared for financial reporting purposes have been prepared as of June 30, 2019, 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) and the Teachers' Retirement System (TRS). For financial reporting purposes, the fair value of the PERS and TRS 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 and TRS asset returns each year is used.





December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Public Employees' Retirement System
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, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long-term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by Buck but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The tables presented for PERS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. Buck has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

The report presents fairly the actuarial position of PERS as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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's 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.

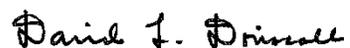
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the "funded ratio" and "unfunded accrued liability" are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it 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. Buck 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 Buck'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.

Buck Global, LLC ("Buck")



David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

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. The 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:

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: RP-2000 Non-Annuitant table, projected with Scale AA on a fully generational basis
- Pre-retirement females: 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

Withdrawal from Service (continued)

Withdrawal Rates			Withdrawal Rates		
Nonstate (4 to 5 years)			Nonstate (greater than 5 years)		
Age	Male	Female	Age	Male	Female
30	0.12000	0.14820	30	0.08910	0.09000
40	0.10800	0.10260	40	0.05400	0.05850
50	0.07920	0.07980	50	0.04000	0.03500
60	0.05040	0.05700	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 Rate

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

ACTUARIAL SECTION
Public Employees' Retirement System

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	% Change in Average Pay	Number of Employers
6/30/2018	34,765	\$ 1,388,662,000	\$ 39,944	0.8%	519
6/30/2017	36,094	1,430,578,000	39,635	1.3%	523
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 6,508,771	\$ 7,003,602	\$ 494,831	92.9%	\$ 1,388,662	35.6%
7/1/2017	6,248,413	6,832,513	584,100	91.5%	1,430,578	40.8%
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%

Solvency Test (in thousands)

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 761,779	\$ 4,141,930	\$ 2,099,893	\$ 6,508,771	100.0%	100.0%	78.5%
6/30/2017	782,548	4,003,286	2,046,679	6,248,413	100.0%	100.0%	71.5%
6/30/2016	777,734	3,806,345	2,031,327	5,888,558	100.0%	100.0%	64.2%
6/30/2015	763,823	3,636,257	2,012,507	5,565,081	100.0%	100.0%	57.9%
6/30/2014	759,854	3,299,873	2,212,100	5,208,828	100.0%	100.0%	51.9%
6/30/2013	744,416	3,137,477	2,029,370	4,709,530	100.0%	100.0%	40.8%
6/30/2012	732,909	2,949,168	2,053,698	4,452,395	100.0%	100.0%	37.5%
6/30/2011	711,213	2,792,236	2,011,803	4,322,668	100.0%	100.0%	40.7%
6/30/2010	695,901	2,593,949	2,035,980	3,974,609	100.0%	100.0%	33.6%
6/30/2009	670,267	2,338,871	1,921,020	3,930,701	100.0%	100.0%	48.0%

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		
2018	1,307	\$ 24,156,218	(792)	\$ 4,433,612	27,568	\$ 421,935,716	4.9%	\$ 15,305
2017	1,758	24,722,798	(998)	5,086,662	27,053	402,213,110	5.1%	14,868
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2017	\$ 584,100,000
Expected increase from amortization method	(14,234,000)
Increase from contributions below actuarial rates	(27,578,000)
Investment experience (smoothed)	(16,792,000)
Liability experience (including transfers)	<u>(30,665,000)</u>
Unfunded Actuarial Liability, June 30, 2018	<u>\$ 494,831,000</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.



December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Teachers' Retirement System
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, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long-term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by Buck but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The tables presented for TRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. Buck has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of TRS as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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.

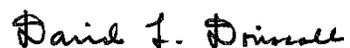
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it 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. Buck 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 Buck’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.

Buck Global, LLC (“Buck”)



David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

ACTUARIAL SECTION
Teachers' Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

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. The 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%:

A sample of salaries from the salary scales is as follows:

Group	Range of Projected Salary Increases
Teachers	3.00% - 6.00%
Non-Teachers	3.00% - 6.50%

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

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 Rates
 Non-Teachers and State (4 to 5 years)

Age	Male	Female
30	0.03750	0.05625
40	0.03450	0.03375
50	0.03450	0.02250
60	0.03450	0.01688

Withdrawal Rates
 Non-Teachers and State (greater than 5 years)

Age	Male	Female
30	0.03507	0.03122
40	0.02363	0.01750
50	0.01688	0.01316
60	0.01500	0.01400

ACTUARIAL SECTION
Teachers' Retirement System

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%

ACTUARIAL SECTION
Teachers' Retirement System

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	% Change in Average Pay	Number of Employers
6/30/2018	33,174	\$ 1,404,586,000	\$ 42,340	-0.3%	79
6/30/2017	34,318	1,457,143,000	42,460	1.0%	80
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 7,497,885	\$ 10,778,022	\$ 3,280,137	69.6%	\$ 1,404,586	233.5%
7/1/2017	7,193,080	10,727,223	3,534,143	67.1%	1,457,143	242.5%
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%	1,510,083	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%

Solvency Test (in thousands)

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 1,116,650	\$ 7,784,459	\$ 1,876,913	\$ 7,497,885	100.0%	82.0%	0.0%
6/30/2017	1,067,691	7,637,691	2,021,841	7,193,080	100.0%	80.2%	0.0%
6/30/2016	1,394,615	7,333,565	1,876,099	6,936,281	100.0%	75.6%	0.0%
6/30/2015	1,433,224	6,976,345	1,901,083	6,803,089	100.0%	77.0%	0.0%
6/30/2014	1,477,848	6,651,706	1,969,139	6,682,093	100.0%	78.2%	0.0%
6/30/2013	1,533,929	6,264,695	2,131,711	5,751,101	100.0%	67.3%	0.0%
6/30/2012	1,598,036	5,806,955	2,307,591	5,144,397	100.0%	61.1%	0.0%
6/30/2011	1,626,258	5,438,589	2,380,301	5,074,665	100.0%	63.4%	0.0%
6/30/2010	1,656,892	4,877,284	2,370,136	4,143,540	100.0%	51.0%	0.0%
6/30/2009	1,663,836	4,511,170	2,432,863	3,554,771	100.0%	41.9%	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		
2018	1,321	\$ 37,062,473	(891)	\$ 10,582,068	36,394	\$ 806,510,264	3.4%	22,161
2017	1,540	71,924,160	(1,016)	41,033,757	35,964	780,029,859	4.1%	21,689
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2017	\$ 3,534,143,000
Expected increase from amortization method	(101,810,000)
Increase from contributions below actuarial rates	(28,037,000)
Investment experience (smoothed)	(29,856,000)
Liability experience (including transfers)	<u>(94,303,000)</u>
Unfunded Actuarial Liability, June 30, 2018	<u><u>\$ 3,280,137,000</u></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.



December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Department of Public Safety Death, Disability and Retirement Fund
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, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long-term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by Buck but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

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, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. Buck has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of Plan A as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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.

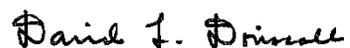
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it 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. Buck 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 Buck’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.

Buck Global, LLC (“Buck”)



David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

ACTUARIAL SECTION
State Police, Death, Disability, and Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

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, 2011, to June 30, 2016. 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-2014 Total Employee Mortality Tables, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Post-Retirement Mortality

Post-retirement mortality tables are as follows:

- Healthy Male: 103% of RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Healthy Female: RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Disabled: RP-2014 Disabled Retiree Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Salary Scales

Compensation is assumed to increase 4.00% per year. 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

ACTUARIAL SECTION
State Police, Death, Disability, and Retirement System

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	0.0004	Duty-Related Full	0.25
30	0.0015	Duty-Related Partial	0.60
40	0.0045	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

At retirement, a member is assumed to be granted one additional year of service for benefits due to allowable military service, plus three additional years for unused annual leave and/or unused sick leave for a total of four additional years.

