

West Virginia Consolidated Public Retirement Board

Pension Trust Funds of the State of West Virginia
(A Component Unit of the State of West Virginia)

2021



Annual Comprehensive Financial Report

Serving Those Who Serve West Virginia

Fiscal Year Ended June 30, 2021





West Virginia Consolidated Public Retirement Board

Pension Trust Funds of the State of West Virginia

ANNUAL COMPREHENSIVE FINANCIAL REPORT

For the Fiscal Year Ended June 30, 2021

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
Natural Resources Police Officers Retirement System
Teachers' Defined Contribution Retirement System

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West Virginia Consolidated Public Retirement Board

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Introductory Section



2021 ANNUAL COMPREHENSIVE FINANCIAL REPORT
For the Fiscal Year Ended June 30, 2021

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8	Board of Trustees, Administrative Staff, and Advisors
9	Awards and Recognition



Consolidated Public Retirement Board



EXECUTIVE DIRECTOR
Jeffrey E. Fleck

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Charleston, West Virginia 25304-1636
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BOARD CHAIRMAN
Joseph G. Bunn

December 15, 2021

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 Annual Comprehensive Financial Report (CAFR) of the West Virginia Consolidated Public Retirement Board (WVCPRB) for the fiscal year ended June 30, 2021. This report provides detail information on the performance of the ten retirement systems (the 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 Retirement System (MPFRS)
- Natural Resources Police Officers Retirement System (NRPORS)

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 Annual Comprehensive 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 We trust that you and the respective members of the Systems will find this report helpful in understanding your retirement systems.

Administration and Plan History

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

Financial Information

Accounting Method - As required by Accounting Principles Generally Accepted in the United States of America (GAAP), the financial information of the PERS, TRS, TDCRS, SPDDRS, SPRS, DSRS, JRS, EMRS, MPFRS, and NRPORS 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 2021 and 2020.

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, 2021, the funded ratios for the retirement systems decreased for five of the systems, while 3 of the systems experienced increases (based on actuarial valuations completed as of July 1, 2020). The funded ratios of the defined benefit systems, are as follows:

	July 1, 2020	July 1, 2019	Increase (Decrease)
PERS	94.97%	93.84%	1.13%
TRS	72.76%	71.12%	1.64%
SPDDRS	87.39%	89.92%	-2.53%
SPRS	88.36%	91.79%	-3.43%
DSRS	89.19%	89.61%	-0.42%
JRS	218.31%	192.49%	25.82%
EMSRS	98.14%	102.89%	-4.75%
MPFRS	166.45%	177.49%	-11.04%

Historical information concerning funding progress is presented in the *actuarial section* for each system.

Investment Activity

Total investments for the WVCPRB increased in fiscal year 2021, 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, 2021 and 2020 were (in thousands):

	June 30, 2021	June 30, 2020	Increase (Decrease)
PERS	\$ 8,807,095	\$ 6,899,129	\$ 1,907,966
TRS	9,886,657	7,820,075	2,066,582
SPDDRS	851,521	675,607	175,914
SPRS	301,155	220,922	80,233
DSRS	314,634	239,120	75,514
JRS	280,669	215,699	64,970
EMSRS	118,768	88,627	30,141
MPFRS	23,817	14,667	9,150
NRPORS	25,063	-	25,063
TDCRS	703,293	582,988	120,305
	<u>\$ 21,312,672</u>	<u>\$ 16,756,834</u>	<u>\$ 4,555,838</u>

Investment Activity (Continued)

Interest and dividend income and the associated investment yields for fiscal years ended June 30, 2021 and 2020, were (dollars in thousands):

	Fiscal Year Ended June 30, 2021			Fiscal Year Ended June 30, 2020			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	\$ 4	\$ 2,170,289	32.02%	\$ 310	\$ 215,045	3.16%	\$ (306)	\$ 1,955,244	28.86%
TRS	8	2,429,803	31.93%	519	241,072	3.14%	(511)	2,188,731	28.79%
SPDDRS	1	208,655	31.99%	61	21,191	3.18%	(60)	187,464	28.81%
SPRS	-	72,138	32.13%	8	7,002	3.32%	(8)	65,136	28.81%
DSRS	-	76,547	32.07%	5	7,523	3.22%	(5)	69,024	28.85%
JRS	-	68,611	32.09%	6	6,844	3.24%	(6)	61,767	28.85%
EMSRS	-	28,643	32.05%	3	2,814	3.30%	(3)	25,829	28.75%
MPFRS	-	5,202	31.86%	3	434	3.49%	(3)	4,768	28.37%
NRPORS	-	2,996	13.91%	-	-	0.00%	-	2,996	13.91%
TDCRS	124,284	17,455	37.06%	13,843	21,342	12.53%	110,441	(3,887)	24.53%

Additional information concerning investments, including investment policies and procedures, is located in the investment section of this Annual Comprehensive 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

Eide Bailly, LLP, issued an unmodified ("clean") opinion on the West Virginia Consolidated Public Retirement Board's financial statements for the fiscal year ended June 30, 2021. 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 annual comprehensive financial report for the fiscal year ended June 30, 2020. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized annual comprehensive financial report. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

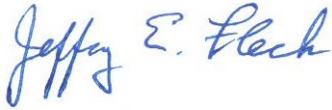
A Certificate of Achievement is valid for a period of one year only. We believe that our current annual comprehensive financial report continues to meet the Certificate of Achievement Program's requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

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, NRPORS, 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, NRPORS, and TDCRS systems.

Sincerely,

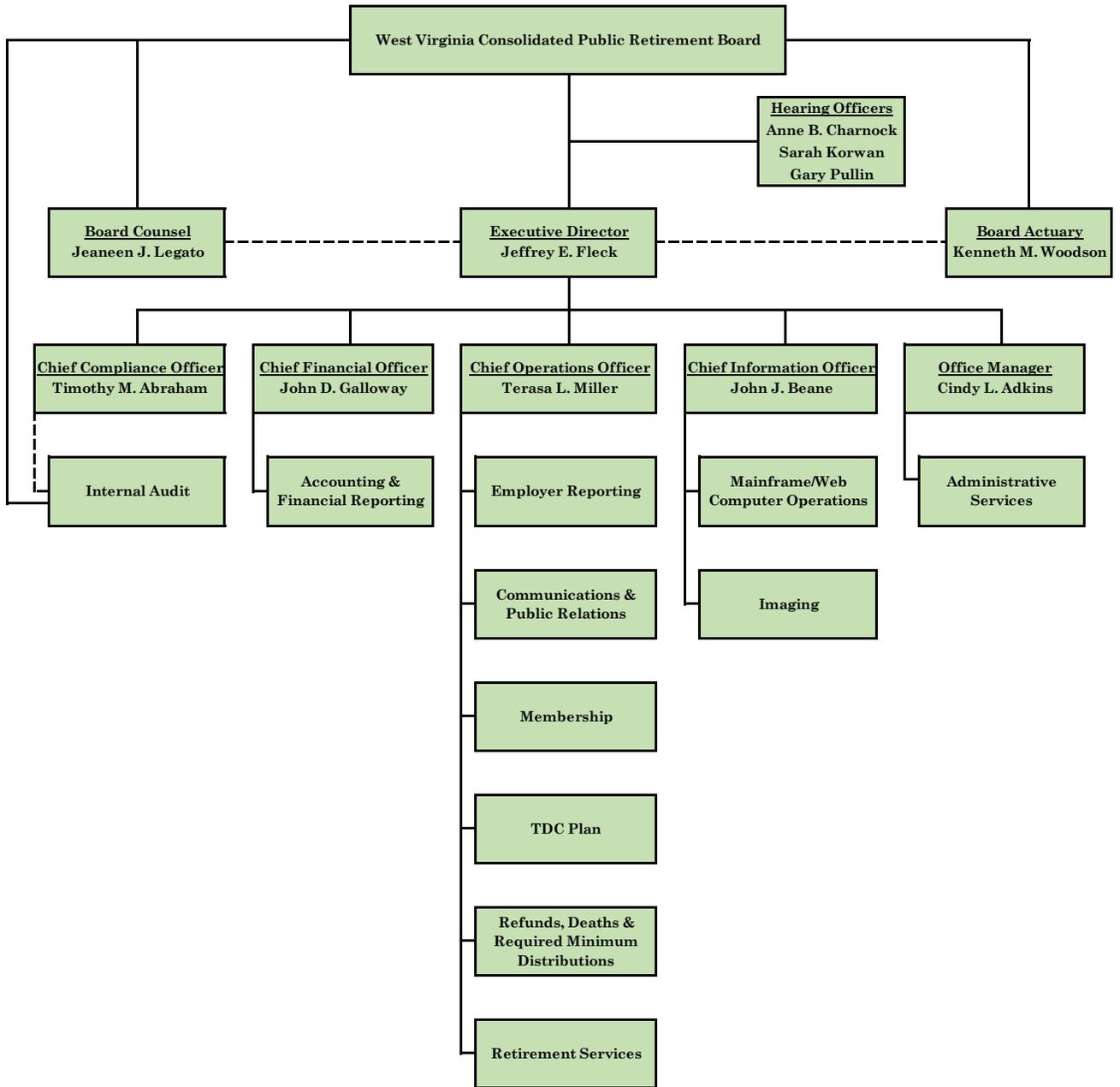


Jeffrey E. Fleck
Executive Director



John D. Galloway
Chief Financial Officer

West Virginia Consolidated Public Retirement Board
Introductory Section
Organization Chart



West Virginia Consolidated Public Retirement Board

Introductory Section

Board of Trustees, Administrative Staff, & Advisors

Board of Trustees:

Chair	Joseph G. Bunn, Esquire
Vice-Chair	Michael McKown
Statutory Board Member	Governor James C. Justice, III
Statutory Board Member	State Auditor John B. McCuskey
Statutory Board Member	State Treasurer Riley Moore
Statutory Board Member	Administration Cabinet Secretary – Mark D. Scott
Board Member	William A. Barker, Jr.
Board Member	Rhonda Bolyard
Board Member	Larry W. Cole
Board Member	Daniel Cart
Board Member	Beth Morgan
Board Member	D. Todd Murray
Board Member	David Nelson
Board Member	Reggie Patterson
Board Member	C. Jeffrey Vallet, CPA

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
Chief IT/Information Officer	John J. Beane
Contract Legal Counsel	J. Jeaneen Legato
Administrative Services Manager	Cindy L. Adkins
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

Advisors:

External Legal Counsel	Bowles, Rice, LLP
Consulting Actuary	Buck Global, LLC
Investment Manager	West Virginia Investment Management Board (1)
Independent Certified Public Accountants	Eide Bailly, LLP

- (1) A schedule of investment fees and commissions by investment pool is presented in the Investment Section on pages 101, 104, 107, 111, and 114.

West Virginia Consolidated Public Retirement Board
Introductory Section
Awards and Recognition

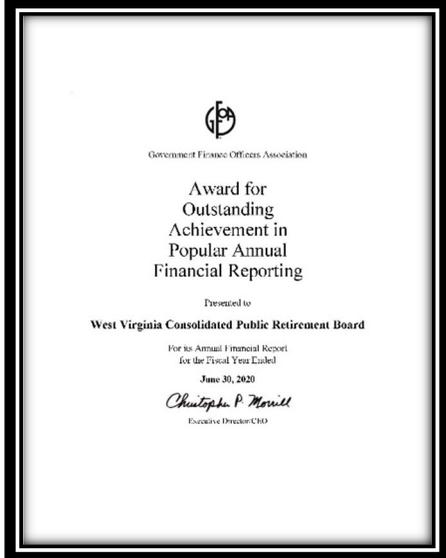


Certificate of Achievement for Excellence in Financial Reporting, Annual Comprehensive Financial Report (ACFR)

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 (WVCPRB) for its Annual Comprehensive Financial Report (ACFR) for the fiscal year ended June 30, 2019. This was the 9th consecutive year that WVCPRB achieved this prestigious recognition.

To be awarded the certificate, a government unit must publish an easily readable and efficiently organized comprehensive annual report. This report must satisfy both generally accepted accounting principles and applicable legal requirements. The certificate is valid for a period of one year.

The WVCPRB ACFR for fiscal year 2021 continues to conform to the Certificate of Achievement Program requirements and will be submitted to GFOA to determine its eligibility for another certificate.



Award for Outstanding Achievement in Popular Annual Financial Reporting (PAFR)

The Government Finance Officers Association of the United States and Canada (GFOA) awarded an Award for Outstanding Achievement in Popular Annual Financial Reporting to the West Virginia Consolidated Public Retirement Board for its Popular Annual Financial Report (PAFR) for the fiscal year ended June 30, 2020. This was the second year of publication for which WVCPRB was eligible to achieve this prestigious recognition.

To be awarded the certificate, a government unit must publish an easily readable and efficiently organized comprehensive annual report. This report must satisfy both generally accepted accounting principles and applicable legal requirements. The certificate is valid for a period of one year.

The WVCPRB PAFR for fiscal year 2021 continues to conform to the Certificate of Achievement Program requirements and will be submitted to GFOA to determine its eligibility for another certificate.



Public Pension Coordinating Council Recognition Award for Administration

West Virginia Consolidated Public Retirement Board received the 2020 Recognition Award for Administration from the Public Pension Coordinating Council (PPCC) in recognition of the agency's fulfillment of the public pension standards. Developed by PPCC, these standards are the benchmark for measuring excellence in defined benefit plan administration. This is the agency's 3rd award from PPCC.

The purpose of the PPCC's awards program is to promote high professional standards for public employee retirement systems and publicly commend systems that adhere to these standards. The PPCC is a coalition of the National Association of State Retirement Administrators (NASRA), the National Conference on Public Employee Retirement Systems (NCPERS) and the National Council on Teacher Retirement (NCTR).

West Virginia Consolidated Public Retirement Board
Introductory Section



Financial Section



2021 ANNUAL COMPREHENSIVE FINANCIAL REPORT *For the Fiscal Years Ended June 30, 2021*

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Independent Auditor's Report

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

Report on Financial Statements

We have audited the accompanying financial statements of the fiduciary activities of the Virginia Consolidated Public Retirement Board (the Board), a component unit of the State of West Virginia, which comprise the statement of fiduciary net position as of June 30, 2021, and the related statement of changes in fiduciary net position, for the year then ended, and the related notes to the financial statements.

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

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective fiduciary financial position of the fiduciary activities of the Board as of June 30, 2021, and the respective changes in fiduciary financial position thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matters

Reporting Entity

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, 2021, the changes in its financial position, and, where applicable, cash flows thereof for the year then ended in accordance with accounting principles generally in the United States of America. Our opinion is not modified with respect to this matter.

Emphasis of Matter – Correction of an Error

As discussed in Note 14 to the financial statements, the Board determined TDC (Teachers Defined Contribution Retirement) forfeitures were booked incorrectly in prior years which resulted in the forfeiture liability to be understated and the net position to be overstated as of July 1, 2020. Accordingly, the amount reported for the forfeiture liability and net position have been restated as of July 1, 2020. 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, the Schedules of Net Pension Liability and Changes in Net Pension Liability, Schedule of Contributions, Schedules of Investment Returns, Schedule of the Proportionate Share of the Net Pension Liability, Schedule of Contributions to The PERS, Schedule of OPEB Contributions, Schedule of Proportionate Share of the Net OPEB Liability and respective notes to the required supplementary information as listed in the table of contents, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, 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 collectively comprise the Board's basic financial statements as a whole. The supplementary information and the introductory, investment, actuarial, and statistical sections as listed in the table of contents are presented for purposes of additional analysis and are not a required part of the financial statements.

The supplementary information accompanying financial information listed as supplemental schedules in the table of contents are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the 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 accompanying financial information listed as supplemental schedules are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

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

A handwritten signature in cursive script that reads "Eide Bailly LLP".

Boise, Idaho
October 13, 2021



West Virginia Consolidated Public Retirement Board

Financial Section

Management's Discussion and Analysis

This section presents management's discussion and analysis of the West Virginia Consolidated Public Retirement Board's (WV CPRB) financial status and performance for the year ended June 30, 2021.

WV CPRB is responsible for administering retirement benefits for nine defined benefit pension systems and one defined contribution system. These retirement systems are:

Defined Benefit Systems:

- Public Employees Retirement System (PERS)
- Teachers' Retirement System (TRS)
- State Police Death, Disability and Retirement System (SPDDRS)
- State Police Retirement System (SPRS)
- Deputy Sheriff Retirement System (DSRS)
- Judges' Retirement System (JRS)
- Emergency Medical Service Retirement System (EMSRS)
- Municipal Police Officers & Firefighters Retirement System (MPFRS)
- Natural Resources Police Officers Retirement System (NRPORS)

Defined Contribution System:

- Teachers' Defined Contribution Retirement System (TDCRS)

OVERVIEW OF THE FINANCIAL STATEMENTS

This discussion and analysis is intended to serve as an introduction to the WV CPRB's financial reporting, which is comprised of the following components:

1. Basic Financial Statements, including Notes to the Basic Financial Statements
2. Required Supplementary Information

Collectively, this information presents the net position held in trust for pension benefits for each of the systems administered by WV CPRB as of June 30, 2021. This financial information also summarizes the changes in net position held in trust for pension and defined contribution benefits for the year then ended. The information in each of these components is briefly summarized as follows:

1. Basic Financial Statements. For the fiscal year ended June 30, 2021, basic financial statements are presented for the retirement systems administered by WV CPRB. Fiduciary funds are used to account for resources held for the benefit of parties outside WV CPRB. These fiduciary funds are comprised of nine defined benefit retirement systems and one defined contribution retirement system.
 - The Statement of Fiduciary Net Position – Pension Funds is presented for the pension funds at June 30, 2021. This financial statement reflects the resources available to pay benefits to members, including retirees and beneficiaries.
 - The Statement of Changes in Fiduciary Net Position – Pension Funds is presented for the pension funds for the year ended June 30, 2021. This financial statement reflects the changes in the resources available to pay benefits to members, including retirees and beneficiaries during the fiscal year.
 - Notes to the Basic Financial Statements. The Notes to the Basic Financial Statements provide additional information that is essential to a full understanding of the data provided in the basic financial statements.
2. Required Supplementary Information. The required supplementary information consists of schedules concerning the net pension liability and changes therein, schedule of investment returns and actuarially determined contribution requirements for the defined benefit retirement systems. Additionally, this section includes the schedules of proportional share of the net pension and OPEB liabilities related to the WV CPRB's employer participation in PERS and the State of West Virginia's OPEB plan that is presented in the Internal Service Fund.

West Virginia Consolidated Public Retirement Board

Financial Section

Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS

Investment Management

Investments held by the defined benefit retirement systems administered by the WV CPRB are managed, as required by West Virginia Code § 12-6-1, by the West Virginia Investment Management Board (WV IMB). The WV IMB maintains nine commingled investment pools by investment type in which the defined benefit systems are invested. Each defined benefit system owns an equity position in each pool and receives proportionate investment income from each pool in accordance with the system's respective ownership percentage in each pool. The value of each system's investments in each of these investment pools is presented in the Statement of Fiduciary Net Position. Investment gains or losses are reported in the Statement of Changes in Fiduciary Net Position for each system.

At June 30, 2021, the nine defined benefit retirement systems had total investments of approximately \$20.61 billion. The defined benefit retirement systems experienced annual investment returns ranging from 20.61% to 31.93%, net of fees, compared to the actuarial assumed rate of return of 7.25%, net of fees.

Administrative Costs

The Defined Benefit Systems are charged an annual fee per system member at the beginning of the fiscal year. For fiscal year 2021, the annual administrative fee was set by the Board of Trustees at \$70 per system member. Annually, the Board of Trustees approves the fee assessment method and rate before the start of the fiscal year. The fee assessment is withdrawn from the systems twice per year, as the Internal Service Fund requires cash flow to pay the administration expenses of the systems.



West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (continued)

Public Employees' Retirement System (PERS)

The Public Employees' Retirement System (PERS) provides retirement benefits to covered employees of the State of West Virginia and other political subdivisions. Employee and employer contributions and earnings on investments fund benefits of the system.

The net position restricted for pensions (total assets minus liabilities) of PERS at June 30, 2021 was approximately \$8.81 billion, an increase of \$1.90 billion (27.6%) from the plan net position restricted for pensions at June 30, 2020.

Additions to PERS' net position restricted for pensions include employer and employee contributions, and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$238.02 million, an increase of \$6.93 million (3.00%) compared to fiscal year 2020. The increase in contributions is directly related to the increase in wages reported by the participating employers for covered employees. PERS reported net investment income of approximately \$2.17 billion for fiscal year 2021, which was an increase of \$1.95 billion (907.77%) from fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from PERS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$469.16 million, an increase of approximately \$16.16 million (3.57%) from the prior year. The increase in benefits is due to the number of members retiring exceeded the number of those who became deceased. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$6.31 million, an increase of \$125 thousand (2.02%), from \$6.19 million in fiscal year 2020. The increase in the administrative expenses charged to the system is the result of an increase in the number of plan participants that the \$70 per member annual administrative charged is assessed.

Refunds and Transfers are the result of employees leaving public service and requesting the money they contributed, plus interest, into the system to be returned or transferring their service credit to another retirement system in which they are eligible. Refunds and Transfers were approximately \$31.54 million in fiscal year 2021, an increase of approximately \$21.22 million (205.53%), from the approximately \$10.3 million in fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 92.89% on June 30, 2020, to 111.07% on June 30, 2021. The net pension (asset) liability as a percentage of covered payroll was 35.30% and (55.77%) as of June 30, 2020, and 2021, respectively. The net pension (asset) liability was (\$877.96) million as of June 30, 2021, compared to \$528.67 million as of June 30, 2020.

Public Employees Retirement System		
Net position		
June 30, (Dollars in Thousands)		
Assets:	2021	2020
Cash	\$ 744	\$ 451
Investments at Fair Value	8,807,095	6,899,129
Receivables	4,226	9,708
Total Assets	8,812,065	6,909,288
Liabilities:		
Accrued Expenses	6,181	6,035
Total Liabilities	6,181	6,035
Total Net Position	\$ 8,805,884	\$ 6,903,253

Public Employees Retirement System		
Change in Net position		
Fiscal Year Ended June 30, (Dollars in Thousands)		
Additions:	2021	2020
Employee Contributions	\$ 78,762	\$ 75,857
Employer Contributions	159,259	155,230
Investment Income	2,170,293	215,355
Other Income and Transfers In	1,325	866
Total Additions	2,409,639	447,308
Deductions:		
Benefits	469,160	453,001
Refunds and Transfers Out	31,537	10,322
Administrative Expenses	6,311	6,186
Total Deductions	507,008	469,509
Change in Net Position	1,902,631	(22,201)
Total Beginning Net Position	6,903,253	6,925,454
Total Ending Net Position	\$ 8,805,884	\$ 6,903,253

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (continued)

Teachers' Retirement System (TRS)

The Teachers' Retirement System (TRS) provides retirement benefits to covered teachers and school service personnel in the State of West Virginia. Employee and employer contributions and earnings on investments fund benefits of the system.

The net position restricted for pensions (total assets minus liabilities) of TRS at June 30, 2021 was approximately \$9.91 billion, an increase of \$2.07 billion (26.39%) from the plan net position restricted for pensions at June 30, 2020.

Additions to TRS' net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$514.59 million, a decrease of \$45.76 million (-8.17%) compared to fiscal year 2020. The decrease in contributions is directly related to the decrease in wages reported by the participating employers for covered employees. TRS reported net investment income of approximately \$2.43 billion for fiscal year 2021, which was an increase of \$2.19 billion (905.75%) from the from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from TRS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$863.13 million, an increase of approximately \$18.86 million (2.23%) from the prior year. The increase in benefits is due to the number of members retiring exceeding the number of those who became deceased. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$5.22 million, a decrease of \$304 thousand (-5.50%), from \$5.53 million in fiscal year 2020. The decrease in the administrative expenses charged to the system is the result of a decrease in the number of plan participants that the \$70 per member annual administrative charged is assessed.

Refunds and Transfers are the result of employees leaving public service and requesting the money they contributed plus interest into the system to be returned or transferring their service credit to another retirement system in which they are eligible. Refunds and Transfers Out were approximately \$8.56 million in fiscal year 2021, a decrease of approximately \$1.37 million (-13.82%), from the approximately \$9.93 million in fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 70.89% on June 30, 2020, to 86.38% on June 30, 2021. The net pension liability as a percentage of covered payroll changed from 213.38% to 97.40% as of June 30, 2020 and 2021, respectively. The net pension liability was \$1.56 billion as of June 30, 2021, compared to \$3.22 billion as of June 30, 2020.

Teachers' Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 2,457	\$ 1,690	
Investments at Fair Value	9,886,657	7,820,075	
Receivables	25,708	22,819	
Total Assets	9,914,822	7,844,584	
Liabilities:			
Accrued Expenses	35	256	
Total Liabilities	35	256	
Total Net Position	\$ 9,914,787	\$ 7,844,328	

Teachers' Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 97,258	\$ 96,511	
Employer Contributions	129,803	129,576	
Other Contributions	287,531	334,264	
Investment Income	2,429,811	241,591	
Other Income and Transfers In	2,964	3,371	
Total Additions	2,947,367	805,313	
Deductions:			
Benefits	863,132	844,272	
Refunds and Transfers Out	8,555	9,927	
Administrative Expenses	5,221	5,525	
Total Deductions	876,908	859,724	
Change in Net Position	2,070,459	(54,411)	
Total Beginning Net Position	7,844,328	7,898,739	
Total Ending Net Position	\$ 9,914,787	\$ 7,844,328	

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

State Police Death, Disability, and Retirement System (SPDDRS)

The West Virginia State Police Death, Disability and Retirement System (SPDDRS) was established to provide retirement, disability, and death benefits for all state troopers hired before March 12, 1994. Employee and employer contributions and earnings on investments fund benefits of the system. Civilian employees of the West Virginia State Police are members of the Public Employees Retirement System (PERS).

The net position restricted for pensions (total assets minus liabilities) of SPDDRS at June 30, 2021 was approximately \$851.53 million, an increase of \$175.93 million (26.04%) from the plan net position restricted for pensions at June 30, 2020.

Additions to SPDDRS' net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$16.73 million, an increase of \$3.45 million (25.99%) compared to fiscal year 2020. The increase is primarily due to the increase in the employer contribution amount resulting from an increase in the amount appropriated by the West Virginia Legislature to continue to increase the system's actuarially funding status. SPDDRS reported net investment income of approximately \$208.66 million for fiscal year 2021, which was an increase of \$187.40 million (881.82%) from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from SPDDRS' net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$50.23 million, an increase of approximately \$1.00 million (2.04%) from the prior year. The increase in benefits is due to the number of members retiring exceeded the number of those who became deceased. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$54 thousand, which was unchanged from fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 87.32% on June 30, 2020 to 106.27% on June 30, 2021. The net pension liability as a percentage of covered payroll changed from 19,093.58% to -14,387.97% as of June 30, 2020 and 2021, respectively. The net pension (asset) liability was (\$50.21) million as of June 30, 2021 compared to \$98.14 million as of June 30, 2020.

