

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY

Financial Statements June 30, 2020 and 2019

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INDEPENDENT AUDITOR'S REPORT

To the Board of Trustees
Teachers' Retirement System of the State of Kentucky
Frankfort, Kentucky

We have audited the accompanying financial statements of the Teachers' Retirement System of the State of Kentucky (TRS), a component unit of the Commonwealth of Kentucky, as of and for the year ended June 30, 2020, and the related notes to the financial statements, which collectively comprise TRS's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. 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 TRS'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 TRS's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

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

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Teachers' Retirement System of the State of Kentucky as of June 30, 2020, and the changes in fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

The financial statements of the Teachers' Retirement System of the State of Kentucky for the year ended June 30, 2019, were audited by other auditors whose report dated November 15, 2019, expressed unmodified opinions on those statements.

Report on Required Supplementary Information

Accounting principles generally accepted in the United States of America require that management's discussion and analysis on pages 4 through 7, and the defined benefit pension plan and other postemployment benefit plan supplemental schedules on pages 59 through 68, 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 audits 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 2020 financial statements that collectively comprise TRS's basic financial statements. The additional supporting schedules (pages 69 through 71) are presented for purposes of additional analysis and are not a required part of the basic financial statements. The Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses 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 audits of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are fairly stated, in all material respects, in relation to the 2020 basic financial statements as a whole. The 2019 information on the additional supporting schedules (pages 69 through 71) was subject to the auditing procedures applied in the 2019 audit of the basic financial statement by other auditors, whose report on such information stated that it was fairly stated in all material respects in relation to the 2019 basic financial statements.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated November 13, 2020 on our consideration of the TRS's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the System's internal control over financial reporting and compliance.

Blue & Co., LLC

Lexington, Kentucky
November 13, 2020

Teachers' Retirement System of the State of Kentucky Management's Discussion and Analysis

This discussion and analysis of the financial performance of Teachers' Retirement System of the State of Kentucky (TRS or system) provides an overview of the Retirement Annuity Trust, the Health Insurance Trust and the Life Insurance Trust for the fiscal years ended June 30, 2020, and 2019. It should be read in conjunction with the respective financial statements, which begin on page 8. TRS is the fiduciary of funds held in trust for its members.

Using This Financial Report

Because of the long-term nature of the defined benefit retirement annuity plan, and the medical and life insurance plans, financial statements alone cannot provide sufficient information to properly reflect the ongoing perspective of the System. The Statement of Fiduciary Net Position and Statement of Changes in Fiduciary Net Position (on pages 8-11) provide information about the activities of the defined benefit retirement annuity plan, medical insurance plan, life insurance plan and the tax-sheltered annuity plan as a whole. The Teachers' Retirement System of the State of Kentucky is the fiduciary of funds held in trust for its members.

Information about the activities of the retirement annuity, health insurance and life insurance trusts and the 403(b) Tax-Sheltered Trust as a whole is provided in the Statement of Fiduciary Net Position and Statement of Changes in Fiduciary Net Position (on pages 13-15). The Notes to the Financial Statements are an essential part of the basic financial statements. They provide important background and detailed information about TRS, the plan and the basic financial statements themselves.

The Required Supplementary Information includes historical trend information about the funded status of the retirement annuity, health insurance and life insurance trusts presented as required by accounting standards. The Schedules of Employer Contributions present historical trend information about the required contributions of employers and the contributions made by employers in relation to the requirement. These schedules provide information that contributes to understanding the changes over time in the funded status of the plans. Separate reports prepared by the actuary using a board-adopted funding policy provide a long-term, ongoing plan perspective and the progress made in accumulating sufficient assets to pay benefits and insurance premiums when due.

Teachers' Retirement System as a Whole

In the fiscal year ended June 30, 2020, the system's combined fiduciary net position increased by \$549.3 million — from \$21.9 billion in 2019 to \$22.4 billion in 2020. In 2018, the combined net position totaled \$21.3 billion. The following summaries focus on the fiduciary net position and changes in fiduciary net position of TRS's retirement annuity, health insurance and life insurance trusts.

Summary of Fiduciary Net Position (In millions)

	Retirement Annuity Trust			Health Insurance Trust			Life Insurance Trust		
	2020	2019	2018	2020	2019	2018	2020	2019	2018
Assets									
Cash and investments	\$ 20,680.9	\$ 20,295.0	\$ 19,885.8	\$ 1,587.6	\$ 1,371.2	\$ 1,140.7	\$ 87.0	\$ 85.4	\$ 83.7
Receivables	113.8	104.3	110.8	61.1	54.7	59.0	0.5	0.5	0.8
Capital assets	12.1	14.1	16.3						
Total assets	20,806.8	20,413.4	20,012.9	1,648.7	1,425.9	1,199.7	87.5	85.9	84.5
Liabilities	(89.8)	(41.6)	(31.3)	(32.0)	(11.9)	(9.4)			
Net position	\$ 20,717.0	\$ 20,371.8	\$ 19,981.6	\$ 1,616.7	\$ 1,414.0	\$ 1,190.3	\$ 87.4	\$ 85.9	\$ 84.5

Teachers' Retirement System of the State of Kentucky

Management's Discussion and Analysis (Continued)

Trust Totals* **

(In millions)

	2020	2019	2018
Assets			
Cash & Investments	\$ 22,355.5	\$ 21,751.6	\$ 21,110.2
Receivables	175.4	159.5	170.6
Capital Assets	12.1	14.1	16.3
Total Assets	<u>22,543.0</u>	<u>21,925.2</u>	<u>21,297.1</u>
Liabilities	<u>(122.0)</u>	<u>(53.5)</u>	<u>(40.7)</u>
Net Position	<u><u>\$ 22,421.0</u></u>	<u><u>\$ 21,871.7</u></u>	<u><u>\$ 21,256.4</u></u>

*Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund. Other Funds had a combined fiduciary net position of \$1.1 million for 2020, \$1.2 million for 2019 and \$1.1 million for 2018.

**Amounts above may not agree to the financial statements due to rounding.

The fiduciary net position of the Retirement Annuity Trust increased by 2% (\$20.7 billion compared to \$20.4 billion in 2019). The fiduciary net position in 2018 was \$20 billion. The increases primarily are due to additional employer contributions from the state and improvements in market conditions. Net investment income was approximately \$1.1 billion in 2020 and \$1.1 billion in 2019. This compares to \$2 billion in 2018.

The fiduciary net position of the Health Insurance Trust increased by 14.3% (\$1.6 billion compared to \$1.4 billion in 2019) primarily due to investment income and contributions from members and employers due to Shared Responsibility legislation passed in 2010. This compares to 2018 when fiduciary net position was \$1.2 billion.

The Summary of Changes in Fiduciary Net Position is presented below followed by discussion of the activities within the different trusts.

Summary of Changes in Fiduciary Net Position

(In millions)

	Retirement Annuity Trust			Health Insurance Trust			Life Insurance Trust		
	2020	2019	2018	2020	2019	2018	2020	2019	2018
Additions									
Member contributions	\$ 324.7	\$ 321.2	\$ 319.1	\$ 133.6	\$ 131.7	\$ 130.8	\$	\$	\$
Employer contributions	1,134.3	1,123.0	1,048.7	184.6	183.1	187.1	1.8	1.4	1.1
Net investment increase (decrease)	1,094.0	1,085.2	1,953.2	32.5	74.4	76.8	5.2	5.1	1.1
Total additions	<u>2,553.0</u>	<u>2,529.4</u>	<u>3,321.0</u>	<u>350.7</u>	<u>389.2</u>	<u>394.7</u>	<u>7.0</u>	<u>6.5</u>	<u>2.2</u>
Deductions									
Benefit payments	2,167.2	2,094.3	2,004.6				5.3	5.2	5.5
Refunds	28.5	32.4	31.1						
Administrative expense	12.2	12.4	11.4	2.0	1.8	1.7			
Insurance expenses				146.0	163.7	161.1			
Total deductions	<u>2,207.9</u>	<u>2,139.1</u>	<u>2,047.1</u>	<u>148.0</u>	<u>165.5</u>	<u>162.8</u>	<u>5.4</u>	<u>5.2</u>	<u>5.5</u>
Net increase (decrease)	<u><u>\$ 345.1</u></u>	<u><u>\$ 390.3</u></u>	<u><u>\$ 1,273.9</u></u>	<u><u>\$ 202.7</u></u>	<u><u>\$ 223.7</u></u>	<u><u>\$ 231.9</u></u>	<u><u>\$ 1.6</u></u>	<u><u>\$ 1.3</u></u>	<u><u>\$ (3.3)</u></u>

Teachers' Retirement System of the State of Kentucky Management's Discussion and Analysis (Continued)

Trust Totals* **			
<i>(In millions)</i>			
	2020	2019	2018
Additions			
Member contributions	\$ 458.3	\$ 452.9	\$ 449.9
Employer contributions	1,320.7	1,307.5	1,236.9
Net investment increase (decrease)	<u>1,131.7</u>	<u>1,164.7</u>	<u>2,031.1</u>
Total additions	<u>2,910.7</u>	<u>2,925.1</u>	<u>3,717.9</u>
Deductions			
Benefit payments	2,172.6	2,099.5	2,010.1
Refunds	28.5	32.4	31.1
Administrative expense	14.2	14.2	13.1
Insurance expenses	<u>146.0</u>	<u>163.7</u>	<u>161.1</u>
Total deductions	<u>2,361.3</u>	<u>2,309.8</u>	<u>2,215.4</u>
Net increase (decrease)	<u><u>\$ 549.4</u></u>	<u><u>\$ 615.3</u></u>	<u><u>\$ 1,502.5</u></u>

*Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund.

**Amounts above may not agree to the financial statements due to rounding.

Retirement Annuity Trust Activities

Retirement contributions are calculated by applying a percentage factor to salary with member and employer contributions withheld from each pay check. Members also may pay contributions to repurchase previously refunded service credit or to purchase various types of elective service credit.

In 2020, employer contributions totaled \$1.13 billion, a net increase of \$11 million from the prior fiscal year. The increase was due to employer contributions paid by the state being more than the prior year. In 2019, employer contributions increased \$74 million compared 2018 primarily due to amounts received from the state.

The Retirement Annuity Trust experienced net investment income of \$1.09 billion in both 2020 and 2019. For 2018, net investment income totaled \$1.95 billion. The increases in net investment income are due to favorable market conditions. Increases in deductions of \$68.8 million in 2020 and \$92 million in 2019 can be attributed to increases in the number of benefit recipients. Members and beneficiaries on the retiree payroll as of June 30, 2020, increased by 1,016 compared to a prior year increase of 2,647.

Other Postemployment Benefit (OPEB) Activities

During 2020, the Health Insurance Trust member contributions increased \$1.9 million from 2019 and \$1 million from 2018. Also during 2020, employer contributions increased \$1.5 million from 2019 and decreased \$4 million from 2018. The member, employer and state contributions increased primarily due to the Shared Responsibility law.

In 2020, the Health Insurance Trust experienced net investment income of \$32.5 million compared to the previous year of \$74.4 million. For 2018, net investment income totaled \$76.8 million. The decreases in net investment income are due to unfavorable market conditions.

The Life Insurance Trust experienced net investment income of \$5.2 million in 2020, \$5.1 million in 2019 and \$1.1 million in 2018. Life insurance benefits paid for 2020, 2019 and 2018 were \$5.3 million, \$5.2 million and \$5.5 million respectively.

Funding

For the 2018-2020 biennium, the state budgeted \$1.09 billion of additional employer contributions for the unfunded liability of the Retirement Annuity Trust. The plan fiduciary net position as a percentage of total pension liability measured in accordance with Governmental Accounting Standards Board (GASB) Statement No. 67 was 58.3% as of June 30, 2020, compared to 2019's 58.8%. The separately issued actuary's valuation shows progress of the trust's funded status over the amortization period set by the board funding policy. The additional funding provided in the budget resulted in 100% of the actuarially determined employer contribution (ADEC) being made for 2020 and 2019. Assuming that contributions to the retirement trust are made by the state

Teachers' Retirement System of the State of Kentucky Management's Discussion and Analysis (Continued)

from year to year in the future as recommended by the actuary, TRS should have sufficient assets to provide all benefits due as defined by law to members.

The funding of the health insurance and life insurance trusts is presented in notes 8 and 9 of these financial statements and the Required Supplementary Information in accordance with GASB Statement No. 74. Although the Health Insurance Trust continues to have a large net OPEB liability, current obligations are being met by current funding. The Shared Responsibility solution enacted in 2010 continues to prefund retiree health benefits. The Schedule of Employer Contributions presented in the Required Supplementary Information provides the ADEC of the health and life insurance trusts.

Historical Trends

Accounting standards require that the Statement of Fiduciary Net Position presents assets at fair value; include only benefits and refunds due to plan members and beneficiaries. The standards also require presenting accrued investment and administrative expenses as of the reporting date. Detailed information regarding the funded status — including the key actuarial assumptions, target allocations and the sensitivity of the discount rate — can be found for the Retirement Annuity Trust in Note 4 of the financial statements, for the Health Insurance Trust in Note 8 and for the Life Insurance Trust in Note 9. The schedules of employer contributions are provided in the Required Supplementary Information.

TRS's independent consulting actuaries are members of the American Academy of Actuaries and experienced in performing valuations for public retirement systems. As mandated by state law, the valuations of the retirement annuity and health insurance trusts are prepared in accordance with principles of practice prescribed by the Actuarial Standards Board consistent with accepted actuarial procedures. Actuarial assumptions used in the valuations are internally consistent and reasonable based on the actual experience of the trusts. An actuarial audit was completed in 2015, which confirmed the accuracy of actuarial procedures and the reasonableness of assumptions. A five-year experience study was completed in 2016, which also confirmed the reasonableness of assumptions based upon the actual experience of the trusts. The actuarial assumptions may be reasonably relied upon as reflected in the results.

This financial report is designed to provide citizens, participating employers, plan members and other users with an overview of TRS's fiscal practices. Direct questions or requests for additional information to TRS Chief Financial Officer Mark Whelan.

Teachers' Retirement System of the State of Kentucky
Statement of Fiduciary Net Position
As of June 30, 2020

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Assets					
Cash	\$ 145,147,445	\$ 59,022,154	\$	\$ 32,119	\$ 204,201,718
Prepaid expenses	40,361				40,361
Receivables					
Contributions	53,939,286	25,205,437	13,058		79,157,781
Due from other trusts	2,084,771				2,084,771
State of Kentucky			178,131		178,131
Investment income	42,747,821	2,942,288	273,122	2,682	45,965,913
Investment sales receivable	14,904,196	1,494,412	13,018		16,411,626
Other receivables	110,557	31,412,496			31,523,053
Total receivables	113,786,631	61,054,633	477,329	2,682	175,321,275
Investments at fair value					
Short-term investments	757,664,315	26,908,534	12,219,575	354,976	797,147,400
Fixed income	2,942,102,334	128,746,941	14,143,524	315,524	3,085,308,323
Equities	12,593,762,661	914,010,573	55,860,313	348,641	13,563,982,188
Alternative investments	1,465,067,724	113,773,956	361,320		1,579,203,000
Real estate	1,227,834,915	82,393,040	2,399,699		1,312,627,654
Additional categories	1,549,337,817	262,798,450	2,034,758		1,814,171,025
Total investments	20,535,769,766	1,528,631,494	87,019,189	1,019,141	22,152,439,590
Capital assets	26,538,763				26,538,763
Accumulated depreciation	(14,466,669)				(14,466,669)
Net capital assets	12,072,094				12,072,094
Total assets	20,806,816,297	1,648,708,281	87,496,518	1,053,942	22,544,075,038
Liabilities					
Accrued expenses and other liabilities	2,512,813	9,039,424	80,326		11,632,563
Due to other trusts		2,047,237	35,980	1,554	2,084,771
State of Kentucky	6,046,307	14,762,969			20,809,276
Investment purchases payable	81,256,853	6,183,391	12,321		87,452,565
Total liabilities	89,815,973	32,033,021	128,627	1,554	121,979,175
Net position restricted for pension and other postemployment benefits	<u>\$20,717,000,324</u>	<u>\$1,616,675,260</u>	<u>\$87,367,891</u>	<u>\$1,052,388</u>	<u>\$22,422,095,863</u>

The Combining Statement of Fiduciary Net Position — Other Funds is presented on page 13.