Retirement Rates

87.5% 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 25% 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	% Change in Average Pay	Number of Employers
6/30/2018	20	\$ 1,366,000	\$ 68,300	14.6%	1
6/30/2017	39	2,325,000	59,615	-16.1%	1
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 682,803	\$ 754,969	\$ 72,166	90.4%	\$ 1,366	5283.0%
7/1/2017	641,748	739,828	98,080	86.7%	2,325	4218.5%
7/1/2016	578,798	729,051	150,253	79.4%	2,985	5033.6%
7/1/2015	607,339	717,362	110,023	84.7%	3,422	3215.2%
7/1/2014	601,077	698,400	97,323	86.1%	4,829	2015.4%
7/1/2013	520,322	679,931	159,609	76.5%	5,988	2665.5%
7/1/2012	477,345	663,341	185,996	72.0%	6,779	2743.7%
7/1/2011	481,994	606,245	124,251	79.5%	8,001	1552.9%
7/1/2010	404,444	590,729	186,285	68.5%	8,960	2079.1%
7/1/2009	362,927	573,579	210,652	63.3%	10,215	2062.2%

Solvency Test

Valuation Date	Aggregate Accrued Liability for			% of Accrued Liabilities Covered by Valuation Assets			
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	(1)	(2)	(3)
6/30/2018	\$ 3,440,152	\$ 731,985,000	\$ 19,543,848	\$ 682,803,000	100.0%	92.8%	0.0%
6/30/2017	6,305,033	695,522,000	38,000,967	641,748,000	100.0%	91.4%	0.0%
6/30/2016	6,239,309	687,180,000	35,631,691	578,798,000	100.0%	83.3%	0.0%
6/30/2015	6,964,607	669,771,000	40,626,393	607,339,000	100.0%	89.6%	0.0%
6/30/2014	9,379,242	634,008,000	55,012,758	601,077,000	100.0%	93.3%	0.0%
6/30/2013	11,913,004	595,963,000	72,054,996	520,322,000	100.0%	85.3%	0.0%
6/30/2012	11,948,960	579,033,000	72,359,040	477,345,000	100.0%	80.4%	0.0%
6/30/2011	13,991,546	504,876,000	87,377,454	481,994,000	100.0%	92.7%	0.0%
6/30/2010	14,406,972	484,787,000	91,535,028	404,444,000	100.0%	80.5%	0.0%
6/30/2009	14,904,554	461,645,000	97,029,446	362,927,000	100.0%	75.4%	0.0%

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		
2018	32	\$ 2,811,688	(17)	\$ 608,065	759	\$ 45,528,806	5.1%	59,985
2017	15	1,626,683	(18)	271,233	744	43,325,183	3.2%	58,233
2016	23	877,188	(22)	877,888	747	41,969,733	0.0%	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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2017	\$ 98,080,000
Expected increase from amortization method	(16,580,000)
Increase from contributions below actuarial rates	(154,000)
Investment experience (smoothed)	(14,193,000)
Liability experience (including transfers)	<u>5,013,000</u>
Unfunded Actuarial Liability, June 30, 2018	<u><u>\$ 72,166,000</u></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.



December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia State Police Retirement System
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, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by Buck but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

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, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. Buck has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of Plan B as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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.

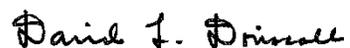
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it 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. Buck 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 Buck’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.

Buck Global, LLC (“Buck”)



David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

ACTUARIAL SECTION
State Police Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

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. The 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, 2011, to June 30, 2016. 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-2014 Total Employee Mortality Tables, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Post-Retirement Mortality

Post-retirement mortality tables are as follows:

- Healthy Male: 103% of RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Healthy Female: RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Disabled: RP-2014 Disabled Retiree Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Salary Scales

Compensation is assumed to increase 4.00% per year service. 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	0.0570
30	0.0407
40	0.0180
50	0.0114

ACTUARIAL SECTION
State Police Retirement System

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	0.0004	Duty-Related Full	0.25
30	0.0015	Duty- Related Partial	0.60
40	0.0045	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

At retirement, a member is assumed to be granted one additional year of service for benefits due to allowable military service. Members hired before July 1, 2015 are also assumed to be granted three additional years for unused annual leave and/or unused sick leave for a total of four additional years.

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	% Change in Average Pay	Number of Employers
6/30/2018	570	\$ 30,938,000	\$ 54,277	0.0%	1
6/30/2017	595	32,291,000	54,271	5.2%	1
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	566	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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 188,915	\$ 185,641	\$ (3,274)	101.8%	\$ 30,938	-10.6%
7/1/2017	166,688	169,890	3,202	98.1%	32,291	9.9%
7/1/2016	138,569	145,326	6,757	95.4%	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%

Solvency Test

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1)	(2)	(3)		(1)	(2)	(3)
	Active Member Contributions	Terms, Retirees, and Beneficiaries	Active Members (Employer Financed Portion)				
6/30/2018	\$ 56,534,849	\$ 20,289,000	\$ 108,817,151	\$ 188,915,000	100.0%	100.0%	103.1%
6/30/2017	52,882,128	16,048,000	100,959,872	166,688,000	100.0%	100.0%	96.8%
6/30/2016	48,209,092	13,601,000	83,515,908	138,569,000	100.0%	100.0%	91.9%
6/30/2015	43,690,814	11,150,000	75,291,186	131,678,000	100.0%	100.0%	102.1%
6/30/2014	39,362,809	9,763,000	65,188,191	120,572,000	100.0%	100.0%	109.6%
6/30/2013	34,875,692	8,776,000	57,851,308	96,092,000	100.0%	100.0%	90.6%
6/30/2012	30,450,149	7,702,000	51,405,851	78,735,000	100.0%	100.0%	78.9%
6/30/2011	26,322,972	6,674,000	46,039,028	70,756,000	100.0%	100.0%	82.0%
6/30/2010	22,702,749	6,695,000	39,773,251	52,735,000	100.0%	100.0%	58.7%
6/30/2009	19,614,392	5,351,000	36,662,608	40,321,000	100.0%	100.0%	41.9%

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		
2018	7	\$ 280,891	(1)	\$ 51,831	33	\$ 1,186,080	23.9%	35,942
2017	4	189,448	(1)	43,640	27	957,020	18.0%	35,445
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2017	\$ 3,202,000
Expected increase from amortization method	(244,000)
Increase from contributions below actuarial rates	521,000
Investment experience (smoothed)	(3,521,000)
Liability experience (including transfers)	<u>(3,232,000)</u>
Funded in excess of Actuarial Liability, June 30, 2018	<u><u>\$ (3,274,000)</u></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



Consolidated Public Retirement Board

4101 MacCorkle Ave., SE
Charleston, West Virginia 25304-1636
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Fax: 304-957-7522
Email: cprb@wv.gov
www.wvretirement.com

EXECUTIVE DIRECTOR
Jeffrey E. Fleck



BOARD CHAIRMAN
David L. Wyant

December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Deputy Sheriffs' Retirement System
4101 MacCorkle Avenue, SE
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia Deputy Sheriffs' Retirement System (DSRS) as of July 1, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long-term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by the West Virginia Consolidated Public Retirement Board but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The tables presented for DSRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. CPRB has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of DSRS as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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 DSRS experience and represent my best estimate of anticipated future experience of DSRS. 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 was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would not result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely by the West Virginia Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Use of this report for any other purposes or by anyone other than the West Virginia 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 prior written consent of the CPRB's Board Actuary.

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.

Respectfully,



Kenneth M. Woodson Jr., FSA, MAAA, Ph.D.
CPRB Board Actuary

ACTUARIAL SECTION
Deputy Sheriff Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Actuarial Valuation Date: July 1, 2018

Funding Method and Basis of Assumptions

The valuation is prepared under the Entry Age Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate.

Experience studies are performed at least once in every five-year period. The 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, 2011, to June 30, 2016. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

Interest Return and Expenses

The interest rate assumption is a net return rate of 7.50% annually, net of investment and administrative expenses.

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.

Pre-Retirement Mortality

The male and female RP-2014 Employee Mortality Tables, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Post-Retirement Mortality

Post-retirement mortality tables are as follows:

- Healthy Male: 103% of RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Healthy Female: RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Disabled: RP-2014 Disabled Retiree Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

ACTUARIAL SECTION
Deputy Sheriff Retirement System

Payroll Growth Rate

The total annual payroll for the active membership is assumed to increase at 5.5% per year. 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+	0.0400

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 Disablement
30	0.0015
40	0.0045
50+	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%

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

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.

ACTUARIAL SECTION
Deputy Sheriff Retirement System

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 additional years of service for benefits due to allowable military service, plus 2 additional years for unused annual leave and/or unused sick leave for a total of 3 additional years.

Retirement Rates

Members who become eligible for unreduced retirement benefits are assumed to have a 16% probability of retiring each year through age 59, with 20% assumed to retire each year through age 64. On or after age at 65, 100% of members are assumed to retire.

Asset Valuation Method

Assets for valuation purposes are included at Market Value.

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, which 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. For the purposes of analyzing the adequacy of total funding for DSRS in meeting the DSRS funding target, an average annual fee income of \$450,000 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	% Change in Average Pay	Number of Employers
6/30/2018	1,050	\$ 53,676,000	\$ 51,120	4.3%	55
6/30/2017	1,018	49,915,000	49,032	0.2%	55
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 220,514	\$ 239,516	\$ 19,002	92.1%	\$ 53,676	35.4%
7/1/2017	200,820	203,293	2,473	98.8%	49,915	5.0%
7/1/2016	172,626	195,681	23,055	88.2%	51,004	45.2%
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%

Solvency Test

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 47,847,056	\$ 122,551,000	\$ 69,117,944	\$ 220,514,000	100.0%	100.0%	72.5%
6/30/2017	44,861,806	106,203,000	52,228,194	200,820,000	100.0%	100.0%	95.3%
6/30/2016	42,061,818	96,344,000	57,275,182	172,626,000	100.0%	100.0%	59.7%
6/30/2015	38,786,095	87,709,000	61,747,905	171,358,000	100.0%	100.0%	72.7%
6/30/2014	36,727,472	84,203,000	59,746,528	162,748,000	100.0%	100.0%	70.0%
6/30/2013	34,909,631	77,437,000	56,913,369	135,756,000	100.0%	100.0%	41.1%
6/30/2012	32,390,261	71,406,000	53,210,739	117,526,000	100.0%	100.0%	25.8%
6/30/2011	29,456,985	65,464,000	54,541,015	113,574,000	100.0%	100.0%	34.2%
6/30/2010	26,879,310	61,890,000	50,868,690	92,692,000	100.0%	100.0%	7.7%
6/30/2009	23,906,877	59,534,000	45,763,123	78,220,000	100.0%	91.2%	0.0%

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		
2018	22	\$ 702,906	(2)	\$ 47,862	403	\$ 9,611,749	7.3%	23,850
2017	45	905,155	(5)	120,872	383	8,956,705	9.6%	23,386
2016	12	425,742	(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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2017	\$ 2,473,000
Expected decrease from amortization method	185,000
Increase from contributions below actuarial rates	(3,530,000)
Investment experience (smoothed)	(4,149,000)
Liability experience (including transfers)	2,162,000
Changes in plan provisions	<u>21,861,000</u>
Unfunded Actuarial Liability, June 30, 2018	<u>\$ 19,002,000</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.