State Police Death, Disability and Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 12	\$ -	
Investments at Fair Value	851,521	675,607	
Receivables	3	-	
Total Assets	851,536	675,607	
Liabilities:			
Accrued Expenses	3	3	
Total Liabilities	3	3	
Total Net Position	\$ 851,533	\$ 675,604	

State Police Death, Disability and Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 34	\$ 35	
Employer Contributions	51	59	
Other Contributions	16,648	13,187	
Investment Income	208,656	21,252	
Other Income	822	530	
Total Additions	226,211	35,063	
Deductions:			
Benefits	50,228	49,225	
Administrative Expenses	54	54	
Total Deductions	50,282	49,279	
Change in Net Position	175,929	(14,216)	
Total Beginning Net Position	675,604	689,820	
Total Ending Net Position	\$ 851,533	\$ 675,604	

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

State Police Retirement System (SPRS)

The West Virginia State Police Retirement System (SPRS) was established to provide retirement, disability, and death benefits for all state troopers hired on or after March 12, 1994. Employee and employer contributions and earnings on investments fund benefits of the system. Civilian employees of the West Virginia State Police are members of the Public Employees Retirement System (PERS).

The net position restricted for pensions (total assets minus liabilities) of SPRS at June 30, 2021 was approximately \$297.22 million, an increase of \$50.59 million (36.54%) from the plan net position restricted for pensions at June 30, 2020.

Additions to SPRS' net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$12.11 million, an increase of \$3.1 million (34.32%) compared to fiscal year 2020. SPRS reported net investment income of approximately \$72.14 million for fiscal year 2021, which was an increase of \$65.13 million (929.07%) from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from SPRS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$3.30 million, an increase of approximately \$1.16 million (54.30%) from the prior year. The increase in benefits is due to the number of members retiring exceeded the number of those who became deceased. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$59 thousand, which is a decrease of \$8 thousand from fiscal year 2020. The decrease in the administrative expenses charged to the system is the result of a decrease in the number of plan participants that the \$70 per member annual administrative charged is assessed.

Refunds and Transfers are the result of employees leaving public service and requesting the money they contributed plus interest into the system to be returned or transferring their service credit to another retirement system in which they are eligible. Refunds and Transfers were approximately \$297 thousand in fiscal year 2021, a decrease of approximately \$61 thousand (-17.04%), from the approximately \$358 thousand in fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 88.53% on June 30, 2020 to 105.11% on June 30, 2021. The net pension (asset) liability as a percentage of covered employee payroll changed from 84.26% to -41.86% as of June 30, 2020 and 2021, respectively. The net pension (asset) liability was (\$14.63) million as of June 30, 2021 compared to \$28.57 million as of June 30, 2020.

State Police Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 11	\$ -	
Investments at Fair Value	301,155	220,922	
Receivables	-	-	
Total Assets	301,166	220,922	
Liabilities:			
Accrued Expenses	8	357	
Total Liabilities	8	357	
Total Net Position	\$ 301,158	\$ 220,565	

State Police Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 4,185	\$ 4,168	
Employer Contributions	7,928	4,850	
Investment Income	72,138	7,010	
Total Additions	84,251	16,028	
Deductions:			
Benefits	3,302	2,140	
Refunds and Transfers	297	358	
Administrative Expenses	59	67	
Total Deductions	3,658	2,565	
Change in Net Position	80,593	13,463	
Total Beginning Net Position	220,565	207,102	
Total Ending Net Position	\$ 301,158	\$ 220,565	

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

Deputy Sheriff Retirement System (DSRS)

The Deputy Sheriff Retirement System (DSRS) provides retirement benefits for all deputy sheriffs hired by all 55 county governments in West Virginia on or after July 1, 1998. Employee and employer contributions and earnings on investments fund benefits of the system.

The net position restricted for pensions (total assets minus liabilities) of DSRS at June 30, 2021 was approximately \$315.67 million, an increase of \$75.47 million (31.42%) from the plan net position restricted for pensions at June 30, 2020.

Additions to DSRS' net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$12.39 million, an increase of \$670 thousand (5.71%) compared to fiscal year 2020. The increase in contributions is directly related to the increase in wages reported by the participating employers for covered employees. DSRS reported net investment income of approximately \$76.55 million for fiscal year 2021, which was an increase of \$69.02 million (916.83%) from the from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from DSRS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$13.36 million, an increase of approximately \$1.10 million (9.0%) from the prior year. The increase in benefits is due to the number of members retiring exceeded the number of those who became deceased. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$136 thousand, an increase of \$3 thousand (2.26%), from \$133 thousand in fiscal year 2020. The increase in the administrative expenses charged to the system is the result of an increase in the number of plan participants that the \$70 per member annual administrative charged is assessed.

Refunds and Transfers are the result of employees leaving public service and requesting the money they contributed plus interest into the system to be returned. Refunds and Transfers Out were approximately \$530 thousand in fiscal year 2021, a decrease of approximately \$186 thousand (-25.98%), from the approximately \$716 thousand in fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 87.01% on June 30, 2020 to 101.95% on June 30, 2021. The net pension (asset) liability as a percentage of covered payroll changed from 62.14% to -10.16% as of June 30, 2020 and 2021, respectively. The net pension (asset) liability was (\$6.03) million as of June 30, 2021 compared to a net pension liability of \$35.85 million as of June 30, 2020.

Deputy Sheriff Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 56	\$ 38	
Investments at Fair Value	314,634	239,120	
Receivables	978	1,048	
Total Assets	315,668	240,206	
Liabilities:			
Accrued Expenses	-	3	
Total Liabilities	-	3	
Total Net Position	\$ 315,668	\$ 240,203	

Deputy Sheriff Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 5,177	\$ 4,860	
Employer Contributions	7,213	6,861	
Investment Income	76,547	7,528	
Other Income and Transfers In	558	404	
Total Additions	89,495	19,653	
Deductions:			
Benefits	13,364	12,260	
Refunds and Transfers Out	530	716	
Administrative Expenses	136	133	
Total Deductions	14,030	13,109	
Change in Net Position	75,465	6,544	
Total Beginning Net Position	240,203	233,659	
Total Ending Net Position	\$ 315,668	\$ 240,203	

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

Judges' Retirement System (JRS)

The Judges' Retirement System (JRS) provides retirement benefits for judges and justices of the State of West Virginia who elect to participate in the retirement system. Employee and employer contributions and earnings on investments fund benefits of the system.

The net position restricted for pensions (total assets minus liabilities) of JRS at June 30, 2021 was approximately \$280.66 million, an increase of \$64.97 million (30.12%) from the plan net position restricted for pensions at June 30, 2020.

Additions to JRS' net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$1.18 million, an increase of \$89 thousand (8.15%) compared to fiscal year 2020. JRS reported net investment income of approximately \$68.61 million for fiscal year 2021, which was an increase of \$61.76 million (901.62%) from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from JRS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$4.81 million, a decrease of approximately \$87 thousand (-1.78%) from the prior year. The decrease in benefits is due to more retirees and/or beneficiaries becoming deceased during the fiscal year than began received retirement benefits during the fiscal year. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$10 thousand which was unchanged from fiscal year 2020.

Refunds and Transfers are the result of employees leaving public service and requesting the money they contributed plus interest into the system to be returned or transferring their service credit to/from another retirement system in which they are eligible. Refunds and Transfers were \$0 in fiscal year 2021 and 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability (asset) is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 185.11% on June 30, 2020 to 257.55% on June 30, 2021. The net pension asset as a percentage of covered payroll changed from -1,016.91% to -1,760.52% as of June 30, 2020 and 2021, respectively. The net pension asset was \$171.69 million as of June 30, 2021 compared to \$99.17 million as of June 30, 2020.

Judges' Retirement System		
Net Position		
June 30, (Dollars in Thousands)		
Assets:	2021	2020
Cash	\$ 3	\$ -
Investments at Fair Value	280,669	215,699
Total Assets	280,672	215,699
Liabilities:		
Accrued Expenses	12	11
Total Liabilities	12	11
Total Net Position	\$ 280,660	\$ 215,688

Judges' Retirement System		
Change in Net Position		
Fiscal Year Ended June 30, (Dollars in Thousands)		
Additions:	2021	2020
Employee Contributions	\$ 295	\$ 301
Employer Contributions	886	791
Investment Income	68,611	6,850
Total Additions	69,792	7,942
Deductions:		
Benefits	4,810	4,897
Refunds and Transfers	-	-
Administrative Expenses	10	10
Total Deductions	4,820	4,907
Change in Net Position	64,972	3,035
Total Beginning Net Position	215,688	212,653
Total Ending Net Position	\$ 280,660	\$ 215,688

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

Emergency Medical Services Retirement System (EMSRS)

The Emergency Medical Services Retirement System (EMSRS) was established to provide retirement benefits for emergency medical services officers employed by participating public employers who voluntarily elected to participate as of December 31, 2007, and to all emergency medical services officers hired into covered employment by participating public employers of EMSRS on or after January 1, 2008. Employee and employer contributions and earnings on investments fund benefits of the system.

The net position restricted for pensions (total assets minus liabilities) of EMSRS at June 30, 2021 was approximately \$119.22 million, an increase of \$30.22 million (33.95%) from the plan net position restricted for pensions at June 30, 2020.

Additions to EMSRS' net position restricted for pensions include employer and employee contributions and investment gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$6.37 million, an increase of \$756 thousand (13.48%) compared to fiscal year 2020. The increase in contributions is directly related to the increase in wages reported by the participating employers for covered employees. EMSRS reported net investment income of approximately \$28.64 million for fiscal year 2021, which was an increase of \$25.83 million (916.79%) from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from EMSRS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$3.75 million, an increase of approximately \$404 thousand (12.07%) from the prior year. The increase in benefits is due to the number of members retiring exceeding the number of those who became deceased. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$78 thousand, an increase of \$5 thousand (6.85%), from \$73 thousand in fiscal year 2020.

Refunds are the result of employees leaving public service and requesting the money they contributed plus interest into the system to be returned or transferring their service credit to another retirement system in which they are eligible. Refunds were approximately \$962 thousand in fiscal year 2021, a decrease of approximately \$7 thousand (-0.72%), from the approximately \$969 thousand in fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability (asset) is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension liability increased from 101.34% on June 30, 2020 to 117.92% on June 30, 2021. The net pension asset as a percentage of covered payroll changed from -4.43% to -61.63% as of June 30, 2020 and 2021, respectively. The net pension asset was \$18.12 million as of June 30, 2021 compared to an asset of \$1.18 million as of June 30, 2020.

Emergency Medical Services Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 10	\$ 1	
Investments at Fair Value	118,768	88,627	
Receivables	443	402	
Total Assets	119,221	89,030	
Liabilities:			
Accrued Expenses	-	25	
Total Liabilities	-	25	
Total Net Position	\$ 119,221	\$ 89,005	

Emergency Medical Services Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 2,842	\$ 2,531	
Employer Contributions	3,523	3,078	
Investment Income	28,643	2,817	
Total Additions	35,008	8,426	
Deductions:			
Benefits	3,752	3,348	
Refunds	962	969	
Administrative Expenses	78	73	
Total Deductions	4,792	4,390	
Change in Net Position	30,216	4,036	
Total Beginning Net Position	89,005	84,969	
Total Ending Net Position	\$ 119,221	\$ 89,005	

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Management's Discussion and Analysis

PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

Municipal Police Officers and Firefighters Retirement System (MPFRS)

The Municipal Police Officers and Firefighters Retirement System (MPFRS) was established to provide retirement benefits for all paid police officers and firefighters first employed in covered employment by a participating municipality or municipal subdivision after the date the municipality or municipal subdivision elected to join MPFRS and are required to be members of MPFRS as a condition of employment.

The net position restricted for pensions (total assets minus liabilities) of MPFRS at June 30, 2021 was approximately \$24.10 million, an increase of \$9.21 million (61.9%) from the plan net position restricted for pensions at June 30, 2020.

Additions to MPFRS' net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$4.29 million, an increase of \$856 thousand (24.90%) compared to fiscal year 2020. The increase in contributions is directly related to the increase in wages reported by the participating employers for covered employees. MPFRS reported net investment income of approximately \$5.2 million for fiscal year 2021, which was an increase of \$4.77 million (1,090.39%) from the from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from MPFRS net position restricted for pensions resulted from retirement and beneficiary benefits, administrative expenses, services transfers, and refunds to members terminating service. For fiscal year 2021, benefits were approximately \$41 thousand, an increase of approximately \$2 thousand (5.13%) from the prior year. The increase in benefits is the result of this relatively immaturity of the retirement system that have members to begin receiving benefits. For fiscal 2021, the administrative costs of administering the retirement system totaled approximately \$41 thousand, an increase of \$5 thousand (13.89%), from \$36 thousand in fiscal year 2020. The increase in the administrative expenses charged to the system is the result of an increase in the number of plan participants that the \$70 per member annual administrative charged is assessed.

Refunds are the result of employees leaving public service and requesting the money they contributed plus interest into the system to be returned or transferring their service credit to another retirement system in which they are eligible. Refunds were approximately \$273 thousand in fiscal year 2021, an increase of approximately \$64 thousand (30.62%), from the approximately \$209 thousand in fiscal year 2020.

Annually, an actuarial valuation of the system's assets and the net pension liability (asset) is performed. The most recent actuarial valuation, the fiduciary net position as a percentage of total pension asset increased from 172.43% on June 30, 2020 to 182.78% on June 30, 2021. The net pension asset as a percentage of covered payroll changed from -35.07% to -49.67% as of June 30, 2020 and 2021, respectively. The net pension asset was \$10.91 million as of June 30, 2021 compared to \$6.25 million as of June 30, 2020.

Municipal Police Officers & Firefighters Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 8	\$ 2	
Investments at Fair Value	23,817	14,667	
Receivables	273	220	
Total Assets	24,098	14,889	
Liabilities:			
Accrued Expenses	-	-	
Total Liabilities	-	-	
Total Net Position	\$ 24,098	\$ 14,889	

Municipal Police Officers & Firefighters Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 2,158	\$ 1,717	
Employer Contributions	2,136	1,721	
Investment Income	5,202	437	
Other Income	68	1	
Total Additions	9,564	3,876	
Deductions:			
Benefits	41	39	
Refunds	273	209	
Administrative Expenses	41	36	
Total Deductions	355	284	
Change in Net Position	9,209	3,592	
Total Beginning Net Position	14,889	11,297	
Total Ending Net Position	\$ 24,098	\$ 14,889	

West Virginia Consolidated Public Retirement Board

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PENSION TRUST FUNDS - DEFINED BENEFIT SYSTEMS (Continued)

Natural Resources Police Officers Retirement System (NRPORS)

The Natural Resources Police Officers Retirement System (NRPORS) was established to provide retirement and disability benefits for the Natural Resources Police Officers, who voluntarily elected to participate (i.e., transfer from PERS to NRPORS) as of January 2, 2021, and for all Natural Resources Police Officers hired into covered employment by the State of West Virginia on or after January 2, 2021. Employee and employer contributions and earnings on investments fund the benefits of the system. Approximately 116 Natural Resources Police Officers elected to transfer from PERS and as a result, approximately \$21.43 million of accumulated member and employer contributions and interest were transferred from PERS to NRPORS during fiscal year 2021, in accordance with West Virginia Code.

Natural Resources Police Officers Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 4	\$ -	
Investments at Fair Value	25,063	-	
Receivables	-	-	
Total Assets	25,067	-	
Liabilities:			
Accrued Expenses	54	-	
Total Liabilities	54	-	
Total Net Position	\$ 25,013	\$ -	

Natural Resources Police Officers Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 263	\$ -	
Employer Contributions	332	-	
Investment Income	2,996	-	
Other Income and Transfers In	21,432	-	
Total Additions	25,023	-	
Deductions:			
Benefits	-	-	
Refunds and Transfers Out	10	-	
Administrative Expenses	-	-	
Total Deductions	10	-	
Change in Net Position	25,013	-	
Total Beginning Net Position	-	-	
Total Ending Net Position	\$ 25,013	\$ -	

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

PENSION TRUST FUNDS – TEACHERS DEFINED CONTRIBUTION RETIREMENT SYSTEM

The Teachers' Defined Contribution Retirement System (TDC Plan) is a multiple employer governmental defined contribution money purchase pension plan, qualified under section 401(a) and made tax-deferred under section 414(h) of the Internal Revenue Code. The TDC Plan provides retirement benefits to full time employees of the State's 55 county public school systems, the State Department of Education, certain Higher Education employees and the Schools for the Deaf and Blind who were hired between July 1, 1991 and June 30, 2005 when the Plan closed for new membership. TDC Plan members may also include former TRS members, including Higher Education employees, who elected to transfer membership to the TDC Plan.

The net position restricted for pensions (total assets minus liabilities) of the TDC Plan at June 30, 2021 was approximately \$705.09 million, an increase of \$134.72 million (23.62%) from the plan net position restricted for pensions at June 30, 2020.

Additions to TDC Plan's net position restricted for pensions include employer and employee contributions and investments gains or losses. Contribution revenue for fiscal year 2021 totaled approximately \$16.29 million, an increase of \$103 thousand (0.64%) compared to fiscal year 2020. The TDC Plan reported net investment income of approximately \$141.74 million for fiscal year 2021, which was an increase of \$106.6 million (302.84%) from the fiscal year 2020. The system's investment returns were consistent with the overall market returns during the fiscal year.

Deductions from the TDC Plan net position restricted for pensions resulted from distributions to plan participants and administrative expenses. For fiscal year 2021, withdrawals, distributions, and forfeitures were approximately \$22.84 million, an increase of approximately \$5.37 million (30.72%) from the prior year. For fiscal 2021, the administrative costs of the TDC Plan totaled approximately \$465 thousand, a decrease of \$319 thousand (-40.69%), from \$784 thousand in fiscal year 2020. The decrease in administrative expense was caused by a reduction in the quarterly fee charged by the system's third-party administrator as a result of the routine contract procurement process.

The administrative costs of the TDC Plan are paid primarily from an administrative fee charged quarterly to each participant's account and revenue sharing from some investment funds. In addition to administrative fees, participants also pay investment fund operating expenses to the investment fund managers depending on the investment options selected by the participant. The TDC Plan's recordkeeper maintains an individual account for each TDC Plan participant to which employer contributions, employee deferrals, and other changes in value are credited.

During fiscal year 2021, it was determined that the liability for forfeitures as of June 30, 2020 was understated by approximately \$13.98 million. This correction related to activity that occurred prior to June 30, 2019, accordingly, the 2020 column in the following summary financial statements has been restated to reflect this correction.

Teachers' Defined Contribution Retirement System			
Net Position			
June 30, (Dollars in Thousands)			
Assets:	2021	2020	
Cash	\$ 15,698	\$ 3,047	
Investments at Fair Value	703,293	582,988	
Receivables	1,490	1,390	
Total Assets	720,481	587,425	
Liabilities:			
Accrued Expenses	15,395	17,059	
Total Liabilities	15,395	17,059	
Total Net Position	\$ 705,086	\$ 570,366	

Teachers' Defined Contribution Retirement System			
Change in Net Position			
Fiscal Year Ended June 30, (Dollars in Thousands)			
Additions:	2021	2020	
Employee Contributions	\$ 5,980	\$ 6,219	
Employer Contributions	10,307	9,965	
Investment Income	141,739	35,185	
Other Income	12	32	
Total Additions	158,038	51,401	
Deductions:			
Forfeitures	766	1,101	
Withdrawals and Distributions	22,072	16,370	
Transfers Out	15	-	
Administrative Expenses	465	784	
Total Deductions	23,318	18,255	
Change in Net Position	134,720	33,146	
Total Beginning Net Position	570,366	537,220	
Total Ending Net Position	\$ 705,086	\$ 570,366	

West Virginia Consolidated Public Retirement Board

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Management's Discussion and Analysis

ECONOMIC FACTORS, FUTURE FUNDING PROVISIONS, OVERALL OUTLOOK

The defined benefit retirement systems 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 COVID-19 pandemic resulted in significant turmoil in the capital markets in the second half of fiscal year. The defined benefit retirement systems had a weighted average return on investments of 13.91% to 32.13% which is significantly above the 7.25% long term expectation.

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.



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Statements of Fiduciary Net Position - Pension Funds
(In Thousands)
June 30, 2021

	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	Natural Resources Police Officers Retirement System	Teachers' Defined Contribution Retirement System	Total
ASSETS											
Cash	\$ 744	\$ 2,457	\$ 12	\$ 11	\$ 56	\$ 3	\$ 10	\$ 8	\$ 4	\$ 15,698	\$ 19,003
Investments at fair value:											
Mutual funds	-	-	-	-	-	-	-	-	-	398,720	398,720
Collective investment trusts	-	-	-	-	-	-	-	-	-	133,529	133,529
Guaranteed investment contract (contract value)	-	-	-	-	-	-	-	-	-	171,044	171,044
Domestic equity	341,413	381,614	32,539	11,510	12,113	10,830	4,567	878	944	-	796,408
International qualified	621,044	696,272	59,755	20,792	21,986	19,676	8,263	1,571	1,704	-	1,451,063
International equity	1,437,613	1,602,687	135,397	49,684	51,592	46,199	19,566	3,889	4,115	-	3,350,742
Private markets	2,341,875	2,619,894	224,878	79,519	83,256	74,354	31,488	6,165	6,591	-	5,468,020
Total return fixed income	860,124	953,290	80,271	29,691	31,074	27,516	11,687	2,267	2,435	-	1,998,355
Core fixed income	369,817	409,962	34,451	12,753	13,352	11,811	5,018	974	1,050	-	859,188
Hedge fund	804,530	899,252	76,959	27,171	28,651	25,588	10,804	2,052	2,244	-	1,877,251
Portable alpha	2,014,704	2,248,941	190,006	68,297	71,732	64,243	27,136	5,251	5,665	-	4,695,975
Short term fixed income	15,975	74,745	17,265	1,738	878	452	239	770	315	-	112,377
Total investments at fair value	8,807,095	9,886,657	851,521	301,155	314,634	280,669	118,768	23,817	25,063	703,293	21,312,672
Contributions receivable	4,193	24,697	-	-	715	-	443	269	-	938	31,255
Participants loans receivable	-	998	-	-	243	-	-	-	-	-	1,241
Miscellaneous revenue receivable	33	13	3	-	20	-	-	4	-	552	625
Total assets	8,812,065	9,914,822	851,536	301,166	315,668	280,672	119,221	24,098	25,067	720,481	21,364,796
LIABILITIES AND PLAN NET POSITION											
Liabilities:											
Accrued expenses and other payables	6,181	35	3	8	-	12	-	-	54	1,153	7,446
Forfeitures payable	-	-	-	-	-	-	-	-	-	14,242	14,242
Total liabilities	6,181	35	3	8	-	12	-	-	54	15,395	21,688
Net position restricted for pensions	\$ 8,805,884	\$ 9,914,787	\$ 851,533	\$ 301,158	\$ 315,668	\$ 280,660	\$ 119,221	\$ 24,098	\$ 25,013	\$ 705,086	\$ 21,343,108

The Accompanying Notes Are An Integral
Part Of These Financial Statements

West Virginia Consolidated Public Retirement Board
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Basic Financial Statements



West Virginia Consolidated Public Retirement Board
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Statements of Changes in Fiduciary Net Position - Pension Funds
(In Thousands)
Year Ended June 30, 2021

	Public Employees' Retirement System	Teachers' Retirement System	State Police 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	Natural Resources Police Officers Retirement System	Teachers' Defined Contribution Retirement System	Total
Additions:											
Contributions:											
Member contributions	\$ 78,762	\$ 97,258	\$ 34	\$ 4,185	\$ 5,177	\$ 295	\$ 2,842	\$ 2,158	\$ 263	\$ 5,980	\$ 196,954
Employer contributions	159,259	129,803	51	7,928	7,213	886	3,523	2,136	332	10,307	321,438
Other statutorily required contributions	-	267,531	-	-	-	-	-	-	-	-	267,531
Other contributions - appropriations	-	20,000	16,648	-	-	-	-	-	-	-	36,648
Total contributions	238,021	514,592	16,733	12,113	12,390	1,181	6,365	4,294	595	16,287	822,571
Investment income:											
Net increase in fair value of investments	2,191,064	2,453,030	210,638	72,848	77,289	69,274	28,923	5,257	3,025	17,455	5,128,803
Investment income	4	8	1	-	-	-	-	-	-	124,284	124,297
Less: Investment expenses	(20,775)	(23,227)	(1,983)	(710)	(742)	(663)	(280)	(55)	(29)	-	(48,464)
Net investment income	2,170,293	2,429,811	208,656	72,138	76,547	68,611	28,643	5,202	2,996	141,739	5,204,636
Transfers from plans	171	20	-	-	166	-	-	-	-	-	21,789
Other income	1,154	2,944	822	-	392	-	-	68	21,432	12	5,392
Total additions	2,409,639	2,947,367	226,211	84,251	89,495	69,792	35,008	9,564	25,023	158,038	6,054,388
Deductions and transfers:											
Benefit expenses	469,160	863,132	50,228	3,302	13,364	4,810	3,752	41	-	-	1,407,789
Forfeitures	-	-	-	-	-	-	-	-	-	766	766
Refunds of contributions/withdrawals	9,934	8,384	-	297	530	-	962	273	10	22,072	42,462
Transfers to plans	21,603	171	-	-	-	-	-	-	-	15	21,789
Administrative expenses	6,311	5,221	54	59	136	10	78	41	-	465	12,375
Total deductions and transfers	507,008	876,908	50,282	3,658	14,030	4,820	4,792	355	10	23,318	1,485,181
Net increase (decrease) in plan net position	1,902,631	2,070,459	175,929	80,593	75,465	64,972	30,216	9,209	25,013	134,720	4,569,207
Net position restricted for pensions:											
Beginning of year, as previously reported	6,903,253	7,844,328	675,604	220,565	240,203	215,688	89,005	14,889	-	584,349	16,787,884
Prior period adjustment	-	-	-	-	-	-	-	-	-	(13,983)	(13,983)
Beginning of year, as restated	6,903,253	7,844,328	675,604	220,565	240,203	215,688	89,005	14,889	-	570,366	16,773,901
End of year	\$ 8,805,884	\$ 9,914,787	\$ 851,533	\$ 301,158	\$ 315,668	\$ 280,660	\$ 119,221	\$ 24,098	\$ 25,013	\$ 705,086	\$ 21,343,108

The Accompanying Notes Are An Integral
Part Of These Financial Statements

West Virginia Consolidated Public Retirement Board
Financial Section
Basic Financial Statements



West Virginia Consolidated Public Retirement Board

Notes to the Financial Statements

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 systems. The nine retirement systems 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), Natural Resources Police Officers' Retirement System (NRPORS), and the Teachers' Defined Contribution Retirement System (TDCRS).

The Total Pension Funds column included in the statement of fiduciary net position and statement of changes in fiduciary net position is for informational purposes only. The assets of each system are only available to satisfy the obligations of that system. 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 systems, 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. System member contributions are recognized in the period when contributions are due. Employer contributions to the system 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 system. 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 system (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.

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

Investments - All defined benefit system 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 system's 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 system. 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 system 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 system. 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 systems.

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.

Allowance for Doubtful Accounts - The Board evaluates all receivables for collectability based on historical collectability 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.

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 systems 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 statement of fiduciary net position. Changes in the value of investment securities could affect the future funding status of the systems or require additional contributions to maintain the current funding status.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION

Membership in the systems consisted of the following as of July 1, 2020, the date of the annual actuarial valuation:

As of July 1, 2020:

	PERS	TRS	SPDDRS	SPRS	DSRS	JRS	EMSRS	MPFRS	NRPORS*
Retirees and beneficiaries									
currently receiving benefits	28,450	36,797	759	59	456	59	130	1	-
Terminated members entitled to benefits but not yet receiving them	4,918	3,038	3	17	119	2	70	6	-
Terminated nonvested members	21,013	5,192	1	134	275	-	299	149	-
Active members	35,781	34,753	4	626	1,086	77	611	436	115
Total	90,162	79,780	767	836	1,936	138	1,110	592	115

* As of January 2, 2021, which is the effective date of the system

Funding policies for all systems 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 West Virginia Legislature in determining contribution rates. The following information is provided for general information purposes only. System participants should refer to the respective West Virginia State Code section for more complete information.