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

Teachers' Retirement System of the State of Kentucky
Statement of Fiduciary Net Position
As of June 30, 2019

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Assets					
Cash	\$ 85,986,592	\$ 35,499,235	\$ 261,416	\$ 239,187	\$ 121,986,430
Prepaid expenses	67,059				67,059
Receivables					
Contributions	38,277,522	22,738,889	19,353		61,035,764
Due from other trusts	1,835,025				1,835,025
State of Kentucky		826,203	120,308		946,511
Investment income	51,446,307	2,420,395	325,174	3,345	54,195,221
Investment sales receivable	12,620,835	1,081,560			13,702,395
Other receivables	163,007	27,671,716			27,834,723
Total receivables	104,342,696	54,738,763	464,835	3,345	159,549,639
Investments at fair value					
Short-term investments	678,260,542	74,104,999	13,451,102	355,729	766,172,372
Fixed income	3,227,674,773	112,630,744	19,859,044	268,672	3,360,433,233
Equities	12,288,549,261	768,005,547	48,261,798	334,537	13,105,151,143
Alternative investments	1,359,374,419	102,153,229	48,510		1,461,576,158
Real estate	1,223,062,000	75,296,027	2,107,202		1,300,465,229
Additional categories	1,432,019,602	203,521,400	1,354,418		1,636,895,420
Total investments	20,208,940,597	1,335,711,946	85,082,074	958,938	21,630,693,555
Capital assets	26,527,263				26,527,263
Accumulated depreciation	(12,439,961)				(12,439,961)
Net capital assets	14,087,302				14,087,302
Total assets	20,413,424,246	1,425,949,944	85,808,325	1,201,470	21,926,383,985
Liabilities					
Accrued expenses and other liabilities	2,674,889	5,920,066	19,654		8,614,609
Due to other trusts		1,803,191	30,392	1,442	1,835,025
State of Kentucky	3,799,618				3,799,618
Investment purchases payable	35,039,834	4,206,631			39,246,465
Total liabilities	41,514,341	11,929,888	50,046	1,442	53,495,717
Net position restricted for pension and other postemployment benefits	<u>\$20,371,909,905</u>	<u>\$1,414,020,056</u>	<u>\$ 85,758,279</u>	<u>\$ 1,200,028</u>	<u>\$21,872,888,268</u>

The Combining Statement of Fiduciary Net Position — Other Funds is presented on page 13.
The accompanying notes are an integral part of these financial statements.

Teachers' Retirement System of the State of Kentucky
Statement of Changes in Fiduciary Net Position
For the Fiscal Year Ended June 30, 2020

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Additions					
Contributions					
State of Kentucky	\$ 1,048,192,668	\$ 77,191,060	\$ 1,543,413	\$	\$ 1,126,927,141
Other employers	86,088,427	107,434,414	252,976		193,775,817
Members	324,664,055	133,588,771			458,252,826
Total contributions	1,458,945,150	318,214,245	1,796,389		1,778,955,784
Investment income (loss)					
Net appreciation (depreciation) in fair value of investments	723,233,156	19,256,856	3,954,293	60,956	746,505,261
Interest	171,256,317	11,545,773	690,620	15,335	183,508,045
Dividends	234,318,496	7,331,916	719,334	6,758	242,376,504
Rental income, net	27,049,513				27,049,513
Securities lending, gross earnings	7,139,418		129,906	943	7,270,267
Gross investment income (loss)	1,162,996,900	38,134,545	5,494,153	83,992	1,206,709,590
Less: investment expense	(64,062,834)	(5,659,596)	(236,018)		(69,958,448)
Less securities lending expense	(4,910,688)		(91,932)	(504)	(5,003,124)
Net investment income (loss)	1,094,023,378	32,474,949	5,166,203	83,488	1,131,748,018
Total additions	2,552,968,528	350,689,194	6,962,592	83,488	2,910,703,802
Deductions					
Benefits	2,167,239,241		5,317,000	229,574	2,172,785,815
Refunds of contributions	28,472,217				28,472,217
Insurance expenses		145,986,752			145,986,752
Administrative expense	12,166,651	2,047,238	35,980	1,554	14,251,423
Total deductions	2,207,878,109	148,033,990	5,352,980	231,128	2,361,496,207
Net increase (decrease)	345,090,419	202,655,204	1,609,612	(147,640)	549,207,595
Net position restricted for pension and other postemployment benefits					
Beginning of year	20,371,909,905	1,414,020,056	85,758,279	1,200,028	21,872,888,268
End of year	<u>\$20,717,000,324</u>	<u>\$1,616,675,260</u>	<u>\$ 87,367,891</u>	<u>\$ 1,052,388</u>	<u>\$22,422,095,863</u>

The Combining Statement of Changes in Fiduciary Net Position — Other Funds is presented on page 14.
The accompanying notes, are an integral part of these financial statements.

Teachers' Retirement System of the State of Kentucky
Statement of Changes in Fiduciary Net Position
For the Fiscal Year Ended June 30, 2019

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Additions					
Contributions					
State of Kentucky	\$ 1,051,451,775	\$ 76,381,841	\$ 1,209,055	\$	\$ 1,129,042,671
Other employers	71,583,048	106,764,314	212,172	267,554	178,827,088
Members	321,172,166	131,676,820			452,848,986
Total contributions	1,444,206,989	314,822,975	1,421,227	267,554	1,760,718,745
Investment income (loss)					
Net appreciation (depreciation) in fair value of investments	651,487,372	63,835,895	3,706,870	43,283	719,073,420
Interest	159,741,150	9,120,053	764,520	21,645	169,647,368
Dividends	304,120,073	6,724,667	727,547	6,365	311,578,652
Rental income, net	28,402,562				28,402,562
Securities lending, gross earnings	15,694,255		353,336	5,277	16,052,868
Gross investment income (loss)	1,159,445,412	79,680,615	5,552,273	76,570	1,244,754,870
Less: investment expense	(61,166,252)	(5,295,133)	(172,703)	(15,830)	(66,649,918)
Less securities lending expense	(13,089,811)		(321,382)	(4,718)	(13,415,911)
Net investment income (loss)	1,085,189,349	74,385,482	5,058,188	56,022	1,164,689,041
Total additions	2,529,396,338	389,208,457	6,479,415	323,576	2,925,407,786
Deductions					
Benefits	2,094,364,072		5,153,000	244,424	2,099,761,496
Refunds of contributions	32,403,149				32,403,149
Insurance expenses		163,666,017			163,666,017
Administrative expense	12,352,308	1,803,192	30,392	1,442	14,187,334
Total deductions	2,139,119,529	165,469,209	5,183,392	245,866	2,310,017,996
Net increase (decrease)	390,276,809	223,739,248	1,296,023	77,710	615,389,790
Net position restricted for pension and other postemployment benefits					
Beginning of year	19,981,633,096	1,190,280,808	84,462,256	1,122,318	21,257,498,478
End of year	<u>\$20,371,909,905</u>	<u>\$1,414,020,056</u>	<u>\$ 85,758,279</u>	<u>\$1,200,028</u>	<u>\$21,872,888,268</u>

The Combining Statement of Changes in Fiduciary Net Position — Other Funds is presented on page 15.
The accompanying notes are an integral part of these financial statements.

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Teachers' Retirement System of the State of Kentucky
Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2020

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	\$	\$ 32,119	\$	\$ 32,119
Receivables				
Investment income	25		2,657	2,682
Investments at fair value				
Short-term investments	310,423		44,553	354,976
Fixed income			315,524	315,524
Equities			348,641	348,641
Total investments	<u>310,423</u>	<u></u>	<u>708,718</u>	<u>1,019,141</u>
Total assets	<u>310,448</u>	<u>32,119</u>	<u>711,375</u>	<u>1,053,942</u>
Liabilities				
Due to other trusts	28	1,404	122	1,554
Total liabilities	<u>28</u>	<u>1,404</u>	<u>122</u>	<u>1,554</u>
Net position restricted for pension and other postemployment benefits	<u>\$ 310,420</u>	<u>\$ 30,715</u>	<u>\$ 711,253</u>	<u>\$ 1,052,388</u>

Teachers' Retirement System of the State of Kentucky
Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2019

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	\$	\$ 239,187	\$	\$ 239,187
Receivables				
Investment income	580		2,765	3,345
Investments at fair value				
Short-term investments	310,008		45,721	355,729
Fixed income			268,672	268,672
Equities			334,537	334,537
Total investments	<u>310,008</u>	<u></u>	<u>648,930</u>	<u>958,938</u>
Total assets	<u>310,588</u>	<u>239,187</u>	<u>651,695</u>	<u>1,201,470</u>
Liabilities				
Due to other trusts	45	1,293	104	1,442
Total liabilities	<u>45</u>	<u>1,293</u>	<u>104</u>	<u>1,442</u>
Net position restricted for pension and other postemployment benefits	<u>\$ 310,543</u>	<u>\$ 237,894</u>	<u>\$ 651,591</u>	<u>\$ 1,200,028</u>

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

Teachers' Retirement System of the State of Kentucky
Combining Statement of Changes in Fiduciary Net Position — Other Funds
For the Fiscal Year Ended June 30, 2020

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Additions				
Contributions				
Other employers	\$	\$	\$	\$
Investment income (loss)				
Net appreciation in fair value of investments			60,956	60,956
Interest	3,964	1,738	9,633	15,335
Dividends			6,758	6,758
Securities lending, gross			943	943
Gross investment income (loss)	<u>3,964</u>	<u>1,738</u>	<u>78,290</u>	<u>83,992</u>
Less investment expense			504	504
Less securities lending expense				
Net investment income (loss)	<u>3,964</u>	<u>1,738</u>	<u>77,786</u>	<u>83,489</u>
Total additions	<u>3,964</u>	<u>1,738</u>	<u>77,786</u>	<u>83,489</u>
Deductions				
Benefits	4,061	207,513	18,000	229,574
Administrative expense	26	1,404	124	1,554
Total deductions	<u>4,087</u>	<u>208,917</u>	<u>18,124</u>	<u>231,128</u>
Net Increase (Decrease)	<u>(123)</u>	<u>(207,179)</u>	<u>59,662</u>	<u>(147,640)</u>
Net position restricted for pension and other postemployment benefits				
Beginning of year	<u>310,543</u>	<u>237,894</u>	<u>651,591</u>	<u>1,200,028</u>
End of year	<u>\$ 310,420</u>	<u>\$ 30,715</u>	<u>\$ 711,253</u>	<u>\$ 1,052,388</u>

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

Teachers' Retirement System of the State of Kentucky
Combining Statement of Changes in Fiduciary Net Position — Other Funds
For the Fiscal Year Ended June 30, 2019

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Additions				
Contributions				
Other employers	\$	\$ 267,554		\$ 267,554
Investment income (loss)				
Net appreciation in fair value of investments			43,283	43,283
Interest	6,820	4,730	10,095	21,645
Dividends			6,365	6,365
Securities lending, gross			5,277	5,277
Gross investment income (loss)	6,820	4,730	65,020	76,570
Less investment expense	13,592		2,238	15,830
Less securities lending expense			4,718	4,718
Net investment income (loss)	(6,772)	4,730	58,064	56,022
Total additions	(6,772)	272,284	58,064	323,576
Deductions				
Benefits	7,371	219,053	18,000	244,424
Administrative expense	44	1,292	106	1,442
Total deductions	7,415	220,345	18,106	245,866
Net increase (decrease)	(14,187)	51,939	39,958	77,710
Net position restricted for pension and other postemployment benefits				
Beginning of year	324,730	185,955	611,633	1,122,318
End of year	<u>\$ 310,543</u>	<u>\$ 237,894</u>	<u>\$ 651,591</u>	<u>\$ 1,200,028</u>

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

Note 1 Description of Retirement Annuity Trust

Reporting Entity

The Teachers' Retirement System of the State of Kentucky (TRS, or system) was created by the 1938 General Assembly, began operations July 1, 1940, and is governed by Kentucky Revised Statutes (KRS) chapter 161 sections 220 through 990. TRS is a blended component unit of the Commonwealth of Kentucky (commonwealth or state) and, therefore, is included in the commonwealth's financial statements. TRS is a cost-sharing multiple-employer defined benefit plan with a special funding situation established to provide retirement, health and life insurance benefits for specified employees of local school districts and other public educational agencies in the commonwealth.

KRS 161.250 provides that the general administration and management of TRS, and the responsibility for its proper operation, is vested in a board of trustees. The Board of Trustees consists of the chief state school officer, the state treasurer, two trustees appointed by the governor and seven elected trustees. Four of the elected trustees are active teachers, two are not members of the teaching profession, and one is an annuitant of the system.

Participants

As of June 30, 2020, a total of 207 employers participated in the plan. Employers are comprised of local school districts, Department of Education agencies, universities, the Kentucky Community and Technical College System and other educational organizations. The state under the Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 74 is recognized as a non-employer contributing entity providing the employer matching contributions for members employed by the local school districts and regional educational cooperatives.

According to KRS 161.220, any regular or special teacher, or professional occupying a position requiring certification or graduation from a four-year college or university is eligible to participate in the system. The following table illustrates the classifications of members.

	2020	2019
Active contributing members:		
Vested	49,045	48,562
Non-vested	24,106	24,085
Inactive members, vested	9,139	8,992
Retirees and beneficiaries currently receiving benefits	56,629	55,613
Total members, retirees and beneficiaries	<u>138,919</u>	<u>137,252</u>

Benefit Provisions

For Members Before July 1, 2008: Members become vested when they complete five years of credited service. To qualify for monthly retirement benefits, payable for life, members must either:

1. Attain age 55 and complete five years of Kentucky service, or
2. Complete 27 years of Kentucky service.

Non-university members receive monthly payments equal to 2% (service prior to July 1, 1983) and 2.5% (service after July 1, 1983) of their final average salaries for each year of credited service. Non-university members who became members on or after July 1, 2002, will receive monthly benefits equal to 2% of their final average salary for each year of service if, upon retirement, their total service is less than 10 years. New members after July 1, 2002, who retire with 10 or more years of total service will receive monthly benefits equal to 2.5% of their final average salary for each year of service, including the first 10 years. In addition, non-university members who retire July 1, 2004, and later with more than 30 years of service will have a multiplier for all years over 30 of 3%.

University employees receive monthly benefits equal to 2% of their final average salary for each year of credited service.

The final average salary is the member's five highest annual salaries except members at least age 55 with 27 or more years of service may use their three highest annual salaries. For all members, the annual allowance is reduced by 5% per year from the earlier of age 60 or the date the member would have completed 27 years of service. The minimum annual service allowance for all members is \$440 multiplied by credited service.

For Members On or After July 1, 2008: Members become vested when they complete five years of credited service. To qualify for monthly retirement benefits, payable for life, members must either:

1. Attain age 60 and complete five years of Kentucky service, or
2. Complete 27 years of Kentucky service, or
3. Attain age 55 and complete 10 years of Kentucky service.