ACTUARIAL SECTION
Deputy Sheriff Retirement System





500 Plaza Drive
Secaucus, NJ 07096

December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Judges' Retirement System
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, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine if whether expected contributions will be sufficient to fulfill the System's long term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by Buck but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The tables presented for JRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. Buck has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of JRS as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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 JRS experience and represent my best estimate of anticipated future experience of JRS. 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.

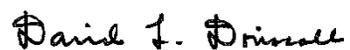
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it 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. Buck 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 Buck’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.

Buck Global, LLC (“Buck”)



David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

ACTUARIAL SECTION
Judges' Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

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. The valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the 2013 Assumption Review, except the mortality assumption was updated based on the Uniform Services Plans experience study covering the period from July 1, 2011, to June 30, 2016. 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.

Mortality

No pre-retirement mortality is assumed due to the small number of active members.

Post-retirement mortality tables are as follows:

- Healthy Male: 103% of RP-2014 Healthy Annuitant Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Healthy Female: RP-2014 Healthy Annuitant Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Disabled: RP-2014 Disabled Retiree Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Withdrawal from Service

No withdrawal is assumed due to the small number of active members.

ACTUARIAL SECTION
Judges' Retirement System

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.

Disability

No disablement is assumed due to the small number of active members.

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	% Change in Average Pay	Number of Employers
6/30/2018	74	\$ 9,374,000	\$ 126,676	0.0%	1
6/30/2017	75	9,500,000	126,667	0.0%	1
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 204,488	\$ 110,215	\$ (94,273)	185.5%	\$ 9,374	-1005.7%
7/1/2017	189,956	108,932	(81,024)	174.4%	\$ 9,500	-852.9%
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%

Solvency Test

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 6,302,978	\$ 62,968,000	\$ 40,944,022	\$ 204,488,000	100.0%	100.0%	330.3%
6/30/2017	6,526,575	61,650,000	40,755,425	189,956,000	100.0%	100.0%	298.8%
6/30/2016	7,481,777	53,847,000	46,445,223	167,194,000	100.0%	100.0%	227.9%
6/30/2015	7,485,928	53,805,000	45,834,072	170,152,000	100.0%	100.0%	237.5%
6/30/2014	8,157,052	49,709,000	48,162,948	165,239,000	100.0%	100.0%	222.9%
6/30/2013	7,823,170	52,408,000	45,507,830	141,476,000	100.0%	100.0%	178.5%
6/30/2012	7,438,197	48,319,000	42,357,803	126,265,000	100.0%	100.0%	166.5%
6/30/2011	7,037,426	48,143,000	40,410,574	124,583,000	100.0%	100.0%	171.7%
6/30/2010	6,930,720	48,116,000	40,961,280	102,814,000	100.0%	100.0%	116.6%
6/30/2009	6,428,398	49,554,000	37,202,602	88,310,000	100.0%	100.0%	86.9%

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		
2018	6	\$ 378,000	(5)	\$ 123,777	58	\$ 4,764,530	5.6%	82,147
2017	7	568,043	(4)	439,783	57	4,510,307	2.9%	79,128
2016	-	-	(1)	72,573	54	4,382,047	-0.4%	81,149
2015	2	201,600	-	-	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

Changes in Unfunded Actuarial Liability

Funded in excess of Actuarial Liability, June 30, 2017	\$ (81,024,000)
Expected increase from amortization method	(6,077,000)
Investment experience (smoothed)	(4,259,000)
Liability experience (including transfers)	<u>(2,913,000)</u>
Funded in excess of Actuarial Liability, June 30, 2018	<u>\$ (94,273,000)</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.



Consolidated Public Retirement Board

4101 MacCorkle Ave., SE
Charleston, West Virginia 25304-1636
Telephone: 304-558-3570 or 800-654-4406
Fax: 304-957-7522
Email: cprb@wv.gov
www.wvretirement.com

EXECUTIVE DIRECTOR
Jeffrey E. Fleck



BOARD CHAIRMAN
David L. Wyant

December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Emergency Medical Services Retirement System
4101 MacCorkle Avenue, SE
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia Emergency Medical Services Retirement System (EMSRS) as of July 1, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long-term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by the West Virginia Consolidated Public Retirement Board but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The tables presented for EMSRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. CPRB has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of EMSRS as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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 EMSRS experience and represent my best estimate of anticipated future experience of EMSRS. 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.

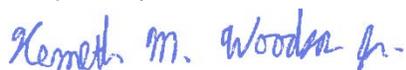
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would not result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely by the West Virginia Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Use of this report for any other purposes or by anyone other than the West Virginia 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 prior written consent of the CPRB's Board Actuary.

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.

Respectfully,



Kenneth M. Woodson Jr., FSA, MAAA, Ph.D.
CPRB Board Actuary

ACTUARIAL SECTION
Emergency Medical Services Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

Funding Method and Basis of Assumptions

The valuation is prepared under the Entry Age Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate.

Experience studies are performed at least once in every five-year period. The 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, 2011, to June 30, 2016. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

Interest Return and Expenses

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.

Pre-Retirement Mortality

The male and female RP-2014 Employee Mortality Tables, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Post-Retirement Mortality

Post-retirement mortality tables are as follows:

- Healthy Male: 103% of RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Healthy Female: RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Disabled: RP-2014 Disabled Retiree Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Salary Scale

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%

ACTUARIAL SECTION
Emergency Medical Services Retirement System

Payroll Growth Rate

Total annual payroll for the active membership is assumed to increase at 6.0% annually. This growth rate is applied in certain projections contained in the actuarial valuation report tables. The growth rate is an open group assumption that includes new entrants into EMSRS

Withdrawal Rates

Withdrawal rates predict termination of employment prior to unreduced retirement eligibility. A sample of unisex rates by age are:

Age	Rate of Withdrawal
30	0.1900
40	0.1300
50	0.0800
55	0.0000

Disability rates predict an active member becoming disabled prior to unreduced retirement eligibility. A sample of disability rates by age and sex are:

Age	Rate of Disablement
30	0.0015
40	0.0045
50+	0.0040

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%

Family Composition

It is assumed that 80% of all members are married with husbands three years older than their wives. Remarriage rates are not considered.

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%.

ACTUARIAL SECTION
Emergency Medical Services Retirement System

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 retirement, male members are assumed to be granted one additional year of service for benefits due to allowable military service, plus one additional year for unused annual leave and/or unused sick leave for a total of two additional years. Female members are assumed to be granted one additional year of service, solely attributed to unused sick leave.

Retirement Rates

Members who are eligible for unreduced retirement benefits are assumed to have a 25% probability of retiring each year prior to age 65. On or after age 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.

Asset Valuation Method

Assets for valuation purposes are included at Market Value.

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

Schedule of Active Member Valuation Data

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Change in Average Pay	Number of Employers
6/30/2018	577	\$ 26,024,000	\$ 45,102	1.6%	15
6/30/2017	608	27,001,000	44,410	-3.6%	14
6/30/2016	586	26,992,000	46,061	0.8%	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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 79,302	\$ 75,574	\$ (3,728)	104.9%	\$ 26,024	-14.3%
7/1/2017	71,165	71,590	425	99.4%	27,001	1.6%
7/1/2016	58,868	67,053	8,185	87.8%	26,992	30.3%
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	26,969	9,796	63.7%	20,338	48.2%

Solvency Test

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 16,378,993	\$ 32,802,000	\$ 2,639,307	\$ 79,302,000	100.0%	100.0%	114.1%
6/30/2017	15,405,406	29,942,000	26,242,594	71,165,000	100.0%	100.0%	98.4%
6/30/2016	14,137,547	26,599,000	26,316,453	58,868,000	100.0%	100.0%	68.9%
6/30/2015	13,099,832	22,687,000	24,500,168	56,938,000	100.0%	100.0%	86.3%
6/30/2014	12,317,472	19,879,000	24,262,528	53,647,000	100.0%	100.0%	88.4%
6/30/2013	11,173,226	15,401,000	24,375,774	42,903,000	100.0%	100.0%	67.0%
6/30/2012	10,274,957	10,034,000	23,839,043	35,483,000	100.0%	100.0%	63.7%
6/30/2011	9,557,115	6,666,000	23,001,885	32,366,000	100.0%	100.0%	70.2%
6/30/2010	8,664,435	1,341,000	21,497,565	23,662,000	100.0%	100.0%	63.5%
6/30/2009	7,083,748	1,413,000	18,472,252	17,173,000	100.0%	100.0%	47.0%

ACTUARIAL SECTION
Emergency Medical Services 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		
2018	13	\$ 379,419	-	\$ -	102	\$ 2,580,724	17.2%	25,301
2017	9	128,661	(1)	24,392	89	2,201,305	5.0%	24,734
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	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2017	\$ 425,000
Expected increase from amortization method	(8,000)
Increase from contributions below actuarial rates	(1,712,000)
Investment experience (smoothed)	(1,407,000)
Liability experience (including transfers)	<u>(1,026,000)</u>
Funded in excess of Actuarial Liability, June 30, 2018	<u>\$ (3,728,000)</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.