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, 2021
West Virginia state agencies	121
Cities and towns	100
Counties	55
Special districts	358
Total	634

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 system to the West Virginia Legislature. In certain circumstances, this Article also permits members of TRS to transfer accumulated service credit and member contributions into PERS.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Public Employees' Retirement System (PERS) (continued)

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 rate was 10.0% of covered employees' annual earnings for fiscal years ending June 30, 2021. Contributions as a percentage of payroll for members are established by statutes, subject to legislative limitations and are not actuarially determined. Contributions as a percentage of payroll for employers are established by the Board. Employer contributions from State and non-State agencies for the fiscal years ended June 30, 2021, were (in thousands):

	2021
State	\$ 111,786
Non-State	47,473
Total	\$ 159,259

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, the State of West Virginia, participating in TRS as of June 30, 2021.

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 TDCRS to elect to transfer to 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 West Virginia 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.

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Teachers' Retirement System (TRS) (continued)

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 \$267,531,440 were made through the State's school aid formula during the years ended June 30, 2021. Certain additional contributions of approximately \$20,000,000 were made during the year ended June 30, 2021, representing extra appropriations to reduce the unfunded liability.

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 \$16,648,000 were made during the years ended June 30, 2021, 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. The employer contribution rate was 23.0% of covered employees' annual base salary for fiscal years ending June 30, 2021.

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 systems to the West Virginia Legislature.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

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, 2021.

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. Member has ceased covered employment has attained the age of 50 and completion of 20 or more years of service
4. Member has ceased covered employment has attained the age of 62 years and has completed five or more years of service

The annual regular retirement benefit is equal to 2.50% 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 system to the West Virginia 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 the year ended June 30, 2021. In addition, the Sheriff's Office/County Commissions contribute certain fees charged for reports and other services provided by the sheriff's offices.

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

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.

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 system to the West Virginia 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 West Virginia 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 West Virginia 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 Emergency Medical Services Retirement System (EMSRS) became effective January 1, 2008. There were 21 employers participating in EMSRS as of June 30, 2021.

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.

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Emergency Medical Services Retirement System (EMSRS) (continued)

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

Chapter 16, Article 5V of the West Virginia State Code assigns the authority to establish and amend the provisions of the plan to the West Virginia 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 system. The West Virginia Municipal Police Officers and Firefighters Retirement System Act was passed by the West Virginia 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. The MPFRS had 595 participating members as of June 30, 2021. 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 37 employers participating in MPFRS as of June 30, 2021.

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 West Virginia Legislature.

Contributions - Currently, the MPFRS employee and employer contribution rates are both 8.5% of gross monthly salary.

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

2 - PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION (Continued)

Natural Resources Police Officers Retirement System (NRPORS)

Plan Description - NRPORS, a single employer defined benefit public employee retirement system, was established for all natural resources police officers hired by the West Virginia Division of Natural Resources (DNR) on or after January 2, 2021. The NRPORS was also made available to any natural resources police officers employed in covered employment participating in PERS on the effective date so long as he/she made notification in writing before September 30, 2020, to both the DNR and the Board of his/her desire to transfer to the NRPORS. Approximately 115 natural resources police officers elected such transfer and as a result, approximately \$21,432,000 of accumulated member and employer contributions and interest were transferred from PERS to NRPORS in fiscal year 2021, in accordance with Chapter 20, Article 18 of the West Virginia State Code.

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

- Member has attained at least age 55 and completion of 15 years of service; or
- Member in covered employment, has attained the age of 55 years with age plus service equal to 70 or greater;
or
- Member has attained the age of 62 and completion of 10 or more years of service.

All members must have a minimum of 10 years of contributory service to qualify for a retirement benefit.

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.

Chapter 20, Article 18 of the West Virginia State Code assigns the authority to establish and amend the provisions of the system to the West Virginia Legislature.

Contributions - Members contribute 9.5% of monthly base salary, and the DNR as the employer, contribute an additional 12% of the member's monthly base salary during the year ended June 30, 2021.

Teachers' Defined Contribution Retirement System (TDCRS)

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.

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.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS

The total pension liabilities for financial reporting purposes were determined by actuarial valuations as of July 1, 2020 and rolled forward to June 30, 2021, using the actuarial assumptions and methods described in the *Actuarial Assumptions and Methods* section of this note.

Schedule of Net Pension Liability (Asset)

The schedules of net pension liability (asset) and changes in net pension liability (asset), 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, 2021, were as follows (in thousands):

As of June 30, 2021:	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability (Asset)	Net Position as a Percentage of the Total Pension Liability
PERS	\$ 7,927,948	\$ 8,805,884	\$ (877,936)	111.07%
TRS	11,477,566	9,914,787	1,562,779	86.38%
SPDDRS	801,319	851,533	(50,214)	106.27%
SPRS	286,528	301,158	(14,630)	105.11%
DSRS	309,642	315,668	(6,026)	101.95%
JRS	108,974	280,660	(171,686)	257.55%
EMSRS	101,106	119,221	(18,115)	117.92%
MPFRS	13,184	24,098	(10,914)	182.78%
NRPORS	28,440	25,013	3,427	87.95%

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 year ended June 30, 2021:

Asset Class	Target Allocation	Long-term Expected Rate of Return	Weighted Average Expected Real Rate of Return
Domestic Equity	27.50%	5.5%	1.51%
International Equity	27.50%	7.0%	1.93%
Fixed Income	15.00%	2.2%	0.33%
Real Estate	10.00%	6.6%	0.66%
Private Equity	10.00%	8.5%	0.85%
Hedge Funds	10.00%	4.0%	0.40%
Total	100.00%		5.68%
Inflation (CPI)			2.10%
			7.78%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Discount Rate

The discount rate used to measure the total pension liability was 7.5% for all defined benefit plans for fiscal years 2020. 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.

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 7.25% 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, 2021 (in thousands):

	Total Net Pension Liability (Asset)		
	1% Decrease (6.25%)	Current Discount Rate (7.25%)	1% Increase (8.25%)
As of June 30, 2021:			
PERS	\$ 10,032	\$ (877,936)	\$ (1,627,424)
TRS	2,761,538	1,562,779	544,130
SPDDRS	48,947	(50,214)	(131,798)
SPRS	33,508	(14,630)	(53,266)
DSRS	37,244	(6,026)	(41,689)
JRS	(159,610)	(171,686)	(181,951)
EMSRS	(3,387)	(18,115)	(30,067)
MPFRS	(7,351)	(10,914)	(13,595)
NRPORS	7,475	3,427	49

Annual Money-Weighted Rates of Return

The following table provides the annual money-weighted rates of return, net of investment expenses, for the year ending June 30, 2021, for each defined benefit pension system:

System	
PERS	32.02%
TRS	31.93%
SPDDRS	31.99%
SPRS	32.13%
DSRS	32.07%
JRS	32.09%
EMSRS	32.05%
MPFRS	31.86%
NRPORS	13.91% *

* From inception (January 2, 2021) to June 30, 2021

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods

Significant assumptions used in the actuarial valuations are as follows:

	<u>PERS</u>	<u>TRS</u>	<u>SPDDRS</u>
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	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	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2035	Through Fiscal Year 2034	Through Fiscal Year 2025
Actuarial assumptions:			
Investment rate of return	7.25%	7.25%	7.25%
Projected salary increases:			
State	2.75% - 5.55%	n/a	4.00%
Nonstate	3.60% - 6.75%	n/a	n/a
Educators	n/a	2.75% - 5.90%	n/a
Non-Educators	n/a	2.75% - 6.50%	n/a
Inflation rate	2.75%	2.75%	2.75%
Discount rate	7.25%	7.25%	7.25%
Mortality rates:			
Actives	100% of Pub-2010 General Employees table, below-median, headcount weighted, projected generationally with scale MP-2018	100% of Pub-2010 General Employees table, headcount weighted, projected generationally with scale MP-2019	100% of Pub-2010 Safety Employee table, amount-weighted, Scale MP-2020 fully generational
Retired healthy males	108% of Pub-2010 General Retiree Male table, below-median, headcount weighted, projected generationally with scale MP-2018	100% of Pub-2010 General Retiree Male table, headcount weighted, projected generationally with scale MP-2019	98% of Pub-2010 Safety Retiree Male table, amount weighted, Projected generationally with Scale MP-2020
Retired healthy females	122% of Pub-2010 General Retiree Female table, below-median, headcount weighted, projected generationally with scale MP-2018	112% of Pub-2010 General Retiree Female table, headcount weighted, projected generationally with scale MP-2019	98% of Pub-2010 Safety Retiree Female table, amount weighted, Projected generationally with Scale MP-2020
Disabled males	118% of Pub-2010 General / Teachers Disabled Male table, headcount weighted, projected generationally with scale MP-2018	107% of Pub-2010 General / Teacher Disabled Male table, headcount weighted, projected generationally with scale MP-2019	124% of Pub-2010 Safety Disabled Male table, amount weighted, Projected generationally with Scale MP-2020
Disabled females	117% of Pub-2010 General / Teachers Disabled Female table, headcount weighted, projected generationally with scale MP-2018	113% of Pub-2010 General / Teacher Disabled Female table, headcount weighted, projected generationally with scale MP-2019	100% of Pub-2010 Safety Disabled Female table, amount weighted, Projected generationally with Scale MP-2020
Withdrawal rates:			
State	2.28% - 45.63%	n/a	0.08% - 2.67%
Nonstate	2.50% - 35.88%	n/a	n/a
Educators	n/a	7.00% - 35.00%	n/a
Non-Educators	n/a	2.30% - 18.00%	n/a
Disability rates	0.005% - 0.540%	0.004% - 0.563%	0.03% - 0.40%
Retirement rates	12% - 100%	15% - 100%	25% - 100%
Date range in most recent experience study	2013-2018	2014 - 2019	2015 - 2020

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

	SPRS	DSRS	JRS
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	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	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2029	Through Fiscal Year 2029	n/a
Actuarial assumptions:			
Investment rate of return	7.25%	7.25%	7.25%
Projected salary increases:			
State	4.00%	n/a	4.25% - 5.00%
Nonstate	n/a	3.75% - 5.25%	n/a
Educators	n/a	n/a	n/a
Non-Educators	n/a	n/a	n/a
Inflation rate	2.75%	2.75%	2.75%
Discount rate	7.25%	7.25%	7.25%
Mortality rates:			
Actives	100% of Pub-2010 Safety Employee Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 Safety Employee Table, Amount-weighted, projected generationally with Scale MP-2020	n/a
Retired healthy males	98% of Pub-2010 Safety Retiree Male Table, Amount-weighted, projected generationally with Scale MP-2020	98% of Pub-2010 Safety Retiree Male Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 General Retiree Table, Above-median, amount weighted, Projected generationally with Scale MP-2020
Retired healthy females	99% of Pub-2010 Safety Retiree Female Table, Amount-weighted, projected generationally with Scale MP-2020	99% of Pub-2010 Safety Retiree Female Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 General Retiree Table, Above-median, amount weighted, Projected generationally with Scale MP-2020
Disabled males	124% of Pub-2010 Safety Disabled Male Table, Amount-weighted, projected generationally with Scale MP-2020	124% of Pub-2010 Safety Disabled Male Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 General / Teachers Disabled Table, Amount weighted, Projected generationally with Scale MP-2020
Disabled females	100% of Pub-2010 Safety Disabled Female Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 Safety Disabled Female Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 General / Teachers Disabled Table, Amount weighted, Projected generationally with Scale MP-2020
Withdrawal rates:			
State	0.28% - 6.84%	n/a	n/a
Nonstate	n/a	4.93% - 12.32%	n/a
Educators	n/a	n/a	n/a
Non-Educators	n/a	n/a	n/a
Disability rates	0.03% - 0.40%	0.03% - 0.50%	n/a
Retirement rates	20% - 100%	16% - 100%	5% - 100%
Date range in most recent experience study	2015 - 2020	2015 - 2020	2015 - 2020

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

3 - ACTUARIAL INFORMATION - DEFINED BENEFIT PLANS (Continued)

Actuarial Assumptions and Methods (continued)

	EMSRs	MPFRS	NRPORS
Actuarial cost method	Individual entry age normal cost with level percentage of payroll	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	Fair value
Amortization method	Level dollar, fixed period	Level dollar, fixed period	Level dollar, fixed period
Amortization period	Through Fiscal Year 2038	n/a	n/a
Actuarial assumptions:			
Investment rate of return	7.25%	7.25%	7.25%
Projected salary increases:			
State	n/a	n/a	4.25% - 5.75%
Nonstate	3.00% - 5.00%	3.25% - 4.75%	n/a
Educators	n/a	n/a	n/a
Non-Educators	n/a	n/a	n/a
Inflation rate	2.75%	2.75%	2.75%
Discount rate	7.25%	7.25%	7.25%
Mortality rates:			
Actives	100% of Pub-2010 Safety Employee Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 Safety Employee Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 Safety Employee Table, Amount-weighted, projected generationally with Scale MP-2020
Retired healthy males	98% of Pub-2010 Safety Retiree Male Table, Amount-weighted, projected generationally with Scale MP-2020	98% of Pub-2010 Safety Retiree Male Table, Amount-weighted, projected generationally with Scale MP-2020	98% of Pub-2010 Safety Retiree Male Table, Amount-weighted, projected generationally with Scale MP-2020
Retired healthy females	99% of Pub-2010 Safety Retiree Female Table, Amount-weighted, projected generationally with Scale MP-2020	99% of Pub-2010 Safety Retiree Female Table, Amount-weighted, projected generationally with Scale MP-2020	99% of Pub-2010 Safety Retiree Female Table, Amount-weighted, projected generationally with Scale MP-2020
Disabled males	124% of Pub-2010 Safety Disabled Male Table, Amount-weighted, projected generationally with Scale MP-2020	124% of Pub-2010 Safety Disabled Male Table, Amount-weighted, projected generationally with Scale MP-2020	124% of Pub-2010 Safety Disabled Male Table, Amount-weighted, projected generationally with Scale MP-2020
Disabled females	100% of Pub-2010 Safety Disabled Female Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 Safety Disabled Female Table, Amount-weighted, projected generationally with Scale MP-2020	100% of Pub-2010 Safety Disabled Female Table, Amount-weighted, projected generationally with Scale MP-2020
Withdrawal rates:			
State	n/a	n/a	2.00% - 6.16%
Nonstate	6.00% - 28.00%	3.00% - 21.00%	n/a
Educators	n/a	n/a	n/a
Non-Educators	n/a	n/a	n/a
Disability rates	0.03% - 0.40%	0.03% - 0.40%	0.03% - 0.40%
Retirement rates	25% - 100%	25% - 100%	20% - 100%
Date range in most recent experience study	2015 - 2020	2015 - 2020	2015 - 2020

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

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. |

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 administered defined benefit retirement systems, 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.

Mutual funds: Valued at the daily closing price as reported by the fund. Mutual funds held by the System 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 System 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.

WVIMB 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.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

4 - FAIR VALUE MEASUREMENTS (Continued)

The following is a summary of the investments held by WVIMB for each plan as of June 30, 2021 (in thousands) which are all measured at NAV and not within the fair value hierarchy:

	PERS	TRS	SPDDRS	SPRS	DSRS	JRS	EMSRS	MPFRS	NRPORS	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Portable Alpha	\$ 2,014,704	\$ 2,248,941	\$ 190,006	\$ 68,297	\$ 71,732	\$ 64,243	\$ 27,136	\$ 5,251	\$ 5,665	N/A	Daily	Daily
Non-Large Cap												
Domestic equity	341,413	381,614	32,539	11,510	12,113	10,830	4,567	878	944	N/A	Daily	Daily
International qualified	621,044	696,272	59,755	20,792	21,986	19,676	8,263	1,571	1,704	N/A	Daily	Daily
International equity	1,437,613	1,602,687	135,397	49,684	51,592	46,199	19,566	3,889	4,115	N/A	Daily	Daily
Private markets	2,341,875	2,619,894	224,878	79,519	83,256	74,354	31,488	6,165	6,591	N/A	Daily	Daily
Total return												
fixed income	860,124	953,290	80,271	29,691	31,074	27,516	11,687	2,267	2,435	N/A	Daily	Daily
Core fixed income	369,817	409,962	34,451	12,753	13,352	11,811	5,018	974	1,050	N/A	Daily	Daily
Hedge fund	804,530	899,252	76,959	27,171	28,651	25,588	10,804	2,052	2,244	N/A	Daily	Daily
Short-term												
fixed income	15,975	74,745	17,265	1,738	878	452	239	770	315	N/A	Daily	Daily
Total investments (a)	\$ 8,807,095	\$ 9,886,657	\$ 851,521	\$ 301,155	\$ 314,634	\$ 280,669	\$ 118,768	\$ 23,817	\$ 25,063			

(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, 2021. 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, 2021			
	Total	Level 1	Level 2	Level 3
Investments in the fair value hierarchy:				
Mutual funds	\$ 398,720	\$ 398,720	\$ -	\$ -
Total assets in the fair value hierarchy	\$ 398,720	\$ 398,720	\$ -	\$ -
Investments measured at net asset value:				
Collective investment trusts	133,529			
	133,529			
Investments at fair value	\$ 532,249			

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, 2021 (in thousands). There are no participant redemption restrictions for these investments.

	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Collective investment trusts funds(b)	\$ 133,529	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.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

The following information presents the disclosures for each pool as of June 30, 2021. For more information see WVIMB's website at www.wvimb.org. The investment risks for the various investments in which the plans participate are described below:

Portable Alpha

The Pool's objective is to exceed, net of external investment management fees, the S&P 500 Index over three- to five-year periods. The Pool has three main components: 1) a domestic large capitalization equity beta replication manager and the related margin account, 2) a portfolio of alternative risk premia funds, and 3) a domestic large capitalization equity index manager. Russell Investments Implementation Services, LLC (Russell) is the equity beta replication manager. Russell primarily trades S&P 500 futures contracts and invests the margin account in fixed income securities and a money market mutual fund. Albourne America, LLC has been retained by the IMB to provide consulting services for the portfolio of alternative risk premia funds. The remainder of the Pool's assets are invested in the BlackRock Equity Index Fund B (BlackRock). BlackRock uses a replication indexing approach to achieve investment results that correspond generally to the price and yield performance, before fees and expenses, of the S&P 500 Stock Index.

Credit Risk

The Pool is exposed to credit risk from its fixed income investments and money market mutual fund investment. The IMB limits the exposure to credit risk in the Pool by requiring securities purchased to have a minimum long-term rating of BBB (investment grade) and/or a short-term rating of A-2 (Tier-II). The IMB 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.

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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2021, the Pool held no securities that were subject to custodial credit risk. Investments in the commingled equity fund and money market mutual fund are not subject to custodial credit risk. 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 and money market mutual fund investment. As of June 30, 2021, the money market mutual fund has a weighted average maturity (WAM) of 41 days.

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 2,014,704	39.61%
Teachers' Retirement System	2,248,941	44.22%
State Police Death, Disability, and Retirement System	190,006	3.74%
State Police Retirement System	68,297	1.34%
Deputy Sheriff's Retirement System	71,732	1.41%
Judges' Retirement System	64,243	1.26%
Emergency Medical Services Retirement System	27,136	0.53%
Municipal Police Officers' and Firefighters' Retirement System	5,251	0.10%
Natural Resources Police Officers's Retirement System	5,665	0.11%
Total of Retirement Systems	4,695,975	92.33%
Other Participants	390,210	7.67%
Total	\$ 5,086,185	100.00%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Non-Large Cap Domestic Equity

The Pool's objective is to exceed, net of external investment management fees, the Russell 2500 Index over three- to five-year periods. Assets were managed by Westfield Capital Management for the entire fiscal year. Assets were managed by AJO Partners from July 1, 2020, until November 30, 2020, when they ceased trading client accounts in preparation to close the firm on December 31, 2020. Russell Implementation Services (Russell) was hired on a transition basis, effective December 1, 2020, until a long-term replacement could be found. In June 2021, the WVIMB signed a contract with Cooper Creek Partners Management LLC (Cooper Creek) as the long-term replacement for AJO Partners, with an effective date of July 1, 2021. During June 2021, Russell traded their investment portfolio in line with the Cooper Creek target portfolio.

Credit Risk

The Pool's money market mutual fund investment and the Cash Collateral Account are exposed to credit risk. The money market mutual fund has the highest credit rating. The Cash Collateral Account is not rated.

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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2021, the Pool held no securities that were subject to custodial credit risk. 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. The money market mutual fund, the Cash Collateral Account, and the comingled equity fund are not subject to custodial credit risk. 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 the Cash Collateral Account. As of June 30, 2021, the money market mutual fund's weighted average maturity (WAM) was 41 days. Except for repurchase agreements that can have up to 95 days to maturity, investments in the Cash Collateral Account are limited to overnight investments. As of June 30, 2021, the WAM for the Cash Collateral Account was 1 day.

Foreign Currency Risk

The Pool is exposed to foreign currency risk through a foreign common stock denominated in Canadian Dollars with a fair value, in U.S. dollars, of \$6,561 as of June 30, 2021. The remaining foreign common stock investments as of June 30, 2021 are denominated in U.S. dollars.

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 341,413	36.84%
Teachers' Retirement System	381,614	41.18%
State Police Death, Disability, and Retirement System	32,539	3.51%
State Police Retirement System	11,510	1.24%
Deputy Sheriff's Retirement System	12,113	1.31%
Judges' Retirement System	10,830	1.17%
Emergency Medical Services Retirement System	4,567	0.49%
Municipal Police Officers' and Firefighters' Retirement System	878	0.09%
Natural Resources Police Officers's Retirement System	944	0.10%
Total of Retirement Systems	796,408	85.94%
Other Participants	130,246	14.06%
Total	\$ 926,654	100.00%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

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.

The Pool invests in a collective trust fund that invests in equities denominated in foreign currencies. The value of this investment at June 30, 2021, was \$1,451,771. 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.

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 621,044	42.78%
Teachers' Retirement System	696,272	47.96%
State Police Death, Disability, and Retirement System	59,755	4.12%
State Police Retirement System	20,792	1.43%
Deputy Sheriff's Retirement System	21,986	1.51%
Judges' Retirement System	19,676	1.36%
Emergency Medical Services Retirement System	8,263	0.57%
Municipal Police Officers' and Firefighters' Retirement System	1,571	0.11%
Natural Resources Police Officers's Retirement System	1,704	0.12%
Total of Retirement Systems	1,451,063	99.95%
Other Participants	708	0.05%
Total	\$ 1,451,771	100.00%

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 County 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, Allianz Global Investors, Axiom International Investors, LLC, Brandes Investment Partners, L.P., LSV Asset Management, and Oberweis Asset Management, Inc.

Credit Risk

The Pool's money market mutual fund investment and the Cash Collateral Account are exposed to credit risk. The money market mutual fund has the highest credit rating. The Cash Collateral Account is not rated.

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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2021, the Pool held no securities that were subject to custodial credit risk. 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. The money market mutual fund, the Cash Collateral Account, and the comingled equity fund are not subject to custodial credit risk. All remaining securities are held by the WVIMB's custodian in the name of the WVIMB.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

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 the Cash Collateral Account. As of June 30, 2021, the money market mutual fund's weighted average maturity (WAM) was 41 days. Except for repurchase agreements that can have up to 95 days to maturity, investments in the Cash Collateral Account are limited to overnight investments. As of June 30, 2021, the WAM for the Cash Collateral Account was 1 day.

Foreign Currency Risk

The Pool has equity investments, cash, and foreign currency spot contracts that are exposed to foreign currency risks. The amounts at fair value (in U.S. dollars) of equity investments, cash, and foreign currency spot contracts as of June 30, 2021 are as follows (in thousands):

Currency	Equity Investments	Cash	Foreign Currency Spot Contracts	Total
Australian Dollar	\$ 104,378	\$ 30	\$ -	\$ 104,408
Brazil Real	70,455	233	-	70,688
British Pound	268,235	179	-	268,414
Canadian Dollar	140,558	120	-	140,678
Chilean Peso	4,312	-	-	4,312
Chinese Yuan	65,675	2,068	-	67,743
Danish Krone	17,419	5	-	17,424
Emirati Dirham	5,243	-	-	5,243
Euro Currency Unit	467,252	172	-	467,424
Hong Kong Dollar	405,762	1,167	-	406,929
Hungarian Forint	15,976	166	-	16,142
Indian Rupee	115,465	5,632	-	121,097
Indonesian Rupiah	33,103	1	1	33,105
Israeli Shekel	542	(1)	-	541
Japanese Yen	383,698	1,535	-	385,233
Malaysian Ringgit	10,160	1	-	10,161
Mexican Peso	54,171	11	-	54,182
New Taiwan Dollar	177,597	32	-	177,629
New Zealand Dollar	384	35	-	419
Norwegian Krone	34,169	14	-	34,183
Philippine Peso	5,102	4	-	5,106
Polish Zloty	3,913	15	-	3,928
Qatari Riyal	159	11	-	170
Singapore Dollar	25,575	160	-	25,735
South African Rand	18,783	7	-	18,790
South Korean Won	258,055	-	(5)	258,050
Swedish Krona	100,537	33	-	100,570
Swiss Franc	101,305	52	-	101,357
Thailand Baht	42,631	9	-	42,640
Turkish Lira	4,720	108	-	4,828
Total	\$ 2,935,334	\$ 11,799	\$ (4)	\$ 2,947,129

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 \$877,326,000.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

International Equity (continued)

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 1,437,613	36.74%
Teachers' Retirement System	1,602,687	40.96%
State Police Death, Disability, and Retirement System	135,397	3.46%
State Police Retirement System	49,684	1.27%
Deputy Sheriff's Retirement System	51,592	1.32%
Judges' Retirement System	46,199	1.18%
Emergency Medical Services Retirement System	19,566	0.50%
Municipal Police Officers' and Firefighters' Retirement System	3,889	0.10%
Natural Resources Police Officers's Retirement System	4,115	0.11%
Total of Retirement Systems	3,350,742	85.64%
Other Participants	562,388	14.36%
Total	\$ 3,913,130	100.00%

Short-Term Fixed Income

The main objective of the Pool is to maintain sufficient liquidity to meet the daily disbursements requested by participants and to invest any contributions until the time the money is transferred to other WVIMB operated investment pools without sustaining capital losses while earning a small return above inflation. The Pool's benchmark, net of external investment management fees, is the FTSE 3 Month US T-Bill Index. JP Morgan Investment Advisors, Inc. manages the Pool.

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 10 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, 2021.