The annual retirement allowance for non-university members is equal to: (a) 1.7% of final average salary for each year of credited service if their service is 10 years or less; (b) 2% of final average salary for each year of credited service if their service is greater than 10 years but no more than 20 years; (c) 2.3% of final average salary for each year of credited service if their service is greater than 20 years but no more than 26 years; (d) 2.5% of final average salary for each year of credited service if their service is greater than 26 years but no more than 30 years; (e) 3% of final average salary for years of credited service greater than 30 years.

The annual retirement allowance for university members is equal to: (a) 1.5% of final average salary for each year of credited service if their service is 10 years or less; (b) 1.7% of final average salary for each year of credited service if their service is greater than 10 years but no more than 20 years; (c) 1.85% of final average salary for each year of credited service if their service is greater than 20 years but less than 27 years; (d) 2% of final average salary for each year of credited service if their service is greater than or equal to 27 years.

The final average salary is the member's five highest annual salaries except members at least age 55 with 27 or more years of service may use their three highest annual salaries. For all members, the annual allowance is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

Other Benefits

TRS provides postemployment medical insurance benefits to retirees as fully described in Note 8. TRS also provides disability benefits for vested members at the rate of 60% of the final average salary. A life insurance benefit payable upon the death of a member, also described in Note 9, is \$2,000 for active contributing members and \$5,000 for retired or disabled members.

Cost of living increases are 1.5% annually. Additional ad hoc increases and any other benefit amendments must be authorized by the General Assembly.

Note 2

Summary of Significant Accounting Policies

Basis of Accounting

The financial statements are prepared on the accrual basis of accounting. Member contributions and employer matching contributions are recognized in the fiscal year due. Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

Cash

TRS has seven cash accounts. At June 30, 2020, the retirement annuity cash account totaled \$60.4 million, the control cash account totaled \$116 million and the capital project cash account totaled \$274,003 for a total of \$177 million as carrying value of cash in the retirement trust. The medical insurance's Internal Revenue Code sec. 115 (IRC 115) trust cash account totaled \$43.4 million, the medical insurance 401(h) cash account totaled \$15.8 million and the medical claims cash account totaled \$116,793 for a total of \$59.3 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled a negative \$52,642 due to timing. The Supplemental Benefit Fund cash account contained \$32,121. Therefore, the carrying value of cash was \$236 million, and the bank balance was \$234.2 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2020.

At June 30, 2019, the retirement annuity cash account totaled \$11.7 million, the control cash account totaled \$74 million and the capital project cash account totaled \$274,003 for a total of \$86 million as carrying value of cash in the retirement trust. The medical insurance's IRC 115 trust cash account totaled \$23.6 million, the medical insurance 401(h) cash account totaled \$11.8 million and the medical claims cash account totaled \$115,598 for a total of \$35.5 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled \$261,417. The Supplemental Benefit Fund cash account contained \$239,187. Therefore, the carrying value of cash was \$122 million, and the bank balance was \$134.1 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2019.

Capital Assets

Property and equipment are carried at cost, less accumulated depreciation. All costs of property and equipment \$5,000 or greater are capitalized. Expenditures for maintenance and repairs are charged to operations as incurred. Depreciation is calculated using the straight-line method, with estimated lives ranging from five to 40 years in the following major classes: office furniture and equipment, five years; other equipment, five years; computer software, 10 years; and TRS office buildings, 40 years. Pathway replaced TRS's legacy computer system and is TRS's primary business information technology system. Pathway was capitalized and is being amortized or depreciated over 10 years.

Investments

Plan investments are reported at fair value. Fair value is the amount that a plan can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller. Short-term securities are carried at cost, which approximates fair value. Fixed income and common and preferred stocks are generally valued based on published market prices and quotations from national security exchanges and securities pricing services. Real estate is primarily valued based on appraisals performed by independent appraisers. Other investments, such as private equity, timberland, real estate funds and other additional categories, are valued using the most recent general partner statement at net asset value. Examples of other additional categories are opportunistic credit, high yield bonds and direct lending.

Purchase and sales of debt securities, equity securities and short-term investments are recorded on the trade date. Real estate equity transactions are recorded on the settlement date. Upon sale of investments, the difference between sales proceeds and cost is reflected in the statement of changes in fiduciary net position. Investment expenses consist of investment manager and consultant fees along with fees for custodial services.

Compensated Absences

Expenses for accumulated vacation days and compensatory time earned by TRS's employees are recorded when earned. Upon termination or retirement, employees of TRS are paid for accumulated vacation time limited to 60 days and accumulated compensatory time limited to 240 hours. As of June 30, 2020 and 2019, accrued compensated absences were included in accrued expenses and other liabilities on the statements of fiduciary net position amounting to \$1.4 million and \$1.2 million, respectively.

Risk Management

Destruction of assets, theft, employee injuries and court challenges to administrative policy are among the various risks to which TRS is exposed. In order to cover such risks, TRS carries appropriate insurance policies, such as fire and tornado, employee bonds, fiduciary liability, worker's compensation and equipment insurance.

Other Receivables

In the Retirement Annuity Trust, other receivables consists primarily of installment contract receivables. TRS allows qualified purchases of service credit to be made by installment payments that are not to exceed a five-year period. Revenue is recognized in the initial year of the installment agreement. The June 30, 2020, other receivables in the retirement trust were \$110,557 and \$163,007 in 2019.

In the Health Insurance Trust, other receivables consists primarily of Medicare subsidies and formulary rebates accrued, but not received. The June 30, 2020, other receivables in the health trust were \$31.4 million and \$27.7 million in 2019.

Accrued Expenses and Other Payables

TRS's accrued expenses and other payables results primarily from the actual amount needed from the state for health insurance premiums for the current biennium being less than what was estimated when the 2018-2020 state budget was enacted. This amount will be netted against the state's share of retiree health costs requested in the 2020-2022 state budget submitted by TRS.

Use of 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 certain reported amounts and disclosures. Accordingly, actual results could differ from those estimates. The most significant estimates impacting the financial statements relate to the actuarial assumptions.

Income Taxes

The Retirement Annuity Trust is organized as a tax-exempt retirement plan under the Internal Revenue Code. The 403(b) Tax-Sheltered Trust no longer accepts contributions and will be fully terminated when all lifetime annuities have expired. TRS's management believes that it has operated the plans within the constraints imposed by federal tax law.

Note 3

Contributions and Funds of the Plan

Contributions

Contribution rates are established by Kentucky Revised Statutes. Non-university members are required to contribute 12.855% of their salaries to the system effective July 1, 2015; university members are required to contribute 10.4% of their salaries effective July 1, 2015. KRS 161.565 allows each university to reduce the contribution of its members by 2.215%; therefore, university members contribute 8.185% of their salary to TRS. For members employed by local school districts, the state, as a non-employer contributing entity, contributes 13.105% of salary for those who joined before July 1, 2008, and 14.105% for those who joined thereafter.

Other participating employers are required to contribute the percentage contributed by members plus an additional 3.25% of members' gross salaries.

The member and employer contributions consist of retirement annuity contributions and other post-employment benefits (OPEB) contributions to the medical and life insurance trusts. The member postemployment medical contribution is 3.75% of salary. The employer postemployment medical contribution is 0.75% of member salaries. Also, employers (other than the state) contribute 3% of members' salaries and the state contributes the net cost of health insurance premiums for new retirees after June 30, 2010, in the non-Medicare eligible group. If a member leaves covered employment before accumulating five years of credited service, accumulated member contributions to the retirement trust are refunded with interest upon the member's request.

Funds of the Plan

Teacher Savings Fund: KRS 161.420(2) establishes the Teacher Savings Fund consisting of contributions paid by university and non-university members. The fund also includes interest authorized by the Board of Trustees from the Guarantee Fund (described below). The accumulated contributions of members that are returned upon withdrawal or paid to the estate or designated

beneficiary in the event of death are paid from this fund. Upon retirement, the member's contributions and the matching state contributions are transferred from this fund to the Allowance Reserve Fund, the fund (also described below) from which retirement benefits are paid.

State Accumulation Fund: KRS 161.420(3) establishes the State Accumulation Fund, which receives state appropriations to the system. The state matches an amount equal to members' contributions. State appropriations during the year are based on estimates of members' salaries. At year-end when actual salaries are known, the required state matching also is realized by producing either a receivable from or a payable to the state.

Allowance Reserve Fund: KRS 161.420(4) establishes the Allowance Reserve Fund, which is the source for retirement, disability and survivor benefits paid to TRS members. These benefits are paid from the retired members' contributions until they are exhausted, at which time state matching contributions are used to pay the benefits. After an individual member's contributions and the state matching contributions have been exhausted, retirement benefits are paid from monies transferred from the Guarantee Fund (described below).

Guarantee Fund: KRS 161.420(6) establishes the Guarantee Fund to collect income from investments, state matching contributions of members withdrawn from the system, and state matching contributions for cost-of-living adjustments (COLAs). In addition, it receives money for which disposition is not otherwise provided. This fund provides interest to the other funds, benefits in excess of both members' and state matching contributions, monies for administrative expenses of TRS and deficiencies not covered by the other funds.

Expense Fund: KRS 161.420(1) establishes the Expense Fund for administrative expenses. Investment income transferred to this fund from the Guarantee Fund is used to pay the administrative expenses of TRS. Administrative expenses are allocated among the funds based on benefits paid.

Note 4 Net Pension Liability of Employers

The net pension liability (i.e., the system's liability determined in accordance with GASB Statement No. 67 less the fiduciary net position) as of June 30, 2020 and 2019 follows.

Schedule of Net Pension Liability of Employers (Dollars in thousands)

Fiscal Year Ending June 30	Total Pension Liability A	Plan Fiduciary Net Position B	Employers Net Pension Liability (A-B)	Plan Fiduciary Net Position as a % of Total Pension Liability (B/A)	Covered Payroll C	Net Pension Liability as a % of Covered Payroll [(A-B)/C]
2020	\$ 35,552,041	\$ 20,717,000	\$ 14,835,041	58.3	\$ 3,569,262	415.6
2019	34,666,795	20,371,910	14,294,885	58.8	3,497,216	408.8

Summary of Actuarial Assumptions

A summary of the actuarial assumptions as of the latest actuarial valuation follows.

Valuation date	June 30, 2019
Actuarial cost method	Entry age
Investment rate of return	7.5%, net of pension plan investment expense, including inflation.
Projected salary increases	3.5 - 7.3%, including inflation
Inflation rate	3%
Municipal bond index rate	3.5%
Single equivalent interest rate	7.5%

Mortality rates were based on the RP-2000 Combined Mortality Table for Males or Females, as appropriate, with adjustments for mortality improvements based on a projection of Scale BB to 2025, set forward two years for males and one year for females. The actuarial assumptions used in the June 30, 2019 valuation were based on the results of an actuarial experience study for the period July 1, 2010, to June 30, 2015, adopted by the board on September 19, 2016. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System.

Target Allocations

The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis in which best-estimate ranges 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 percentage and by adding expected inflation.

A summary of the target allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, follows.

Asset Class	Target Allocation Percentage	Long-Term Expected Real Rate Percentage of Return
U.S. equity	40	4.6
International equity	22	5.6
Fixed income	15	—
Additional categories	7	2.5
Real estate	7	4.3
Private equity	7	7.7
Cash	2	(0.5)
Total	100	

Discount Rate

For 2020, the discount rate used to measure the total pension liability was 7.5%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made in full at the current contribution rates and the employer contributions will be made at actuarially determined contribution (ADC) rates for all future fiscal years. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

The following table presents TRS's net pension liability for 2020. TRS's 2020 net pension liability is calculated using the discount rate of 7.5%, as well as what the system's net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (6.5%) or 1 percentage point higher (8.5%) than the current rate.

	2020		
(In thousands)	1% Decrease (6.5%)	Current Discount (7.5%)	1% Increase (8.5%)
Net pension liability	\$18,868,453	\$14,835,041	\$11,439,108

For 2019, the discount rate used to measure the total pension liability was 7.5%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made in full at the current contribution rates and the employer contributions will be made at ADC rates, adjusted by 95%, for all future fiscal years. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members.

Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

The following table presents TRS's net pension liability for 2019. TRS's 2019 net pension liability is calculated using the discount rate of 7.5%, as well as what the system's net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (6.5%) or 1 percentage point higher (8.5%) than the current rate.

2019			
<i>(In thousands)</i>	1% Decrease (6.5%)	Current Discount (7.5%)	1% Increase (8.5%)
Net pension liability	\$18,252,330	\$14,294,885	\$10,964,314

June 30, 2019, is the actuarial valuation date upon which the total pension liability (TPL) is based for 2020. An expected TPL is determined as of June 30, 2020, using standard roll forward techniques for the TPL using a discount rate of 7.5%. An expected TPL was also determined using the prior year TPL rolled forward to June 30, 2019. The roll-forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments, refunds for the plan year and applies the assumed interest rate (single equivalent interest rate (SEIR)) for the year. The difference between the two roll-forward amounts as of June 30, 2020, is the experience gain or loss.

TPL Roll Forward 2020

(Dollars in thousands)

	Expected	Actual
(a) Interest Rate	7.5%	7.5%
(b) TPL as of June 30, 2019	\$34,666,795	\$34,676,713
(c) Entry Age Normal Cost for the Year July 1, 2019 - June 30, 2020	552,625	552,625
(d) Actual Benefit Payments (including refunds) For the year July 1, 2019 - June 30, 2020	2,195,711	2,195,711
(e) TPL as of June 30, 2020 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	35,541,380	35,552,041
(f) Difference between Expected and Actual Experience (Gain)/Loss		10,661

June 30, 2018, is the actuarial valuation date upon which the TPL is based for 2019. An expected TPL is determined as of June 30, 2019, using standard roll-forward techniques for the TPL using a discount rate of 7.5%. An expected TPL was also determined using the prior year TPL rolled forward to June 30, 2019. The roll forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year and then applies the assumed interest rate (SEIR) for the year. The difference between the two roll-forward amounts as of June 30, 2019, is the gain or loss.

In addition, we have determined an expected TPL as of June 30, 2019, based on the TPL roll forward in the June 30, 2018 GASB Statement No. 67 report. The difference between this amount and the roll-forward of the actual TPL using last year's assumptions is reflected as an experience gain or loss for the year. These procedures are shown in the following table.

TPL Roll Forward 2019
(Dollars in thousands)

	Expected	Actual Before Assumption Change
(a) Interest Rate	7.50%	7.50%
(b) TPL as of June 30, 2018	\$33,708,555	\$33,795,671
(c) Entry Age Normal Cost for the Year July 1, 2018 - June 30, 2019	542,970	542,970
(d) Actual Benefit Payments (including refunds) For the year July 1, 2018 - June 30, 2019	2,126,767	2,126,767
(e) TPL as of June 30, 2019 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	34,573,145	34,666,795
(f) Difference between Expected and Actual Experience (Gain)/Loss		93,650

Note 5
Deposits With Financial Institutions and Investments
(Including Repurchase Agreements)

Legal Provisions for Investments

The following disclosures are meant to help the users of the financial statements for the Teachers' Retirement System of the State of Kentucky (TRS or system) assess the risks TRS takes in investing member funds. The Board of Trustees and the Investment Committee are guided by asset allocation parameters that the board approves through its powers as defined in KRS 161.430.

TRS administers a Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust in accordance with state and federal law. TRS provides benefits for service and disability retirements; death and survivors; retiree health insurance; and life insurance for Kentucky public education employees and their beneficiaries.