ACTUARIAL SECTION
Emergency Medical Services Retirement System





Consolidated Public Retirement Board

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EXECUTIVE DIRECTOR
Jeffrey E. Fleck

BOARD CHAIRMAN
David L. Wyant

December 16, 2019

West Virginia Consolidated Public Retirement Board
West Virginia Municipal Police Officers and Firefighters Retirement System
4101 MacCorkle Avenue, SE
Charleston, WV 25304

Dear Board Members:

We performed the annual actuarial valuation of the West Virginia Municipal Police Officers and Firefighters Retirement System (MPFRS) as of July 1, 2018. The purpose of the actuarial valuation is to determine the actuarial liabilities for the System for funding purposes and to determine whether expected contributions will be sufficient to fulfill the System's long-term funding policy.

The valuation was based on membership data as of June 30, 2018, maintained by the West Virginia Consolidated Public Retirement Board, and unaudited financial information received from the West Virginia Investment Management Board. Census and financial data were not audited by the West Virginia Consolidated Public Retirement Board but were reviewed for consistency. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The tables presented for MPFRS in the actuarial section of this Comprehensive Annual Financial Report are based on information contained in our July 1, 2018, valuation report dated February 28, 2019. These tables include:

Actuarial Section

- Summary of Actuarial Assumptions and Methods
- Schedule of Active Member Valuation Data
- Schedule of Funding Progress
- Solvency Test
- Schedule of Retirees and Beneficiaries
- Changes in Unfunded Actuarial Liability

Financial Section

- Schedules of Contributions

All schedules in the Actuarial Section above were completed by the West Virginia Consolidated Public Retirement Board. CPRB has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2018, valuation report.

This report presents fairly the actuarial position of MPFRS as of July 1, 2018, in accordance with Actuarial Standards of Practice (ASOP) 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 MPFRS experience and represent my best estimate of anticipated future experience of MPFRS. 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.

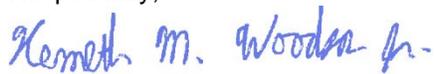
Future actuarial measurements may differ significantly from current measurements due to system experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in system provisions, or applicable law or regulations. An analysis of the potential range of such future differences was beyond the scope of the valuation.

Where presented, the “funded ratio” and “unfunded accrued liability” are typically measured using the actuarial value of assets. It should be noted that use of the market value of assets would not result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need and level of future contributions but make no assessment of the funded status of the plan if it were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

The results presented herewith were prepared solely by the West Virginia Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Use of this report for any other purposes or by anyone other than the West Virginia 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 prior written consent of the CPRB's Board Actuary.

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.

Respectfully,



Kenneth M. Woodson Jr., FSA, MAAA, Ph.D.
CPRB Board Actuary

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2018

Funding Method and Basis of Assumptions

The valuation is prepared under the Entry Age Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate.

Experience studies are performed at least once in every five-year period. The 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, 2011, to June 30, 2016. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

Interest Return and Expenses

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.

Pre-Retirement Mortality

The male and female RP-2014 Employee Mortality Tables, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Post-Retirement Mortality

Post-retirement mortality tables are as follows:

- Healthy Male: 103% of RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Healthy Female: RP-2014 Healthy Annuitant Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.
- Disabled: RP-2014 Disabled Retiree Mortality Table, rolled back to 2006 and projected with Scale MP-2016 on a fully generational basis.

Salary Scale

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%

ACTUARIAL SECTION
Municipal Police Officers & Firefighters' Retirement System

Payroll Growth Rate

Total annual payroll for the active membership is assumed to increase at 6.0% annually. This payroll growth rate is applied in certain projections contained in the actuarial valuation report tables. The growth rate is an open group assumption that includes new entrants into MPFRS

Withdrawal Rates

Withdrawal rates predict termination of employment prior to unreduced retirement eligibility. A sample of unisex rates by age are:

Age	Rate of Withdrawal
30	0.1900
40	0.0650
50	0.0400
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 Disablement
30	0.0015
40	0.0045
50+	0.0040

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%

ACTUARIAL SECTION
Municipal Police Officers & Firfighters' Retirement System

Family 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. Remarriage rates are not considered.

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, male members are assumed to claim up to one additional service credit year for allowable military service additional retirement service credits. Female members are assumed to have no additional years of service credits.

Retirement Rates

Members who become eligible for unreduced retirement benefits are assumed to have 25% probability of retiring each year prior to age 65. On or after age 65, 100% of members are assumed to retire.

Asset Valuation Method

Assets for valuation purposes are included at Market Value.

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	% Change in Average Pay	Number of Employers
6/30/2018	332	\$ 15,132,000	\$ 45,578	-2.4%	30
6/30/2017	217	\$ 10,136,000	\$ 46,710	13.0%	21
6/30/2016	191	7,898,000	41,351	5.6%	16
6/30/2015	140	5,483,000	39,164	0.4%	16
6/30/2014	97	3,784,000	39,010	2.2%	11
6/30/2013	48	1,833,000	38,188	6.7%	9
6/30/2012	27	966,000	35,778	-6.1%	8
6/30/2011	9	343,000	38,111	9.9%	2
6/30/2010	6	208,000	34,667	100.0%	2

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entrt Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
7/1/2018	\$ 8,077	\$ 4,798	\$ (3,279)	168.3%	\$ 15,132	-21.7%
7/1/2017	5,522	2,957	(2,565)	186.7%	10,136	-25.3%
7/1/2016	3,082	2,015	(1,067)	153.0%	7,898	-13.5%
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	75.0%	208	0.5%

Solvency Test

Valuation Date	Aggregate Accrued Liability for			Valuation Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
6/30/2018	\$ 3,159,458	\$ 770,000	\$ 868,542	\$ 8,077,000	100.0%	100.0%	477.5%
6/30/2017	2,173,360	283,000	500,640	5,522,000	100.0%	100.0%	612.3%
6/30/2016	1,484,433	106,000	424,567	3,082,000	100.0%	100.0%	351.3%
6/30/2015	871,797	61,000	183,203	2,046,000	100.0%	100.0%	607.6%
6/30/2014	502,241	35,000	30,759	1,201,000	100.0%	100.0%	2157.9%
6/30/2013	232,075	19,000	12,925	529,000	100.0%	100.0%	2150.3%
6/30/2012	95,132	4,000	(9,132)	202,000	100.0%	100.0%	-1126.5%
6/30/2011	27,113	6,000	(10,113)	65,000	100.0%	100.0%	-315.3%
6/30/2010	2,816	-	722	2,821	100.0%	100.0%	0.7%

ACTUARIAL SECTION
Municipal Police Officers & Firfighters' 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		
2018	1	\$ 38,734	-	\$ -	1	\$ 38,734	100.0%	38,734
2017	-	-	-	-	-	-	0.0%	-
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, 2017	\$ (2,565,000)
Expected increase from amortization method	(192,000)
Increase from contrubutions below actuarial rates	(765,000)
Investment experience (smoothed)	(35,000)
Liability experience (including transfers)	<u>278,000</u>
Funded in excess of Actuarial Liability, June 30, 2018	<u>\$ (3,279,000)</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



2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT
For the Fiscal Years Ended June 30, 2019 and June 30, 2018

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STATISTICAL SECTION

Overview

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)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 70,357	\$ 147,031	\$ 393,179	\$ 763
2018	65,150	152,541	606,303	1,497
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

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Administrative Expenses	
		Transfers to/(from)	Refunds		
2019	\$ 436,966	\$ (232)	\$ 6,915	\$ 11,782	\$ 155,900
2018	421,936	-	6,850	12,248	384,457
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

STATISTICAL SECTION**Additions by Source, Deductions by Type, and Change in Plan Net Position****Teachers' Defined Benefit Retirement System**

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 92,759	\$ 481,986	\$ 396,327	\$ 3,446
2018	89,128	471,837	688,273	3,046
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

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Refunds	
		Transfers to/(from)	Administrative Expenses		
2019	\$ 827,539	\$ 174	\$ 6,239	\$ 10,769	\$ 129,796
2018	806,511	-	6,035	9,591	430,147
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

* 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			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 110	\$ 15,595	\$ 38,174	\$ 752
2018	186	24,829	60,939	691
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

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Refunds	
		Transfers to/(from)	Administrative Expenses		
2019	\$ 47,551	\$ -	\$ 63	\$ -	\$ 7,017
2018	45,529	-	61	-	41,055
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

STATISTICAL SECTION

Additions by Source, Deductions by Type, and Change in Plan Net Position

State Police Retirement System
(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 3,905	\$ 4,556	\$ 11,730	\$ -
2018	3,621	4,205	16,303	-
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