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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2021, 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.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Short-Term Fixed Income (continued)

Interest Rate Risk

The Pool is exposed to interest rate risk from its fixed income investments and money market mutual fund investments. The IMB monitors interest rate risk of the Pool by limiting the weighted average maturity (WAM) of the investments of the Pool to 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, 2021:

Investment Type	WAM (days)	Carrying Value
Commerical paper	55	\$ 26,920
Money market mutual fund	1	39,753
Repurchase agreements	1	47,669
U.S. Treasury bills	44	102,887
Total investments	28	\$ 217,229

Foreign currency risk

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

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 15,975	8.31%
Teachers' Retirement System	74,745	38.88%
State Police Death, Disability, and Retirement System	17,265	8.98%
State Police Retirement System	1,738	0.90%
Deputy Sheriff's Retirement System	878	0.46%
Judges' Retirement System	452	0.24%
Emergency Medical Services Retirement System	239	0.12%
Municipal Police Officers' and Firefighters' Retirement System	770	0.40%
Natural Resources Police Officers's Retirement System	315	0.16%
Total of Retirement Systems	112,377	58.45%
Other Participants	79,845	41.55%
Total	\$ 192,222	100.00%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Total Return Fixed Income

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

Credit Risk

The Pool is exposed to credit risk from its fixed income investments, money market mutual fund investment, and Cash Collateral Account investment. 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, 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 Cash Collateral Account is not rated. The following table provides credit ratings for the Pool's fixed income investments as of June 30, 2021 (in thousands):

Rating	Fair Value
AAA	\$ 15,315
AA	1,231,457
A	98,223
BBB	580,929
BB	388,622
B	360,429
CCC	24,868
CC	4,947
D	3,992
Withdrawn	701
Not rated	82,383
Total fixed income investments	\$ 2,791,866

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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2021, except for posted collateral on cleared derivatives and over-the-counter derivative instruments, 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 for U.S. Dollar denominated loans and 105 percent for foreign denominated loans, and the collateral is held by the IMB's custodian in the name of the IMB. Investments in commingled debt funds, money market mutual funds, and the Cash Collateral Account are not subject to custodial credit risk. 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 Cash Collateral Account investment. As of June 30, 2021, the money market mutual fund has a weighted average maturity (WAM) of 41 days. Except for repurchase agreements that can have up to 95 days to maturity, investments in the Cash Collateral Account are limited to overnight investments. As of June 30, 2021, the WAM for the Cash Collateral Account was 1 day.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Total Return Fixed Income (Continued)

The IMB monitors interest rate risk of the Pool by evaluating the effective duration of the investments in the Pool. Effective duration is a method of disclosing interest rate risk that measures the expected change in the price of a fixed income security for a 1 percent change in interest rates. The effective duration calculation takes into account the most likely timing of variable cash flows, which is particularly useful for measuring interest rate risk of callable bonds, commercial and residential mortgage-backed securities, asset-backed securities, and collateralized mortgage obligations. The following table provides the weighted average effective duration for the various asset types in the Pool as of June 30, 2021 (in thousands):

Investment Type	Fair Value	Effective Duration (years)
Commingled debt funds	\$ 415,969	2.7
Corporate asset-backed issues	88,145	0.9
Corporate CMO	68,170	1.3
Corporate CMO interest only	6	0.0
Foreign asset-backed issues	45,895	0.5
Foreign corporate bonds	294,249	5.5
Foreign government bonds	331,607	6.7
Municipal bonds	28,917	8.8
U.S. corporate bonds	406,148	8.4
U.S. Government agency bonds	170	0.3
U.S. Government agency CMO	62,411	1.3
U.S. Government agency CMO interest-only	5,866	3.5
U.S. Government agency MBS	379,822	4.1
U. S. Government agency TBA	62,580	4.3
U.S. Treasury bonds	601,911	11.9
Total fixed income investments	\$ 2,791,866	

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, 2021, the Pool held \$712,895 of these securities. This represents approximately 26 percent of the value of the Pool's fixed income securities.

Foreign Currency Risk

The Pool has foreign fixed income, foreign equity investments, and cash that is denominated in foreign currencies and exposed to foreign currency risks. Foreign denominated derivative investments are disclosed in Note 4. Additionally, the Pool has indirect exposure to foreign currency risk through its ownership interests in certain of the commingled debt funds. Approximately \$82,977, or 20 percent, of the commingled debt funds hold substantially all of their investments in securities denominated in foreign currencies. This represents approximately 3 percent of the value of the Pool's fixed income securities.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

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, 2021, are as follows (in thousands):

Currency	Foreign Fixed Income	Common Stock	Cash	Total
Argentine Peso	\$ 3,547	\$ -	\$ 1,420	\$ 4,967
Australian Dollar	-	-	2,751	2,751
Belarusian Ruble	1,638	-	-	1,638
Brazil Real	22,293	-	698	22,991
British Pound	-	739	3,065	3,804
Canadian Dollar	-	-	1,105	1,105
Colombian Peso	4,703	-	-	4,703
Deutsche Mark	230	-	-	230
Dominican Peso	4,018	-	-	4,018
Egyptian Pound	3,039	-	-	3,039
Euro Currency Unit	8,685	-	6,776	15,461
Georgia Lari	2,275	-	-	2,275
Ghana Cedi	2,327	-	-	2,327
Indonesian Rupiah	21,388	-	-	21,388
Japanese Yen	5,292	-	4,620	9,912
Kazakhstani Tenge	3,311	-	9	3,320
Kenyan Shilling	3,347	-	-	3,347
Mexican Peso	63,982	-	593	64,575
New Zealand Dollar	-	-	823	823
Peruvian Nuevo Sol	146	-	-	146
Russian Ruble	75,397	-	-	75,397
South African Rand	13,536	-	-	13,536
Swedish Krona	-	-	515	515
Turkish Lira	3,106	-	-	3,106
Uruguayan Peso	6,875	-	-	6,875
Uzbekistan Som	995	-	-	995
Total foreign denominated investments	\$ 250,130	\$ 739	\$ 22,375	\$ 273,244

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 \$418,608,000.

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 860,124	28.06%
Teachers' Retirement System	953,290	31.10%
State Police Death, Disability, and Retirement System	80,271	2.62%
State Police Retirement System	29,691	0.97%
Deputy Sheriff's Retirement System	31,074	1.01%
Judges' Retirement System	27,516	0.90%
Emergency Medical Services Retirement System	11,687	0.38%
Municipal Police Officers' and Firefighters' Retirement System	2,267	0.07%
Natural Resources Police Officers's Retirement System	2,435	0.08%
Total of Retirement Systems	1,998,355	65.19%
Other Participants	1,066,448	34.79%
Total	\$ 3,064,803	99.98%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Core Fixed Income

The main objective of the Pool is to generate investment income, provide stability, and enhance diversification but not at the expense of total return. The Pool's investment objective is to outperform the Bloomberg Barclays U.S. Aggregate Bond Index over three- to five-year periods, net of external investment management fees. JP Morgan Investment Advisors, Inc. manages this Pool.

Credit Risk

The Pool is exposed to credit risk from its fixed income investments, money market mutual fund investment, and Cash Collateral Account investment. 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, 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 Cash Collateral Account is not rated. The following table provides credit ratings for the Pool's fixed income investments as of June 30, 2021 (in thousands):

Rating	Fair Value
AAA	\$ 39,264
AA	616,520
A	111,180
BBB	328,988
BB	21,582
B	869
CCC	172
D	57
Withdrawn	13,036
Not rated	106,192
Total fixed income investments	\$ 1,237,860

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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Custodial Credit Risk

At June 30, 2021, the Pool held no securities that were subject to custodial credit risk. 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. The money market mutual fund and the Cash Collateral Account are not subject to custodial credit risk. 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 Cash Collateral Account investment. As of June 30, 2021, the money market mutual fund has a weighted average maturity (WAM) of 41 days. Except for repurchase agreements that can have up to 95 days to maturity, investments in the Cash Collateral Account are limited to overnight investments. As of June 30, 2021, the WAM for the Cash Collateral Account was 1 day.

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, 2021 (in thousands):

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Core Fixed Income (continued)

Investment Type	Fair Value	Effective Duration (years)
Corporate asset-backed issues	\$ 122,533	2.5
Corporate CMO	96,489	2.4
Corporate CMO interest-only	197	(1.7)
Corporate CMO principal-only	47	3.0
Foreign asset-backed issues	3,508	1.1
Foreign corporate bonds	116,081	6.2
Foreign government bonds	6,606	11.8
Municipal bonds	12,058	13.8
U.S. corporate bonds	295,067	8.4
U.S. Government agency CMO	108,672	3.8
U.S. Government agency CMO interest-only	3,402	6.2
U.S. Government agency CMO principal-only	3,225	5.5
U.S. Government agency MBS	175,912	4.4
U.S. Government agency TBAs	32,366	4.2
U.S. Treasury bonds	261,215	8.7
U.S. Treasury inflation protected security	482	0.5
Total fixed income investments	\$ 1,237,860	

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, 2021, the Pool held \$546,351,000 of these securities. This represents approximately 44 percent of the value of the Pool's fixed income securities.

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 369,817	28.11%
Teachers' Retirement System	409,962	31.16%
State Police Death, Disability, and Retirement System	34,451	2.62%
State Police Retirement System	12,753	0.97%
Deputy Sheriff's Retirement System	13,352	1.01%
Judges' Retirement System	11,811	0.90%
Emergency Medical Services Retirement System	5,018	0.38%
Municipal Police Officers' and Firefighters' Retirement System	974	0.07%
Natural Resources Police Officers's Retirement System	1,050	0.08%
Total of Retirement Systems	859,188	65.30%
Other Participants	456,639	34.70%
Total	\$ 1,315,827	100.00%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

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. The Pool primarily holds the WVIMB's investments in private credit & income funds, private equity funds, real estate investment trusts (REITs), and real estate limited partnerships and funds. Franklin Park, StepStone Group LP, and Verus have been retained by the WVIMB to provide consulting services related to the selection of limited partnerships and funds. Publicly traded assets are managed by CBRE Clarion Securities LLC and Security Capital Research & Management Inc.

Credit Risk

The Pool is exposed to credit risk from its fixed income investments, money market mutual fund investment, investments in unrated private credit & income funds, and the Cash Collateral Account. The IWVMB 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. The Cash Collateral Account is not rated. Credit risk associated with the unrated private credit & income funds are limited by requiring that underlying fund holdings are at least 90 percent collateralized by one or more assets of the borrower.

The following table provides credit ratings for the Pool's fixed income investments as of June 30, 2021:

Rating	Fair Value
A	\$ 334
BBB	12,582
BB	351
Total fixed income investments	\$ 13,267

Concentration of Credit Risk

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

Custodial Credit Risk

At June 30, 2021, the Pool held no securities that were directly subject to custodial credit risk. 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.

Interest Rate Risk

The Pool is exposed to interest rate risk through its investments in U.S. corporate bonds, opportunistic income funds 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, 2021, the effective duration for U.S. corporate bonds was 5.5 years. The WVIMB manages interest rate risk of the private credit & income funds by investing primarily in funds that originate or invest in loans that have a variable or floating interest rates, most of these investments have relatively short durations, and final maturities within three- to five-years. As of June 30, 2021, the money market mutual fund has a weighted average maturity (WAM) of 41 days. The WAM for securities lending collateral investments is not to exceed 90 days. As of June 30, 2021, the WAM for securities lending collateral was 1 day.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Private Markets Pool (continued)

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 credit & income funds and private equity partnerships 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, 2021, are as follows:

Currency	Foreign Common Stock	Real Estate Limited Partnerships and Funds	Cash	Total
Australian Dollar	\$ 5,212	\$ -	\$ -	\$ 5,212
British Pound	4,961	-	-	4,961
Canadian Dollar	1,949	41,385	-	43,334
Euro Currency Unit	10,311	138,485	-	148,796
Hong Kong Dollar	6,273	-	-	6,273
Japanese Yen	10,605	-	13	10,618
Singapore Dollar	3,103	-	-	3,103
Swedish Krona	2,285	-	-	2,285
Total foreign denominated investments	44,699	179,870	13	224,582
U.S. Dollar	3,417	1,776,105	-	1,779,522
Total	\$ 48,116	\$ 1,955,975	\$ 13	\$ 2,004,104

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021:

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 2,341,875	39.55%
Teachers' Retirement System	2,619,894	44.25%
State Police Death, Disability, and Retirement System	224,878	3.80%
State Police Retirement System	79,519	1.34%
Deputy Sheriff's Retirement System	83,256	1.41%
Judges' Retirement System	74,354	1.26%
Emergency Medical Services Retirement System	31,488	0.53%
Municipal Police Officers' and Firefighters' Retirement System	6,165	0.10%
Natural Resources Police Officers's Retirement System	6,591	0.11%
Total of Retirement Systems	5,468,020	92.35%
Other Participants	452,724	7.65%
Total	\$ 5,920,744	100.00%

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

5 - INVESTMENTS (Continued)

Hedge Fund

The Pool was established to hold the WVIMB's investments in hedge funds. The objective of the Pool is to reduce risk through diversification of participants' assets. The primary performance benchmark is the Hedge Funds Research, Inc. Fund of Funds Composite Index plus 100 Basis points. The secondary benchmark is the FTSE 3 Month US T-Bill Index plus 500 basis points. Albourne America, LLC has been retained by the IMB to provide consulting services for this investment strategy.

The Pool holds shares in hedge funds and shares of a money market mutual fund. As of June 30, 2021, the money market mutual fund has the highest credit rating and has a weighted average maturity of 41 days. 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, 2021, the Pool was in compliance with this restriction and is not exposed to concentration of credit risk.

Participation Schedule

This pool is participated in by entities other than the retirement systems administered by the WVCPRB. The disclosures for this pool represent the pool, as a whole. The following schedule provides the values of the WVCPRB's administered retirement systems' participation in the Pool at June 30, 2021 (in thousands):

Participant	Account Value	Percentage of Total
Public Employees' Retirement System	\$ 804,530	33.48%
Teachers' Retirement System	899,252	37.42%
State Police Death, Disability, and Retirement System	76,959	3.20%
State Police Retirement System	27,171	1.13%
Deputy Sheriff's Retirement System	28,651	1.19%
Judges' Retirement System	25,588	1.06%
Emergency Medical Services Retirement System	10,804	0.45%
Municipal Police Officers' and Firefighters' Retirement System	2,052	0.09%
Natural Resources Police Officers's Retirement System	2,244	0.09%
Total of Retirement Systems	1,877,251	78.11%
Other Participants	525,802	21.89%
Total	\$ 2,403,053	100.00%

Investments and Deposits - TDCRS

Concentration of Credit Risk

As of June 30, 2021, the TDCRS has investment balances with the following issuers which were greater than 5% of the total investment balance of the TDCRS (in thousands):

VALIC Fixed Annuity Option	\$ 171,044
T. Rowe Price Blue Chip Growth	120,333
Vanguard Large Cap Index	67,758
Putnam Large Cap Value Y	61,212
Great West Secure Foundation Balanced	44,872
Western Asset Core Plus Bond A	35,647
Other (less than 5% individually)	202,427
	\$ 703,293

Investments and Deposits – TDCRS (continued)

Concentration of Credit Risk - Cash Deposits

At June 30, 2021, TDCRS had \$15,420,000 on deposit with the West Virginia State Treasurer's Office and \$278,000 in depository accounts with financial institutions. The deposits with financial institutions, which had a bank balance of \$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, 2021, all of TDCRS' investments had a maturity date less than one year.

West Virginia Consolidated Public Retirement Board
Notes to the Financial Statements (Continued)

6 - INVESTMENT CONTRACT WITH INSURANCE COMPANY

The TDCRS 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 TDCRS. 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 TDCRS. 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 on June 30, 2021, was \$171,044,000.

7 - 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.

8 - 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.

9 - NEW ACCOUNTING PRONOUNCEMENTS

Recent Statements Issued by the Governmental Accounting Standards Board

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 2022 (as extended by one year by GASB Statement No. 95), 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 2021 (as extended by one year by GASB Statement No. 95), and management has not yet determined the financial statement impact of the pronouncement.

West Virginia Consolidated Public Retirement Board Notes to the Financial Statements (Continued)

9 - NEW ACCOUNTING PRONOUNCEMENTS (Continued)

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

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 2022 (as extended by one year by GASB Statement No. 95), and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 92, *Omnibus 2020*, to enhance comparability in accounting and financial reporting and to improve the consistency of authoritative literature by addressing practice issues that have been identified during implementation and application of certain GASB Statements. This statement is effective for fiscal year 2022 (as extended by one year by GASB Statement No. 95), and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 93, *Replacement of Interbank Offered Rates*, to provide guidance to address the accounting and financial reporting implications that result from the replacement of an interbank offered rate. As a result of global reference rate reform, the London Interbank Offered Rate (LIBOR) is expected to cease to exist in its current form at the end of 2021, prompting governments to amend or replace financial instruments for the purpose of replacing LIBOR with other reference rates, by either changing the reference rate or adding or changing fallback provisions related to the reference rate. This statement is effective for fiscal year 2022 (as extended by one year by GASB Statement No. 95), and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 94, *Public-Private and Public-Public Partnerships and Availability Payment Arrangements*, to improve financial reporting by addressing issues related to public-private and public-public partnership arrangements. This statement is effective for fiscal year 2023, and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 96, *Subscription-Based Information Technology Arrangements*, to provide guidance on the accounting and financial reporting for subscription-based information technology arrangements for government end users. This statement is effective for fiscal year 2023, and management has not yet determined the financial statement impact of the pronouncement.

The GASB issued Statement No. 97, *Certain Component Unit Criteria, and Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans*, to (1) increase consistency and comparability related to the reporting of fiduciary component units in circumstances in which a potential component unit does not have a governing board and the primary government performs the duties that a governing board typically would perform; (2) mitigate costs associated with the reporting of certain defined contribution pension plans, defined contribution other postemployment benefit (OPEB) plans, and employee benefit plans other than pension plans or OPEB plans (other employee benefit plans) as fiduciary component units in fiduciary fund financial statements; and (3) enhance the relevance, consistency, and comparability of the accounting and financial reporting for Internal Revenue Code (IRC) Section 457 deferred compensation plans (Section 457 plans) that meet the definition of a pension plan and for benefits provided through those plans. This statement is effective for fiscal year 2022, and management has not yet determined the financial statement impact of the pronouncement.

10 – PRIOR PERIOD RESTATEMENT – TEACHERS DEFINED CONTRIBUTION RETIREMENT SYSTEM (TDCRS)

The Board has restated the net position, restricted for pensions of the TDCRS as of June 30, 2020, to record forfeitures activity, which was not reported in accordance with GAAP. As a result, beginning net position has been decreased by \$13,982,517 to \$570,366,000.

REQUIRED SUPPLEMENTARY INFORMATION

West Virginia Consolidated Public Retirement Board
Financial Section
Required Supplementary Information



West Virginia Consolidated Public Retirement Board
Financial Section
Required Supplementary Information

SCHEDULES OF NET PENSION LIABILITY AND CHANGES IN NET PENSION LIABILITY

(In Thousands)

Fiscal years Ending June 30

	PERS									
	2021	2020	2019	2018	2017	2016	2015	2014		
Total pension liability:										
Service cost	\$ 130,480	\$ 123,401	\$ 121,228	\$ 124,019	\$ 124,129	\$ 123,073	\$ 137,207	\$ 132,500		
Interest	549,214	527,407	519,350	504,275	490,075	475,335	456,022	440,022		
Differences between actual and expected experience	80,207	104,199	(26,020)	16,954	(1,271)	674	152,277	-		
Change in benefit terms	(20,850)	-	2,500	-	-	-	-	-		
Assumption changes	236,067	-	(55,650)	-	-	-	(89,556)	-		
Benefit payments	(479,094)	(463,550)	(448,747)	(434,184)	(412,779)	(394,454)	(374,164)	(353,611)		
Net change in total pension liability	496,024	291,457	112,661	211,064	200,154	204,628	281,786	218,911		
Total pension liability, beginning	7,431,924	7,140,467	7,027,806	6,816,742	6,616,588	6,411,960	6,130,174	5,911,263		
Total pension liability, ending (a)	7,927,948	7,431,924	7,140,467	7,027,806	6,816,742	6,616,588	6,411,960	6,130,174		
Plan fiduciary net position:										
Contributions - employer	159,259	155,230	147,031	152,541	165,676	186,867	189,947	194,728		
Contributions - member	78,762	75,857	70,357	65,150	64,599	62,982	61,838	60,899		
Net investment income	2,170,293	215,355	393,179	606,303	875,090	(6,827)	219,329	864,023		
Benefit payments	(479,094)	(463,550)	(448,747)	(434,184)	(412,779)	(394,454)	(374,164)	(353,611)		
Administrative expense	(6,311)	(6,186)	(6,915)	(6,850)	(4,989)	(4,887)	(4,785)	(4,695)		
Other	(20,278)	1,093	995	1,497	120	142	282	132		
Net change in plan fiduciary net position	1,902,631	(22,201)	155,900	384,457	687,717	(156,177)	92,447	761,476		
Plan fiduciary net position, beginning	6,903,253	6,925,454	6,769,554	6,385,097	5,697,470	5,853,556	5,761,109	4,999,633		
Prior period adjustment	-	-	-	-	(90)	91	-	-		
Plan fiduciary net position, beginning, as restated	6,903,253	6,925,454	6,769,554	6,385,097	5,697,380	5,853,647	5,761,109	4,999,633		
Plan fiduciary net position, ending (b)	8,805,884	6,903,253	6,925,454	6,769,554	6,385,097	5,697,470	5,853,556	5,761,109		
Net pension liability, ending (a) - (b)	\$ (877,936)	\$ 528,671	\$ 215,013	\$ 258,252	\$ 431,645	\$ 919,118	\$ 558,404	\$ 369,065		
Plan fiduciary net position as a percentage of total pension liability	111.07%	92.89%	96.99%	96.33%	93.67%	86.11%	91.29%	93.98%		
Covered payroll	1,574,183	1,497,636	1,388,662	1,430,577	1,414,584	1,392,113	1,373,129	1,389,850		
Net pension liability as a percentage of covered payroll	-55.77%	35.30%	15.48%	18.05%	30.51%	66.02%	40.67%	26.55%		

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

West Virginia Consolidated Public Retirement Board
 Financial Section
 Required Supplementary Information

SCHEDULES OF NET PENSION LIABILITY AND CHANGES IN NET PENSION LIABILITY

(In Thousands)
 Fiscal years Ending June 30

	TRS							
	2021	2020	2019	2018	2017	2016	2015	2014
Total pension liability:								
Service cost	\$ 150,254	\$ 149,759	\$ 141,472	\$ 146,797	\$ 153,006	\$ 149,857	\$ 146,798	\$ 147,149
Interest	808,482	794,751	792,389	786,313	780,855	753,418	744,455	730,912
Differences between actual and expected experience	96,300	83,412	(69,708)	(19,576)	(52,290)	45,210	(36,005)	-
Change in benefit terms	-	-	5,200	-	-	-	-	-
Assumption changes	228,777	17,404	-	-	-	195,343	-	-
Benefit payments	(871,516)	(853,967)	(838,309)	(816,102)	(789,058)	(759,503)	(718,838)	(676,210)
Net change in total pension liability	412,297	191,359	31,044	97,432	92,513	384,325	136,410	201,851
Total pension liability, beginning	11,065,269	10,873,910	10,842,866	10,745,434	10,652,921	10,268,596	10,132,186	9,930,335
Total pension liability, ending (a)	11,477,566	11,065,269	10,873,910	10,842,866	10,745,434	10,652,921	10,268,596	10,132,186
Plan fiduciary net position:								
Contributions - employer	417,334	463,840	481,986	471,837	451,447	426,678	490,640	141,840
Contributions - member	97,258	96,511	92,759	89,128	91,503	95,177	94,694	90,612
Other satutorily required contributions	-	-	-	-	-	-	-	321,553
Other contributions - appropriations	-	-	-	-	-	-	-	50,855
Net investment income	2,429,811	241,591	444,661	688,273	994,989	(18,402)	255,988	1,003,180
Benefit payments	(871,516)	(853,967)	(838,309)	(816,102)	(789,058)	(759,503)	(718,838)	(676,210)
Administrative expense	(5,221)	(5,525)	(6,239)	(6,035)	(4,582)	(4,507)	(4,432)	(4,348)
Other	2,793	3,139	3,272	3,046	3,077	302	3,197	3,510
Net change in plan fiduciary net position	2,070,459	(54,411)	178,130	430,147	747,376	(260,255)	121,249	930,992
Plan fiduciary net position, beginning	7,844,328	7,898,739	7,720,609	7,290,462	6,543,087	6,803,342	6,682,093	5,751,101
Prior period adjustment	-	-	-	-	(1)	-	-	-
Plan fiduciary net position, beginning, as restated	7,844,328	7,898,739	7,720,609	7,290,462	6,543,086	6,803,342	6,682,093	5,751,101
Plan fiduciary net position, ending (b)	9,914,787	7,844,328	7,898,739	7,720,609	7,290,462	6,543,087	6,803,342	6,682,093
Net pension liability, ending (a) - (b)	\$ 1,562,779	\$ 3,220,941	\$ 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	86.38%	70.89%	72.64%	71.20%	67.85%	61.42%	66.25%	65.95%
Covered payroll	1,604,576	1,509,477	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 payroll	97.40%	213.38%	211.82%	214.27%	229.55%	271.95%	233.86%	231.00%

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(In Thousands)
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	SPDDRS									
	2021	2020	2019	2018	2017	2016	2015	2014		
Total pension Liability:										
Service cost	\$ 89	\$ 153	\$ 540	\$ 931	\$ 1,071	\$ 1,263	\$ 1,774	\$ 2,215		
Interest	56,154	55,378	54,438	54,004	53,131	51,913	50,748	49,778		
Differences between actual and expected experience	(672)	4,601	6,331	(2,218)	47	6,283	4,344	-		
Assumption changes	22,231	-	-	-	1,961	-	-	-		
Benefit payments	(50,228)	(49,225)	(47,551)	(45,529)	(43,325)	(41,969)	(39,708)	(37,565)		
Net change in total pension liability	27,574	10,907	13,758	7,188	12,885	17,490	17,158	14,428		
Total pension liability, beginning	773,745	762,838	749,080	741,892	729,007	711,517	694,359	679,931		
Total pension liability, ending (a)	801,319	773,745	762,838	749,080	741,892	729,007	711,517	694,359		
Plan fiduciary net position:										
Contributions - employer	16,699	13,246	15,595	24,829	17,155	13,977	21,668	1,072		
Contributions - member	34	35	110	186	362	320	445	545		
Net investment income	208,656	21,252	38,174	60,939	87,793	(1,230)	22,866	90,872		
Benefit payments	(50,228)	(49,225)	(47,551)	(45,529)	(43,325)	(41,969)	(39,708)	(37,566)		
Administrative expense	(54)	(54)	(63)	(61)	(45)	(48)	(51)	(53)		
Other	822	530	752	691	847	590	861	739		
Net change in plan fiduciary net position	175,929	(14,216)	7,017	41,055	62,787	(28,360)	6,081	55,609		
Plan fiduciary net position, beginning	675,604	689,820	682,803	641,585	578,798	607,158	601,077	545,468		
Prior period adjustment	-	-	-	163	-	-	-	-		
Plan fiduciary net position, beginning, as restated	675,604	689,820	682,803	641,748	578,798	607,158	601,077	545,468		
Plan fiduciary net position, ending (b)	851,533	675,604	689,820	682,803	641,585	578,798	607,158	601,077		
Net pension liability, ending (a) - (b)	\$ (50,214)	\$ 98,141	\$ 73,018	\$ 66,277	\$ 100,307	\$ 150,209	\$ 104,359	\$ 93,282		
Plan fiduciary net position as a percentage of total pension liability	106.27%	87.32%	90.43%	91.15%	86.48%	79.40%	85.33%	86.57%		
Covered payroll	349	514	1,527	2,963	3,181	3,713	5,120	5,988		
Net pension liability as a percentage of covered payroll	-14387.97%	19093.58%	4781.79%	2236.82%	3153.32%	4045.49%	2038.26%	1557.82%		

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(In Thousands)
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 (Continued)