The asset allocation parameters for the retirement annuity and life insurance trusts are set forth in 102 Kentucky Administrative Regulations (KAR) 1:175, sections 2 and 3 as follows:

- There shall be no limit on the amount of investments owned if the investments are guaranteed by the U.S. government.
- Not more than 35% of the assets at fair value shall be invested in corporate debt obligations.
- Not more than 10% of the assets at fair value shall be invested in foreign debt.
- Not more than 65% of the assets at fair value shall be invested in common stocks or preferred stocks.
- Not more than 25% of the assets at fair value shall be invested in a stock portfolio designed to replicate a general stock index.
- Not more than 30% of the assets at fair value shall be invested in the stocks of companies domiciled outside of the United States; any amounts so invested shall be included in the 65% limitation for total stocks.
- Not more than 10% of the assets at fair value shall be invested in real estate. This would include real estate equity, real estate lease agreements and shares in real estate investment trusts.
- Not more than 10% of the assets at fair value shall be invested in alternative investments. This category may include private equity, venture capital, timberland and infrastructure investments.
- Not more than 15% of the assets at fair value shall be invested in any additional category or categories of investments. The board shall approve by resolution such additional category or categories of investments.

The asset allocation parameters for the Health Insurance Trust fund are set forth in 102 KAR 1:178, section 2 as follows:

- In order to preserve the assets and produce the required rate of return while minimizing risk, assets shall be prudently diversified among various classes of investments.
- In determining asset allocation policy, the investment committee and the board shall be mindful of the trust's liquidity and its capability of meeting both short and long-term obligations.

Cash and Cash Equivalents

For cash deposits and cash equivalents, custodial credit risk is the risk that, in the event of a bank failure, TRS's deposits may not be returned to the system. TRS's total cash balance held at J.P. Morgan Chase bank on June 30, 2020, was \$234.2 million. TRS's total cash balance held at J.P. Morgan Chase on June 30, 2019, was \$134.1 million.

Deposits are exposed to custodial credit risk if they are not covered by depository insurance and the deposits are:

- a. uncollateralized,
- b. collateralized with securities held by the pledging financial institution or
- c. collateralized with securities held by the pledging financial institution's trust department or agent but not in the depositor-government's name.

As of June 30, 2020, TRS's cash balance of \$234.2 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of \$200 million as well as securities held by the Federal Reserve Bank of New York in the name of the Commonwealth of Kentucky — Teachers' Retirement valued at \$34.4 million.

As of June 30, 2019, TRS's cash balance of \$134.1 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of \$200 million.

Investments

All of TRS's assets are invested in short-term and long-term debt (bonds and mortgages) securities, equity (stock) securities, real estate, alternative investments and additional categories as permitted by regulation. These assets are reported at fair value.

Investments are governed by the board's policies. The board and the Investment Committee execute their fiduciary responsibilities in accordance with the prudent person rule, as identified in KRS 161.430 (2)(b). The prudent person rule establishes a standard for all fiduciaries to act as a prudent person would be expected to act, with the "care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims."

The following tables represent the fair values of TRS's investments for June 30, 2020, and 2019.

Schedules of Investments
Retirement Annuity Trust

	Fair Value June 30, 2020	Fair Value June 30, 2019
Short-term investments		
Cash and cash equivalents	\$ 758,019,291	\$ 678,616,271
Subtotal	<u>758,019,291</u>	<u>\$ 678,616,271</u>
Fixed Income		
U.S. government	889,924,118	\$ 1,297,994,618
Agency bonds	55,122,909	\$ 77,746,291
Mortgage-backed securities	132,326,674	\$ 101,618,762
Asset-backed securities	51,470,861	\$ 48,533,798
Commercial mortgage-backed securities	32,705,450	\$ 28,030,171
Collateralized mortgage obligations	34,109,190	\$ 22,172,884
Municipal bonds	303,262,635	\$ 284,472,393
Corporate bonds	1,443,496,021	\$ 1,367,374,528
Subtotal	<u>2,942,417,858</u>	<u>\$ 3,227,943,445</u>
Equities		
International	4,827,288,559	\$ 4,813,405,181
U.S.	7,766,822,743	\$ 7,475,478,617
Subtotal	<u>12,594,111,302</u>	<u>\$ 12,288,883,798</u>
Real estate	1,227,834,915	\$ 1,223,062,000
Alternative investments		
Private equity	1,209,514,168	\$ 1,176,784,326
Timberland	255,553,556	\$ 182,590,093
Subtotal	<u>1,465,067,724</u>	<u>\$ 1,359,374,419</u>
Additional categories		
Opportunistic credit	539,632,620	\$ 584,110,105
Corporate bonds	629,837,577	\$ 530,949,357
Corporate loans	303,538,415	\$ 316,960,140
U.S. equity	76,329,205	
Subtotal	<u>1,549,337,817</u>	<u>\$ 1,432,019,602</u>
Total*	<u><u>\$ 20,536,788,907</u></u>	<u><u>\$ 20,209,899,535</u></u>

*This schedule includes the 403(b) Tax Shelter fund, and Losey Scholarship fund.

Health Insurance Trust

	Fair Value June 30, 2020	Fair Value June 30, 2019
Short-term investments		
Cash and cash equivalents	\$ 26,908,534	\$ 74,104,999
Subtotal	26,908,534	\$ 74,104,999
Fixed income		
U.S. government	28,776,155	\$ 30,905,025
Agency bonds	1,006,590	\$ 1,014,190
Mortgage-backed securities	1,437,464	
Collateralized mortgage obligations	1,074,579	
Municipal bonds	5,986,249	\$ 3,200,070
Corporate bonds	90,465,904	\$ 77,511,459
Subtotal	128,746,941	\$ 112,630,744
Equities		
Global	812,169,939	\$ 732,597,127
International	6,990,116	
U.S.	94,850,518	\$ 35,408,420
Subtotal	914,010,573	\$ 768,005,547
Real estate equity	82,393,040	\$ 75,296,027
Private equity	113,773,956	\$ 102,153,229
Additional categories		
Opportunistic credit	85,150,167	\$ 65,752,634
Corporate bonds	133,717,678	\$ 98,976,970
Corporate loans	36,903,439	\$ 38,791,796
U.S. equity	7,027,166	
Subtotal	262,798,450	\$ 203,521,400
Total	<u>\$ 1,528,631,494</u>	<u>\$ 1,335,711,946</u>

Life Insurance Trust

	Fair Value June 30, 2020	Fair Value June 30, 2019
Short-term investments		
Cash and cash equivalents	\$ 12,219,575	\$ 13,451,102
Subtotal	12,219,575	13,451,102
Fixed income		
U.S. government	3,596,065	11,529,380
Mortgage-backed securities	491,359	577,168
Municipal bonds	2,889,990	2,601,460
Corporate bonds	7,166,110	5,151,036
Subtotal	14,143,524	19,859,044
Equities		
International	18,189,635	18,036,908
U.S.	37,670,678	30,224,890
Subtotal	55,860,313	48,261,798
Real estate equity	2,399,699	2,107,202
Private equity	361,320	48,510
Additional categories		
Corporate bonds	42,116	
Opportunistic credit	1,235,718	1,354,418
U.S equity	756,924	
Subtotal	2,034,758	1,354,418
Total	\$ 87,019,189	\$ 85,082,074

Custodial Credit Risk

Custodial credit risk for an investment is the risk that, in the event of the failure of a counterparty, TRS will not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the system and are held by either:

- a. the counterparty or
- b. the counterparty's trust department or agent, but not in the system's name.

The cash reserve of TRS is maintained primarily in high quality short-term investments through the Dreyfus Institutional Cash Advantage Fund. This fund invests in a diversified portfolio of high quality, short-term debt securities, and the fund is rated AAA by S&P, Moody's and Fitch. The fund's portfolio is structured within the confines of Rule 2a-7 under the Investment Company Act of 1940. Commercial paper; U.S. Treasury and agency obligations; certificates of deposit; bankers' acceptances; repurchase agreements; time deposits; etc. all are permissible investments within this fund.

Whenever repurchase agreements are ordered by TRS under the terms of master repurchase agreements with various brokers, the terms are dictated by TRS. The repurchase agreements and their supporting collateral are held by the custodial agent's correspondent bank in an account identified by the custodian's name and TRS's nominee name. This account is unique to TRS. The master repurchase agreements require that the supporting collateral have a fair value of at least 102% of the value of the repurchase agreements.

As of June 30, 2020, cash collateral reinvestment securities acquired through securities lending for the Retirement Annuity Trust by TRS's custodian amounted to \$951.3 million in relation to the \$938.1 million securities lent consistent with the lending agreement with the custodian. Cash collateral reinvestment securities lending for the Life Insurance Trust by TRS's custodian

amounted to \$13.3 million in relation to the \$13.2 million securities lent consistent with the lending agreement with the custodian. The custodian also is the lending agent and counterparty.

Interest Rate Risk

Interest rate risk on investments is the possibility that changes in interest rates will reduce the fair value of TRS's investments. In general, the longer the period until an investment matures, the greater the risk of a negative impact on fair value resulting from changes in interest rates.

As of June 30, 2020, and 2019, the Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust had the following investment fair values and weighted average maturities.

Retirement Annuity Trust

2020

2019

Investment Type	Fixed Income	Additional Categories	Average Maturity (years)	Fixed Income	Additional Categories	Average Maturity (years)
U.S. government	\$ 889,924,118	\$	11.04	\$ 1,297,994,618	\$	9.77
Agency bonds	55,122,909		6.41	77,746,291		7.33
Mortgage-backed securities	132,326,674		18.99	101,618,762		19.33
Asset-backed securities	51,470,861		11.28	48,533,798		12.01
Commercial mortgage-backed securities	32,705,450		17.92	28,030,171		22.26
Collateralized mortgage obligations	34,109,190		13.52	22,172,884		15.36
Municipal bonds	303,262,635		12.14	284,472,393		12.50
Corporate bonds	1,443,496,021	629,837,577	9.16	1,367,374,528	530,949,357	8.42
Corporate loans		303,538,415	4.42		316,960,140	4.54
Total	<u>\$ 2,942,417,858</u>	<u>\$ 933,375,992</u>	<u>9.89</u>	<u>\$ 3,227,943,445</u>	<u>\$ 847,909,497</u>	<u>9.26</u>

Health Insurance Trust

2020

2019

Investment Type	Fixed Income	Additional Categories	Average Maturity (years)	Fixed Income	Additional Categories	Average Maturity (years)
U.S. government	\$ 28,776,155	\$	9.36	\$ 30,905,025	\$	8.39
Agency bonds	1,006,590		3.20	1,014,190		4.19
Mortgaged-backed securities	1,437,464		28.61			
Collateralized mortgage obligations	1,074,579		9.29			
Municipal Bonds	5,986,249		6.77	3,200,070		7.38
Corporate bonds	90,465,904	133,717,678	6.47	77,511,459	98,976,970	6.30
Corporate loans		36,903,439	4.67		38,791,797	4.82
Total	<u>\$ 128,746,941</u>	<u>\$ 170,621,117</u>	<u>6.65</u>	<u>\$ 112,630,744</u>	<u>\$ 137,768,767</u>	<u>6.34</u>

Life Insurance Trust

2020

2019

Investment Type	Fixed Income	Additional Categories	Average Maturity (years)	Fixed Income	Additional Categories	Average Maturity (years)
U.S. government	\$ 3,596,065	\$	1.68	\$ 11,529,380	\$	8.42
Mortgage-backed securities	491,359		13.40	577,168		13.90
Municipal bonds	2,889,990		9.68	2,601,460		10.85
Corporate bonds	7,166,110	42,116	14.50	5,151,036		8.67
Total	\$ 14,143,524	\$ 42,116	10.23	\$ 19,859,044	\$	8.96

In addition to the above securities, TRS held short-term cash investments in the Dreyfus Institutional Cash Advantage Fund, at the Bank of New York Mellon (BNYM), with a total fair value of \$797.1 million and a weighted average maturity of 39 days. Average maturity is used as a measure of a security's exposure to interest rate risk due to fluctuations in market interest rates. Mortgage-backed securities and collateralized mortgage obligations typically are amortizing investments with an average life and interest rate risk significantly less than suggested by the legal maturity. Mortgage-backed securities, which generally are prepayable, and other callable bonds are subject to adverse changes in average life in response to market interest rate changes. The schedule above reflects only the legal maturity of all such bonds.

Interest rate risk is the risk that changes in interest rates will affect adversely the fair value of an investment. This risk is managed by using the effective duration or option adjusted methodology to quantify the risk of interest rate changes. This methodology takes into account optionality on bonds and scales the risk of price changes on bonds depending upon the degree of changes in rates and the slope of the yield curve. The control of interest rate risk is not set forth in a particular policy; however, the system manages interest rate risk in practice by establishing appropriate benchmarks for its various portfolios.

Mortgage-backed securities are securities representing pass-through interests in the cash flows from pools of mortgage loans on single-family or multi-family residential properties. All of the mortgage-backed securities owned by TRS were securitized and are guaranteed by Fannie Mae, Freddie Mac or Government National Mortgage Association (GNMA). The average life of a mortgage-backed security depends upon the level of prepayments experienced in the underlying pool of loans. Market interest rates are a primary determinant of prepayment levels. Lower-than- anticipated market rates generally lead to higher-than-anticipated prepayments and a shorter average life; higher-than-anticipated market rates generally lead to lower-than-anticipated prepayments and a longer average life. The Retirement Annuity Trust held \$132.3 million in mortgage-backed securities as of June 30, 2020, compared to \$101.6 million as of June 30, 2019. The Health Insurance Trust held \$1.4 million in mortgage-backed securities as of June 30, 2020, compared to no mortgage-backed securities as of June 30, 2019. The Life Insurance Trust held \$491.4 thousand in mortgage-backed securities as of June 30, 2020, compared to \$577.2 thousand as of June 30, 2019.

Collateralized mortgage obligations are bonds that are collateralized by whole loan mortgages, mortgage pass-through securities or stripped mortgage-backed securities. Income is derived from payments and prepayments of principal and interest generated from collateral mortgages. Cash flows are distributed to different investment classes in accordance with collateralized mortgage obligations' established payment order. The Retirement Annuity Trust held \$34.1 million in collateralized mortgage obligations as of June 30, 2020, compared to \$22.2 million as of June 30, 2019. The Health Insurance Trust held \$1.1 million in collateralized mortgage obligations as of June 30, 2020, compared to no collateralized mortgage obligations as of June 30, 2019.

Asset-backed securities are bonds or notes backed by loan paper or accounts receivables originated by banks, credit card companies or other credit providers and are considered to be moderately sensitive to changes in interest rates. The originator of the loan or accounts receivable paper sells it to a specially created trust, which repackages it as securities. Asset-backed securities have been structured as passthroughs and as structures with multiple bond classes. The Retirement Annuity Trust held \$51.5 million as of June 30, 2020, compared to \$48.5 million as of June 30, 2019.

Commercial mortgage-backed securities represent interests in the cash flows from pools of mortgage loans on commercial properties. The interests in a securitized pool of loans are divided generally into various tranches based upon planned payment order and level of seniority. TRS's commercial mortgage-backed securities consist of highly rated, relatively senior tranches. The average maturity of TRS's commercial mortgage-backed securities in the schedule above reflects the legal maturity of these holdings. Most of the tranches held are earlier in the planned payment order than the legal maturity suggests. The Retirement

Annuity Trust held \$32.7 million in commercial mortgage-backed securities investments as of June 30, 2020, compared to \$28 million as of June 30, 2019.

Credit Risk

Credit risk is the risk that an issuer or counterparty to an investment will not fulfill its obligations. The following schedules list TRS's fixed income investment fair values (net of cash equivalents) according to credit ratings as of June 30, 2020, and 2019.