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Refunds	
		Transfers to/(from)	Administrative Expenses		
2019	\$ 1,473	\$ -	\$ 60	\$ 471	\$ 18,187
2018	1,186	-	60	656	22,227
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

STATISTICAL SECTION

Additions by Source, Deductions by Type, and Change in Plan Net Position

Deputy Sheriffs Retirement System
(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 4,846	\$ 6,705	\$ 13,200	\$ 479
2018	4,416	6,194	19,361	471
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

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Refunds	
		Transfers to/(from)	Administrative Expenses		
2019	\$ 11,338	\$ -	\$ 145	\$ 602	\$ 13,145
2018	9,614	-	137	997	19,694
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

STATISTICAL SECTION

Additions by Source, Deductions by Type, and Change in Plan Net Position

Judges Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 331	\$ 779	\$ 12,085	\$ -
2018	364	735	18,373	-
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	-

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Refunds	
		Transfers to/(from)	Administrative Expenses		
2019	\$ 4,846	\$ 86	\$ 11	\$ 87	\$ 8,165
2018	4,765	-	8	167	14,532
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

STATISTICAL SECTION

Additions by Source, Deductions by Type, and Change in Plan Net Position

Emergency Medical Services Retirement System
(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 2,302	\$ 2,844	\$ 4,774	\$ -
2018	2,231	2,765	6,867	-
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

Fiscal Year	Deductions				Total Change In Plan Net Position	
	Benefit Payments	Services		Administrative Expenses		Refunds
		Transfers to/(from)				
2019	\$ 2,989	\$ -	\$ 77	\$ 1,187	\$ 5,667	
2018	2,582	-	73	1,071	8,137	
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	

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			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 1,438	\$ 1,438	\$ 611	\$ 38
2018	1,087	1,089	547	-
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	-	-

Fiscal Year	Deductions				Total Change In Plan Net Position	
	Benefit Payments	Services		Administrative Expenses		Refunds
		Transfers to/(from)				
2019	\$ 36	\$ (28)	\$ 35	\$ 262	\$ 3,220	
2018	20	-	23	125	2,555	
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	

STATISTICAL SECTION

Additions by Source, Deductions by Type, and Change in Plan Net Position

Teachers' Defined Contributions Retirement System
(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2019	\$ 6,126	\$ 10,204	\$ 34,920	\$ 95
2018	6,075	11,664	41,447	34
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

Fiscal Year	Deductions				Total Change In Plan Net Position
	Benefit Payments	Services		Refunds	
		Transfers to/(from)	Administrative Expenses		
2019	\$ -	\$ -	\$ 752	\$ 16,282	\$ 34,311
2018	-	-	1,054	12,173	45,993
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

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
2019	\$ 378,882	\$ 29,435	\$ 28,648	\$ 189	\$ 11,593
2018	355,308	33,028	33,600	1,041	11,207
2017	338,865	31,400	31,944	990	9,580
2016	320,869	30,223	31,868	1,317	10,177
2015	304,113	28,795	30,480	1,123	9,653
2014	285,706	27,880	29,933	80	10,013
2013	266,830	26,821	29,157	1,161	9,175
2012	255,134	25,781	23,348	1,170	9,674
2011	232,437	24,651	27,445	952	8,982
2010	215,414	23,664	26,221	1,263	7,216

Teachers' Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2019	\$ 773,205	\$ 27,583	\$ 26,751	\$ 3,090	\$ 7,679
2018	748,486	30,522	27,503	2,203	7,388
2017	723,929	29,482	26,576	2,095	6,976
2016	695,555	27,591	26,292	4,231	5,834
2015	658,674	25,230	25,947	3,910	5,078
2014	618,616	24,327	25,183	2,418	5,666
2013	569,705	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

State Police Death, Disability, and Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2019	\$ 36,524	\$ 3,023	\$ 8,004	\$ -	-
2018	34,052	3,610	7,867	-	-
2017	32,403	3,436	7,486	-	-
2016	31,525	3,092	7,352	-	-
2015	30,240	2,320	7,148	-	-
2014	28,469	2,209	6,888	-	-
2013	26,735	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	-	-

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
2019	\$ 815	\$ 201	\$ 457	\$ -	471
2018	518	252	417	-	655
2017	425	199	329	-	501
2016	344	153	317	-	257
2015	319	21	292	-	419
2014	316	22	290	-	284
2013	266	48	243	8	241
2012	243	26	207	-	*
2011	226	50	187	-	1
2010	150	34	185	-	*

* - Under \$500

Deputy Sheriffs Retirement System
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2019	\$ 9,388	\$ 130	\$ 1,820	\$ -	602
2018	7,654	398	1,562	46	951
2017	7,095	380	1,493	235	940
2016	6,517	342	1,333	43	563
2015	6,060	271	1,219	-	821
2014	5,421	261	1,137	75	900
2013	5,085	250	976	-	669
2012	4,818	201	966	43	719
2011	4,635	175	904	35	624
2010	4,325	139	863	-	503

Judges Retirement System
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2019	\$ 3,894	\$ 774	\$ 178	\$ -	87
2018	3,909	856	-	-	167
2017	3,710	800	-	-	99
2016	3,427	955	-	-	47
2015	3,314	866	47	-	86
2014	3,310	969	95	-	81
2013	3,196	1,060	95	-	-
2012	3,097	1,056	121	-	-
2011	3,115	899	-	-	-
2010	3,065	872	-	-	86

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
2019	\$ 2,315	\$ 87	\$ 587	\$ 57	1,130
2018	2,031	26	525	-	1,071
2017	1,782	20	399	-	575
2016	1,616	20	282	-	640
2015	1,320	20	261	-	665
2014	1,042	22	228	11	446
2013	798	22	173	38	404
2012	517	13	121	32	632
2011	237	-	24	-	352
2010	-	-	-	-	171

Municipal Police Officers & Firefighters Retirement System*
(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2019	\$ 36	\$ -	\$ -	\$ 20	242
2018	-	-	20	-	125
2017	-	-	-	-	79
2016	-	-	-	-	34
2015	-	-	-	-	49
2014	-	-	-	-	7
2013	-	-	-	3	2
2012	-	-	-	-	10
2011	-	-	-	-	-
2010	-	-	-	-	-



STATISTICAL SECTION
Retired Members by Type of Benefit

Public Employees 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	13,776	11,256	584	1,936	6,894	4,972	1,910	-
1,001 - 2,000	9,205	7,949	235	1,021	4,696	3,147	1,362	-
2,001 - 3,000	3,789	3,634	57	98	1,855	1,248	686	-
3,001 - 4,000	1,324	1,295	16	13	627	403	294	-
4,001 - 5,000	447	441	4	2	194	170	83	-
Over \$ 5,000	219	219	-	-	131	53	35	-
	<u>28,760</u>	<u>24,794</u>	<u>896</u>	<u>3,070</u>	<u>14,397</u>	<u>9,993</u>	<u>4,370</u>	<u>-</u>

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			Option Selected			
		A	B	C	Maximum	Opt-1	Opt-2	Other
\$ 1 - 1,000	10,542	8,928	43	1,571	6,228	2,436	1,362	516
1,001 - 2,000	10,975	10,122	99	754	6,139	2,614	1,632	590
2,001 - 3,000	8,600	8,425	45	130	4,838	1,802	1,471	489
3,001 - 4,000	4,466	4,442	15	9	2,704	728	830	204
4,001 - 5,000	1,524	1,518	6	-	1,016	196	262	50
Over \$ 5,000	722	720	1	1	470	93	125	34
	<u>36,829</u>	<u>34,155</u>	<u>209</u>	<u>2,465</u>	<u>21,395</u>	<u>7,869</u>	<u>5,682</u>	<u>1,883</u>

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

State Police Death, Disability, and 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	14	11	-	3	-	14	-	-
1,001 - 2,000	48	30	4	14	-	48	-	-
2,001 - 3,000	65	46	6	13	-	65	-	-
3,001 - 4,000	57	44	2	11	-	57	-	-
4,001 - 5,000	114	100	4	10	-	114	-	-
Over \$ 5,000	483	404	6	73	2	481	-	-
	<u>781</u>	<u>635</u>	<u>22</u>	<u>124</u>	<u>2</u>	<u>779</u>	<u>-</u>	<u>-</u>

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			Option Selected			
		A	B	C	Maximum	Opt-1	Opt-2	Other
\$ 1 - 1,000	2	1	1	-	-	2	-	-
1,001 - 2,000	4	-	1	3	-	4	-	-
2,001 - 3,000	5	1	1	3	-	5	-	-
3,001 - 4,000	9	8	1	-	-	9	-	-
4,001 - 5,000	18	10	2	6	-	18	-	-
Over \$ 5,000	-	-	-	-	-	-	-	-
	<u>38</u>	<u>20</u>	<u>6</u>	<u>12</u>	<u>-</u>	<u>38</u>	<u>-</u>	<u>-</u>