	SPRS									
	2021	2020	2019	2018	2017	2016	2015	2014		
Total pension Liability:										
Service cost	\$ 8,794	\$ 8,533	\$ 7,456	\$ 7,617	\$ 6,827	\$ 6,750	\$ 6,337	\$ 5,890		
Interest	19,210	16,918	14,654	13,496	11,410	10,113	9,024	8,021		
Differences between actual and expected experience	513	7,888	(3,513)	(3,610)	(765)	1,636	(201)	-		
Change in benefit terms	-	-	12,731	-	-	-	-	-		
Assumption changes	12,476	-	-	-	11,192	-	-	-		
Benefit payments	(3,599)	(2,498)	(1,944)	(1,842)	(1,454)	(1,071)	(1,051)	(913)		
Net change in total pension liability	37,394	30,841	29,384	15,661	27,210	17,428	14,109	12,998		
Total pension liability, beginning	249,134	218,293	188,909	173,248	146,038	128,610	114,501	101,503		
Total pension liability, ending (a)	286,528	249,134	218,293	188,909	173,248	146,038	128,610	114,501		
Plan fiduciary net position:										
Contributions - employer	7,928	4,850	4,556	4,205	3,657	3,887	4,060	4,049		
Contributions - member	4,185	4,168	3,905	3,621	3,634	3,755	3,609	3,630		
Net investment income	72,138	7,010	11,730	16,303	22,346	91	4,972	17,756		
Benefit payments	(3,599)	(2,498)	(1,944)	(1,842)	(1,454)	(1,071)	(1,051)	(912)		
Administrative expense	(59)	(67)	(60)	(60)	(64)	(47)	(45)	(43)		
Other	-	-	-	-	-	(163)	-	-		
Net change in plan fiduciary net position	80,593	13,463	18,187	22,227	28,119	6,452	11,545	24,480		
Plan fiduciary net position, beginning	220,565	207,102	188,915	166,688	138,569	132,117	120,572	96,092		
Plan fiduciary net position, ending (b)	301,158	220,565	207,102	188,915	166,688	138,569	132,117	120,572		
Net pension liability, ending (a) - (b)	\$ (14,630)	\$ 28,569	\$ 11,191	\$ (6)	\$ 6,560	\$ 7,469	\$ (3,507)	\$ (6,071)		
Plan fiduciary net position as a percentage of total pension liability	105.11%	88.53%	94.87%	100.00%	96.21%	94.89%	102.73%	105.30%		
Covered payroll	34,946	33,904	30,938	32,291	31,582	31,792	29,574	27,701		
Net pension liability as a percentage of covered payroll	-41.86%	84.26%	36.17%	-0.02%	20.77%	23.49%	-11.86%	-21.92%		

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(In Thousands)
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 (Continued)

	DSRS									
	2021	2020	2019	2018	2017	2016	2015	2014		
Total pension Liability:										
Service cost	\$ 8,825	\$ 8,569	\$ 7,436	\$ 7,084	\$ 7,386	\$ 5,979	\$ 5,887	\$ 5,716		
Interest	20,845	19,188	16,246	15,476	15,556	14,509	13,612	12,612		
Differences between actual and expected experience	1,935	7,520	2,697	(1,370)	(10,162)	1,530	946	-		
Change in benefit terms	(42)	-	24,170	-	-	-	-	-		
Assumption changes	15,917	-	-	-	(3,174)	-	-	-		
Benefit payments	(13,894)	(12,976)	(11,940)	(10,611)	(10,143)	(8,785)	(8,371)	(7,791)		
Net change in total pension liability	33,586	22,301	38,609	10,579	(537)	13,233	12,074	10,537		
Total pension liability, beginning	276,056	253,755	215,146	204,567	205,104	191,871	179,797	169,260		
Total pension liability, ending (a)	309,642	276,056	253,755	215,146	204,567	205,104	191,871	179,797		
Plan fiduciary net position:										
Contributions - employer	7,213	6,861	6,705	6,194	5,922	6,071	5,972	5,977		
Contributions - member	5,177	4,860	4,846	4,416	4,163	4,306	4,068	3,908		
Net investment income	76,547	7,528	13,200	19,361	27,282	(44)	6,534	24,438		
Benefit payments	(13,894)	(12,976)	(11,940)	(10,611)	(10,143)	(8,785)	(8,371)	(7,794)		
Administrative expense	(136)	(133)	(145)	(137)	(102)	(102)	(95)	(97)		
Other	558	404	479	471	431	463	505	558		
Net change in plan fiduciary net position	75,465	6,544	13,145	19,694	27,553	1,909	8,613	26,990		
Plan fiduciary net position, beginning	240,203	233,659	220,514	200,820	173,268	171,359	162,746	135,756		
Prior period adjustment	-	-	-	-	(1)	-	-	-		
Plan fiduciary net position, beginning, as restated	240,203	233,659	220,514	200,820	173,267	171,359	162,746	135,756		
Plan fiduciary net position, ending (b)	315,668	240,203	233,659	220,514	200,820	173,268	171,359	162,746		
Net pension liability, ending (a) - (b)	\$ (6,026)	\$ 35,853	\$ 20,096	\$ (5,368)	\$ 3,747	\$ 31,836	\$ 20,512	\$ 17,051		
Plan fiduciary net position as a percentage of total pension liability	101.95%	87.01%	92.08%	102.50%	98.17%	84.48%	89.31%	90.52%		
Covered payroll	59,289	57,698	53,676	49,915	51,004	49,081	46,634	45,106		
Net pension liability as a percentage of covered payroll	-10.16%	62.14%	37.44%	-10.75%	7.35%	64.86%	43.99%	37.80%		

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SCHEDULES OF NET PENSION LIABILITY AND CHANGES IN NET PENSION LIABILITY

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

	JRS									
	2021	2020	2019	2018	2017	2016	2015	2014		
Total pension Liability:										
Service cost	\$ 2,358	\$ 2,640	\$ 2,406	\$ 2,587	\$ 2,466	\$ 2,681	\$ 2,812	\$ 2,819		
Interest	8,735	8,711	8,608	8,539	8,521	8,478	8,458	7,978		
Differences between actual and expected experience	(19,046)	(5,885)	(4,959)	(6,054)	(6,101)	(5,813)	(6,506)	-		
Change in benefit terms	-	-	-	-	-	-	-	-		
Assumption changes	5,218	-	-	962	-	-	-	-		
Benefit payments	(4,810)	(4,897)	(4,933)	(4,932)	(4,609)	(4,429)	(4,313)	(4,455)		
Net change in total pension liability	(7,545)	569	1,122	1,102	277	917	451	6,342		
Total pension liability, beginning	116,519	115,950	114,828	113,726	113,449	112,532	112,081	105,739		
Total pension liability, ending (a)	108,974	116,519	115,950	114,828	113,726	113,449	112,532	112,081		
Plan fiduciary net position:										
Contributions - employer	886	791	779	735	739	739	2,845	2,456		
Contributions - member	295	301	331	364	372	401	413	474		
Net investment income	68,611	6,850	12,085	18,373	26,270	(175)	6,525	25,263		
Benefit payments	(4,810)	(4,897)	(4,933)	(4,932)	(4,609)	(4,429)	(4,313)	(4,455)		
Administrative expense	(10)	(10)	(11)	(8)	(6)	(6)	(6)	(7)		
Other	-	-	(86)	-	(4)	(39)	-	32		
Net change in plan fiduciary net position	64,972	3,035	8,165	14,532	22,762	(3,509)	5,464	23,763		
Plan fiduciary net position, beginning	215,688	212,653	204,488	189,956	167,194	170,703	165,239	141,476		
Plan fiduciary net position, ending (b)	280,660	215,688	212,653	204,488	189,956	167,194	170,703	165,239		
Net pension liability (asset), ending (a) - (b)	\$ (171,686)	\$ (99,169)	\$ (96,703)	\$ (89,660)	\$ (76,230)	\$ (53,745)	\$ (58,171)	\$ (53,158)		
Plan fiduciary net position as a percentage of total pension liability	257.55%	185.11%	183.40%	178.08%	167.03%	147.37%	151.69%	147.43%		
Covered payroll	9,752	9,752	9,374	9,500	9,122	8,870	9,248	8,870		
Net pension liability as a percentage of covered payroll	-1760.52%	-1016.91%	-1031.61%	-943.79%	-835.67%	-605.92%	-629.01%	-599.30%		

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(In Thousands)
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 (Continued)

	EMRS						
	2021	2020	2019	2018	2017	2016	2015
Total pension liability:							
Service cost	\$ 3,431	\$ 3,286	\$ 3,272	\$ 3,189	\$ 3,402	\$ 3,187	\$ 2,969
Interest	6,668	6,117	5,911	5,463	5,107	4,649	4,345
Differences between actual and expected experience	3,073	2,317	(2,208)	1,147	(1,079)	724	(1,067)
Change in benefit terms	-	-	-	-	1,545	-	-
Assumption changes	4,818	-	-	-	(792)	-	-
Benefit payments	(4,714)	(4,317)	(4,176)	(3,653)	(2,776)	(2,558)	(2,266)
Net change in total pension liability	13,276	7,403	2,799	6,146	5,407	6,002	3,981
Total pension liability, beginning	87,830	80,427	77,628	71,482	66,075	60,073	56,092
Total pension liability, ending (a)	101,106	87,830	80,427	77,628	71,482	66,073	60,073
Plan fiduciary net position:							
Contributions - employer	3,523	3,078	2,844	2,765	2,859	2,744	2,607
Contributions - member	2,842	2,531	2,302	2,231	2,314	2,222	2,071
Net investment income	28,643	2,817	4,774	6,867	9,506	18	2,144
Benefit payments	(4,714)	(4,317)	(4,176)	(3,653)	(2,776)	(2,558)	(2,266)
Administrative expense	(78)	(73)	(77)	(73)	(53)	(50)	(45)
Other	-	-	-	-	-	1	(1)
Net change in plan fiduciary net position	30,216	4,036	5,667	8,137	11,850	2,377	4,510
Plan fiduciary net position, beginning	89,005	84,969	79,302	71,165	59,315	56,937	53,646
Prior period adjustment	-	-	-	-	-	1	(1,219)
Plan fiduciary net position, beginning, as restated	89,005	84,969	79,302	71,165	59,315	56,938	52,427
Plan fiduciary net position, ending (b)	119,221	89,005	84,969	79,302	71,165	59,315	56,937
Net pension liability (asset), ending (a) - (b)	\$ (18,115)	\$ (1,175)	\$ (4,542)	\$ (1,674)	\$ 317	\$ 6,760	\$ 3,136
Plan fiduciary net position as a percentage of total pension liability	117.92%	101.34%	105.65%	102.16%	99.56%	89.77%	94.78%
Covered payroll	29,395	26,536	26,024	27,421	26,992	25,963	24,145
Net pension liability as a percentage of covered payroll	-61.63%	-4.43%	-17.45%	-6.10%	1.17%	26.04%	12.99%

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(In Thousands)

Fiscal years Ending June 30

(Continued)

	NRPORS
	2021
Total pension Liability:	
Service cost	\$ 494
Interest	18
Differences between actual and expected experience	-
Change in benefit terms	25,978
Assumption changes	1,960
Benefit payments	(10)
Net change in total pension liability	28,440
Total pension liability, beginning	-
Total pension liability, ending (a)	28,440
Plan fiduciary net position:	
Contributions - employer	332
Contributions - member	263
Other satutorily required contributions	-
Other contributions - appropriations	-
Net investment income	2,996
Benefit payments	(10)
Administrative expense	-
Other	21,432
Net change in plan fiduciary net position	25,013
Plan fiduciary net position, beginning	-
Prior period adjustment	-
Plan fiduciary net position, beginning, as restated	-
Plan fiduciary net position, ending (b)	25,013
Net pension liability (asset), ending (a) - (b)	\$ 3,427
Plan fiduciary net position as a percentage of total pension liability	87.95%
Covered payroll	6,220
Net penison liability as a percentage of covered payroll	55.10%

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SCHEDULES OF CONTRIBUTIONS

(In Thousands)

Fiscal Year Ended June 30,

	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contributons as a % of Covered Payroll
PERS					
2021	\$ 106,467	\$ 159,259	\$ (52,792)	\$ 1,574,183	10.12 %
2020	109,904	155,230	(45,326)	1,497,636	10.37
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
TRS (1)					
2021	\$ 418,494	\$ 417,334	\$ 1,160	\$ 1,604,576	26.01 %
2020	413,728	463,840	(50,112)	1,509,477	30.73
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
SPDDRS (2)					
2021	\$ 16,648	\$ 16,699	\$ (51)	\$ 349	4,784.81 %
2020	13,187	13,246	(59)	514	2,577.04
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

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SCHEDULES OF CONTRIBUTIONS

(In Thousands)

Fiscal Year Ended June 30,

	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contributons as a % of Covered Payroll
SPRS					
2021	\$ 9,778	\$ 7,928	\$ 1,850	\$ 34,946	22.69 %
2020	7,716	4,850	2,866	33,904	14.31
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
DSRS (3)					
2021	\$ 7,762	\$ 7,213	\$ 549	\$ 59,289	12.17 %
2020	6,916	6,861	55	57,698	11.89
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
JRS					
2021	\$ 838	\$ 886	\$ (48)	\$ 9,752	9.09 %
2020	791	791	-	9,752	8.11
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

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

West Virginia Consolidated Public Retirement Board
Financial Section
Required Supplementary Information

SCHEDULES OF CONTRIBUTIONS

(In Thousands)

Fiscal Year Ended June 30,

	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contributions as a % of Covered Payroll
EMSRS					
2021	\$ 1,310	\$ 3,523	\$ (2,213)	\$ 29,395	11.99 %
2020	1,167	3,078	(1,911)	26,536	11.60
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
MPFRS					
2021	\$ 706	\$ 2,136	\$ (1,430)	\$ 21,972	9.72 %
2020	588	1,721	(1,133)	17,831	9.65
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
NRPORS					
2021	\$ 356	\$ 332	\$ 24	\$ 6,220	5.34 %

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.

West Virginia Consolidated Public Retirement Board
Financial Section
Required Supplementary Information

SCHEDULES OF INVESTMENT RETURNS (1)
 Fiscal Years Ended June 30,

Retirement System (2):	2021	2020	2019	2018	2017	2016	2015	2014
PERS	32.02%	3.16%	5.94%	9.75%	15.82%	-0.12%	3.93%	17.94%
TRS	31.93%	3.14%	5.93%	9.74%	15.70%	-0.28%	3.92%	17.85%
SPDDRS	31.99%	3.18%	5.78%	9.83%	15.71%	-0.21%	3.92%	17.86%
SPRS	32.13%	3.32%	6.11%	9.61%	15.86%	-0.07%	4.03%	17.92%
DSRS	32.07%	3.22%	6.01%	9.69%	15.83%	-0.04%	3.97%	17.94%
JRS	32.09%	3.24%	5.97%	9.77%	15.88%	0.10%	3.97%	17.95%
EMSRS	32.05%	3.30%	6.03%	9.64%	15.87%	0.30%	4.04%	17.90%
MPFRS	31.86%	3.49%	6.72%	8.86%	15.72%	1.13%	4.37%	17.03%
NRPORS	13.91%	n/a	n/a	n/a	n/a	n/a	n/a	n/a

(1) This schedule is presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, WV CPRB will present information for those years for which information is available.

(2) Annual money-weighted rate of return, net of investment expenses

Notes to Required Supplementary Information - Pension

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, 2019 and rolled forward to June 30, 2020 using the actuarial assumptions and methods described in Note 3 to the Financial Statements, Actuarial Valuations - Defined Benefit Plans.

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.

3 – CHANGE IN ACTUARIAL ASSUMPTIONS

The actuarial assumptions for mortality, withdrawal rates, disability rates, salary scales, and non-contributory service loads that were used in the total Pension liability calculation were changed from June 30, 2019 to June 30, 2020, to reflect the most recent experience study for July 1, 2013 through June 30, 2018.

See Independent Auditor's Report

West Virginia Consolidated Public Retirement Board
Financial Section
Required Supplementary Information



SUPPLEMENTARY INFORMATION



West Virginia Consolidated Public Retirement Board
Financial Section
Supplementary Information

Schedule of Administrative Expenses

(In Thousands)

Year ended June 30, 2021

Salaries	\$ 4,391
Employee Benefits	951
Occupancy	418
Computer Services	998
Legal	243
External Actuarial Services	308
Accounting and Auditing	247
Third Party Administrator's Fees*	197
Disability Exams	79
Office Expense	153
Postage	108
Depreciation and Amortization	3,846
Insurance	44
Travel	5
Miscellaneous and other	387
Total Administrative Expenses	\$ 12,375

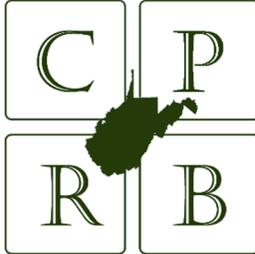
* Third Party Administrative fees relate to the Teacher's Defined Contribution Retirement System only

West Virginia Consolidated Public Retirement Board
Financial Section
Supplementary Information

The following were the payments to consultants for the year ended June 30, 2021:

Legal Services:	
Bowles Rice, LLP	\$ 184,523
Actuarial Services:	
Buck Consulting	\$ 278,811
Auditing Services:	
Eide Bailly, LLP	\$ 205,000

Investment Section



2021 ANNUAL COMPREHENSIVE FINANCIAL REPORT
For the Fiscal Year Ended June 30, 2021

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Individual Retirement System Asset Allocation and Performance

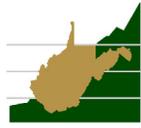
115	Public Employees' Retirement System
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West Virginia Consolidated Public Retirement Board

Investment Section

West Virginia Investment Management Board –Message from Executive Director



West Virginia Investment Management Board

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December 15, 2021

Consolidated Public Retirement Board

4101 MacCorkle Avenue, SE

Charleston, WV 25304-1636

On behalf of the West Virginia Investment Management Board (WV IMB), it is with great pleasure that I submit the investment section of the Consolidated Public Retirement Board's annual comprehensive financial report for the fiscal year ended June 30, 2021.

As described in more detail herein, the WV 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, 2021, was dominated by the COVID-19 pandemic and efforts to deal with it. After what was likely the most sudden economic recession in American history (real GDP contracted at a quarterly annualized rate of negative 31.2 percent from April 1, 2020, to June 30, 2020), or even the world, the economic trajectory reversed and started to trend up with a summer respite from infections and massive fiscal stimulation. Despite "stay at home mandates" and limits on travel, people and businesses found ways to function. New technologies, waiting in the wings, were ready to solve the problem. Kitchens and spare rooms became offices with laptops, the internet, virtual private networks for security, and virtual meetings replacing the daily commute and many hours spent traveling. The real GDP quarterly annualized growth rate rebounded to 33.8 percent in the first quarter of the fiscal year. Meanwhile, reports on the efficacy of vaccines developed with innovative mRNA technology were promising. Although surges in infections continued to ripple around the globe, the economic recovery continued in the second quarter of the fiscal year. In the U.S., November saw the end of the Trump presidency and the election of a Democratic Congress. December 2020 brought the approval of the first vaccine. Building off the perceived success of cash infusions in the economy in the Spring of 2020, Congress passed a second round, and newly-elected President Biden announced a multi-trillion spending plan consisting of traditional physical infrastructure and "human infrastructure." Although there was little bipartisan support, especially for the human infrastructure portions of the plan, optimism seemed to prevail generally as the vaccination of the population proceeded at an unprecedented pace, suggesting that the President's target for lifting restrictions on July 4 was possible. Globally, the story was mixed. China initiated shutdowns and other strict measures, successfully containing the spread of the virus, and providing a bright spot in global economic activity in the early part of the year. India and other developing countries suffered to varying degrees. Few had the resources available to take advantage of the vaccines as quickly as developed countries, putting them at the mercy of the SARS-CoV-2 virus. Throughout the year, central bankers around the world maintained easy monetary policy stances. Fearing deflation more than inflation, the Federal Reserve Bank of the U.S. signaled that it would err on the side of growth as economic activity

West Virginia Consolidated Public Retirement Board

Investment Section

West Virginia Investment Management Board –Message from Executive Director

picked up. Other central bankers followed suit. U.S. stocks lead all asset classes with a one-year return of 44.2 percent (Russell 3000). Technology stocks were the darling for much of the year but value stocks, especially smaller company names, finally saw a run of outperformance. The China A-share market (MSCI China A) produced strong returns as well, up 40.4 percent. Meanwhile, international stocks were up 37.7 percent (MSCI ACWI ex U.S. IMI) and fixed income was up 1.1 percent (Bloomberg Barclays U.S. Universal Bond).

The WV IMB experienced relative outperformance in almost all major asset classes for the fiscal year ending June 30, 2021. The WV IMB's large-cap U.S. public stock portfolio returned 43.1 percent, beating its benchmark (S&P 500) by 2.3 percent with the help of the portable alpha structure implemented at the start of the year. The non-large cap U.S. public stock portfolio was one of the few areas of underperformance. Although it returned an astounding 54.0 percent it was 3.8 percent short of the benchmark (Russell 2500). The WV IMB's international public stock portfolio returns matched the returns of the U.S. large-cap public stock portfolio but only because of outperformance. It returned 43.1 percent, 5.4 percent better than the benchmark (MSCI ACWI ex U.S. IMI). Performance was driven by the international value bias and the significant contribution from the 59.3 percent return in the WV IMB's dedicated portfolio of China A-share stocks. The fixed income portfolio also outperformed with a return of 4.5 percent, 3.4 percent better than the benchmark (Bloomberg Barclays U.S. Universal Bond). The underweight to U.S. Treasuries that hurt the portfolio in fiscal year 2020 was a positive contribution in fiscal year 2021, along with its short duration relative to peers. Performance measurement of private market assets, which includes private equity, private real estate, and private credit, is fraught with measurement issues, so it is less meaningful over shorter time periods. Regardless, the private equity portfolio returned 58.9 percent and the real estate portfolio returned 11.3 percent. The private credit portfolio underperformed its benchmark by 1.3 percent (Credit Suisse Leveraged Loan plus 2.0 percent) returning 12.3 percent for the year. The hedge fund portfolio, which is intended to be a diversifying component of the entire portfolio, returned 18.6 percent, which was short of its benchmark (HFRI FOF plus 1 percent) by 0.7 percent.

The majority of assets managed by the WV IMB are for participants with longer time horizons. These include the defined benefit pension plans, some employment security plans, and other trust assets. Still others, like Revenue Shortfall Reserve Funds A and B, have shorter time horizons of varying degrees.

Defined benefit pension plans make up approximately 81 percent of the WV IMB's total assets under management. For general comparison purposes, the WV 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, 2021, the return for PERS was 32.1 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, 2021, the WV IMB's annualized return was 9.9 percent versus the base portfolio benchmark of 8.0 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, 2021, 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.

As an investor, the WV 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 (commonly referred to as risk), but it is generally at the expense of long-term growth. Growth is the engine of returns. The WV IMB's asset allocation is 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 WV IMB does not set that rate, it has an obligation to advise those that do. The WV 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 on the horizon, there are many concerns that look eerily similar to those discussed in the Message last

West Virginia Consolidated Public Retirement Board

Investment Section

West Virginia Investment Management Board –Message from Executive Director

year. The SARSCoV-2 virus is still with us, with the promise of cyclical surges around the globe into the indefinite future. With regard to its ability to disrupt economic activity, however, much has changed. The prevalence of vaccines and the advent of new treatments promise a return to normal. It appears as if the world is coming to accept a reality where the virus is managed and possibly, never eliminated. Regardless, the fiscal spending required to combat the immediate effects of the pandemic leaves the developed world with an overhang of debt. This is especially true in the U.S. where infrastructure spending, some of which is certainly needed, will only add to it, increasing inflationary pressures. Meanwhile, the geopolitical tensions between the U.S. and China, unlikely to abate any time soon, will likely spawn global changes in patterns of economic activity that have only just begun to be explored. Of no less importance are the threats to free market systems and democracy, as autocrats and wannabe autocrats exploit tensions in societies to gain political power.

There is much to be concerned about. Nevertheless, the future is unknowable. The WV IMB's portfolio is built for the long-term, seeking return from risky assets while diversifying to reduce risk. The WV 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 these challenges as fiscal year 2022 unfolds.

Sincerely,



Craig Slaughter, JD, CFP
Executive Director
West Virginia Investment Management Board



West Virginia Consolidated Public Retirement Board

Investment Section

Investment Background, Philosophy, and Objectives

West Virginia Investment Management Board – Organizational History

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.

West Virginia Consolidated Public Retirement Board

Investment Section

Investment Background, Philosophy, and Objectives

West Virginia Investment Management Board – Organizational History (continued)

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.

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.

West Virginia Investment Management Board – Statutory Mandate

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]

West Virginia Consolidated Public Retirement Board

Investment Section

Investment Background, Philosophy, and Objectives

West Virginia Investment Management Board – Administrative Mandate

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.

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.

West Virginia Investment Management Board – Investment Philosophy

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 West Virginia Investment Management Board 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 West Virginia Investment Management Board and an external general investment consultant.

West Virginia Consolidated Public Retirement Board

Investment Section

Investment Background, Philosophy, and Objectives

West Virginia Investment Management Board – Investment Philosophy (continued)

The WV IMB Board recognizes that even though its investments may be subject to short-term volatility, it is critical that the West Virginia Investment Management Board 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:

<u>Agenda Item</u>	<u>Review Schedule</u>
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 WV IMB 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 WV IMB Board and staff shall monitor performance and supervise all fund managers.

In determining the appropriate level of risk, the WV IMB 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 WV IMB 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 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 West Virginia Investment Management Board's objective is to manage the Participant Plans' moneys in an efficient and economical manner, managing risk as it seeks to achieve the specific goals set out in each Participant Plan's investment program.

Basis of Presentation

The retirement systems' investments reported in the investment section are presented in the same basis of accounting as described in Note 1 of the financial statements and prepared using a time-weighted rate of return based on the market rate of return.