2020 Retirement Annuity Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	\$ 889,924,118	\$	\$ 889,924,118	22.96
AAA	162,370,610		162,370,610	4.19
AA	492,899,091		492,899,091	12.72
A	639,450,650		639,450,650	16.50
BBB	621,669,196	39,550,948	661,220,144	17.06
BB	15,324,324	369,131,222	384,455,546	9.92
B		399,667,392	399,667,392	10.31
CCC		70,658,596	70,658,596	1.82
CC		341,100	341,100	0.01
C		108,435	108,435	
D		2,763,966	2,763,966	0.07
Not rated	120,779,869	51,154,333	171,934,202	4.44
Total	\$ 2,942,417,858	\$ 933,375,992	\$ 3,875,793,850	100.00

2019 Retirement Annuity Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	\$ 1,297,994,618	\$	\$ 1,297,994,618	31.84
AAA	157,995,569		157,995,569	3.88
AA	494,778,867		494,778,867	12.14
A	624,081,123		624,081,123	15.31
BBB	576,137,083	40,857,674	616,994,757	15.14
BB	10,673,125	335,427,734	346,100,859	8.49
B		411,265,618	411,265,618	10.09
CCC		32,622,499	32,622,499	0.80
D		799,464	799,464	0.02
Not rated	66,283,060	26,936,508	93,219,568	2.29
Total	\$ 3,227,943,445	\$ 847,909,497	\$ 4,075,852,942	100.00

2020 Health Insurance Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	\$ 28,776,155	\$	\$ 28,776,155	9.61
AAA	6,533,285		6,533,285	2.18
AA	29,405,298		29,405,298	9.82
A	35,903,821		35,903,821	11.99
BBB	26,055,873	7,648,905	33,704,778	11.26
BB	997,930	73,403,221	74,401,151	24.86
B		68,893,472	68,893,472	23.01
CCC		12,521,206	12,521,206	4.18
CC		253,950	253,950	0.09
C		30,060	30,060	0.01
D		223,398	223,398	0.08
Not rated	1,074,579	7,646,905	8,721,484	2.91
Total	\$ 128,746,941	\$ 170,621,117	\$ 299,368,058	100.00

2019 Health Insurance Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	\$ 30,905,025	\$	\$ 30,905,025	12.34
AAA	3,567,130		3,567,130	1.42
AA	22,718,510		22,718,510	9.07
A	31,647,143		31,647,143	12.64
BBB	23,321,126	7,073,250	30,394,376	12.14
BB	471,810	61,043,391	61,515,201	24.57
B		63,774,983	63,774,983	25.47
CCC		4,591,525	4,591,525	1.84
Not rated		1,285,618	1,285,618	0.51
Total	\$ 112,630,744	\$ 137,768,767	\$ 250,399,511	100.00

2020 Life Insurance Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	\$ 3,596,065	\$	\$ 3,596,065	25.35
AAA	733,380		733,380	5.17
AA	3,698,678		3,698,678	26.07
A	1,994,602		1,994,602	14.06
BBB	3,721,627	21,048	3,742,675	26.39
BB	399,172	21,068	420,240	2.96
Total	\$ 14,143,524	\$ 42,116	\$ 14,185,640	100.00

2019 Life Insurance Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	\$ 11,529,380	\$	\$ 11,529,380	58.06
AAA	499,110		\$ 499,110	2.51
AA	3,634,524		\$ 3,634,524	18.30
A	400,756		\$ 400,756	2.02
BBB	2,379,844		\$ 2,379,844	11.98
BB	1,415,430		\$ 1,415,430	7.13
Total	\$ 19,859,044	\$	\$ 19,859,044	100.00

Total fair value of the Retirement Annuity Trust's fixed income portfolio was \$3.88 billion on June 30, 2020. The Health Insurance Trust's fixed income portfolio was valued at \$299.4 million on June 30, 2020. Total fair value of the Life Insurance Trust's fixed income portfolio was \$14.2 million on June 30, 2020. Standard & Poor's (S&P) rating system is used in the above charts. For securities where an S&P rating is not provided, another nationally recognized system is used and translated to the S&P rating system.

In addition to the above categories, the Retirement Annuity Trust held \$758 million in short-term investments through the Dreyfus Institutional Cash Advantage Fund. The Health Insurance Trust held \$26.9 million in the Dreyfus Institutional Cash Advantage Fund. The Life Insurance Trust held \$12.2 million in the Dreyfus Institutional Cash Advantage Fund. The credit risk associated with this fund is minimal as the securities held are required to maintain the highest possible short-term credit ratings by Moody's and S&P. In addition, investments in U.S. government and agency securities also are highly rated securities since they are backed by the U.S. government. Notation is made that the ratings of securities are subject to change.

The Retirement Annuity Trust's policy on credit rating is set forth in 102 KAR 1:175.

Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of a government's investment in a single issuer. Losses from credit risk are heightened if a significant portion of resources are invested with a single issuer. In compliance with 102 KAR 1:175, the Retirement Annuity Trust has not invested more than 5% of assets at fair value in any single issuer.

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will affect adversely the fair value of an investment or a deposit. As of June 30, 2020, TRS's exposure to foreign currency risk consisted of \$4.94 billion in the Retirement Annuity Trust, \$410.9 million in the Health Insurance Trust and \$17.8 million in the Life Insurance Trust.

The majority of foreign investments are held in commingled funds managed by UBS Global Asset Management, Baillie Gifford, Baring Asset Management and BlackRock. In addition to the commingled funds investing in foreign securities, the Retirement Annuity Trust held \$650 million associated with foreign interests in American depository receipt investments. These American depository receipts are securities that are issued by a U.S. bank in place of the foreign stock shares held in trust by that bank, thereby facilitating the trading of foreign shares in U.S. markets. The cross-listed equities, in the amount of \$492.4 million, represent securities domiciled in foreign countries, but are listed and traded on U.S. exchanges. Other foreign securities and investments consist of debt securities and alternative investment opportunities. Foreign holdings not readily identifiable to a specific country are listed in the various category, which includes investment receivables, payables and new issues.

The Retirement Annuity Trust's policy regarding foreign equities is that not more than 30% of the assets at fair value shall be invested in the stocks of companies domiciled outside of the United States. Any amounts so invested shall be included in the 65% limitation for total stocks under 102 KAR 1:175 Section 2(e).

The following tables represent the fair values of investments that are subject to foreign currency as a result of cash contributions to each portfolio manager as of June 30, 2020, and 2019.

Retirement Annuity Trust

	2020	2019
Commingled	\$ 3,259,745,164	\$ 3,199,692,153
Alternatives	178,887,706	136,944,558
American depository receipts	649,981,377	760,463,253
Cross-listed equities	492,364,508	565,794,759
Bonds	115,368,890	130,318,527
Additional categories (Fixed income)	110,569,345	103,230,600
Additional categories (Opportunistic)	130,135,491	130,321,049
Total	<u>\$ 4,937,052,481</u>	<u>\$ 5,026,764,899</u>

Health Insurance Trust

	2020	2019
Commingled	\$ 336,422,661	\$ 320,682,241
Alternatives	20,596,707	22,398,280
Cross-listed equities	6,990,116	
Bonds	3,627,815	\$ 3,517,240
American depository receipts	1,475,129	\$ 3,391,560
Additional categories (Fixed income)	23,698,777	\$ 18,293,421
Additional categories (Opportunistic)	18,135,565	16,542,883
Total	<u>\$ 410,946,770</u>	<u>\$ 384,825,625</u>

Life Insurance Trust

	2020	2019
Commingled	\$ 16,648,593	\$ 17,681,466
Alternatives	96,721	
Cross-listed equities	601,171	
Bonds	399,172	\$ 399,380
American depository receipts	42,796	47,871
Total	<u>\$ 17,788,453</u>	<u>\$ 18,128,717</u>

The categorized investments in the preceding tables include foreign currencies, the fair value of which are shown in the following tables.

Retirement Annuity Trust

Currency	2020	2019	Currency	2020	2019
Argentine peso	\$ 121,419		Mexican peso	\$ 50,390,490	\$ 52,163,849
Australian dollar	\$ 35,035,566	\$ 60,131,536	Malaysian ringgit	\$ 10,479,531	\$ 11,715,893
Bermudian dollar	52,303,392	59,714,165	Netherlands Antillean guilder	2,624,323	15,682,676
Brazilian real	43,685,570	44,889,952	New Zealand dollar	7,105,662	2,122,452
British pound sterling	452,525,848	570,383,073	Norwegian krone	67,826,204	34,960,926
Bulgarian lev	510,576		Pakistani rupee	107,059	160,131
Canadian dollar	256,065,296	254,345,892	Panamanian balboa	10,439,010	30,452,885
Cayman Islands dollar	62,289,034	59,780,832	Paraguayan guarani	208,000	
Chilean peso	1,143,256	13,938,990	Philippine peso	2,855,804	3,501,301
Chinese yuan	140,592,547	102,706,279	Polish zloty	2,678,300	3,499,312
Columbian peso	22,050,495	15,538,891	Qatari rial	1,257,329	1,655,090
Czech koruna	154,331	270,959	Russian ruble	63,358,118	41,201,117
Danish krone	104,981,588	62,647,510	Saudi riyal	3,987,683	2,399,426
Egyptian pound	214,190	348,495	Singapore dollar	28,911,655	30,545,118
Euro	1,784,062,092	1,800,364,413	South African rand	49,963,451	44,302,136
Guernsey pound	13,819,760	7,233,485	Swedish krona	109,672,167	118,933,882
Hong Kong dollar	368,976,311	323,234,458	Swiss franc	179,783,588	200,349,094
Hungarian forint	330,079	476,256	Taiwan new dollar	51,992,426	53,353,133
Indian rupee	71,420,435	72,172,031	Thai baht	5,194,521	7,143,727
Indonesian rupiah	6,583,031	15,757,628	Trinidadian dollar		311,309
Israeli new shekel	11,059,642	5,999,416	Turkish lira	3,238,704	992,210
Jamaican dollar	144,000		UAE dirham	822,635	1,129,455
Japanese yen	685,643,021	725,825,349	Various	5,235,096	9,358,612
Jersey pound	72,493,175	68,919,072			
Korean won	90,879,746	94,134,336	Total	\$ 4,937,052,481	\$ 5,026,764,899
Liberian dollar	1,836,325	2,018,147			

Health Insurance Trust

Currency	2020	2019	Currency	2020	2019
Argentine peso	\$ 49,467		Malaysian ringgit	\$ 1,835,196	\$ 1,898,836
Australian dollar	17,403,533	17,518,159	Mexican peso	1,688,836	2,192,778
Bermudian dollar	688,936	213,781	Netherlands Antillean guilder	34,740	349,235
Brazilian real	5,353,913	6,506,631	New Zealand dollar	1,030,590	871,670
British pound sterling	36,356,282	40,816,859	Norwegian krone	1,695,396	1,914,237
Canadian dollar	37,276,671	29,218,274	Pakistani rupee	71,730	78,857
Cayman Islands dollar	5,406,292	3,803,707	Panamanian balboa	328,755	
Chilean peso	580,281	806,468	Philippine peso	819,463	946,993
Chinese yuan	5,403,454	1,934,720	Polish zloty	797,091	948,678
Columbian peso	237,254	905,394	Qatari rial	887,366	817,579
Czech koruna	96,577	121,370	Russian ruble	2,170,602	2,240,456
Danish krone	5,143,794	3,810,772	Saudi riyal	2,554,671	1,185,212
Egyptian pound	138,146	166,457	Singapore dollar	2,863,258	3,211,863
Euro	117,233,062	114,816,688	South African rand	3,525,326	4,874,710
Hong Kong dollar	28,600,875	24,795,755	Swedish krona	8,057,831	6,843,091
Hungarian forint	232,812	237,747	Swiss franc	22,176,350	20,243,461
Indian rupee	8,075,541	8,190,359	Taiwan new dollar	13,004,742	9,907,041
Indonesian rupiah	1,436,185	1,806,437	Thai baht	2,291,629	2,717,338
Israeli new shekel	1,132,541	1,089,373	Trinidadian dollar		63,413
Jamaican dollar	144,000		Turkish lira	524,497	479,708
Japanese yen	60,286,397	54,808,895	UAE dirham	560,308	544,088
Jersey pound	775,703	83,475			
Korean won	11,772,475	10,845,060			
Liberian dollar	204,202		Total	\$ 410,946,770	\$ 384,825,625

Life Insurance Fund

Currency	2020	2019	Currency	2020	2019
Argentine peso	\$	13,630	Malaysian ringgit	\$	86,313
Australian dollar	743,270	812,170	Mexican peso	79,790	113,425
Bermudian dollar		23,587	Netherlands Antillean guilder		4,928
Brazilian real	242,444	334,292	New Zealand dollar	43,618	40,682
British pound sterling	1,993,870	2,121,683	Norwegian krone	83,570	100,646
Canadian dollar	1,592,200	1,153,330	Pakistani rupee	3,159	4,014
Cayman Islands dollar	42,796	15,032	Panamanian balboa		90
Chilean peso	27,712	43,545	Papua new guinean kina		4,740
Chinese yuan	185,097	1,138,624	Philippine peso	36,541	48,519
Columbian peso	9,775	25,520	Polish zloty	35,310	47,698
Czech koruna	4,554	7,027	Qatari rial	37,100	40,579
Danish krone	302,707	231,412	Russian ruble	101,369	159,886
Egyptian pound	6,320	8,814	Saudi riyal	117,666	60,142
Euro	3,913,839	4,111,786	Singapore dollar	137,420	162,565
Guernsey pound		4,797	Sol		2,522
Hong Kong dollar	1,531,046	666,709	South African rand	166,674	253,881
Hungarian forint	9,740	11,937	Swedish krona	416,873	392,526
Indian rupee	380,144	427,653	Swiss franc	990,590	1,033,663
Indonesian rupiah	68,337	94,245	Taiwan new dollar	601,247	506,921
Israeli new shekel	52,679	83,831	Thai baht	107,620	140,767
Japanese yen	2,970,885	2,954,539	Turkish lira	22,755	24,870
Jersey pound	67,721	5,290	UAE dirham	24,274	30,206
Korean won	551,428	554,273	Uruguayan peso		606
Macanese pataca		11,866	Various		1,043
			Total	\$ 17,788,453	\$ 18,128,717

Fair Value Measurement

A retiree pension defined benefit plan holds significant amounts of investments that are measured at fair value on a recurring basis. TRS categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles (GAAP) in the United States of America. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and is not necessarily indicative of risk.

Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or liability. Level 2 inputs may include quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in non-active markets; and inputs other than quoted prices that are observable for the assets or liabilities, either directly or indirectly. Level 3 inputs are unobservable inputs for an asset or liability such as property appraisals, third-party valuations and public market comparables of similar assets where applicable. Investments measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy. The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs.

Schedules of Fair Values

These category descriptions that immediately follow refer to the investments shown in the fair value level hierarchy schedules shown after these descriptions.

Cash and Cash Equivalents: Cash equivalents are short-term, highly liquid investments that readily are convertible to known amounts of cash and so near to their maturity that they present insignificant risk of changes in value because of changes in interest rates. This category is comprised of short-term investments via the Dreyfus Institutional Cash Advantage Fund and cash. Cash

equivalents can be valued with inputs from quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date and, therefore, are classified as Level 1 assets.

Equity and Fixed Income Securities: Debt and equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets issued by pricing vendors for these securities. Debt and equity securities classified in Level 2 of the fair value hierarchy may use inputs such as market quotations, yields, maturities, call features and ratings or may be valued using a matrix pricing technique that values securities based on their relationship to benchmark quoted prices. Debt securities classified in Level 3 are securities whose stated market price is unobservable by the market place and, instead, are priced by the issuers or industry groups for these securities.