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

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	41	35	-	6	10	25	6	-
1,001 - 2,000	144	111	4	29	43	73	28	-
2,001 - 3,000	152	128	2	22	57	71	24	-
3,001 - 4,000	63	50	-	13	22	39	8	-
4,001 - 5,000	23	22	-	1	10	4	4	-
Over \$ 5,000	5	5	-	-	4	-	-	-
	<u>428</u>	<u>351</u>	<u>6</u>	<u>71</u>	<u>146</u>	<u>212</u>	<u>70</u>	<u>-</u>

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			Option Selected			
		A	B	C	Maximum	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	14	13	1	-	-	-	14	-
Over \$ 5,000	47	45	-	2	-	-	47	-
	<u>63</u>	<u>60</u>	<u>1</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>63</u>	<u>-</u>

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			Option Selected			
		A	B	C	Maximum	Opt-1	Opt-2	Other
\$ 1 - 1,000	12	11	-	1	11	-	1	-
1,001 - 2,000	39	36	1	2	23	9	1	6
2,001 - 3,000	37	31	2	4	18	7	4	8
3,001 - 4,000	20	14	-	6	9	5	3	3
4,001 - 5,000	6	4	-	2	2	3	-	1
Over \$ 5,000	1	-	-	1	1	-	-	-
	115	96	3	16	64	24	9	18

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			Option Selected			
		A	B	C	Maximum	Opt-1	Opt-2	Other
\$ 1 - 1,000	-	-	-	-	-	-	-	-
1,001 - 2,000	-	-	-	-	-	-	-	-
2,001 - 3,000	-	-	-	-	-	-	-	-
3,001 - 4,000	1	-	-	1	-	1	-	-
4,001 - 5,000	-	-	-	-	-	-	-	-
Over \$ 5,000	-	-	-	-	-	-	-	-
	1	-	-	1	-	1	-	-

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

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	26,312	1	63.37 %	23,463	1	65.69 %
All other employers	<u>15,209</u>		<u>36.63</u>	<u>12,254</u>		<u>34.31</u>
	<u>41,521</u>		<u>100.00 %</u>	<u>35,717</u>		<u>100.00 %</u>

Teachers Retirement System

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
Kanawha County Board of Education	3,369	1	9.13 %	3,477	1	9.75 %
Berkeley County Board of Education	2,363	2	6.40	2,068	2	5.80
Wood County Board of Education	1,631	3	4.42	1,689	3	4.74
Cabell County Board of Education	1,572	4	4.26	1,421	5	3.98
Raleigh County Board of Education	1,503	5	4.07	1,487	4	4.17
Monongalia County Board of Education	1,500	6	4.07	1,388	6	3.89
Harrison County Board of Education	1,417	7	3.84	1,397	7	3.92
Mercer County Board of Education	1,197	8	3.24	1,116	8	3.13
Jefferson County Board of Education	1,122	9	3.04	-		-
Putnam County Board of Education	1,118	10	3.03	1,052	10	2.95
Marion County Board of Education	-		-	1,051	9	2.95
Total Top Employers	<u>16,792</u>		<u>45.50</u>	<u>16,146</u>		<u>45.28</u>
All other employers	<u>20,108</u>		<u>54.50</u>	<u>19,524</u>		<u>54.72</u>
	<u>36,900</u>		<u>100.00 %</u>	<u>35,670</u>		<u>100.00 %</u>

In July 2008, 15,152 members of the Teachers Defined Contribution Retirement System transferred to the Teachers Defined Benefit Retirement System.

State Police Death, Disability, and Retirement System

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	21	1	100.00 %	147	1	100.00 %
All other employers	<u>-</u>		<u>-</u>	<u>-</u>		<u>-</u>
	<u>21</u>		<u>100.00 %</u>	<u>147</u>		<u>100.00 %</u>

STATISTICAL SECTION

Largest Employers

State Police Retirement System

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	651	1	100.00 %	498	1	100.00 %
All other employers	-		-	-		-
	<u>651</u>		<u>100.00 %</u>	<u>498</u>		<u>100.00 %</u>

Deputy Sheriffs Retirement System

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
Kanawha County	103	1	8.65 %	101	1	10.54 %
Berkeley County	63	2	5.29	54	2	5.64
Raleigh County	53	3	4.45	39	5	4.07
Harrison County	52	4	4.37	42	3	4.38
Cabell County	45	5	3.78	41	4	4.28
Monongalia County	44	6	3.69	36	6	3.76
Putnam County	43	7	3.61	36	7	3.76
Wood County	41	8	3.44	36	9	3.76
Fayette County	39	9	3.27	31	8	3.24
Ohio County	37	10	3.11	26	10	2.71
Total Top Employers	<u>520</u>		<u>43.66</u>	<u>442</u>		<u>46.14</u>
All other employers	<u>671</u>		<u>56.34</u>	<u>516</u>		<u>53.86</u>
	<u>1,191</u>		<u>100.00 %</u>	<u>958</u>		<u>100.00 %</u>

Judges Retirement System

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
West Virginia Judiciary	41	1	100.00 %	53	1	100.00 %
All other employers	-		-	-		-
	<u>41</u>		<u>100.00 %</u>	<u>53</u>		<u>100.00 %</u>

STATISTICAL SECTION

Largest Employers

Emergency Medical Services Retirement System

Top Employers	June 30, 2019			June 30, 2010		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
Kanawha County Emergency Ambulance	199	1	25.88 %	184	1	35.05 %
Cabell County Emergency Medical Services	142	2	18.47	101	2	19.24
Putnam County Emergency Medical Services	61	3	7.93	-	-	-
Total Top Employers	402		52.28	285		54.29
All other employers	367		47.72	240		45.71
	<u>769</u>		<u>100.00 %</u>	<u>525</u>		<u>100.00 %</u>

Municipal Police Officers and Firefighters Retirement System

Top Employers	June 30, 2019			June 30, 2010*		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
City of Charleston Police	76	1	17.63 %	-	-	- %
City of Charleston Firefighters	62	2	14.39	-	-	-
City of Huntington Firefighters	40	3	9.28	-	-	-
City of Huntington Police	39	4	9.05	6	1	100.00
Total Top Employers	217		50.35	6		100.00
All other employers	214		49.65	-		-
	<u>431</u>		<u>100.00 %</u>	<u>6</u>		<u>100.00 %</u>

* The MPFRS plan was established in 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 of service.

	Public Employees Retirement System				
	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 550	\$ 791	\$ 1,094	\$ 1,477	\$ 2,729
Average final average salary	\$ 27,186	\$ 29,558	\$ 32,418	\$ 36,048	\$ 46,159
Number of benefit recipients	4,462	4,238	4,636	4,594	8,095
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 543	\$ 775	\$ 1,078	\$ 1,466	\$ 2,317
Average final average salary	\$ 26,402	\$ 28,543	\$ 31,614	\$ 35,540	\$ 42,311
Number of benefit recipients	4,441	4,202	4,555	4,548	7,877
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 547	\$ 764	\$ 1,070	\$ 1,456	\$ 2,299
Average final average salary	\$ 27,350	\$ 26,965	\$ 29,182	\$ 32,356	\$ 36,300
Number of benefit recipients	4,512	4,049	4,448	4,295	6,902
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 531	\$ 743	\$ 1,037	\$ 1,392	\$ 2,274
Average final average salary	\$ 26,550	\$ 26,224	\$ 28,282	\$ 30,933	\$ 35,905
Number of benefit recipients	4,471	3,998	4,309	4,176	6,484
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 522	\$ 733	\$ 1,019	\$ 1,386	\$ 2,204
Average final average salary	\$ 26,100	\$ 25,871	\$ 27,791	\$ 30,800	\$ 34,800
Number of benefit recipients	4,438	3,934	4,296	4,107	6,390
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 547	\$ 760	\$ 1,055	\$ 1,440	\$ 2,281
Average final average salary	\$ 27,350	\$ 26,824	\$ 28,773	\$ 32,000	\$ 36,016
Number of benefit recipients	4,245	3,770	7,165	3,993	6,258
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 529	\$ 741	\$ 1,033	\$ 1,404	\$ 2,231
Average final average salary	\$ 26,450	\$ 26,153	\$ 28,173	\$ 31,200	\$ 35,226
Number of benefit recipients	4,147	3,727	4,085	3,857	5,943
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 497	\$ 698	\$ 983	\$ 1,333	\$ 2,156
Average final average salary	\$ 24,850	\$ 24,635	\$ 26,809	\$ 29,622	\$ 34,042
Number of benefit recipients	4,048	3,653	3,885	3,658	5,367
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ 466	\$ 665	\$ 935	\$ 1,271	\$ 2,066
Average final average salary	\$ 23,300	\$ 23,471	\$ 25,500	\$ 28,244	\$ 32,621
Number of benefit recipients	3,945	3,599	3,749	3,394	4,714
For the Year Ended June 30, 2010:					
Average monthly benefit	\$ 454	\$ 648	\$ 909	\$ 1,242	\$ 2,028
Average final average salary	\$ 22,700	\$ 22,871	\$ 24,791	\$ 27,600	\$ 32,021
Number of benefit recipients	3,926	3,553	3,653	3,302	4,398