West Virginia Consolidated Public Retirement Board
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 sub-components that enable adequate diversification when taken in aggregate. 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 weight Sum must equal 100% of Equity allocation
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 weight Sum must equal 100% of Domestic Equity allocation
U.S. Non-Large Value vs. U.S. Non-Large Growth	Value vs. Growth Percentage in Russell 2500	0.5 to 2.5 times benchmark weight Sum must equal 100% of Non-Large Cap Domestic Equity allocation
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 weight Sum must equal 100% of International Equity allocation

* The Neutral Target is established 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
Portable Alpha Pool <i>U.S. Large Capitalization</i> Russell Investments Implementation Services, LLC BlackRock Institutional Trust Company, N.A. Hedge Fund Committee/Albourne America, LLC	Equity Beta Replication (including margin accounts) Index Core Alternative Risk Premia
Large Cap Domestic Equity Pool BlackRock Institutional Trust Company, N.A.	Index Core
Non-Large Domestic Equity Pool Westfield Capital Management Company, LLC Russell Investments Implementation Services, LLC	Growth at a Reasonable Price Relative Value
International Qualified and International Nonqualified Pools <i>International Large Capitalization</i> Silchester International Investors	All Country, Value
International Equity Pool <i>International Large Capitalization</i> LSV Asset Management <i>International Small Capitalization</i> Oberweis Asset Management, Inc. Acadian Asset Management, LLC	All Country, Relative Value All Country, Growth All Country, Quantitative Value
<i>Emerging Markets</i> Brandes Investment Partners, L.P. Allianz Global Investors U.S. LLC Axiom International Investors, LLC	Emerging Market, Value China, Growth at a Reasonable Price Emerging Market, Growth at a Reasonable Price

West Virginia Consolidated Public Retirement Board
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 WV IMB's Audited Financial Statements
Domestic	Portable Alpha Pool Large Cap Domestic Equity Pool Non-Large Cap Domestic Equity Pool
International	International Qualified Pool International Nonqualified Pool International Equity Pool

Condensed Statement of Net Position:

	Portable Alpha	Large Cap Domestic Equity	Non-Large Cap Domestic Nonqualified	International Qualified	International Nonqualified	International Equity
Investments	\$ 5,142,215	\$ 372,898	\$ 995,522	\$ 1,451,822	\$ 219,112	\$ 3,936,878
Investment derivatives	32,308	-	-	-	-	-
Payable upon return of securities loaned	-	-	(54,346)	-	-	(45,134)
Cash	(14,557)	-	-	-	-	11,799
Receivable for investments sold	-	-	1,419	-	-	2,307
Payable for investments purchased	(75,000)	-	(16,201)	-	-	(1,841)
Other assets and liabilities, net	1,219	(21)	260	(51)	(8)	9,121
Net position - June 30, 2021	\$ 5,086,185	\$ 372,877	\$ 926,654	\$ 1,451,771	\$ 219,104	\$ 3,913,130

Investment Breakdown:

	Fair Value	Percentage of Securities
Portable Alpha:		
Notional value of S&P 500 derivatives	2,420,700	46.8%
S&P 500 index fund	2,852,933	55.1%
Total S&P 500 exposure	5,273,633	101.9%
Margin accounts:		
Money market mutual fund	427,319	8.3%
Enhanced cash collateral	332,996	6.4%
Downside protection (U.S. TIPS & Treasuries)	342,844	6.6%
Total available margin	1,103,159	21.3%
Alternative risk premia funds	1,186,123	22.9%
Total investment exposure	7,562,915	146.2%
Reconciliation tot total investments:		
Less: Notional value of S&P 500 derivatives	(2,420,700)	-46.8%
Add: Unrealized appreciation of S&P 500 derivatives	32,308	0.6%
Total	5,174,523	100.0%

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

EQUITY POOL (Continued)

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

Investment Breakdown:	Fair Value	Percentage of Securities
Large Cap Domestic Equity:		
S&P 500 index fund	367,198	98.5%
Money market mutual fund	5,700	1.5%
Total	372,898	100.0%
Non-Large Cap Domestic Equity:		
Equities sector exposure:		
Basic Materials	\$ 20,130	2.0%
Communication Services	31,345	3.1%
Consumer Discretionary	167,778	16.9%
Consumer Staples	8,582	0.9%
Energy	80,657	8.1%
Financial Services	57,569	5.7%
Health Care	125,129	12.6%
Industrials	150,526	15.1%
Real Estate	17,038	1.7%
Technology	157,051	15.8%
Total domestic equities	815,805	81.9%
Money market mutual funds	125,371	12.6%
Investments made with cash collateral for securities loaned	54,346	5.5%
Total	\$ 995,522	100.0%
International Qualified:		
MSCI EAFE Commingled fund	\$ 1,451,822	100.0%
International Nonqualified:		
MSCI EAFE Commingled fund	\$ 219,112	100.0%
International Equity:		
International equities country exposure:		
Australia	\$ 103,869	2.6%
Brazil	91,488	2.3%
Canada	140,647	3.6%
China	913,273	23.2%
France	143,313	3.6%
Germany	135,773	3.4%
Hong Kong	110,707	2.8%
India	132,998	3.4%
Japan	383,783	9.7%
Korea	258,055	6.6%
Russia	84,454	2.1%
Sweden	103,571	2.6%
Switzerland	102,804	2.6%
Taiwan	230,598	5.9%
United Kingdom	264,421	6.7%
All others (none greater than 2%)	612,906	15.8%
Total international equities	3,812,660	96.9%
Money market mutual fund	79,084	2.0%
Securities lending collateral	45,134	1.1%
Total	\$ 3,936,878	100.0%

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

EQUITY POOL (Continued)

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

Progression of Net Position:

	Portable Alpha	Large Cap Domestic Equity	Non-Large Cap Domestic Nonqualified	International Qualified	International Nonqualified	International Equity
Net position - June 30, 2020	\$ -	\$ -	\$ -	\$ 1,029,324	\$ 163,129	\$ 3,448,856
Net investment income (loss)	1,404,349	274,082	382,249	372,113	55,924	1,403,779
Net in-kind transfers	3,778,171	141,139	790,270			
Net increase (decrease) from unit transactions	(96,335)	(42,344)	(245,865)	50,334	51	(939,505)
Net position - June 30, 2021	\$ 5,086,185	\$ 372,877	\$ 926,654	\$ 1,451,771	\$ 219,104	\$ 3,913,130

INVESTMENT PERFORMANCE

	Portable Alpha		Large Cap Domestic Equity		Non-Large Cap Domestic Equity		International Qualified		International Nonqualified		International Equity	
	Actual	S&P 500	Actual	S&P 500	Actual	Russell 2500	Actual	MSCI EAFE	Actual	MSCI EAFE	Actual	MSCI ACWIex U.S. (IMI)
One-year	43.0%	40.8%	40.7%	40.8%	54.0%	57.8%	34.5%	32.9%	34.3%	32.9%	46.3%	37.7%
Three-year	n/a	n/a	18.4%	18.7%	12.9%	15.2%	6.0%	8.8%	5.7%	8.8%	12.3%	9.9%
Five-year	n/a	n/a	17.2%	17.7%	16.3%	16.4%	9.6%	10.8%	9.4%	10.8%	13.8%	11.7%
Ten-year	n/a	n/a	14.8%	14.9%	12.3%	12.9%	7.9%	6.4%	7.7%	6.4%	6.7%	6.1%
Twenty-year	n/a	n/a	8.6%	8.6%	10.3%	10.1%	9.9%	6.3%	9.6%	6.3%	6.9%	7.0%

LARGEST HOLDINGS (in \$000s)

Ten Largest Holdings	Fair Value
Portable Alpha:	
BlackRock Equity Index Fund B Lendable	2,852,934
Man Alternative Risk Premia SP	221,977
Magnetar Systematic MultiStrat	213,628
Unigestion Risk Premia Fund LP	173,672
BlackRock 32 Capital Fund	155,038
NB Breton Hill Multi-Style	152,276
Man AHL Alpha 1.5XL Ltd	149,016
Systematic Alpha Global Macro	120,515
S&P 500 E-mini Futures September 2021	32,308
U.S. Treasury Inflation-Protected Security, 0 1/8% Due 1/15/2030	23,791
Non-Large Cap Domestic Equity:	
The Gap Inc, Common Stock	\$ 20,982
Alto Ingredients Inc, Common Stock	15,271
Scorpio Tankers Inc, Common Stock	13,927
Catalent Inc, Common Stock	12,164
Bloom Energy Corp, Common Stock	12,109
Steelcase Inc, Common Stock	11,944
Plantronics Inc, Common Stock	11,721
Infinera Corporation, Common Stock	11,498
Bio-Rad Laboratories Inc, Common Stock	11,289
Weatherford International Ltd, Common Stock	11,161

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

EQUITY POOL (Continued)

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

Ten Largest Holdings	Fair Value
International Qualified:	
Silchester International Investors International Value Equity Group Trust	\$ 1,451,771
International Nonqualified:	
Silchester International Investors International Value Equity Group Trust	\$ 219,104
International Equity:	
AllianzGI China A Shares LLC	\$ 536,180
Samsung Electronics Co Ltd, Common Stock	68,320
Taiwan Semiconductor, ADR	56,331
Roche Holding AG, Common Stock	30,619
Alibaba Group Holding Ltd, Common Stock	28,292
Tencent Holdings Ltd, Common Stock	27,020
GlaxoSmithKline PLC, Common Stock	26,324
Hana Financial Group, Common Stock	23,625
Taiwan Semiconductor, Common Stock	21,639
Kia Motors Corp, Common Stock	20,347

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 fee, and an allocated share of other expenses. The Equity Pool's expense for the year, divided by the average net position, are as follows:

Expense Ratios (in basis points):	Portable Alpha	Large Cap Domestic Qualified	Non-Large Cap Domestic Nonqualified	International Qualified	International Nonqualified	International Equity
Investment advisor fees	2.2	0.7	8.6	52.2	59.8	44.8
Trustee fees	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *
Custodian bank fees	0.1	0.0 *	0.7	N/A	N/A	2.6
Management fees	2.3	2.1	2.2	2.3	2.3	2.3
Fiduciary bond fees	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *
Professional service fees	0.9	0.4	0.4	0.4	0.4	0.4
Total	5.5	3.2	11.9	54.9	62.5	50.1

* Expense Ratio rounds to less than 0.1 basis points.

Trading Costs (in \$000s):	Portable Alpha	Large Cap Domestic Qualified	Non-Large Cap Domestic Nonqualified	International Qualified	International Nonqualified	International Equity
Net commission costs	\$ 539	N/A	\$ 915	N/A	N/A	\$ 2,896

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance



West Virginia Consolidated Public Retirement Board
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 Retirement Systems 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 money market fund where the goal is a stable dollar value per share, thus preserving principal. The pool's risk factor 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	\$ 217,229
Payable for investments purchased	(24,996)
Other assets and liabilities, net	(11)
Net position - June 30, 2021	\$ 192,222

Investment Breakdown:	Fair Value	Percentage of Securities
Commercial paper	\$ 26,920	12.4%
Money market mutual funds	39,753	18.3%
Repurchase agreement	47,669	21.9%
U.S. Treasury bonds	102,887	47.4%
Total	\$ 217,229	100.0%

Progression of Net Position:

Net position - June 30, 2020	\$ 616,541
Net investment income (loss)	70
Distributions to unitholders	(70)
Net increase (decrease) from unit transactions	(424,319)
Net position - June 30, 2021	\$ 192,222

West Virginia Consolidated Public Retirement Board
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.

	Actual	FTSE 3 Month US T-Bill
One-year	0.0%	0.1%
Three-year	1.2%	1.3%
Five-year	1.1%	1.1%
Ten-year	0.6%	0.6%
Twenty-year	1.4%	1.4%

LARGEST HOLDINGS (in \$000s)

Largest Holdings	Fair Value
Repurchase Agreement, 0.05%, Due 7/1/2021	\$ 47,669
United States Treasury Bill, Due 7/8/2021	40,000
United States Treasury Bill, Due 11/2/2021	24,996
United States Treasury Bill, Due 7/29/2021	13,000
United States Treasury Bill, Due 8/3/2021	12,604
United States Treasury Bill, Due 7/20/2021	12,286
Manhattan Asset Funding Co LLC Commercial Paper, Due 8/12/2021	5,499
Pacific Life Short Term Fundin Commercial Paper, Due 7/19/2021	4,200
Thunder Bay Funding LLC Commercial Paper, Due 9/13/2021	3,999
Gotham Funding Corp Commercial Paper, Due 9/21/2021	3,999

A complete listing of the investments in each pool is available at www.wvim.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	3.5
Trustee fees	0.0 *
Custodian bank fees	0.2
Management fees	2.5
Fiduciary bond fees	0.0 *
Professional service fees	0.5
Total	6.7

* Expense Ratio rounds to less than 0.1 basis points.

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

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
30% Core Fixed Income	Minimum 20% to Maximum 70%
70% Total Return Fixed Income	Minimum 30% to Maximum 80%
	Sum equals 100% of 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 Fixed Income	Core Fixed Income
Investments	\$ 3,169,176	\$ 1,385,345
Investment derivatives	12,779	-
Payable upon return of securities loaned	(62,253)	(33,706)
Cash	19,362	-
Receivable for investments sold	96,960	24,707
Payable for investments purchased	(186,187)	(65,308)
Other assets and liabilities, net	14,966	4,789
Net position - June 30, 2021	\$ 3,064,803	\$ 1,315,827

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

FIXED INCOME POOL (Continued)

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

Investment Breakdown:	Total Return Fixed Income		Core Fixed Income	
	Fair Value	Percentage of Securities	Fair Value	Percentage of Securities
Commingled debt funds	\$ 415,969	13.2%	\$ -	0.0%
Corporate asset backed issues	89,782	2.8%	122,533	8.8%
Corporate CMO	68,176	2.1%	96,733	7.0%
Corporate preferred security	10,851	0.3%	1,226	0.1%
Foreign asset backed issues	45,895	1.4%	3,508	0.3%
Foreign corporate bonds	294,249	9.2%	116,081	8.4%
Foreign currency forward contracts	(1,653)	-0.1%	-	0.0%
Foreign equity investments	739	0.0%	-	0.0%
Foreign government bonds	331,607	10.4%	6,606	0.5%
Futures contracts	(1,415)	0.0%	-	0.0%
Money market mutual fund	304,104	9.6%	112,553	8.1%
Municipal bonds	28,917	0.9%	12,058	0.9%
Option contracts purchased	1,453	0.0%	-	0.0%
Option contracts written	(1,911)	-0.1%	-	0.0%
Securities lending collateral	62,253	2.0%	33,706	2.4%
Swaps	16,305	0.5%	-	0.0%
U.S. corporate bonds	406,148	12.8%	295,067	21.3%
U.S. government agency bonds	170	0.0%	-	0.0%
U.S. government agency CMO	68,277	2.1%	115,299	8.3%
U.S. government agency MBS	440,128	13.9%	208,278	15.0%
U.S. Treasury issues	601,911	19.0%	261,697	18.9%
Total	\$ 3,181,955	100.0%	\$ 1,385,345	100.0%

Progression of Net Position:

	Total Return Fixed Income	Core Fixed Income
Net position - June 30, 2020	\$ 2,110,145	\$ 926,249
Net investment income (loss)	141,027	13,336
Net increase (decrease) from unit transactions	813,631	376,242
Net position - June 30, 2021	\$ 3,064,803	\$ 1,315,827

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.

	Total Return Fixed Income		Core Fixed Income	
	Actual	Bloomberg Barclays U.S. Universal Bond *	Actual	Bloomberg Barclays U.S. Aggregate Bond
One-year	5.9%	1.1%	1.4%	-3.0%
Three-year	6.4%	5.6%	6.1%	5.4%
Five-year	5.3%	3.5%	3.6%	3.0%
Ten-year	4.4%	3.7%	4.0%	3.4%
Twenty-year	5.8%	5.0%	N/A	N/A

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

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

FIXED INCOME POOL (Continued)

LARGEST HOLDINGS (in \$000s)

Ten Largest Holdings	Fair Value
Core Fixed Income:	
United States Treasury Note, 2 1/8% Due 3/31/2024	\$ 35,167
United States Treasury Note, 1 3/4% Due 5/15/2023	26,002
Federal National Mortgage Assn TBA 30 Yrs, 2 1/2% Due 9/1/2050	21,550
United States Treasury Note, 1 3/4% Due 12/31/2024	21,033
United States Treasury Note, 0 5/8% Due 12/31/2027	16,010
United States Treasury Bond, 1 7/8% Due 2/15/2051	14,435
United States Treasury Note, 2 1/8% Due 12/31/2021	12,032
United States Treasury Bond, 1 1/8% Due 5/15/2040	11,706
United States Treasury STRIPS, Due 2/15/2032	11,431
United States Treasury Bond, 2 1/4% Due 8/15/2046	10,806
Total Return Fixed Income:	
Western Asset Floating Rate High Income Fund, LLC	\$ 159,638
Western Asset Structured Product Opportunities, LLC	91,738
United States Treasury Note, 1 1/4% Due 4/30/2028	71,021
United States Treasury Note, 0 7/8% Due 11/15/2030	61,193
Federal National Mortgage Assn TBA 30 Yrs, 2 1/2% Due 9/1/2050	59,997
United States Treasury Note, 0 3/4% Due 4/30/2026	50,254
United States Treasury Note, 0 5/8% Due 12/31/2027	44,065
United States Treasury Bond, 1 3/8% Due 8/15/2050	43,314
Mex Bonos Desarr Fix Rt Bond, 7 3/4% Due 11/13/2042	38,655
Freddie Mac Pool # RA3404, 2% Due 8/1/2050	37,047

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 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	14.2
Trustee fees	0.0 *	0.0 *
Custodian bank fees	0.5	0.3
Management fees	2.3	2.3
Fiduciary bond fees	0.0 *	0.0 *
Professional service fees	0.4	0.4
Total	25.2	17.2

* Expense Ratio rounds to less than 0.1 basis points.

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance



West Virginia Consolidated Public Retirement Board
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 credit & income, private equity, and real estate strategies. Prior to July 1, 2017, each of these strategies were operated as individual investment pools. For operational efficiencies, the three pools were combined on July 1, 2017 to form the Private Markets Pool. Investment performance for each of these strategies is tracked separately and presented on the following page.

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

The private equity strategy is comprised of the following categories and target range allocations as of June 30, 2021:

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, 2020, are as follows:

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

MANAGEMENT STRUCTURE

The selection of investments in the 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	\$ 5,915,403
Payable upon return of securities loaned	(6,501)
Cash	13
Fund distributions receivable	12,838
Receivable for investments sold	379
Payable for investments purchased	(45)
Other assets and liabilities, net	(1,343)
Net position - June 30, 2021	\$ 5,920,744

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PRIVATE MARKETS POOL (Continued)

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

Investment Breakdown:	Fair Value	Percentage of Securities
Corporate bonds	\$ 13,267	0.2%
Equity investments	172,762	2.9%
Money market mutual fund	165,668	2.8%
Private credit & income funds	690,713	11.7%
Private equity partnerships	2,910,517	49.2%
Private real estate partnerships and funds	1,955,975	33.1%
Securities lending collateral	6,501	0.1%
Total	\$ 5,915,403	100.0%

Progression of Net Position:

Net position - June 30, 2020	\$ 4,807,545
Net investment income (loss)	1,443,329
Net increase (decrease) from unit transactions	(330,130)
Net position - June 30, 2021	\$ 5,920,744

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.

	Private Credit & Income		Private Equity		Real Estate	
	Actual	Credit Suisse Leveraged Loan plus 200 basis points **	Actual	Russell 3000 plus 300 basis points*	Actual	NCREIF Property Index plus 100 basis points
One-year	12.3%	13.7%	58.9%	47.2%	11.3%	3.6%
Three-year	7.1%	6.4%	31.1%	21.7%	6.2%	5.9%
Five-year	6.2%	7.1%	26.7%	20.9%	7.3%	6.8%
Ten-year	N/A	N/A	19.7%	18.2%	8.7%	9.8%

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

** Prior to April 2017, the Opportunistic Income index was the Credit Suisse Leveraged Loan plus 250 basis points.

LARGEST HOLDINGS (in \$000s)

Ten Largest Holdings	Fair Value
RREEF America REIT II, Inc.	\$ 252,702
Invesco Core Real Estate - U.S.A., L.P.	236,606
FP Venture 2011	187,709
WV Direct Lending LLC (TCW)	172,670
Harrison Street Core Property Fund	160,948
UBS Trumbull Property Fund	128,545
Veritas Capital Fund VI, L.P.	120,557
AG Mountain Laurel Direct Lending Fund, L.P.	119,750
UBS Trumbull Property Income Fund, L.P.	117,000
Invesco Commercial Mortgage Income Fund, L.P.	99,909

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

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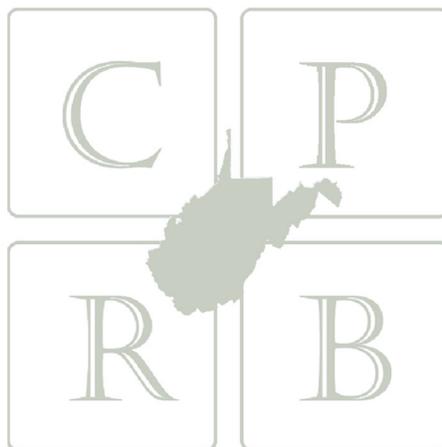
PRIVATE MARKETS POOL (Continued)

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 Ratios (in basis points):	
Investment advisor fees	2.3
Trustee fees	0.0 *
Custodian bank fees	0.1
Management fees	2.3
Fiduciary bond fees	0.0 *
External fees/Fund closing costs	16.8
Professional service fees	3.1
Total	24.6

* Expense Ratio rounds to less than 0.1 basis points.



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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, 2021:

Category	Target Range	Allocation Range
Core		
Relative Value	25% - 35%	20% - 50%
Event Driven	20% - 30%	15% - 35%
Long-Short Equity	20% - 30%	15% - 35%
Directional	10% - 20%	5% - 25%
Supplemental		
Long Biased	3% - 15%	0% - 20%
Private Equity	0% - 3%	0% - 5%
Private Credit	0% - 3%	0% - 5%
Real Assets	0% - 3%	0% - 5%

MANAGEMENT STRUCTURE

The selection of investments in the Hedge Fund Pool 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	\$ 2,317,162
Advance on investments in hedge funds	75,000
Investment funds redeemed	10,921
Other assets and liabilities, net	(30)
Net position - June 30, 2021	\$ 2,403,053

Investment Breakdown:

	Fair Value	Percentage of Securities
Hedge funds	\$ 2,231,493	96.3%
Money market mutual fund	85,669	3.7%
Total	\$ 2,317,162	100.0%

Progression of Net Position:

Net position - June 30, 2020	\$ 2,034,088
Net investment income (loss)	371,925
Net increase (decrease) from unit transactions	(2,960)
Net position - June 30, 2021	\$ 2,403,053

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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.

	Actual	HFRI FoF plus 100 basis points
One-year	18.6%	19.3%
Three-year	6.7%	7.3%
Five-year	6.5%	7.1%
Ten-year	5.2%	4.9%

LARGEST HOLDINGS

Ten Largest Holdings	Fair Value
Caxton Global Investments, Ltd.	\$ 169,536
Hudson Bay International Fund	168,376
HBK Multi-Strategy Offshore	147,493
Farallon COI II Holdings	143,580
Marshall Wace Eureka Fund	138,699
Davidson Kempner International	137,978
Tenor Opportunity Fund, Ltd.	137,375
CQS Diversified Fund (SPC), Ltd.	123,574
Palestra Capital Partners	111,377
Southpoint Qualified Fund L.P.	104,111

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 Ratios (in basis points):	
Trustee fees	0.0 *
Custodian bank fees	0.0 *
Management fees	2.3
Fiduciary bond fees	0.0 *
Professional service fees	2.3
Total	4.6

* Expense Ratio rounds to less than 0.1 basis points.

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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 Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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PUBLIC EMPLOYEES' RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 6,899,129
Contributions	114,676
Withdrawals	(377,003)
Net	(262,327)
Investment Income	4
Net appreciation	2,170,289
June 30, 2021	<u>\$ 8,807,095</u>

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 2,014,704	22.8%
Non-Large Cap Domestic	341,413	3.9%
International Qualified	621,044	7.1%
International Equity	1,437,612	16.3%
Short-Term Fixed Income	15,975	0.2%
Total Return Fixed Income	860,124	9.8%
Core Fixed Income	369,817	4.2%
Private Markets	2,341,876	26.6%
Hedge Fund	804,530	9.1%
Total	<u>\$ 8,807,095</u>	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	32.1%	7.5%
Three-year	13.1%	7.5%
Five-year	12.9%	7.5%
Ten-year	9.9%	7.5%
Twenty-year	8.1%	7.5%

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TEACHERS' RETIREMENT SYSTEM

HISTORY

The Teachers' Retirement System (TRS) was created in 1941. It was closed to new members in 1991, but reopened to first-time hires as of July 1, 2005. Employees hired from 1991 through June 30, 2005, joined the Teachers' Defined Contribution Plan (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 Allocations
Equity (including Portable Alpha)	60.0%	55.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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TEACHERS' RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 7,820,075
Contributions	445,500
Withdrawals	(808,625)
Net	(363,125)
Investment Income	8
Net appreciation	2,429,700
June 30, 2021	\$ 9,886,658

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 2,248,941	22.8%
Non-Large Cap Domestic	381,614	3.9%
International Qualified	696,272	7.0%
International Equity	1,602,687	16.2%
Short-Term Fixed Income	74,745	0.8%
Total Return Fixed Income	953,290	9.6%
Core Fixed Income	409,963	4.1%
Private Markets	2,619,894	26.5%
Hedge Fund	899,252	9.1%
Total	\$ 9,886,658	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	32.0%	7.5%
Three-year	13.0%	7.5%
Five-year	12.9%	7.5%
Ten-year	9.9%	7.5%
Twenty-year	7.9%	7.5%

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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 Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance	
June 30, 2020	\$ 675,608
Contributions	17,534
Withdrawals	(50,277)
Net	(32,743)
Investment Income	1
Net appreciation	208,654
June 30, 2021	\$ 851,520

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 190,006	22.5%
Non-Large Cap Domestic	32,539	3.8%
International Qualified	59,755	7.0%
International Equity	135,397	15.9%
Short-Term Fixed Income	17,265	2.0%
Total Return Fixed Income	80,271	9.4%
Core Fixed Income	34,451	4.0%
Private Markets	224,877	26.4%
Hedge Fund	76,959	9.0%
Total	\$ 851,520	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	32.1%	7.5%
Three-year	13.0%	7.5%
Five-year	12.9%	7.5%
Ten-year	9.9%	7.5%
Twenty-year	8.1%	7.5%

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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 Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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STATE POLICE RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 220,921
Contributions	9,085
Withdrawals	(988)
Net	8,097
Investment Income	-
Net appreciation	72,138
June 30, 2021	\$ 301,156

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 68,297	22.7%
Non-Large Cap Domestic	11,510	3.8%
International Qualified	20,792	6.9%
International Equity	49,684	16.5%
Short-Term Fixed Income	1,738	0.6%
Total Return Fixed Income	29,691	9.9%
Core Fixed Income	12,753	4.2%
Private Markets	79,519	26.4%
Hedge Fund	27,172	9.0%
Total	\$ 301,156	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	32.1%	7.5%
Three-year	13.1%	7.5%
Five-year	12.9%	7.5%
Ten-year	9.9%	7.5%
Twenty-year	8.1%	7.5%

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DEPUTY SHERIFFS' RETIREMENT SYSTEM

HISTORY

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

LIQUIDITY NEEDS

DSRS currently has positive net cash flows.