Real Estate: Real estate falls into the Level 3 classification of the fair value hierarchy. Much of TRS's real estate consists of owned properties leased to various commercial enterprises. The fair value measurement for real estate is determined by professional appraisals every five years.

Timberland: Timberland investments are managed investments regarding the acquiring, growing and disposing of timber on timberlands owned by TRS. The adviser contracts with outside appraisers to generate annual fair value estimates. The outside appraisers utilized the cost, sales comparison and income capitalization approaches to estimate the fair value of the timber and timberlands. The adviser challenges the reasonableness of the assumptions used and reviews the methodology to ensure the estimated fair value complies with GAAP. These funds are not available for redemption; instead, they make distributions to TRS as the underlying assets are sold.

Additional Categories: Investments in this category do not fit the regular parameters for the Retirement Annuity Trust in 102 KAR 1:175. They fall into the allowable 15% of assets invested in any additional categories approved by the board. Corporate bonds falling within the Level 1 classification are valued using prices quoted in active markets issued by pricing vendors for these securities. Corporate bonds listed in Level 2 may use inputs such as market quotations, yields, maturities, call features and ratings or may be valued using a matrix pricing technique that values securities based on their relationship to benchmark quoted prices. Corporate loans at Level 3 are valued by third-party pricing vendors such as Markit or Reuters.

Commingled Funds: These funds hold European loans, international equities and domestic equities. Commingled funds are valued at the net asset value held at the end of the period based upon the fair value of the underlying investments.

Private Equity: Private equity funds invest in equity and debt securities issued by private and publicly held companies in connection with leveraged buyouts, recapitalizations and expansion opportunities. Three of these funds are redeemable, but the majority do not allow redemptions. Alternatively, TRS receives distributions as the underlying assets of the funds liquidate, usually over a five- to 10-year liquidation period. Exchange quotations are not available readily for these investments. The fair value for most of these funds is determined using the net asset value one quarter in arrears, plus current quarter cash flows.

Private Real Estate: Three private real estate investments are open-ended. The remaining investments are not redeemable; rather, TRS receives distributions as the underlying assets liquidate, usually over a five- to 10-year liquidation period. Exchange quotations for these investments are not available readily. Most private real estate fair values are determined using the net assets valued one quarter in arrears, plus current quarter cash flows.

Private Timber: TRS has one private timberland fund that is valued using the NAV as a practical expedient. Like most private funds, the fair value for this fund is determined using the net assets valued one quarter in arrears, plus current quarter cash flows.

Private Opportunistic Credit: One private opportunistic credit fund is redeemable. The remainder are closed funds that issue distributions as the underlying assets of the fund liquidate, usually over a five- to 10-year liquidation period. The fair value for most of these funds is determined using the net assets valued one month in arrears, plus current period cash flows.

Retirement Annuity Trust
Schedule of Investments at Fair Value Level 2020

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	\$ 758,019,291	\$	\$	\$ 758,019,291
Fixed income				
Asset-backed securities		51,470,861		51,470,861
Agency bonds		55,122,909		55,122,909
Commercial mortgage-backed securities		32,705,450		32,705,450
Collateralized mortgage obligations		34,109,190		34,109,190
Corporate bonds		1,443,496,021		1,443,496,021
Mortgage-backed securities		131,598,301	728,373	132,326,674
Municipal bonds		303,262,635		303,262,635
U.S. government	885,601,054	4,323,064		889,924,118
Subtotal	885,601,054	2,056,088,431	728,373	2,942,417,858
Equities				
International	1,130,769,157	2,077,449,066		3,208,218,223
U.S.	7,458,451,678	179,564		7,458,631,242
Subtotal	8,589,220,835	2,077,628,630		10,666,849,465
Real estate			408,820,072	408,820,072
Timberland			226,960,581	226,960,581
Additional categories				
Corporate bonds	161,689	629,675,888		629,837,577
Corporate loans			212,808,415	212,808,415
U.S. equity	76,329,205			76,329,205
Subtotal	76,490,894	629,675,888	212,808,415	918,975,197
Total investments at fair value level	\$ 10,309,332,074	\$ 4,763,392,949	\$ 849,317,441	\$ 15,922,042,464
At Net Asset Value (NAV)				
Commingled European loan funds				\$ 90,730,000
Commingled international equity funds				1,619,070,336
Commingled domestic equity funds				308,191,501
Private equity funds				1,209,514,168
Private real estate funds				819,014,843
Private timber funds				28,592,975
Private opportunistic credit funds				539,632,620
Total investments measured at NAV				<u>\$ 4,614,746,443</u>
Total investments at fair value				<u><u>\$ 20,536,788,907</u></u>

Schedule of Investments at Net Asset Value (NAV) 2020

	June 30, 2020	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European loan	\$ 90,730,000	\$	Daily	30 days
Commingled international equities	1,619,070,336		Daily	1-30 days
Commingled domestic equities	308,191,501		Daily	1-30 days
Private equity				
Open-ended*	310,562,854	100,095,789	Quarterly, annually	90 days
Closed-ended	898,951,314	936,378,234	N/A	N/A
Private real estate				
Open-ended	501,164,147		Quarterly	45-90 days
Closed-ended	317,850,696	363,106,038	N/A	N/A
Private timber	28,592,975		Biennially	90 days
Private opportunistic credit				
Open-ended	327,655,526		Semiannually	75 days
Closed-ended	211,977,094	88,893,707	N/A	N/A
Total investments at NAV	<u><u>\$ 4,614,746,443</u></u>			

*Regarding the open-ended private equity, a few restrictions remain that would prevent redemption at this time. One fund currently valued at \$51,031,923 in the Retirement Annuity Trust has a three-year lock-up period that expires June 30, 2021.

Schedule of Investments at Fair Value Level 2019

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	\$ 678,616,271	\$	\$	\$ 678,616,271
Fixed income				
Asset-backed securities		\$ 48,533,798		\$ 48,533,798
Agency bonds		\$ 77,746,291		\$ 77,746,291
Commercial mortgage-backed securities		\$ 28,030,171		\$ 28,030,171
Collateralized mortgage obligations		\$ 22,172,884		\$ 22,172,884
Corporate bonds		\$ 1,367,374,528		\$ 1,367,374,528
Mortgage-backed securities		\$ 100,749,057	\$ 869,705	\$ 101,618,762
Municipal bonds		\$ 284,472,393		\$ 284,472,393
U.S. government	\$ 1,290,892,773	\$ 7,101,845		\$ 1,297,994,618
Subtotal	\$ 1,290,892,773	\$ 1,936,180,967	\$ 869,705	\$ 3,227,943,445
Equities				
International	\$ 1,304,147,775	\$ 1,846,353,781		\$ 3,150,501,556
U.S.	\$ 7,193,195,834			\$ 7,193,195,834
Subtotal	\$ 8,497,343,609	\$ 1,846,353,781		\$ 10,343,697,390
Real estate			\$ 424,559,554	\$ 424,559,554
Timberland			\$ 153,586,426	\$ 153,586,426
Additional categories				
Corporate bonds	\$ 35,392	\$ 530,913,965		\$ 530,949,357
Corporate loans			\$ 216,920,140	\$ 216,920,140
Subtotal	\$ 35,392	\$ 530,913,965	\$ 216,920,140	\$ 747,869,497
Total investments at fair value level	\$ 10,466,888,045	\$ 4,313,448,713	\$ 795,935,825	\$ 15,576,272,583
At NAV				
Commingled European loan funds				\$ 100,040,000
Commingled international equity funds				\$ 1,662,903,625
Commingled domestic equity funds				\$ 282,282,783
Private equity funds				\$ 1,176,784,326
Private real estate funds				\$ 798,502,446
Private timber funds				\$ 29,003,667
Private opportunistic credit funds				\$ 584,110,105
Total investments measured at NAV				\$ 4,633,626,952
Total investments at fair value				<u>\$ 20,209,899,535</u>

Schedule of Investments at NAV 2019

	June 30, 2019	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European loan	\$ 100,040,000	\$	Daily	30 days
Commingled international equities	1,662,903,625		Daily	1-30 days
Commingled domestic equities	282,282,783		Daily	1-30 days
Private equity				
Open-ended	249,596,594	84,016,297	Quarterly, annually	90 days
Closed-ended	927,187,732	767,795,807	N/A	N/A
Private real estate				
Open-ended*	474,326,009		Quarterly	45-90 days
Closed-ended	324,176,437	382,276,117	N/A	N/A
Private timber	29,003,667		Biennially	90 days
Private opportunistic credit				
Open-ended	367,578,268		Semiannually	75 days
Closed-ended	216,531,837	139,978,408	N/A	N/A
Total investments measured at the NAV	<u><u>\$ 4,633,626,952</u></u>			

*Regarding the open-ended private equity, a few restrictions remain that would prevent redemption at this time. One fund currently valued at \$49,674,834 in the Retirement Annuity Trust has a three-year lock-up period that expires June 30, 2021.

Health Insurance Trust
Schedule of Investments at Fair Value Level 2020

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	\$ 26,908,534	\$	\$	\$ 26,908,534
Fixed income				
Agency bonds		1,006,590		1,006,590
Collateralized mortgage obligations		1,074,579		1,074,579
Corporate bonds		90,465,904		90,465,904
Mortgage-backed securities		1,437,464		1,437,464
Municipal bonds		5,986,249		5,986,249
U.S. government	28,776,155			28,776,155
Subtotal	28,776,155	99,970,786		128,746,941
Equities				
Global		812,169,939		812,169,939
International	6,990,116			6,990,116
U.S.	94,850,518			94,850,518
Subtotal	101,840,634	812,169,939		914,010,573
Additional categories				
Corporate bonds	58,878	133,658,800		133,717,678
Corporate loans			36,903,439	36,903,439
U.S. equity	7,027,166			7,027,166
Subtotal	7,086,044	133,658,800	36,903,439	177,648,283
Total investments at fair value level	\$ 164,611,367	\$ 1,045,799,525	\$ 36,903,439	\$ 1,247,314,331
At NAV				
Private equity funds				\$ 113,773,956
Private real estate funds				82,393,040
Private opportunistic credit funds				85,150,167
Total investments measured at NAV				\$ 281,317,163
Total investments at fair value				\$ 1,528,631,494

Schedule of Investments at NAV 2020

	June 30, 2020	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private real estate				
Open-ended	\$ 37,580,381	\$	Quarterly	45-90 days
Closed-ended	44,812,659	61,192,724	N/A	N/A
Private equity				
Closed-ended	113,773,956	130,997,340	N/A	N/A
Private opportunistic credit				
Open-ended	63,007,367		Semiannually	75 days
Closed-ended	22,142,800	12,934,663	N/A	N/A
Total investments at NAV	<u>\$ 281,317,163</u>			

Schedule of Investments at Fair Value Level 2019

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	\$ 74,104,999	\$	\$	\$ 74,104,999
Fixed income				
Agency bonds		\$ 1,014,190		\$ 1,014,190
Corporate bonds		\$ 77,511,459		\$ 77,511,459
Municipal bonds		\$ 3,200,070		\$ 3,200,070
U.S. government	\$ 29,905,005	\$ 1,000,020		\$ 30,905,025
Subtotal	\$ 29,905,005	\$ 82,725,739		\$ 112,630,744
Equities				
Global		\$ 732,597,127		\$ 732,597,127
U.S.	\$ 35,408,420			\$ 35,408,420
Subtotal	\$ 35,408,420	\$ 732,597,127		\$ 768,005,547
Additional categories				
Corporate bonds		\$ 98,976,969		\$ 98,976,969
Corporate loans			\$ 38,791,797	\$ 38,791,797
Subtotal		\$ 98,976,969	\$ 38,791,797	\$ 137,768,766
Total investments at fair value level	\$ 139,418,424	\$ 914,299,835	\$ 38,791,797	\$ 1,092,510,056
At NAV				
Private equity funds				\$ 102,153,229
Private real estate funds				\$ 75,296,027
Private opportunistic credit funds				\$ 65,752,634
Total investments measured at NAV				\$ 243,201,890
Total investments at fair value				<u><u>\$ 1,335,711,946</u></u>

Schedule of Investments at NAV 2019

	June 30, 2019	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private real estate				
Open-ended	\$ 35,426,494		Quarterly	45-90 days
Closed-ended	\$ 39,869,533	\$ 61,800,630	N/A	N/A
Private equity				
Closed-ended	\$ 102,153,229	\$ 108,147,568	N/A	N/A
Private opportunistic credit				
Open-ended	\$ 46,789,856		Semiannually	75 days
Closed-ended	\$ 18,962,778	\$ 18,474,255	N/A	N/A
Total investments at NAV	<u><u>\$ 243,201,890</u></u>			

Life Insurance Trust
Schedule of Investments at Fair Value Level 2020

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	\$ 12,219,575	\$	\$	\$ 12,219,575
Fixed income				
Corporate bonds		7,166,110		7,166,110
Mortgage-backed securities		491,359		491,359
Municipal bonds		2,889,990		2,889,990
U.S. government	3,596,065			3,596,065
Subtotal	3,596,065	10,547,459		14,143,524
Equities				
International	601,171	17,588,464		18,189,635
U.S.	37,670,678			37,670,678
Subtotal	38,271,849	17,588,464		55,860,313
Additional categories				
Corporate bonds		\$ 42,116		\$ 42,116
U.S. equity	756,924			756,924
Subtotal	\$ 756,924	\$ 42,116		\$ 799,040
Total investments at fair value level	\$ 54,844,413	\$ 28,178,039	\$	\$ 83,022,452
At NAV				
Private equity funds				\$ 361,320
Private real estate funds				2,399,699
Private opportunistic credit funds				1,235,718
Total investments measured at NAV				\$ 3,996,737
Total investments at fair value				\$ 87,019,189

Schedule of Investments at NAV 2020

	June 30, 2020	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private equity				
Closed-ended	\$ 361,320	\$ 4,153,449	N/A	N/A
Private real estate				
Closed-ended	147,882	\$ 1,346,692	N/A	N/A
Open-ended	2,251,817		Quarterly	45 days
Private opportunistic credit				
Open-ended	1,235,718		Semiannually	75 days
Total investments at NAV	\$ 3,996,737			

Schedule of Investments at Fair Value Level 2019

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	\$ 13,451,102	\$	\$	\$ 13,451,102
Fixed income				
Corporate bonds		\$ 5,151,036		\$ 5,151,036
Mortgage-backed securities		\$ 577,168		\$ 577,168
Municipal bonds		\$ 2,601,460		\$ 2,601,460
U.S. government	\$ 11,529,380			\$ 11,529,380
Subtotal	<u>\$ 11,529,380</u>	<u>\$ 8,329,664</u>		<u>\$ 19,859,044</u>
Equities				
International		\$ 18,036,908		\$ 18,036,908
U.S.	\$ 30,224,890			\$ 30,224,890
Subtotal	<u>\$ 30,224,890</u>	<u>\$ 18,036,908</u>		<u>\$ 48,261,798</u>
Total investments at fair value level	<u>\$ 55,205,372</u>	<u>\$ 26,366,572</u>	<u>\$</u>	<u>\$ 81,571,944</u>
At NAV				
Private equity funds				\$ 48,510
Private real estate funds				\$ 1,354,418
Private opportunistic credit funds				\$ 2,107,202
Total investments measured at NAV				<u>\$ 3,510,130</u>
Total investments at fair value				<u><u>\$ 85,082,074</u></u>

Schedule of Investments at NAV 2019

	June 30, 2019	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private equity				
Closed-ended	\$ 48,510	\$ 1,450,000	N/A	N/A
Private real estate				
Closed-ended		\$ 1,500,000	N/A	N/A
Open-ended	\$ 2,107,202		Quarterly	45 days
Private opportunistic credit				
Open-ended	1,354,418		Semiannually	75 days
Total investments at NAV	<u>\$ 3,510,130</u>			

Securities Lending

KRS 161.430 empowers the board with fiduciary responsibility for TRS funds. The system operates a securities lending program in which it temporarily lends securities to qualified agents in exchange for a net fee and high-quality collateral. The types of securities lent are U.S. government and agency securities; selected domestic bonds; and domestic and international stocks. TRS's custodian, BNYM, acts as lending agent in exchanging securities for collateral. The collateral has a value of not less than 102% of the fair value of the lent securities, plus any accrued, unpaid distributions. The collateral may consist of both cash and non-cash collateral. The non-cash collateral may include, but not be limited to, debt obligations and securities, equity securities, corporate bonds and convertible securities.