STATISTICAL SECTION
Average Monthly Benefit Payments

Teachers Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 485	\$ 739	\$ 1,054	\$ 1,468	\$ 3,096
Average final average salary	\$ 22,542	\$ 23,782	\$ 25,525	\$ 30,212	\$ 42,789
Number of benefit recipients	2,410	3,154	4,440	5,258	20,383
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 479	\$ 728	\$ 1,040	\$ 1,460	\$ 2,596
Average final average salary	\$ 21,520	\$ 22,553	\$ 24,240	\$ 29,356	\$ 42,331
Number of benefit recipients	2,400	3,157	4,434	5,274	20,051
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 475	\$ 719	\$ 1,048	\$ 1,488	\$ 2,572
Average final average salary	\$ 23,750	\$ 25,376	\$ 28,582	\$ 33,067	\$ 40,611
Number of benefit recipients	2,476	3,199	4,674	5,383	18,717
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 443	\$ 692	\$ 1,021	\$ 1,437	\$ 2,486
Average final average salary	\$ 22,150	\$ 24,424	\$ 27,845	\$ 31,933	\$ 39,253
Number of benefit recipients	2,402	3,191	4,605	5,359	17,974
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 432	\$ 668	\$ 1,004	\$ 1,414	\$ 2,453
Average final average salary	\$ 21,600	\$ 23,576	\$ 27,382	\$ 31,422	\$ 38,732
Number of benefit recipients	2,352	3,187	4,728	5,351	17,680
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 452	\$ 695	\$ 1,026	\$ 1,446	\$ 2,481
Average final average salary	\$ 22,600	\$ 24,529	\$ 27,982	\$ 32,133	\$ 39,174
Number of benefit recipients	2,224	3,020	4,575	5,200	17,445
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 434	\$ 667	\$ 1,008	\$ 1,404	\$ 2,409
Average final average salary	\$ 21,700	\$ 23,541	\$ 27,491	\$ 31,200	\$ 38,037
Number of benefit recipients	2,192	3,038	4,601	5,116	16,775
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 395	\$ 622	\$ 957	\$ 1,322	\$ 2,244
Average final average salary	\$ 19,750	\$ 21,953	\$ 26,100	\$ 29,378	\$ 35,432
Number of benefit recipients	2,138	3,003	4,629	4,873	15,154
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ 368	\$ 588	\$ 909	\$ 1,246	\$ 2,082
Average final average salary	\$ 18,400	\$ 20,753	\$ 24,791	\$ 27,689	\$ 32,874
Number of benefit recipients	2,132	3,077	4,580	4,577	13,642
For the Year Ended June 30, 2010:					
Average monthly benefit	\$ 355	\$ 578	\$ 886	\$ 1,217	\$ 2,011
Average final average salary	\$ 17,750	\$ 20,400	\$ 24,164	\$ 27,044	\$ 31,753
Number of benefit recipients	2,149	3,129	4,539	4,496	12,976

STATISTICAL SECTION
Average Monthly Benefit Payments

State Police Death, Disability, and Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 5,664	\$ 5,541	\$ 4,487	\$ 5,104	\$ 5,776
Average final average salary	\$ 88,270	\$ 63,629	\$ 40,791	\$ 38,400	\$ 42,007
Number of benefit recipients	27	28	87	502	118
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 5,459	\$ 5,270	\$ 4,337	\$ 4,928	\$ 5,729
Average final average salary	\$ 85,075	\$ 60,517	\$ 39,427	\$ 37,076	\$ 41,665
Number of benefit recipients	27	30	86	483	119
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 5,307	\$ 5,356	\$ 4,332	\$ 5,069	\$ 5,707
Average final average salary	\$ 82,706	\$ 61,504	\$ 39,382	\$ 38,137	\$ 41,505
Number of benefit recipients	29	27	105	450	83
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 5,276	\$ 5,262	\$ 4,109	\$ 4,747	\$ 5,466
Average final average salary	\$ 82,223	\$ 60,425	\$ 37,355	\$ 35,714	\$ 39,753
Number of benefit recipients	29	27	103	449	84
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 5,224	\$ 4,965	\$ 3,910	\$ 4,574	\$ 5,277
Average final average salary	\$ 81,413	\$ 57,014	\$ 35,545	\$ 34,413	\$ 38,378
Number of benefit recipients	30	27	111	446	85
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 5,202	\$ 5,097	\$ 3,870	\$ 4,611	\$ 5,153
Average final average salary	\$ 81,070	\$ 58,530	\$ 35,182	\$ 34,691	\$ 37,476
Number of benefit recipients	24	22	89	423	86
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 5,001	\$ 4,913	\$ 3,705	\$ 4,433	\$ 4,951
Average final average salary	\$ 77,938	\$ 56,417	\$ 33,682	\$ 33,352	\$ 36,007
Number of benefit recipients	24	22	91	405	88
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 4,383	\$ 4,267	\$ 3,313	\$ 4,085	\$ 4,549
Average final average salary	\$ 68,306	\$ 48,999	\$ 30,118	\$ 30,734	\$ 33,084
Number of benefit recipients	25	23	92	379	91
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ 4,078	\$ 4,208	\$ 3,067	\$ 3,768	\$ 4,437
Average final average salary	\$ 63,553	\$ 48,322	\$ 27,882	\$ 28,349	\$ 32,269
Number of benefit recipients	25	25	97	353	90
For the Year Ended June 30, 2010:					
Average monthly benefit	\$ 4,060	\$ 4,198	\$ 2,993	\$ 3,584	\$ 4,270
Average final average salary	\$ 63,273	\$ 48,207	\$ 27,209	\$ 26,964	\$ 31,055
Number of benefit recipients	25	25	96	346	89

STATISTICAL SECTION
Average Monthly Benefit Payments

State Police Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 3,186	\$ 4,163	\$ 3,193	\$ 3,303	\$ 4,375
Average final average salary	\$ 99,304	\$ 95,610	\$ 58,055	\$ 49,700	\$ 63,636
Number of benefit recipients	6	5	3	12	6
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 3,159	\$ 4,123	\$ 3,694	\$ 3,379	\$ 4,298
Average final average salary	\$ 98,462	\$ 94,691	\$ 67,164	\$ 50,844	\$ 62,516
Number of benefit recipients	6	5	6	7	3
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 3,537	\$ 3,683	\$ 3,031	\$ 2,953	\$ 3,998
Average final average salary	\$ 110,244	\$ 84,586	\$ 55,109	\$ 44,434	\$ 58,153
Number of benefit recipients	3	4	3	7	2
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 3,489	\$ 3,718	\$ 3,015	\$ 3,058	\$ 3,998
Average final average salary	\$ 108,748	\$ 85,389	\$ 54,818	\$ 46,014	\$ 58,153
Number of benefit recipients	3	3	3	2	2
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 3,468	\$ 4,130	\$ 3,034	\$ 3,058	\$ 4,469
Average final average salary	\$ 108,094	\$ 94,852	\$ 55,164	\$ 46,014	\$ 65,004
Number of benefit recipients	3	2	2	2	1
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 2,601	\$ 4,131	\$ 3,034	\$ 3,058	\$ 4,469
Average final average salary	\$ 81,070	\$ 94,875	\$ 55,164	\$ 46,014	\$ 65,004
Number of benefit recipients	4	2	2	2	1
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 2,575	\$ 4,091	\$ 3,004	\$ 3,044	\$ 4,469
Average final average salary	\$ 80,260	\$ 93,956	\$ 54,618	\$ 45,803	\$ 65,004
Number of benefit recipients	4	2	2	2	1
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 2,525	\$ 2,453	\$ 2,957	\$ 3,044	\$ 4,469
Average final average salary	\$ 78,701	\$ 56,337	\$ 53,764	\$ 45,803	\$ 65,004
Number of benefit recipients	4	1	2	1	1
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ 2,500	\$ -	\$ 2,781	\$ 3,044	\$ 4,469
Average final average salary	\$ 77,922	\$ -	\$ 50,564	\$ 45,803	\$ 65,004
Number of benefit recipients	4	-	1	2	1
For the Year Ended June 30, 2010:					
Average monthly benefit	\$ 2,475	\$ -	\$ 2,754	\$ 3,189	\$ -
Average final average salary	\$ 77,143	\$ -	\$ 50,073	\$ 47,985	\$ -
Number of benefit recipients	4	-	1	1	-