INVESTMENT OBJECTIVES

The investment objectives are as follows:

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

ASSET ALLOCATION

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

Asset Class	Base Allocation	Strategic Allocations
Equity (including Portable Alpha)	60.0%	55.0%
Fixed Income	40.0%	10.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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DEPUTY SHERIFFS' RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 239,121
Contributions	5,370
Withdrawals	(6,377)
Net	(1,007)
Investment Income	-
Net appreciation	76,519
June 30, 2021	\$ 314,633

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 71,732	22.8%
Non-Large Cap Domestic	12,113	3.8%
International Qualified	21,986	7.0%
International Equity	51,592	16.4%
Short-Term Fixed Income	878	0.3%
Total Return Fixed Income	31,074	9.9%
Core Fixed Income	13,352	4.2%
Private Markets	83,255	26.5%
Hedge Fund	28,651	9.1%
Total	\$ 314,633	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	32.1%	7.5%
Three-year	13.1%	7.5%
Five-year	12.9%	7.5%
Ten-year	9.9%	7.5%
Twenty-year	8.1%	7.5%

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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 Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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JUDGES' RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 212,653
Contributions	833
Withdrawals	(4,637)
Net	(3,804)
Investment Income	6
Net appreciation	6,844
June 30, 2021	\$ 215,699

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 54,393	25.22%
Non-Large Cap Domestic	13,901	6.44%
International Qualified	39,701	18.41%
International Equity	445	0.21%
Short-Term Fixed Income	17,942	8.32%
Total Return Fixed Income	8,010	3.71%
Core Fixed Income	59,993	27.81%
Private Markets		
Hedge Fund	21,314	9.88%
Total	\$ 215,699	100.00%

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	32.1%	7.5%
Three-year	13.1%	7.5%
Five-year	13.0%	7.5%
Ten-year	9.9%	7.5%
Twenty-year	8.1%	7.5%

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EMERGENCY MEDICAL SERVICES RETIREMENT SYSTEM

HISTORY

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

LIQUIDITY NEEDS

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

INVESTMENT OBJECTIVES

The investment objectives are as follows:

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

ASSET ALLOCATION

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

Asset Class	Base Allocation	Strategic Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

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EMERGENCY MEDICAL SERVICES RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 88,627
Contributions	2,835
Withdrawals	(1,337)
Net	1,498
Investment Income	-
Net appreciation	28,644
June 30, 2021	\$ 118,769

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 27,136	22.9%
Non-Large Cap Domestic	4,567	3.8%
International Qualified	8,263	7.0%
International Equity	19,566	16.5%
Short-Term Fixed Income	239	0.2%
Total Return Fixed Income	11,687	9.8%
Core Fixed Income	5,018	4.2%
Private Markets	31,488	26.5%
Hedge Fund	10,805	9.1%
Total	\$ 118,769	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	32.0%	7.5%
Three-year	13.1%	7.5%
Five-year	12.9%	7.5%
Ten-year	9.9%	7.5%

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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 Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

MUNICIPAL POLICE OFFICERS AND FIREFIGHTERS RETIREMENT SYSTEM (Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$ 14,669
Contributions	3,965
Withdrawals	(20)
Net	3,945
Investment Income	-
Net appreciation	5,202
June 30, 2021	\$ 23,816

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 5,251	22.00%
Non-Large Cap Domestic	878	3.70%
International Qualified	1,571	6.60%
International Equity	3,889	16.30%
Short-Term Fixed Income	770	3.30%
Total Return Fixed Income	2,267	9.50%
Core Fixed Income	974	4.10%
Private Markets	6,164	25.90%
Hedge Fund	2,052	8.60%
Total	\$ 23,816	100.00%

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	31.6%	7.5%
Three-year	13.0%	7.5%
Five-year	12.8%	7.5%
Ten-year	9.9%	7.5%

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

NATURAL RESOURCES POLICE OFFICERS RETIREMENT SYSTEM

HISTORY

The Natural Resources Police Officers Retirement System (NRPORS) was created in 2021 under the Natural Resources Police Officers’ Retirement System Act effective January 2, 2021, under West Virginia Code §20-18-4. NRPORS members with benefits earned in the Public Employees’ Retirement System (PERS) transferred their full membership and benefits under PERS to NRPORS on the effective date.

LIQUIDITY NEEDS

NRPORS is expected to be in a positive net cash flow position through fiscal year 2022.

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 NRPORS 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 NRPORS. Base and Strategic Allocations are established on a market value basis.

Asset Class	Base Allocation	Strategic Allocations
Equity (including Portable Alpha)	60.0%	50.0%
Fixed Income	40.0%	15.0%
Private Markets:		
Private Credit and Income	0.0%	5.0%
Private Equity	0.0%	10.0%
Real Estate	0.0%	10.0%
Hedge Fund	0.0%	10.0%

West Virginia Consolidated Public Retirement Board
Investment Section
Investment Pool Objectives, Financial Highlights, and Performance

NATURAL RESOURCES POLICE OFFICERS RETIREMENT SYSTEM
(Continued)

FINANCIAL HIGHLIGHTS (in \$000s)

Progression of Plan Balance

June 30, 2020	\$	-
Contributions		22,077
Withdrawals		(10)
Net		22,067
Investment Income		-
Net appreciation		2,996
June 30, 2021	\$	25,063

Asset Allocation	Fair Value	Percentage of Securities
Domestic Equity	\$ 5,665	22.60%
Non-Large Cap Domestic	944	3.80%
International Qualified	1,704	6.80%
International Equity	4,115	16.40%
Short-Term Fixed Income	315	1.20%
Total Return Fixed Income	2,435	9.70%
Core Fixed Income	1,050	4.20%
Private Markets	6,591	26.30%
Hedge Fund	2,244	9.00%
Total	\$ 25,063	100.00%

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	13.9%	7.5%
Three-year	n/a	n/a
Five-year	n/a	n/a
Ten-year	n/a	n/a

Actuarial Section



2021 ANNUAL COMPREHENSIVE FINANCIAL REPORT *For the Fiscal Year Ended June 30, 2021*

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West Virginia Consolidated Public Retirement Board Actuarial Section

OVERVIEW

The Actuarial Section of the annual comprehensive 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 annual comprehensive financial report have been prepared for funding purposes and have been prepared as of July 1, 2020, the beginning of the plan year. The actuarial valuations prepared for financial reporting purposes have been prepared as of June 30, 2021, 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 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated March 31, 2021. 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, 2020, valuation report.

The report presents fairly the actuarial position of PERS as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 ("ASOP 56") provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

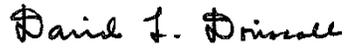
Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software or model. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output.

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, 2020

Funding Method and Basis for Assumptions

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on date of hire.

Experience studies are performed at least once in every 5-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the experience study covering the period from July 1, 2013, to June 30, 2018. 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 employees range from 3.10% to 5.30% per year and Nonstate employees range from 3.35% to 6.50% per year. Assumed increases in salary for sample ages are as follows:

Salary Scales		
Age	State	Nonstate
30	4.80%	4.60%
40	4.30%	4.10%
50	3.95%	3.85%
60	3.10%	3.35%

Mortality

The mortality tables are as follows:

- Pre-retirement males: 100% of Pub-2010 General Employee male table, below-median, headcount-weighted, projected generationally with scale MP-2018
- Pre-retirement females: 100% of Pub-2010 General Employee female table, below-median, headcount-weighted, projected generationally with scale MP-2018
- Post-retirement healthy males: 108% of Pub-2010 General Retiree male table, below-median, headcount-weighted, projected generationally with scale MP-2018
- Post-retirement healthy females: 122% of Pub-2010 General Retiree female table, below-median, headcount-weighted, projected generationally with scale MP-2018
- Disabled males: 118% of Pub-2010 General/Teachers Disabled male table, headcount-weighted, projected generationally with scale MP-2018
- Disabled females: 117% of Pub-2010 General/Teachers Disabled female table, headcount-weighted, projected generationally with scale MP-2018
- Beneficiary males: 112% of Pub-2010 Contingent Survivor male table, below-median, headcount-weighted, projected generationally with scale MP-2018
- Beneficiary females: 115% of Pub-2010 Contingent Survivor female table, below-median, headcount-weighted, projected generationally with scale MP-2018

West Virginia Consolidated Public Retirement Board
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:

State (less than 1 year)		
Age	Male	Female
30	0.35068	0.29227
40	0.27209	0.23023
50	0.21294	0.19734
60	0.19520	0.16445

State (1 to 2 years)		
Age	Male	Female
30	0.27720	0.24200
40	0.20160	0.18000
50	0.16706	0.15000
60	0.15188	0.13500

State (2 to 3 years)		
Age	Male	Female
30	0.20930	0.20016
40	0.14950	0.16046
50	0.11000	0.13750
60	0.08250	0.10313

State (3 to 4 years)		
Age	Male	Female
30	0.17160	0.18144
40	0.11440	0.12600
50	0.08580	0.10584
60	0.05720	0.07560

State (4 to 5 years)		
Age	Male	Female
30	0.13230	0.14625
40	0.10500	0.11375
50	0.07700	0.08626
60	0.04025	0.06000

State (greater than 5 years)		
Age	Male	Female
30	0.10080	0.11000
40	0.06000	0.05850
50	0.03900	0.04550
60	0.03000	0.02275

Nonstate (less than 1 year)		
Age	Male	Female
30	0.30360	0.27577
40	0.24840	0.24035
50	0.19320	0.18975
60	0.15180	0.15180

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

Nonstate (2 to 3 years)		
Age	Male	Female
30	0.19360	0.19542
40	0.15180	0.13965
50	0.10800	0.12564
60	0.09600	0.10379

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

Nonstate (4 to 5 years)		
Age	Male	Female
30	0.12000	0.14820
40	0.10800	0.10260
50	0.07920	0.07980
60	0.05040	0.05700

Nonstate (greater than 5 years)		
Age	Male	Female
30	0.10247	0.09000
40	0.06210	0.06435
50	0.04600	0.04200
60	0.02500	0.02600

West Virginia Consolidated Public Retirement Board
Actuarial Section
Public Employees Retirement System

Disablement Rates

Sample rates of disablement are as follows:

State and Nonstate		
Age	Male	Female
30	0.00022	0.00039
40	0.00082	0.00073
50	0.00351	0.00225
60	0.00540	0.00488

Retirement Rates

The retirement rates are as follows:

State and Nonstate	
Age	Rates
55	0.30
56	0.18
57	0.15
58	0.15
59	0.15
60	0.12
61	0.15
62	0.22
63	0.15
64	0.18
65	0.25
66	0.20
67	0.20
68	0.20
69	0.20
70+	1.00

Family Composition

It is assumed that 85% of males and 80% of females are married, with husbands 3 years older than wives. Remarriage rates are not used.

Accrual of Future Service

It is assumed that active members will accrue 1 year of service for each future year of employment.

West Virginia Consolidated Public Retirement Board
Actuarial Section
Public Employees Retirement System

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:

Group	Tier 1	Tier 2
Male - State	10.10%	0.00%
Male - Nonstate	8.80%	0.00%
Female - State	3.20%	0.00%
Female - Nonstate	2.80%	0.00%

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.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	35,781	\$ 1,577,290,000	\$ 44,082	4.5%	516
6/30/2019	35,508	1,497,636,000	42,177	5.6%	517
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)		Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll
		Entry Age (b)					((b-a)/c)
7/1/2020	\$ 7,129,022	\$ 7,506,535	\$ 377,513	95.0%	\$ 1,577,290	23.9%	
7/1/2019	6,792,291	7,237,396	445,105	93.9%	1,497,636	29.7%	
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%	

Solvency Test (in thousands)

Valuation Date	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation of Assets	% of Accrued Liabilities Covered by Valuation Assets		
					(1)	(2)	(3)
6/30/2020	\$ 810,953	\$ 4,381,135	\$ 2,314,447	\$ 7,129,022	100.0%	100.0%	83.7%
6/30/2019	781,469	4,250,094	2,205,833	6,792,291	100.0%	100.0%	79.8%
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%

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	1,533	\$ 17,437,818	(1,116)	\$ 1,401,904	28,450	\$ 453,001,213	3.7%	15,923
2019	1,587	15,953,248	(1,122)	923,665	28,033	436,965,299	3.6%	15,588
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2019	\$ 445,105,000
Expected increase from amortization method	(13,829,000)
Increase from contributions below actuarial rates	(45,326,000)
Investment experience (smoothed)	(68,332,000)
Liability experience (including transfers)	59,895,000
Unfunded Actuarial Liability, June 30, 2020	\$ 377,513,000

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive Financial Report.

Plan Provisions

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated March 31, 2021. 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, 2020, valuation report.

This report presents fairly the actuarial position of TRS as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

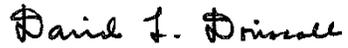
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The results presented herewith were prepared solely for the Consolidated Public Retirement Board for the purposes herein stated and may not be appropriate to use for other purposes. Buck does not intend to benefit and assumes no duty or liability to 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, 2020

Funding Method and Basis for Assumptions

The valuation is prepared under the Entry Age Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on adjusted date of hire (i.e. valuation date minus known past service).

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the experience study covering the period from July 1, 2014, to June 30, 2019. These assumptions will remain in effect for valuation purposes until such time as the Board adopts revised assumptions.

Interest Rate and Expenses

The valuation interest assumption is 7.5% per annum, with no loading for plan expenses.

Salary Scales

Projected salary increases are in the following ranges by group, with an underlying inflation rate of 3.0%:

Group	Range of Projected Salary Increases
Teachers	3.00% - 6.16%
Non-Teachers	3.00% - 6.76%

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

Age	Teachers	Non-Teachers and State
30	5.725%	5.837%
40	4.868%	5.099%
50	4.012%	4.363%
60	3.464%	3.625%

Pre-Retirement Mortality

Pub-2010 General Employee table, headcount-weighted, projected generationally with scale MP-2019.

Post-Retirement Mortality

The mortality tables used are as follows:

- Retired Males: 100% of Pub-2010 General Retiree male table, headcount-weighted, projected generationally with scale MP-2019
- Retired Females: 112% of Pub-2010 General Retiree female table, headcount-weighted, projected generationally with scale MP-2019
- Disabled Males: 107% of Pub-2010 General/Teachers Disabled male table, headcount-weighted, projected generationally with scale MP-2019
- Disabled Females: 113% of Pub-2010 General/Teachers Disabled female table, headcount-weighted, projected generationally with scale MP-2019
- Beneficiary Males: 101% of Pub-2010 Contingent Survivor male table, headcount-weighted, projected generationally with scale MP-2019
- Beneficiary Females: 113% of Pub-2010 Contingent Survivor female table, headcount-weighted, projected generationally with scale MP-2019

West Virginia Consolidated Public Retirement Board
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:

Teachers (less than 1 year)		
Age	Male	Female
30	0.19571	0.19571
40	0.25286	0.24172
50	0.31000	0.27900
60	0.35000	0.35000

Teachers (1 to 2 years)		
Age	Male	Female
30	0.15574	0.11000
40	0.14250	0.11000
50	0.12926	0.11000
60	0.12000	0.11000

Teachers (2 to 3 years)		
Age	Male	Female
30	0.10275	0.10360
40	0.09750	0.07560
50	0.09750	0.07000
60	0.09750	0.07000

Teachers (3 to 4 years)		
Age	Male	Female
30	0.07200	0.07186
40	0.05592	0.07000
50	0.04500	0.07000
60	0.04500	0.07000

Teachers (4 to 5 years)		
Age	Male	Female
30	0.07888	0.08100
40	0.06448	0.05102
50	0.05008	0.04050
60	0.04000	0.04050

Teachers (greater than 5 years)		
Age	Male	Female
30	0.04200	0.04800
40	0.03332	0.03200
50	0.02100	0.01600
60	0.02800	0.02400

Non-Teachers and State (less than 1 year)		
Age	Male	Female
30	0.15600	0.20378
40	0.13200	0.17243
50	0.10800	0.14108
60	0.08400	0.10973

Non-Teachers and State (1 to 2 years)		
Age	Male	Female
30	0.12650	0.12560
40	0.09200	0.08568
50	0.06900	0.06480
60	0.05750	0.05850

Non-Teachers and State (2 to 3 years)		
Age	Male	Female
30	0.12500	0.09520
40	0.09360	0.06160
50	0.06000	0.05242
60	0.06000	0.05600

Non-Teachers and State (3 to 4 years)		
Age	Male	Female
30	0.08000	0.10000
40	0.07000	0.05400
50	0.07000	0.05265
60	0.07000	0.06075

Non-Teachers and State (4 to 5 years)		
Age	Male	Female
30	0.05625	0.08438
40	0.05175	0.05063
50	0.05175	0.03375
60	0.05175	0.02532

Non-Teachers and State (greater than 5 years)		
Age	Male	Female
30	0.05349	0.04728
40	0.03899	0.03063
50	0.02785	0.02303
60	0.02475	0.02450

West Virginia Consolidated Public Retirement Board
Actuarial Section
Teachers' Retirement System

Disablement Rates

A sample of disablement rates follows:

Age	Male	Female
30	0.00040	0.00051
40	0.00132	0.00128
50	0.00305	0.00241
60	0.00560	0.00563

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	0.175	0.175	0.200	0.150
56	0.175	0.175	0.200	0.175
57	0.200	0.200	0.175	0.150
58	0.200	0.200	0.200	0.150
59	0.200	0.225	0.150	0.175
60	0.200	0.225	0.125	0.150
61	0.225	0.225	0.125	0.150
62	0.325	0.275	0.300	0.225
63	0.225	0.250	0.225	0.175
64	0.250	0.225	0.150	0.175
65	0.325	0.300	0.300	0.275
66	0.275	0.350	0.225	0.275
67	0.225	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	7.50%	0.00%	4.60%	0.00%
Non-Teachers	6.00%	0.00%	4.00%	0.00%

West Virginia Consolidated Public Retirement Board
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

Four-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.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	34,753	\$ 1,606,568,000	\$ 46,228	4.5%	80
6/30/2019	34,108	1,508,177,000	44,218	4.4%	82
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets		Actuarial Accrued Liability (AAL)		Unfunded AAL (UAAL)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
	(a)	(b)	(b)	(b)				
7/1/2020	\$ 8,116,332	\$ 11,154,850	\$ 3,038,518	72.8%	\$ 1,606,568	189.1%		
7/1/2019	7,788,482	10,951,502	3,163,020	71.1%	1,508,177	209.7%		
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%		

Solvency Test (in thousands)

Valuation Date	Active Members			% of Accrued Liabilities Covered by Valuation Assets			
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) (Employer Financed Portion)	(1)	(2)	(3)	
6/30/2020	\$ 1,155,649.00	\$ 7,909,421.00	\$ 2,089,780.00	\$ 8,116,332	100.0%	88.0%	0.0%
6/30/2019	1,113,929	7,854,163	1,983,410	7,788,482	100.0%	85.0%	0.0%
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%

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	1,305	\$ 48,789,550	(1,160)	\$ 11,029,063	36,797	\$ 844,270,751	5.4%	\$ 22,944
2019	1,477	31,808,469	(1,219)	10,779,503	36,652	801,058,825	-0.7%	21,856
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2019	\$ 3,163,020,000
Expected increase from amortization method	(107,190,000)
Increase from contributions below actuarial rates	(50,112,000)
Investment experience (smoothed)	(48,141,000)
Liability experience (including transfers)	57,135,000
Changes in assumptions	23,806,000
Unfunded Actuarial Liability, June 30, 2020	\$ 3,038,518,000

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive Financial Report.

Plan Provisions

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



500 Plaza Drive
Secaucus, NJ 07096

December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated March 31, 2021. 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, 2020, valuation report.

This report presents fairly the actuarial position of Plan A as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

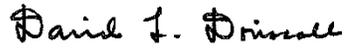
Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software or model. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output.

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



West Virginia Consolidated Public Retirement Board
Actuarial Section
State Police Death, Disability, and Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2020

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 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.

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

West Virginia Consolidated Public Retirement Board
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
30	0.0015	Duty-Related Full	0.25
40	0.0045	Duty-Related Partial	0.60
50	0.0040	Nonduty- Related	0.15
60	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.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	4	\$ 219,000	\$ 54,750	-14.0%	1
6/30/2019	6	382,000	63,667	-6.8%	1
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll
						((b-a)/c)
7/1/2020	\$ 675,604	\$ 773,120	\$ 97,516	87.4%	\$ 219	44527.9%
7/1/2019	689,820	767,118	77,298	89.9%	382	20235.1%
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%

Solvency Test

Valuation Date	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation of Assets	% of Accrued Liabilities Covered by Valuation Assets		
					(1)	(2)	(3)
6/30/2020	\$ 847,409	\$ 767,477,000	\$ 4,795,591	\$ 675,604,000	100.0%	87.9%	0.0%
6/30/2019	1,186,240	759,154,000	6,777,760	689,820,000	100.0%	90.7%	0.0%
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%

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	13	\$ 2,260,665	(19)	\$ 586,695	759	\$ 49,225,066	3.5%	64,855
2019	25	2,619,144	(19)	596,854	765	47,551,096	4.4%	62,158
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2019	\$ 77,298,000
Expected increase from amortization method	(7,269,000)
Increase from contributions below actuarial rates	(59,000)
Investment experience	28,685,000
Liability experience (including transfers)	(1,139,000)
Unfunded Actuarial Liability, June 30, 2020	\$ 97,516,000

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive Financial Report.

Plan Provisions

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.



500 Plaza Drive
Secaucus, NJ 07096

December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated March 31, 2021. 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, 2020, valuation report.

This report presents fairly the actuarial position of Plan B as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

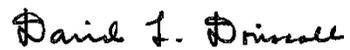
Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software or model. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output.

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, 2020

Funding Method and Basis for Assumptions

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry age is based on date of hire.

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on an experience study covering the period from July 1, 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 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 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.

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

West Virginia Consolidated Public Retirement Board
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
30	0.0015	Duty-Related Full	0.25
40	0.0045	Duty-Related Partial	0.60
50	0.0040	Nonduty- Related	0.15
60	0.0040		

Family Composition

It is assumed that 90% of members are married, with husbands 3 years older than their wives. Remarriage 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.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	626	\$ 34,946,000	\$ 55,824	0.9%	1
6/30/2019	613	33,904,000	55,308	1.9%	1
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Accrued			Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
	Actuarial Value of Assets (a)	Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)			
7/1/2020	\$ 220,565	\$ 249,612	\$ 29,047	88.4%	\$ 34,946	83.1%
7/1/2019	207,102	225,630	18,528	91.8%	33,904	54.6%
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%

Solvency Test

Valuation Date					% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation of Assets	(1)	(2)	(3)
6/30/2020	64,167,341	37,282,000	148,162,659	220,565,000	100.0%	100.0%	80.4%
6/30/2019	60,679,470	26,652,000	138,298,530	207,102,000	100.0%	100.0%	86.6%
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%

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	19	\$ 667,829	-	\$ -	59	2,140,154	45.4%	\$ 36,274
2019	7	286,245	-	-	40	1,472,325	24.1%	36,808
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2019	\$ 18,528,000
Expected increase from amortization method	(1,268,000)
Increase from contributions below actuarial rates	2,866,000
Investment experience	8,830,000
Liability experience (including transfers)	91,000
Unfunded Actuarial Liability, June 30, 2020	\$ 29,047,000

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive 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
Joseph G. Bunn

December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated April 30, 2021. 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. The CPRB has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2020, valuation report.

This report presents fairly the actuarial position of DSRS as of July 1, 2020, 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 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. The CPRB uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

The CPRB has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. The CPRB also reviews the third-party model when significant changes are made to the software or model. The review is performed by the CPRB Board Actuary who is familiar with applicable funding methods as well as the manner in which the model generates its output.

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 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.

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



SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Actuarial Valuation Date: July 1, 2020

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. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on an experience study covering the period from July 1, 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.

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 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 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.

West Virginia Consolidated Public Retirement Board
Actuarial Section
Deputy Sheriff Retirement System

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. Remarriage 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.

West Virginia Consolidated Public Retirement Board
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. For interest calculation purposes, all amounts are treated as being deposited on an average of half-way through the Plan year.

Fee Contributions under Section 7-14E-2

A portion of fees generated by each sheriff department for reports are contributed to the DSRS Trust Fund. Fees are deposited throughout the year. For interest calculation purposes they are treated as being deposited on an average of half-way through the Plan year.

Fees are estimated based upon historical amounts contributed to the Trust Fund. 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.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	1,086	\$ 59,289,000	\$ 54,594	2.3%	55
6/30/2019	1,081	57,698,000	53,375	4.4%	55
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets		Actuarial Accrued Liability (AAL)		Unfunded AAL (UAAL)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
	(a)	(b)	Entry Age (b)	(b-a)				
7/1/2020	\$ 247,776	\$ 277,817	\$ 277,817	\$ 30,041	89.2%	\$ 59,289	50.7%	
7/1/2019	233,659	260,750	260,750	27,091	89.6%	57,698	47.0%	
7/1/2018	220,514	239,516	239,516	19,002	92.1%	53,676	35.4%	
7/1/2017	200,820	203,293	203,293	2,473	98.8%	49,915	5.0%	
7/1/2016	172,626	195,681	195,681	23,055	88.2%	51,004	45.2%	
7/1/2015	171,358	188,243	188,243	16,885	91.0%	49,081	34.4%	
7/1/2014	162,748	180,677	180,677	17,929	90.1%	46,634	38.4%	
7/1/2013	135,756	169,260	169,260	33,504	80.2%	45,106	74.3%	
7/1/2012	117,526	157,007	157,007	39,481	74.9%	43,583	90.6%	
7/1/2011	113,574	149,462	149,462	35,888	76.0%	42,366	84.7%	

Solvency Test

Valuation Date	Active Members			Valuation of Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) (Employer Financed Portion)		(1)	(2)	(3)
6/30/2020	\$ 54,371,378	\$ 140,698,000	\$ 82,747,622	\$247,776,000	100.0%	100.0%	63.7%
6/30/2019	50,450,775	132,668,000	77,631,225	233,659,000	100.0%	100.0%	65.1%
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%

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	30	\$ 1,085,378	(6)	\$ 164,861	456	\$ 12,260,265	8.1%	26,887
2019	35	1,791,272	(6)	63,273	432	11,339,748	18.0%	26,249
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

Changes in Unfunded Actuarial Liability

Unfunded Actuarial Liability, June 30, 2019	\$ 27,091,000
Expected decrease from amortization method	(1,325,000)
Increase from contributions below actuarial rates	101,000
Investment experience	10,098,000
Liability experience (including transfers)	1,649,000
Change in methods (asset smoothing)	(7,573,000)
Unfunded Actuarial Liability, June 30, 2020	\$ 30,041,000

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive Financial Report.

Plan Provisions

A discussion of plan provisions is included in Note 2 to the financial statements included in the Financial Section.





December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated March 31, 2021. 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, 2020, valuation report.

This report presents fairly the actuarial position of JRS as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

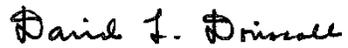
Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software or model. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output.

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, 2020

Funding Method and Basis for Assumptions

The valuation is prepared under the Entry Age Normal Cost Method with individually computed accrued liabilities. The Normal Cost is computed in aggregate. Entry is based on date of hire. Active liabilities include amounts calculated for judges currently participating in the Public Employees' Retirement System (PERS) who may in the future transfer into the Judges' Retirement System (JRS) with an adjustment for the anticipated transfer of required member contributions.

Experience studies are performed at least once in every five-year period. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on the 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

In accordance with West Virginia Senate Bill 597, salary is assumed to increase by 5.00% effective July 1, 2021 and 4.76% effective on July 1, 2022. Salary is assumed to increase 4.25% annually thereafter. The most recent pay increase occurred on 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.

Pre-Retirement Mortality

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

Post-Retirement Mortality

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.

West Virginia Consolidated Public Retirement Board
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.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	77	\$ 9,752,000	\$ 126,649	0.0%	1
6/30/2019	77	9,752,000	126,649	0.0%	1
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Accrued			Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
	Actuarial Value of Assets (a)	Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)			
7/1/2020	\$ 215,688	\$ 98,800	\$ (116,888)	218.3%	9,752	-1198.6%
7/1/2019	212,653	110,476	(102,177)	192.5%	9,752	-1047.8%
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%

Solvency Test

Valuation Date	Active Members			Valuation of Assets	% of Accrued Liabilities Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) (Employer Financed Portion)		(1)	(2)	(3)
6/30/2020	\$ 5,174,080	\$ 60,657,000	\$ 32,968,920	\$215,688,000	100.0%	100.0%	454.5%
6/30/2019	5,108,621	68,734,000	36,633,379	212,653,000	100.0%	100.0%	378.9%
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%

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	3	\$ 114,975	(3)	\$ 61,567	61	\$ 4,896,830	1.1%	80,276
2019	4	157,012	(1)	78,120	61	4,843,422	1.7%	79,400
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

Changes in Unfunded Actuarial Liability

Funded in excess of Actuarial Liability, June 30, 2019	\$ (102,177,000)
Expected increase from amortization method	(7,663,000)
Investment experience	8,969,000
Liability experience (including transfers)	(16,017,000)
Funded in excess of Actuarial Liability, June 30, 2020	\$ (116,888,000)

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive 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

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Fax: 304-957-7522
Email: cprb@wv.gov
www.wvretirement.com

EXECUTIVE DIRECTOR
Jeffrey E. Fleck



BOARD CHAIRMAN
Joseph G. Bunn

December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated April 30, 2021. 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. The CPRB has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2020, valuation report.