Securities lending transactions are accounted for in accordance with GASB Statement No. 28. During the fiscal year ended June 30, 2020, only the Retirement Annuity Trust fund and the Life Insurance Trust fund had securities lending transactions. The following schedules detail the net income earned in the Retirement Annuity Trust fund and the Life Insurance Trust fund from securities lending for the fiscal years ended June 30, 2020, and 2019.

	Securities Lending Net Earnings			
	Retirement Annuity*		Life	
	2020	2019	2020	2019
Gross earnings (interest and fees)	\$ 7,140,361	\$ 15,699,532	\$ 129,906	\$ 353,336
Gross borrower rebates	(3,956,163)	(11,978,600)	(75,661)	(307,690)
Bank fees	(955,029)	(1,115,929)	(16,271)	(13,692)
Net earnings	<u>\$ 2,229,169</u>	<u>\$ 2,605,003</u>	<u>\$ 37,974</u>	<u>\$ 31,954</u>

*This schedule includes the Losey Scholarship fund.

Cash collateral is invested in guaranteed, short-term obligations of the U.S. government, select government agencies and repurchase agreements with qualified agents. TRS cannot pledge or sell collateral securities received unless the borrower defaults. BNYM as the lending agent also indemnifies TRS from any financial loss associated with a borrower's default and collateral inadequacy. The Statement of Fiduciary Net Position does not report securities lending transactions collateralized by letters of credit or by securities that the governmental entity does not have the ability to pledge or sell, unless the borrower defaults.

As of June 30, 2020, the average days to maturity for loans in the Retirement Annuity Trust was one day, and the weighted average investment maturity of cash collateral investments was one day. The trust had no credit risk exposure to borrowers because the amounts owed to borrowers exceeded the amounts the borrowers owed the trust, and no losses resulted during the period.

Security lending programs can entail interest rate risk and credit risk. TRS minimizes interest rate risk by limiting the term of cash collateral investments to several days.

The credit risk is controlled by investing cash collateral in securities with qualities similar to the credit worthiness of lent securities.

The following table presents the fair values of the underlying securities and the value of the collateral pledged at June 30, 2020, and 2019.

Retirement Annuity Trust
2020

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	\$ 90,312,494	\$ 28,774,564	\$ 63,733,412	\$ 92,507,976
Equities	847,758,772	505,835,183	352,937,188	858,772,371
Total	<u>\$ 938,071,266</u>	<u>\$ 534,609,747</u>	<u>\$ 416,670,600</u>	<u>\$ 951,280,347</u>

2019

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	\$ 191,232,211	\$ 3,860,561	\$ 192,188,154	\$ 196,048,715
Equities	959,736,176	400,199,282	570,029,895	970,229,177
Total	<u>\$ 1,150,968,387</u>	<u>\$ 404,059,843</u>	<u>\$ 762,218,049</u>	<u>\$ 1,166,277,892</u>

Life Insurance Trust
2020

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	\$	\$	\$	\$
Equities	13,159,604	11,336,520	1,929,780	13,266,300
Total	<u>\$ 13,159,604</u>	<u>\$ 11,336,520</u>	<u>\$ 1,929,780</u>	<u>\$ 13,266,300</u>

2019

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	\$ 2,996,246	\$ 1,016,250	\$ 2,093,253	\$ 3,109,503
Equities	469,915		473,027	473,027
Total	<u>\$ 3,466,161</u>	<u>\$ 1,016,250</u>	<u>\$ 2,566,280</u>	<u>\$ 3,582,530</u>

Annual Money-Weighted Rate of Return

A money-weighted rate of return is an expression of investment performance that is net of TRS's investment fees and expenses, adjusted for the changing amounts actually invested. The following table reflects the money-weighted rates of return.

Annual Rate of Return Net of Investment Fees and Expenses

	2020	2019
Retirement Annuity Trust	5.47 %	5.56 %
Health Insurance Trust	2.30 %	6.11 %
Life Insurance Trust	6.32 %	6.49 %

Note 6

Retirement Plans for TRS Employees

Full-time employees of TRS participate in either TRS or Kentucky Employees Retirement System (KERS). Both plans are multiple-employer cost-sharing defined benefit retirement annuity and other postemployment benefits plans. All TRS employees in positions requiring a four-year degree are covered under TRS. The contribution rates and required employer matching are the same as state agency employers in TRS. These rates, the plan description and funding policy are disclosed fully in the notes to the financial statements.

The annual required contributions for TRS employee members in TRS for the fiscal years 2020, 2019 and 2018 were \$980,508, \$943,837 and \$961,413, respectively. TRS contributed 100% of the required contribution each year.

All other TRS employees are covered under the KERS non-hazardous employees' plan. The plan provides for retirement, disability and death benefits to plan members. Retirement benefits may be extended to beneficiaries of plan members under certain circumstances. Per KRS 61.565(3), contribution rates shall be determined by the KRS board on the basis of an annual actuarial valuation. Rates may be amended by the KRS board as needed.

Members of KERS who joined prior to July 1, 2008, are required to contribute 5% of their annual creditable compensation, and members who joined on or after July 1, 2008, contribute 6%. As the employer, TRS is required to contribute the annual actuarially determined rate of the creditable compensation (or the rate approved by legislators). The approved rate for the fiscal years 2020, 2019 and 2018 were 83.43%, 83.43% and 49.47%, and TRS's annual required contributions to KERS were \$1 million, \$1.1 and \$673,457, respectively. TRS contributed 100% of the required contributions for each year.

Note 7

Description of Other Funds

403(B) Tax-Sheltered Annuity Plan

Plan Description

TRS has, in prior years, administered a salary deferral program as permitted by section 403(b) of the Internal Revenue Code. Under this program members were able to voluntarily defer a portion of their compensation within the limits established by the applicable laws and regulations. However, TRS's Board of Trustees determined that the cost of providing the necessary services to assure continuing compliance with these laws and regulations was not economically feasible due to the limited participation in the program by TRS's members. The board decided, therefore, to discontinue offering the program as of April 30, 1997. Members who were not receiving annuities from their account as of April 30, 1997, were able to transfer their respective accounts directly into other tax-sheltered plans on a tax-free basis. As of June 30, 2020, the four members who are receiving annuities will continue to receive distributions according to the terms of their respective elections.

Basis of Accounting

The Tax-Sheltered Annuity Plan financial statements are prepared using an accrual basis of accounting. Contributions are no longer being accepted into the plan; therefore, no receivables are recognized.

Method Used to Value Investments

The short-term investments are reported at cost, which approximates fair value.

Supplemental Benefit Fund

The Supplemental Benefit Fund is a qualified governmental excess benefit arrangement as described in Section 415 of the Internal Revenue Code. In accordance with KRS 161.611 and KRS 161.420(8), TRS is authorized to provide a supplemental retirement benefit fund for the sole purpose of enabling the employer to apply the same formula for determining benefits payable to all members of TRS employed by the employer, whose benefits under the system are limited by Section 415 of the Internal Revenue Code of 1986 as amended. Funding of benefits payable under this fund are provided by the employer and are segregated from funds that are maintained by TRS for payment of regular benefits.

Junita Losey Scholarship Fund

Junita Losey, a retired teacher, designated TRS as a residuary beneficiary of her estate and expressed a desire that TRS establish a scholarship program for Kentucky students studying to be teachers. Ms. Losey died in 1997, and her estate provided a scholarship bequest to TRS. The scholarship bequest has at all times been segregated from funds that are maintained by TRS for payment of regular benefits. The board's Scholarship Committee meets each December to consider scholarship standards and administration of the bequest.

Note 8

Other Postemployment Benefits (OPEB) — Health Insurance Trust

Plan Description

In addition to the retirement annuity plan described in Note 1, KRS 161.675 requires TRS to provide access to postemployment healthcare benefits for eligible members and dependents. The TRS Health Insurance Trust is funded by employer and member contributions. Changes made to the medical plans provided through the trust may be made by the TRS Board of Trustees, the Kentucky Department of Employee Insurance and the General Assembly.

Medical coverage through TRS is funded by a combination of contributions from employees, the state and other employers. Coverage is provided through an account established pursuant to 26 U.S.C. sec. 401(h) and a 115 trust fund that went into effect on July 1, 2010. The insurance trust fund includes employer and retired member contributions required under KRS 161.550 and KRS 161.675(4)(b).

To be eligible for medical benefits, the member must have retired either for service or disability and a required amount of service credit. The TRS medical plan offers members who are not eligible for Medicare and under age 65 coverage through the Kentucky Employees Health Plan (KEHP) administered by the Kentucky Department of Employee Insurance. Once retired members and eligible spouses attain age 65 and or are eligible for Medicare, coverage is obtained through the Medicare Eligible Health Plan (MEHP) administered by TRS.

Contributions are made on behalf of TRS retired members toward payment of health insurance premiums. The amount of the member's contribution is based on a table approved by the TRS board. Retired members pay premiums in excess of the monthly contribution. The amount of insurance premiums paid by retirees for fiscal years 2020 and 2019 were \$59.2 million and \$57.7 million, respectively. The Commonwealth of Kentucky bears risk for excess claims expenses that exceed the premium equivalents charged for the KEHP.

At June 30, 2020, TRS insurance covered 41,154 retirees and 6,883 dependents, and at June 30, 2019, TRS insurance covered 40,711 retirees and 7,569 dependents. The medical plan has 207 participating employers with 73,151 and 72,647 active members contributing at June 30, 2020, and 2019, respectively.

Retiree health care premiums and other income received reduces the amount of expenditures reported in the deductions section in the Statement of Changes in Fiduciary Net Position for the Health Insurance Trust. These expenditures are summarized in the following table.

	2020	2019
MEHP group expenditures	\$ 195,911,904	\$ 191,245,906
KEHP group expenditures	109,708,027	114,509,069
Subtotal	305,619,931	305,754,974
Less: Amounts paid by retirees	(59,220,473)	(57,731,316)
Less: Medicare subsidies and formulary rebates	(100,412,705)	(84,357,641)
Total insurance expenditures	<u>\$ 145,986,752</u>	<u>\$ 163,666,017</u>

Net OPEB Liability of Employers

The net OPEB liability [i.e., the system's liability determined in accordance with GASB Statement No. 74 less the fiduciary net position (FNP)] for the Health Insurance Trust as of June 30, 2020, and 2019 is shown in the following table.

Net OPEB Liability of Employers

(Dollars in thousands)

Fiscal Year Ending June 30	Total OPEB Liability (TOL)* A	Plan Fiduciary Net Position B	Employers Net OPEB Liability (NOL) (A-B)	Plan Fiduciary Net Position (FNP) as a % of Total OPEB Liability (B/A)	Covered Payroll C	Net OPEB Liability as a % of Covered Payroll [(A-B)/C]
2020	\$ 4,140,425	\$ 1,616,675	\$ 2,523,750	39.1	\$ 3,569,262	70.7
2019	4,340,807	1,414,020	2,926,787	32.6	3,497,216	83.7

*The TOL includes the additional consideration for the current treatment of KEHP implicit subsidies that may be needed in the future. This is an additional liability from Health Insurance Trust accrued liabilities.

Actuarial Assumptions

A summary of the actuarial assumptions as of the latest actuarial valuation follows.

Valuation date	June 30, 2019
Investment rate of return	8%, net of OPEB plan investment expense, including inflation
Projected salary increases	3.5 - 7.2%, including wage inflation
Inflation rate	3%
Real wage growth	0.5%
Wage inflation	3.5%
Municipal bond index rate	2.2%
Discount rate	8%
Single equivalent interest rate	8%, net of OPEB plan investment expense, including price inflation
Health care cost trends	
KEHP group	7.25% for fiscal year 2020 decreasing to an ultimate rate of 5% by fiscal year 2029
MEHP group	5.25% for fiscal year 2019 decreasing to an ultimate rate of 5% by fiscal year 2022
Medicare Part B premiums	6.49% for fiscal year 2020 with an ultimate rate of 5% by 2031

Mortality rates were based on the RP-2000 Combined Mortality Table projected to 2025 with projection scale BB, and set forward two years for males and one year for females is used for the period after service retirement and for dependent beneficiaries. The RP-2000 Disabled Mortality Table set forward two years for males and seven years for females is used for the period after disability retirement. The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation, and rates of plan election used in the June 30, 2019, valuation were based on the results of the most recent actuarial experience studies for the system, which covered the five-year period ending June 30, 2015. The remaining actuarial assumptions used in the June 30, 2019, valuation of the health trust were based on a review of recent plan experience done concurrently with the June 30, 2019, valuation. The health care cost trend rate assumption was updated for the June 30, 2019, valuation and was shown as an assumption change in the total OPEB liability (TOL) roll forward while the change in initial per capita claims costs were included with experience in the TOL roll forward. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System.

Target Allocations

The long-term expected rate of return on OPEB investments was determined using a log-normal distribution analysis in which best-estimate ranges 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 percentage and by adding expected inflation.

The target allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized in the following table.

Asset Class	Target Allocation Percentage	30-Year Expected Geometric Real Rate Percentage of Return
Global equity	58	5.4
Fixed income	9	0.0
Real estate	6.5	4.3
Private equity	8.5	7.7
Additional categories	17	2.5
Cash	1	(0.5)
Total	100	

Discount Rate

The discount rate used to measure the TOL as of the measurement date was 8%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of June 30, 2019. In addition to the actuarial methods and assumptions of the June 30, 2019, actuarial valuation, the following actuarial methods and assumptions were used in the projection of cash flows:

- Total payroll for the initial projection year consists of the payroll of the active membership present on the valuation date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.5%.
- The KEHP group retiree health care costs for members retired on or after July 1, 2010, were assumed to be paid by either the state or the retirees themselves.
- As administrative expenses, other than the administrative fee of \$7.44 per member per month (PMPM) paid to KEHP by TRS, were assumed to be paid in all years by the employer as they come due, they were not considered.
- Cash flows occur midyear.
- Future contributions to the Health Insurance Trust were based upon the contribution rates defined in statute and the projected payroll of active employees. Per KRS 161.540(1)(c).3 and 161.550(5), when the health trust achieves a sufficient funded status, as determined by TRS's actuary, the following health trust statutory contributions are to be decreased, suspended or eliminated:
 - Employee contributions
 - Employer contributions
 - State contributions for KEHP premium subsidies payable to retirees who retire after June 30, 2010

To reflect these adjustments, open group projections were used and assumed an equal, pro rata reduction to the current statutory amounts in the years if the health trust is projected to achieve a funded ratio of 100% or more. Here, the current statutory amounts are adjusted to achieve total contributions equal to the actuarially determined contribution, as determined by the prior year's valuation and in accordance with the health trust's funding policy (Schedule E). As the specific methodology to be used for the adjustments has yet to be determined, there may be differences between the projected results and future experience. This also may include any changes to retiree contributions for KEHP coverage pursuant to KRS 161.675(4)(b).