STATISTICAL SECTION
Average Monthly Benefit Payments

Deputy Sheriffs Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 1,158	\$ 1,856	\$ 1,935	\$ 2,240	\$ 2,769
Average final average salary	\$ 34,405	\$ 38,925	\$ 31,359	\$ 29,579	\$ 32,908
Number of benefit recipients	19	40	109	114	129
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 1,136	\$ 1,807	\$ 1,680	\$ 1,914	\$ 2,545
Average final average salary	\$ 33,752	\$ 34,147	\$ 38,653	\$ 40,547	\$ 45,086
Number of benefit recipients	16	33	78	108	151
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 1,535	\$ 1,537	\$ 1,645	\$ 1,810	\$ 2,549
Average final average salary	\$ 45,607	\$ 48,220	\$ 39,879	\$ 35,753	\$ 45,316
Number of benefit recipients	18	29	67	105	135
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 1,479	\$ 1,541	\$ 1,613	\$ 1,757	\$ 2,487
Average final average salary	\$ 43,943	\$ 48,345	\$ 39,103	\$ 34,706	\$ 44,213
Number of benefit recipients	16	26	64	98	129
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 1,428	\$ 1,503	\$ 1,570	\$ 1,729	\$ 2,424
Average final average salary	\$ 42,427	\$ 47,153	\$ 38,061	\$ 34,153	\$ 43,093
Number of benefit recipients	14	25	62	95	121
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 1,333	\$ 1,533	\$ 1,579	\$ 1,789	\$ 2,456
Average final average salary	\$ 39,605	\$ 48,094	\$ 38,279	\$ 35,338	\$ 43,662
Number of benefit recipients	15	24	64	94	124
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 1,333	\$ 1,581	\$ 1,521	\$ 1,750	\$ 2,412
Average final average salary	\$ 39,605	\$ 49,600	\$ 36,873	\$ 34,568	\$ 42,880
Number of benefit recipients	15	25	58	90	113
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 1,238	\$ 1,501	\$ 1,453	\$ 1,685	\$ 2,265
Average final average salary	\$ 36,782	\$ 47,090	\$ 35,224	\$ 33,284	\$ 40,267
Number of benefit recipients	10	23	54	80	104
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ 1,150	\$ 1,435	\$ 1,420	\$ 1,694	\$ 2,203
Average final average salary	\$ 34,168	\$ 45,020	\$ 34,424	\$ 33,462	\$ 39,164
Number of benefit recipients	8	22	44	76	95
For the Year Ended June 30, 2010:					
Average monthly benefit	\$ 1,219	\$ 1,431	\$ 1,379	\$ 1,713	\$ 2,189
Average final average salary	\$ 36,218	\$ 44,894	\$ 33,430	\$ 33,837	\$ 38,916
Number of benefit recipients	7	88	42	72	90

STATISTICAL SECTION
Average Monthly Benefit Payments

Judges Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 4,200	\$ 6,253	\$ 7,357	\$ 7,465	\$ 6,914
Average final average salary	\$ 67,200	\$ 100,048	\$ 117,712	\$ 119,440	\$ 110,624
Number of benefit recipients	1	21	24	10	7
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 4,200	\$ 6,160	\$ 7,335	\$ 7,419	\$ 6,914
Average final average salary	\$ 67,200	\$ 98,560	\$ 117,360	\$ 118,704	\$ 110,624
Number of benefit recipients	1	22	23	9	7
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 4,200	\$ 5,581	\$ 6,841	\$ 7,363	\$ 7,265
Average final average salary	\$ 67,200	\$ 89,296	\$ 109,456	\$ 117,808	\$ 116,240
Number of benefit recipients	1	25	20	8	5
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 4,200	\$ 5,600	\$ 6,847	\$ 7,442	\$ 7,265
Average final average salary	\$ 67,200	\$ 89,600	\$ 109,552	\$ 119,072	\$ 116,240
Number of benefit recipients	1	26	17	8	5
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 4,200	\$ 5,607	\$ 6,864	\$ 7,789	\$ 7,265
Average final average salary	\$ 67,200	\$ 89,712	\$ 109,824	\$ 124,624	\$ 116,240
Number of benefit recipients	1	26	15	8	5
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 4,200	\$ 5,713	\$ 7,257	\$ 7,953	\$ 7,265
Average final average salary	\$ 67,200	\$ 91,408	\$ 116,112	\$ 127,248	\$ 116,240
Number of benefit recipients	1	23	15	8	5
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 4,200	\$ 5,861	\$ 7,213	\$ 7,964	\$ 7,265
Average final average salary	\$ 67,200	\$ 93,776	\$ 115,408	\$ 127,424	\$ 116,240
Number of benefit recipients	1	26	14	7	5
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 4,200	\$ 5,690	\$ 7,288	\$ 7,964	\$ 7,269
Average final average salary	\$ 67,200	\$ 91,040	\$ 116,608	\$ 127,424	\$ 116,304
Number of benefit recipients	1	29	14	7	4
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ -	\$ 5,342	\$ 6,536	\$ 7,302	\$ 6,331
Average final average salary	\$ -	\$ 85,472	\$ 104,576	\$ 116,832	\$ 101,296
Number of benefit recipients	-	31	16	6	3
For the Year Ended June 30, 2010:					
Average monthly benefit	\$ -	\$ 5,302	\$ 6,724	\$ 7,302	\$ 6,331
Average final average salary	\$ -	\$ 84,832	\$ 107,584	\$ 116,832	\$ 101,296
Number of benefit recipients	-	31	16	6	3

STATISTICAL SECTION
Average Monthly Benefit Payments

Emergency Medical Services Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 2,053	\$ 2,038	\$ 2,068	\$ 2,333	\$ 2,985
Average final average salary	\$ 74,655	\$ 52,312	\$ 41,018	\$ 37,705	\$ 43,418
Number of benefit recipients	17	22	27	22	19
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 1,975	\$ 2,009	\$ 1,988	\$ 2,393	\$ 2,940
Average final average salary	\$ 71,818	\$ 51,568	\$ 40,461	\$ 42,885	\$ 50,472
Number of benefit recipients	15	20	22	21	17
For the Year Ended June 30, 2017:					
Average monthly benefit	\$ 1,933	\$ 1,528	\$ 1,948	\$ 2,535	\$ 3,173
Average final average salary	\$ 70,291	\$ 39,221	\$ 39,647	\$ 45,430	\$ 54,472
Number of benefit recipients	12	15	20	21	10
For the Year Ended June 30, 2016:					
Average monthly benefit	\$ 1,874	\$ 1,596	\$ 2,012	\$ 2,274	\$ 3,176
Average final average salary	\$ 68,145	\$ 40,967	\$ 40,950	\$ 40,753	\$ 54,524
Number of benefit recipients	10	12	18	17	10
For the Year Ended June 30, 2015:					
Average monthly benefit	\$ 1,812	\$ 1,632	\$ 2,027	\$ 2,104	\$ 3,189
Average final average salary	\$ 65,891	\$ 41,891	\$ 41,255	\$ 37,706	\$ 54,747
Number of benefit recipients	10	10	16	16	8
For the Year Ended June 30, 2014:					
Average monthly benefit	\$ 1,830	\$ 1,775	\$ 2,114	\$ 2,308	\$ 3,057
Average final average salary	\$ 66,545	\$ 45,561	\$ 43,026	\$ 41,362	\$ 52,481
Number of benefit recipients	10	10	16	17	9
For the Year Ended June 30, 2013:					
Average monthly benefit	\$ 2,030	\$ 1,547	\$ 2,076	\$ 2,315	\$ 2,939
Average final average salary	\$ 73,818	\$ 39,709	\$ 42,252	\$ 41,487	\$ 50,455
Number of benefit recipients	8	6	14	13	8
For the Year Ended June 30, 2012:					
Average monthly benefit	\$ 1,281	\$ 1,580	\$ 2,164	\$ 2,132	\$ 2,521
Average final average salary	\$ 46,582	\$ 40,556	\$ 44,043	\$ 38,208	\$ 43,279
Number of benefit recipients	4	6	7	6	5
For the Year Ended June 30, 2011:					
Average monthly benefit	\$ 840	\$ 1,712	\$ 1,945	\$ 1,611	\$ 3,102
Average final average salary	\$ 30,545	\$ 43,944	\$ 39,586	\$ 28,871	\$ 53,253
Number of benefit recipients	1	2	2	5	4

STATISTICAL SECTION
Average Monthly Benefit Payments

Municipal Police Officers & Firefighters Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2019:					
Average monthly benefit	\$ 3,228	\$ -	\$ -	\$ -	-
Average final average salary	\$ 43,038	\$ -	\$ -	\$ -	-
Number of benefit recipients	1	-	-	-	-
For the Year Ended June 30, 2018:					
Average monthly benefit	\$ 3,228	\$ -	\$ -	\$ -	-
Average final average salary	\$ 43,038	\$ -	\$ -	\$ -	-
Number of benefit recipients	1	-	-	-	-

Note: The MPFRS was established in January 2010 and has no benefits or retirees to report



Our Mission

To serve those who serve West Virginia by administering nine governmental pension plans to ensure members receive accurate and timely benefits earned for their public service.

Our Vision

To be a trusted leader in pension administration and provide public employees with the security and information they need to empower them for a productive tomorrow

Our Core Values

Responsibility - To professionally serve and be accountable to the people of West Virginia while fulfilling our fiduciary duties to the plans, their members, and retirees.

Education - To ensure that all members, retirees, employers, and legislators have the understanding they need to make informed decisions.

Transparency - To be open, honest, and trustworthy in all matters and actions through good internal and external communication.

Integrity - To hold one another to the highest standard of character and ethics.

Resourcefulness - To continually improve our expertise and work together to find the best solutions in all situations.

Excellence - To provide outstanding customer service through accuracy, timeliness, responsiveness, reliability, and compassion.



Serving Those Who Serve West Virginia

(304) 558-3570 or (800) 654-4406

Fax: (304) 957-7522

Website: <http://www.wvretirement.com/>

Retiree Self-Service Portal: <https://mywvretirement.wv.gov/>

Consolidated Public Retirement Board

(Pension Trust Funds of the State of West Virginia)

4101 MacCorkle Ave. S.E., Charleston, WV 25304

Hours of Operation:

8:00 AM – 5:00 PM (EST) Monday-Friday