This report presents fairly the actuarial position of EMSRS as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. The CPRB uses the following:

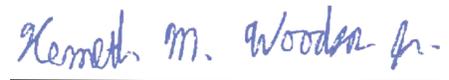
- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

The CPRB has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. The CPRB also reviews the third-party model when significant changes are made to the software or model. The review is performed by the CPRB Board Actuary who is familiar with applicable funding methods as well as the manner in which the model generates its output.

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 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



West Virginia Consolidated Public Retirement Board
Actuarial Section
Emergency Medical Services Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2020

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. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on an experience study covering the period from July 1, 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.

Pre-Retirement Mortality

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 Tables, 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%

West Virginia Consolidated Public Retirement Board
Actuarial Section
Emergency Medical Services Retirement System

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

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	50%
Non-Duty Disability	50%

Family Composition

In determining the value of pre-retirement spousal death benefits, it is assumed that 80% of all members will be married at death. Males are assumed to be three years older than their female spouse. Remarriage rates are not considered.

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 credited with 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 credited with one additional year of service, solely attributed to unused sick leave.

West Virginia Consolidated Public Retirement Board
Actuarial Section
Emergency Medical Services Retirement System

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. For interest calculation purposes, all amounts are treated as being deposited on an average of half way through the Plan year.

West Virginia Consolidated Public Retirement Board
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
6/30/2020	611	\$ 29,395,000	\$ 48,110	6.4%	15
6/30/2019	587	26,536,000	45,206	0.2%	15
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Accrued				Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
	Actuarial Value of Assets (a)	Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)				
7/1/2020	\$ 89,005	\$ 90,691	\$ 1,686	98.1%	\$ 29,395	5.7%	
7/1/2019	84,969	82,582	(2,387)	102.9%	26,536	-9.0%	
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%	

Solvency Test

Valuation Date	(1) Active Member Contributions			(2) Terms, Retirees, and Beneficiaries			(3) Active Members (Employer Financed Portion)			% of Accrued Liabilities Covered by Valuation Assets		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
6/30/2020	\$ 17,732,945	\$ 43,090,000	\$ 29,868,055	\$ 89,005,000	100.0%	100.0%	94.4%					
6/30/2019	16,631,777	38,276,000	27,674,223	84,969,000	100.0%	100.0%	108.6%					
6/30/2018	16,378,993	32,802,000	26,393,007	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%					

West Virginia Consolidated Public Retirement Board
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 Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	11	\$ 373,902	(1)	\$ 16,113	130	\$ 3,347,589	12.0%	25,751
2019	18	409,076	-	-	120	2,989,800	15.9%	24,915
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

Changes in Unfunded Actuarial Liability

Funded in excess of Actuarial Liability, June 30, 2019	\$ (2,387,000)
Expected increase from amortization method	(179,000)
Increase from contributions below actuarial rates	(1,911,000)
Investment experience	3,676,000
Liability experience (including transfers)	2,487,000
Unfunded Actuarial Liability, June 30, 2020	\$ 1,686,000

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive 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

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EXECUTIVE DIRECTOR
Jeffrey E. Fleck



BOARD CHAIRMAN
Joseph G. Bunn

December 15, 2021

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, 2020. 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, 2020, 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 Annual Comprehensive Financial Report are based on information contained in our July 1, 2020, valuation report dated April 30, 2021. 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. The CPRB has reviewed these schedules for accuracy and consistency with the information provided in our July 1, 2020, valuation report.

This report presents fairly the actuarial position of MPFRS as of July 1, 2020, 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.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. The CPRB uses the following:

- third-party software to calculate the liabilities associated with the provisions of the plan using data, assumptions and funding methods as specified in our report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets, to generate the exhibits found in our report.

The CPRB has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. The CPRB also reviews the third-party model when significant changes are made to the software or model. The review is performed by the CPRB Board Actuary who is familiar with applicable funding methods as well as the manner in which the model generates its output.

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 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.

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



West Virginia Consolidated Public Retirement Board
Actuarial Section
Municipal Police Officers and Firefighters Retirement System

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date: July 1, 2020

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. This valuation was prepared on the basis of assumptions that were recommended to and adopted by the Board based on an experience study covering the period from July 1, 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.

Pre-Retirement Mortality

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%
65	3.25%

West Virginia Consolidated Public Retirement Board
Actuarial Section
Municipal Police Officers and Firefighters Retirement System

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%

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.

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.

West Virginia Consolidated Public Retirement Board
Actuarial Section
Municipal Police Officers and Firefighters Retirement System

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.

West Virginia Consolidated Public Retirement Board
Actuarial Section
Municipal Police Officers and Firefighters Retirement System

Schedule of Active Member Valuation Data

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Change in Average Pay	Number of Employers
6/30/2020	436	\$ 21,972,000	\$ 50,394	4.6%	37
6/30/2019	370	17,831,000	48,192	5.7%	32
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

Schedule of Funding Progress (in thousands)

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of
						Covered Payroll ((b-a)/c)
7/1/2020	\$ 14,889	\$ 8,945	\$ (5,944)	166.5%	\$ 21,972	-27.1%
7/1/2019	11,297	6,365	(4,932)	177.5%	17,831	-27.7%
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%

Solvency Test

Valuation Date	(1) Active Member Contributions	(2) Terms, Retirees, and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation of Assets	% of Accrued Liabilities Covered by Valuation Assets		
					(1)	(2)	(3)
6/30/2020	\$ 5,952,221	\$ 1,021,000	\$ 1,971,779	\$ 14,889,000	100.0%	100.0%	401.5%
6/30/2019	4,215,858	981,000	1,168,142	11,297,000	100.0%	100.0%	522.2%
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%

West Virginia Consolidated Public Retirement Board
Actuarial Section
Municipal Police Officers and Firefighters Retirement System

Schedule of Retirees and Beneficiaries Added and Removed

Fiscal Year Ended	Added		Removed		Year End		% Increase in Annual Allowances	Average Annual Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2020	-	\$ -	-	\$ -	1	\$ 38,734	0.0%	38,734
2019	-	19,367	-	-	1	38,734	100.0%	38,734
2018	1	19,367	-	-	1	19,367	100.0%	19,367
2017	-	-	-	-	-	-	0.0%	-
2016	-	-	-	-	-	-	0.0%	-
2015	-	-	-	-	-	-	0.0%	-
2014	-	-	-	-	-	-	0.0%	-
2013	-	-	-	-	-	-	0.0%	-
2012	-	-	-	-	-	-	0.0%	-
2011	-	-	-	-	-	-	0.0%	-

Changes in Unfunded Actuarial Liability

Funded in excess of Actuarial Liability, June 30, 2019	\$ (4,932,000)
Expected increase from amortization method	(370,000)
Increase from contributions below actuarial rates	(1,133,000)
Investment experience	563,000
Liability experience (including transfers)	(72,000)
Funded in excess of Actuarial Liability, June 30, 2020	\$ (5,944,000)

Schedule of Contributions

The Schedule of Contributions is included in the Required Supplementary Information provided in the Financial Section of this Annual Comprehensive 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



2021 ANNUAL COMPREHENSIVE FINANCIAL REPORT
For the Fiscal Year Ended June 30, 2021

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West Virginia Consolidated Public Retirement Board

Statistical Section

Overview

The statistical section of the annual comprehensive 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 annual comprehensive 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



West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Public Employees Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 78,762	\$ 159,259	\$ 2,170,293	\$ 1,154
2020	75,857	155,230	215,355	866
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

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service		Refunds	
		Transfers to (from)	Administrative Expenses		
2021	\$ 469,160	\$ 21,432	\$ 6,311	\$ 9,934	\$ 1,902,631
2020	453,001	(227)	6,186	10,549	(22,201)
2019	436,965	(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)

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Teachers' Defined Benefit Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 97,258	\$ 417,334	\$ 2,429,811	\$ 2,944
2020	96,511	463,840	241,591	3,371
2019	93,219	481,525	444,661	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

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service	Administrative	Refund	
		Transfers to (from)	Expenses		
2021	\$ 863,132	\$ 151	\$ 5,221	\$ 8,384	\$ 2,070,459
2020	844,272	232	5,525	9,695	(54,411)
2019	827,539	174	6,239	10,769	178,130
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

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

State Police Death, Disability, and Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 34	\$ 16,699	\$ 208,656	\$ 822
2020	35	13,246	21,252	530
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

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service		Refund	
		Transfers to (from)	Administrative Expenses		
2020	\$ 50,228	\$ -	\$ 54	\$ -	\$ 175,929
2020	49,225	-	54	-	(14,216)
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)

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

State Police Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 4,185	\$ 7,928	\$ 72,138	\$ -
2020	4,168	4,850	7,010	-
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

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit	Service	Administrative		
	Payments	Transfers to (from)	Expenses	Refund	
2021	\$ 3,302	\$ -	\$ 59	\$ 297	\$ 80,593
2020	2,140	-	67	358	13,463
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

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Deputy Sheriffs Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 5,177	\$ 7,213	\$ 76,547	\$ 392
2020	4,860	6,861	7,528	404
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

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service Transfers to (from)	Administrative Expenses	Refund	
2021	\$ 13,364	\$ (166)	\$ 136	\$ 530	\$ 75,465
2020	12,260	-	133	716	6,544
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

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Judges Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 295	\$ 886	\$ 68,611	\$ -
2020	301	791	6,850	-
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	-

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service		Refund	
		Transfers to (from)	Administrative Expenses		
2021	\$ 4,810	\$ -	\$ 10	\$ -	\$ 64,972
2020	4,897	-	10	-	3,035
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

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Emergency Medical Services Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 2,842	\$ 3,523	\$ 28,643	\$ -
2020	2,531	3,078	2,817	-
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	-

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service Transfers to (from)	Administrative Expenses	Refund	
2021	\$ 3,752	\$ -	\$ 78	\$ 962	\$ 30,216
2020	3,348	-	73	969	4,036
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

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Municipal Police Officers & Firefighters Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 2,158	\$ 2,136	\$ 5,202	\$ 68
2020	1,717	1,721	437	1
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	-

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service Transfers to (from)	Administrative Expenses	Refund	
2021	\$ 41	\$ -	\$ 41	\$ 273	\$ 9,209
2020	39	-	36	209	3,592
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

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Natural Resources Police Officers Retirement System*

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment Income	Other Income
	Member	Employer		
2021	\$ 263	\$ 332	\$ 2,996	\$ 21,432

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service Transfers to (from)	Administrative Expenses	Refund	

* The NRPORS was established in January 2021.

West Virginia Consolidated Public Retirement Board

Statistical Section

Additions by Source, Deductions by Type, and Changes in Plan Net Assets

Teachers' Defined Contribution Retirement System

(in thousands)

Fiscal Year	Additions			
	Contributions		Investment	Other
	Member	Employer	Income	Income
2021	\$ 5,980	\$ 10,307	\$ 141,739	\$ 12
2020	6,219	9,965	35,185	32
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

Fiscal Year	Deductions				Total Change in Plan Net Position
	Benefit Payments	Service	Administrative Expenses	Refund	
		Transfers to (from)			
2021	\$ -	\$ 15	\$ 465	\$ 22,838	\$ 134,720
2020	-	(5)	784	17,476	33,146
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

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.

West Virginia Consolidated Public Retirement Board

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
2021	\$ 427,658	\$ 10,475	\$ 31,027	\$ 563	\$ 9,371
2020	411,166	10,315	31,520	1,523	9,026
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

Teachers' Defined Benefit Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2021	\$ 832,041	\$ 4,410	\$ 26,681	\$ 3,157	\$ 5,227
2020	812,961	4,479	26,832	2,826	6,869
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

State Police Death, Disability, and Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2021	\$ 40,949	\$ 1,007	\$ 8,272	\$ -	\$ -
2020	40,052	1,021	8,152	-	-
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

West Virginia Consolidated Public Retirement Board

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
2021	\$ 2,497	\$ 204	\$ 601	\$ -	\$ 297
2020	1,448	489	203	-	358
2019	815	201	457	-	471
2018	518	252	416	-	656
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	-	-

Deputy Sheriffs Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2021	\$ 10,925	\$ 156	\$ 2,283	\$ -	\$ 530
2020	10,032	147	2,081	53	663
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

Judges Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2021	\$ 4,564	\$ 101	\$ 145	\$ -	\$ -
2020	4,650	102	145	-	-
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	-	-

West Virginia Consolidated Public Retirement Board

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
2021	\$ 2,895	\$ 129	\$ 728	\$ 52	\$ 910
2020	2,649	75	624	1	968
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

Municipal Police Officers & Firefighters Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2021	\$ -	\$ -	\$ 41	\$ -	\$ 273
2020	39	-	-	-	209
2019	36	-	-	20	242
2018	-	-	20	-	125
2017	-	-	-	-	79
2016	-	-	-	-	34
2015	-	-	-	-	49
2014	-	-	-	-	7
2013	-	-	-	3	2
2012	-	-	-	-	10

Natural Resources Police Officers Retirement System

(in thousands)

Fiscal Year	Age & Service Benefits		Disability Benefits	Death Benefits & Refunds	
	Retirants	Survivors		Death	Resignation
2021	\$ -	\$ -	\$ -	\$ -	\$ 10



West Virginia Consolidated Public Retirement Board

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	Option 1	Option 2	Other
\$ 1 - 1,000	13,649	11,215	559	1,875	6,867	4,860	1,922	-
1,001 - 2,000	9,634	8,394	261	979	4,868	3,357	1,409	-
2,001 - 3,000	4,130	3,963	65	102	2,000	1,393	737	-
3,001 - 4,000	1,526	1,494	18	14	730	470	326	-
4,001 - 5,000	530	525	3	2	237	184	109	-
Over \$ 5,000	280	279	1	-	160	72	48	-
	29,749	25,870	907	2,972	14,862	10,336	4,551	-

Teachers' Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 2	Other
\$ 1 - 1,000	10,374	8,808	39	1,527	6,048	2,432	1,374	520
1,001 - 2,000	10,952	10,102	95	755	6,112	2,632	1,641	567
2,001 - 3,000	8,792	8,612	48	132	4,909	1,884	1,505	494
3,001 - 4,000	4,804	4,779	16	9	2,890	807	895	212
4,001 - 5,000	1,694	1,687	7	-	1,127	218	296	53
Over \$ 5,000	841	839	1	1	534	115	154	38
	37,457	34,827	206	2,424	21,620	8,088	5,865	1,884

State Police Death, Disability, and Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 2	Other
\$ 1 - 1,000	13	10	-	3	-	-	-	13
1,001 - 2,000	41	28	3	10	-	-	-	41
2,001 - 3,000	51	31	4	16	-	-	-	51
3,001 - 4,000	53	38	4	11	-	-	-	53
4,001 - 5,000	85	73	2	10	-	-	-	85
Over \$ 5,000	524	444	8	72	2	-	-	522
	767	624	21	122	2	-	-	765

State Police Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 2	Other
\$ 1 - 1,000	6	5	1	-	-	1	-	5
1,001 - 2,000	7	3	1	3	-	-	-	7
2,001 - 3,000	9	3	1	5	-	1	-	8
3,001 - 4,000	13	12	1	-	-	2	-	11
4,001 - 5,000	36	27	2	7	-	8	-	28
Over \$ 5,000	20	19	-	1	-	3	-	17
	91	69	6	16	-	15	-	76

West Virginia Consolidated Public Retirement Board
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	Option 1	Option 2	Other
\$ 1 - 1,000	49	42	1	6	11	10	7	21
1,001 - 2,000	149	116	5	28	41	20	25	63
2,001 - 3,000	181	153	2	26	65	24	30	62
3,001 - 4,000	72	57	-	15	25	7	9	31
4,001 - 5,000	34	29	-	5	16	2	4	12
Over \$ 5,000	10	9	-	1	4	1	1	4
	495	406	8	81	162	64	76	193

Judges Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 2	Other
\$ 1 - 1,000	-	-	-	-	-	-	-	-
1,001 - 2,000	-	-	-	-	-	-	-	-
2,001 - 3,000	-	-	-	-	-	-	-	-
3,001 - 4,000	3	3	-	-	-	-	-	3
4,001 - 5,000	14	11	2	1	-	-	-	14
Over \$ 5,000	45	44	-	1	-	-	-	45
	62	58	2	2	-	-	-	62

Emergency Medical Services Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 2	Other
\$ 1 - 1,000	16	15	-	1	13	2	1	-
1,001 - 2,000	50	45	3	2	29	11	2	8
2,001 - 3,000	43	36	2	5	20	7	6	10
3,001 - 4,000	25	18	-	7	12	5	3	5
4,001 - 5,000	8	5	-	3	3	3	-	2
Over \$ 5,000	1	-	-	1	1	-	-	-
	143	119	5	19	78	28	12	25

West Virginia Consolidated Public Retirement Board
Statistical Section
Retired Members by Type of Benefit

Municipal Police Officers & Firefighters Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 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

Natural Resources Police Officers Retirement System

Amount of Monthly Benefit	Number of Retirants	Type of Retirement			Option Selected			
		A	B	C	Maximum	Option 1	Option 2	Other
\$ 1 - 1,000	-	-	-	-	-	-	-	-
1,001 - 2,000	-	-	-	-	-	-	-	-
2,001 - 3,000	-	-	-	-	-	-	-	-
3,001 - 4,000	-	-	-	-	-	-	-	-
4,001 - 5,000	-	-	-	-	-	-	-	-
Over \$ 5,000	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Type of Retirement
A - Service
B - Survivor Benefit
C - Disability

Option
Maximum - Life Annuity
Option 1 - 100% Joint Survivorship
Option 2 - 50% Joint Survivorship
Other

West Virginia Consolidated Public Retirement Board
Statistical Section
Largest Employers

Public Employees Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	26,424	1	63.09%	24,268	1	66.35%
All other employers	15,458		36.91%	12,305		33.65%
	41,882		100.00%	36,573		100.00%

Teachers Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
Kanawha County Board of Education	3,336	1	9.07%	3,549	1	9.91%
Berkeley County Board of Education	2,370	2	6.43%	-	-	-
Cabell County Board of Education	1,632	3	4.43%	1,486	5	4.15%
Wood County Board of Education	1,618	4	4.39%	1,689	3	4.72%
Monongalia County Board of Education	1,546	5	4.20%	1,443	7	4.03%
Raleigh County Board of Education	1,516	6	4.12%	1,561	4	4.36%
Harrison County Board of Education	1,426	7	3.87%	1,432	6	4.00%
Mercer County Board of Education	1,165	8	3.16%	1,271	8	3.55%
Putnam County Board of Education	1,143	9	3.10%	1,060	10	2.96%
Jefferson County Board of Education	1,122	10	3.05%	-	-	-
Barbour County Board of Education	-	-	-	2,109	2	5.89%
Marion County Board of Education	-	-	-	1,061	9	2.96%
Total Top Employers	16,874		45.81%	16,661		46.53%
All other employers	19,964		54.19%	19,146		53.47%
	36,838		100.00%	35,807		100.00%

State Police Death, Disability, and Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	4	1	100.00%	108	1	100.00%
All other employers	-		-	-		0.00%
	4		100.00%	108		100.00%

West Virginia Consolidated Public Retirement Board
Statistical Section
Largest Employers

State Police Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	660	1	100.00%	566	1	100.00%
All other employers	-		-	-		-
	660		100.00%	566		100.00%

Deputy Sheriffs Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
Kanawha County	105	1	8.74%	101	1	10.32%
Berkeley County	66	2	5.50%	58	2	5.92%
Harrison County	54	3	4.50%	48	3	4.90%
Raleigh County	52	4	4.33%	40	7	4.09%
Monongalia County	46	5	3.83%	42	5	4.29%
Cabell County	46	6	3.83%	43	4	4.39%
Putnam County	43	7	3.58%	40	6	4.09%
Fayette County	39	8	3.25%	34	9	3.47%
Wood County	38	9	3.16%	37	8	3.78%
Ohio County	36	10	3.00%			
Mercer County				29	10	2.96%
Total Top Employers	525		43.72%	472		48.21%
All other employers	676		56.28%	507		51.79%
	1,201		100.00%	979		100.00%

Judges Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	35	1	100.00%	55	1	100.00%
All other employers	-		-	-		-
	35		100.00%	55		100.00%

West Virginia Consolidated Public Retirement Board
Statistical Section
Largest Employers

Emergency Medical Services Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
Kanawha County Emergency Ambulance	177	1	20.21%	187	1	37.85%
Cabell County Emergency Medical Services	171	2	19.52%	113	2	22.87%
Grant County Ambulance	82	4	9.36%			
Berkeley County Emergency Ambulance Auth	66	3	7.53%			
Total Top Employers	496		56.62%	300		60.72%
All other employers	380		43.38%	194		39.28%
	876		100.00%	494		100.00%

Municipal Police Officers and Firefighters Retirement System

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
City of Charleston Police	92	1	15.46%	7	2	36.84%
City of Charleston Firefighters	78	2	13.11%			
City of Huntington Police	56	3	9.41%	12	1	63.16%
City of Huntington Firefighters	41	4	6.89%			
City of Wheeling Firefighters	41	5	6.89%			
Total Top Employers	308		51.76%	19		100.00%
All other employers	287		48.24%	-		-
	595		100.00%	19		100.00%

Natural Resources Police Officers Retirement System*

Top Employers	June 30, 2021			June 30, 2012		
	Covered Members	Rank	Percentage of Total	Covered Members	Rank	Percentage of Total
State of West Virginia	121	1	100.00%	n/a	n/a	n/a
All other employers	-		-	n/a		n/a
	121		100.00%	n/a		n/a

* The NRPORS was established in January 2021.

West Virginia Consolidated Public Retirement Board

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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, 2021:					
Average monthly benefit	\$ 569	\$ 825	\$ 1,147	\$ 1,533	\$ 2,431
Average final average salary	\$ 28,988	\$ 31,436	\$ 34,510	\$ 37,669	\$ 44,737
Number of benefit recipients	4,575	4,341	4,771	4,682	8,518
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 560	\$ 810	\$ 1,119	\$ 1,507	\$ 2,383
Average final average salary	\$ 28,080	\$ 30,541	\$ 33,400	\$ 36,863	\$ 46,815
Number of benefit recipients	4,530	4,288	4,666	4,606	8,292
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	\$ 248,850	\$ 24,635	\$ 26,809	\$ 29,622	\$ 34,042
Number of benefit recipients	4,048	3,653	3,885	3,658	5,367

West Virginia Consolidated Public Retirement Board

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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, 2021:					
Average monthly benefit	\$ 517	\$ 787	\$ 1,105	\$ 1,516	\$ 2,705
Average final average salary	\$ 25,327	\$ 26,910	\$ 28,177	\$ 32,173	\$ 45,247
Number of benefit recipients	2,577	3,293	4,434	5,181	20,676
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 503	\$ 763	\$ 1,080	\$ 1,491	\$ 2,665
Average final average salary	\$ 24,025	\$ 25,418	\$ 26,939	\$ 31,067	\$ 44,093
Number of benefit recipients	2,502	3,197	4,397	5,211	20,528
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

West Virginia Consolidated Public Retirement Board

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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, 2021:					
Average monthly benefit	\$ 6,097	\$ 5,960	\$ 4,839	\$ 5,425	\$ 6,416
Average final average salary	\$ 95,018	\$ 68,441	\$ 43,991	\$ 40,813	\$ 46,662
Number of benefit recipients	27	28	84	494	113
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 5,877	\$ 5,745	\$ 4,631	\$ 5,263	\$ 6,156
Average final average salary	\$ 91,589	\$ 65,972	\$ 42,100	\$ 39,596	\$ 44,770
Number of benefit recipients	27	28	86	499	117
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

West Virginia Consolidated Public Retirement Board

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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, 2021:					
Average monthly benefit	\$ 3,179	\$ 4,011	\$ 3,033	\$ 4,037	\$ 4,975
Average final average salary	\$ 41,520	\$ 55,284	\$ 60,307	\$ 67,507	\$ 70,849
Number of benefit recipients	8	6	12	35	25
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 2,977	\$ 4,204	\$ 3,101	\$ 4,014	\$ 4,842
Average final average salary	\$ 92,790	\$ 55,005	\$ 60,885	\$ 65,026	\$ 63,259
Number of benefit recipients	7	5	11	18	8
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

West Virginia Consolidated Public Retirement Board

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, 2021:					
Average monthly benefit	\$ 1,195	\$ 2,083	\$ 2,006	\$ 2,333	\$ 3,091
Average final average salary	\$ 31,595	\$ 34,112	\$ 41,169	\$ 42,439	\$ 48,585
Number of benefit recipients	25	47	130	124	150
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 1,198	\$ 1,888	\$ 1,954	\$ 2,267	\$ 2,986
Average final average salary	\$ 29,839	\$ 32,584	\$ 40,255	\$ 41,045	\$ 46,914
Number of benefit recipients	21	43	122	118	134
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

West Virginia Consolidated Public Retirement Board

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, 2021:					
Average monthly benefit	\$ 4,200	\$ 6,345	\$ 7,335	\$ 7,011	\$ 6,719
Average final average salary	\$ 67,200	\$ 101,520	\$ 117,360	\$ 112,176	\$ 107,504
Number of benefit recipients	1	20	23	9	9
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 4,200	\$ 6,451	\$ 7,335	\$ 7,098	\$ 6,719
Average final average salary	\$ 67,200	\$ 103,216	\$ 117,360	\$ 113,568	\$ 107,504
Number of benefit recipients	1	19	23	10	9
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

West Virginia Consolidated Public Retirement Board

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, 2021:					
Average monthly benefit	\$ 2,015	\$ 1,959	\$ 2,049	\$ 2,480	\$ 3,012
Average final average salary	\$ 37,674	\$ 43,541	\$ 46,313	\$ 49,382	\$ 60,984
Number of benefit recipients	21	30	29	28	22
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 2,084	\$ 2,016	\$ 2,049	\$ 2,391	\$ 3,012
Average final average salary	\$ 39,092	\$ 41,246	\$ 46,313	\$ 47,565	\$ 60,984
Number of benefit recipients	18	26	29	24	22
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	\$ 2,038	\$ 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

West Virginia Consolidated Public Retirement Board

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, 2021:					
Average monthly benefit	\$ 3,228	\$ -	\$ -	\$ -	\$ -
Average final average salary	\$ 43,038	\$ -	\$ -	\$ -	\$ -
Number of benefit recipients	1	-	-	-	-
For the Year Ended June 30, 2020:					
Average monthly benefit	\$ 3,228	\$ -	\$ -	\$ -	\$ -
Average final average salary	\$ 43,038	\$ -	\$ -	\$ -	\$ -
Number of benefit recipients	1	-	-	-	-
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 had no benefits or retirees to report before the year ended June 30, 2018

Natural Resources Police Officers Retirement System

	Years of Credited Service				
	10 - 14	15 - 19	20 - 24	25 - 29	30+
For the Year Ended June 30, 2021:					
Average monthly benefit	\$ -	\$ -	\$ -	\$ -	\$ -
Average final average salary	\$ -	\$ -	\$ -	\$ -	\$ -
Number of benefit recipients	-	-	-	-	-

Note: The NRPORS was established in January 2021 and had no benefits or retirees to report before the year ended June 30, 2021.



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