- In developing the adjustments to the statutory contributions in future years, the following was assumed:
 - Liabilities and cash flows are net of expected retiree contributions and any implicit subsidies attributable to coverage while participating in KEHP.
 - A 0% active member growth rate was assumed for the purposes of developing estimates for new entrants (membership dates beyond June 30, 2019).

Based on these assumptions, the Health Insurance Trust's FNP was not projected to be depleted.

The FNP projections are based upon the health trust's financial status on the valuation date, the indicated set of methods and assumptions, and the requirements of GASB Statement No. 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing basis, reflecting the impact of future members. Therefore, the results of these tests do not necessarily indicate whether or not the health trust will actually run out of money, the financial condition of the trust, or the trust's ability to make benefit payments in future years.

These paragraphs require disclosure of the sensitivity of the NOL to changes in the health care cost trend rates and the discount rate for the Health Insurance Trust. The following exhibits present the NOL of the trust, calculated using the health care cost trend rates, as well as what the trust's NOL would be if it were calculated using a health care cost trend rate that is 1% lower or 1% higher than the current rate. Similarly, the exhibits present the NOL of the trust, calculated using the SEIR, as well as what the NOL would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current SEIR.

Schedule of Net OPEB Liability and Health Care Cost Trend Rates 2020

(In thousands)

		Health Care Cost Trend Rates		
		1% Decrease	Current	1% Increase
Discount Rate	1% Increase (9%)	\$	\$2,084,146	\$
	Current (8%)	2,000,282	2,523,750	3,168,621
	1% Decrease (7%)		3,050,233	

Schedule of Net OPEB Liability and Health Care Cost Trend Rates 2019

(In thousands)

		Health Care Cost Trend Rates		
		1% Decrease	Current	1% Increase
Discount Rate	1% Increase (9%)	\$	\$2,474,190	\$
	Current (8%)	2,382,551	2,926,787	3,596,018
	1% Decrease (7%)		3,467,106	

The TOL of the Health Insurance Trust for 2020 is based upon an actuarial valuation performed as of the valuation date, June 30, 2019. An expected TOL is determined as of June 30, 2020, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2019, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the health trust, as of June 30, 2020, is shown in the following table.

TOL Roll-Forward 2020

(In thousands)

	Expected	Actual
(a) TOL as of June 30, 2019*	\$ 4,340,807	\$ 3,799,057
(b) Actual benefit payments and refunds for July 1, 2019-June 30, 2020	(145,869)	(145,869)
(c) Interest on TOL = [(a) x (0.08)] + [(b) x (0.04)]	341,430	298,090
(d) Service cost for July 1, 2019-June 30, 2020	82,572	82,572
(e) Changes of benefit terms		
(f) Changes of assumptions (updated health care trend)	106,575	106,575
(g) TOL rolled forward to June 30, 2020 = (a) + (b) + (c) + (d) + (e) + (f)	4,725,515	4,140,425
(h) Difference between expected and actual experience (gain) loss		\$ (585,090)

*The TOL used in the roll-forward as of June 30, 2019, is calculated using the discount rate as of the prior measurement date.

The TOL of the Health Insurance Trust for 2019 is based upon an actuarial valuation performed as of the June 30, 2018, valuation date. An expected, TOL was determined as of June 30, 2019, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2018, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year, and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the health trust, as of June 30, 2019, is shown in the following table.

TOL Roll-Forward 2019
(In thousands)

	Expected	Actual
(a) TOL as of June 30, 2018*	\$ 4,659,996	\$ 4,047,748
(b) Actual benefit payments and refunds for July 1, 2018-June 30, 2019	(163,666)	(163,666)
(c) Interest on TOL = [(a) x (0.08)] + [(b) x (0.04)]	366,254	317,274
(d) Service cost for July 1, 2018-June 30, 2019	93,792	93,792
(e) Changes of benefit terms		
(f) Changes of assumptions (updated health care trend)	45,659	45,659
(g) TOL rolled forward to June 30, 2019 = (a) + (b) + (c) + (d) + (e) + (f)	5,002,035	4,340,807
(h) Difference between expected and actual experience (gain) loss		<u>\$ (661,228)</u>

*The TOL used in the roll-forward as of June 30, 2018, is calculated using the discount rate as of the prior measurement date.

Note 9
Other Postemployment Benefits (OPEB) — Life Insurance Trust

Plan Description

TRS administers the Life Insurance Trust as provided by KRS 161.655 to provide life insurance benefits to retired and active members. This benefit is financed by actuarially determined contributions from the 207 participating employers. The benefit is \$5,000 for members who are retired for service or disability, and \$2,000 for active contributing members.

Net OPEB Liability of Employers

The net OPEB liability (NOL) (i.e., the system's liability determined in accordance with GASB Statement No. 74 less the fiduciary net position) for the life insurance fund as of June 30, 2020, and 2019 follows.

Schedule of Net OPEB Liability of Employers
(Dollars in thousands)

Fiscal Year Ending June 30	Total OPEB Liability (TOL) A	Plan Fiduciary Net Position B	Employers Net OPEB Liability (NOL) (A-B)	Plan Fiduciary Net Position (FNP) as a % of Total OPEB Liability (B/A)	Covered Payroll C	Net OPEB Liability as a % of Covered Payroll [(A-B)/C]
2020	\$ 122,080	\$ 87,368	\$ 34,712	71.6	\$ 3,569,262	1.0
2019	116,830	85,758	31,072	73.4	3,497,216	0.9

Actuarial Assumptions

A summary of the actuarial assumptions as of the latest actuarial valuation is shown below.

Valuation date	June 30, 2019
Investment rate of return	7.5%, net of OPEB plan investment expense, including inflation.
Projected salary increases	3.5 - 7.2%, including wage inflation
Inflation rate	3%
Real wage growth	0.5%
Wage inflation	3.5%
Municipal bond index rate	2.2%
Discount rate	7.5%
Single equivalent interest rate	7.5%, net of OPEB plan investment expense, including price inflation

Mortality rates were based on the RP-2000 Combined Mortality Table projected to 2025 with projection scale BB, and set forward two years for males and one year for females is used for the period after service retirement and for dependent beneficiaries. The RP-2000 Disabled Mortality Table set forward two years for males and seven years for females is used for the period after disability retirement. The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation and rates of plan election used in the June 30, 2019, valuation were based on the results of the most recent actuarial experience studies for the system, which covered the five-year period ending June 30, 2015. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System.

Target Allocations

The long-term expected rate of return on OPEB investments was determined using a log-normal distribution analysis in which best-estimate ranges 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 percentage and by adding expected inflation.

The target allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized in the following table.

Asset Class	Target Allocation Percentage	Expected Geometric Real Rate Percentage of Return
U.S. equity	40	4.6
International equity	23	5.6
Fixed income	18	—
Real estate	6	4.3
Private equity	5	7.7
Additional Categories	6	2.5
Cash	2	(0.5)
Total	100	

Discount Rate

The discount rate used to measure the total OPEB liability (TOL) as of the measurement date was 7.5%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of June 30, 2019. In addition to the actuarial methods and assumptions of the June 30, 2019, actuarial valuation, the following actuarial methods and assumptions were used in the projection of the life insurance cash flows:

- Total payroll for the initial projection year consists of the payroll of the active membership present on the valuation date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.5%.
- The employer will contribute the actuarially determined contribution (ADC) in accordance with the Life Insurance Trust's funding policy (Schedule E) determined by a valuation performed on a date two years prior to the beginning of the fiscal year in which the ADC applies.

- As administrative expenses were assumed to be paid in all years by the employer as they come due, they were not considered.
- Active employees do not contribute to the plan.
- Cash flows occur midyear.

Based on these assumptions, the Life Insurance Trust's fiduciary net position (FNP) was not projected to be depleted. The FNP projections are based upon the Life Insurance Trust's financial status on the valuation date, the indicated set of methods and assumptions, and the requirements of GASB Statement No. 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing basis, reflecting the impact of future members. Therefore, the results of these tests do not necessarily indicate whether the Life Insurance Trust actually will run out of money, the financial condition of the trust, or the trust's ability to make benefit payments in future years.

These paragraphs require disclosure of the sensitivity of the NOL to changes the discount rate for the Life Insurance Trust. The schedules below presents the NOL of the trust calculated using the single equivalent interest rate (SEIR), as well as what the trust's NOL would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current SEIR.

Schedule of Net OPEB Liability 2020
(In thousands)

1% Decrease (6.5%)	Current Discount Rate (7.5%)	1% Increase (8.5%)
\$50,234	\$34,712	\$21,943

Schedule of Net OPEB Liability 2019
(In thousands)

1% Decrease (6.5%)	Current Discount Rate (7.5%)	1% Increase (8.5%)
\$45,921	\$31,072	\$18,868

The TOL of the Life Insurance Trust for 2020 is based upon an actuarial valuation performed as of the valuation date, June 30, 2019. An expected TOL is determined as of June 30, 2020, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2019, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year, and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the Life Insurance Trust, as of June 30, 2020, is shown in the following table.

TOL Roll-Forward 2020
(In thousands)

	Expected	Actual
(a) TOL as of June 30, 2019*	\$ 116,830	\$ 117,485
(b) Actual benefit payments and refunds for July 1, 2019-June 30, 2020	(5,317)	(5,317)
(c) Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375)]	8,563	8,613
(d) Service cost for July 1, 2019-June 30, 2020	1,299	1,299
(e) Changes of benefits terms		
(f) Changes of assumptions		
(g) TOL rolled forward to June 30, 2020 =(a)+(b)+(c)+(d)+(e)+(f)	\$ 121,375	\$ 122,080
(h) Difference between expected and actual experience gain (loss)		<u>(705)</u>

*The TOL used in the roll-forward as of June 30, 2019, is calculated using the discount rate as of the prior measurement date.

The TOL of the Life Insurance Trust for 2019 is based upon an actuarial valuation performed as of the June 30, 2018, valuation date. An expected TOL is determined as of June 30, 2019, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2018, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the trust, as of June 30, 2019, is shown in the following table.

TOL Roll-Forward 2019
(In thousands)

	Expected	Actual
(a) TOL as of June 30, 2018*	\$ 112,660	\$ 112,471
(b) Actual benefit payments and refunds for July 1, 2018-June 30, 2019	(5,153)	(5,153)
(c) Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375)]	8,256	8,241
(d) Service cost for July 1, 2018-June 30, 2019	1,271	1,271
(e) Changes of benefits terms		
(f) Changes of assumptions		
(g) TOL rolled forward to June 30, 2019 = (a)+(b)+(c)+(d)+(e)+(f)	\$ 117,034	\$ 116,830
(h) Difference between expected and actual experience gain (loss)		<u>(204)</u>

*The TOL used in the roll-forward as of June 30, 2018, is calculated using the discount rate as of the prior measurement date.

Note 10
Contingencies

On March 11, 2020, the World Health Organization declared coronavirus (COVID-19) a pandemic. The continued spread of COVID-19, or any similar outbreaks in the future, may adversely impact the local, regional, national and global economies. The extent to which COVID-19 impacts the plan's operating results is dependent on the breadth and duration of the pandemic. That extent could also be affected by other factors management currently is not able to predict. Potential impacts include, but are not limited to, changes in contribution and budget projections, changes to the plan's liability and investment portfolio declines. Management believes the plan is taking appropriate actions to respond to the pandemic; however, the full impact is unknown and cannot be estimated at the date the financial statements were issued.

Required Supplementary Information

Retirement Annuity Trust

Schedule of Changes in Net Pension Liability (In thousands)

	2020	2019	2018	2017
Total pension liability				
Service cost	\$ 552,625	\$ 542,970	\$ 1,104,102	\$ 1,332,587
Interest	2,517,671	2,448,387	2,063,109	1,964,107
Difference between expected and actual experience	10,661	93,650	(222,473)	199,471
Changes of assumptions			(14,167,315)	(2,321,327)
Benefit payments	(2,167,239)	(2,094,364)	(2,004,617)	(1,918,612)
Refunds of contributions	(28,472)	(32,403)	(31,073)	(26,305)
Net change in total pension liability	885,246	958,240	(13,258,267)	(770,079)
Total pension liability - beginning	34,666,795	33,708,555	46,966,822	47,736,901
Total pension liability - ending (a)	35,552,041	34,666,795	33,708,555	46,966,822
Plan net position				
Contributions - state	1,048,193	1,051,452	969,698	981,417
Contributions - other employers	86,088	71,583	78,973	79,303
Contributions - members	324,664	321,172	319,127	313,625
Net investment income	1,094,023	1,085,189	1,953,214	2,475,753
Benefit payments	(2,167,239)	(2,094,364)	(2,004,617)	(1,918,612)
Administrative expense	(12,167)	(12,352)	(11,388)	(10,314)
Refunds of contributions	(28,472)	(32,403)	(31,073)	(26,305)
Net change in plan net position	345,090	390,277	1,273,934	1,894,867
Plan net position - beginning	20,371,910	19,981,633	18,707,699	16,812,832
Plan net position - ending (b)	20,717,000	20,371,910	19,981,633	18,707,699
Net pension liability - ending (a)-(b)	<u>\$ 14,835,041</u>	<u>\$ 14,294,885</u>	<u>\$ 13,726,922</u>	<u>\$ 28,259,123</u>

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Schedule of Changes in Net Pension Liability
(In thousands)

	2016	2015	2014
Total pension liability			
Service cost	\$ 1,120,893	\$ 1,015,080	\$ 1,002,338
Interest	2,027,457	2,029,372	1,956,610
Difference between expected and actual experience	(58,035)		
Changes of assumptions	4,030,834	1,511,960	(353,043)
Benefit payments	(1,833,199)	(1,741,456)	(1,654,376)
Refunds of contributions	(27,748)	(23,033)	(25,462)
Net change in total pension liability	5,260,202	2,791,923	926,067
Total pension liability - beginning	42,476,699	39,684,776	38,758,709
Total pension liability - ending (a)	47,736,901	42,476,699	39,684,776
Plan net position			
Contributions - state	484,987	480,073	483,330
Contributions - other employers	80,468	79,506	79,996
Contributions - members	313,044	308,160	304,982
Net investment income	(245,215)	862,179	2,803,249
Benefit payments	(1,833,199)	(1,741,456)	(1,654,376)
Administrative expense	(8,636)	(8,869)	(7,956)
Refunds of contributions	(27,748)	(23,033)	(25,462)
Net change in plan net position	(1,236,299)	(43,440)	1,983,763
Plan net position - beginning	18,049,131	18,092,571	16,108,808
Plan net position - ending (b)	16,812,832	18,049,131	18,092,571
Net pension liability - ending (a)-(b)	<u>\$30,924,069</u>	<u>\$24,427,568</u>	<u>\$21,592,205</u>

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Net Pension Liability

The total pension liability contained in the following schedule was provided by TRS's actuary, Cavanaugh Macdonald Consulting. The net pension liability is measured as the total pension liability less the amount of the fiduciary net position of the system.

Changes of Benefit Terms. None.

Changes of assumptions. In the 2016 valuation, rates of withdrawal, retirement, disability, mortality and rates of salary increase were adjusted to more closely reflect actual experience. In the 2016 valuation and later, the expectation of retired life mortality was changed to the RP-2000 Mortality Tables projected to 2025 with projection scale BB, set forward two year for males and one year for females rather than the RP-2000 Mortality Tables projected to 2020 with projection scale AA, which was used prior to 2016.

In the 2011 valuation, rates of withdrawal, retirement, disability and mortality were adjusted to more closely reflect actual experience. In the 2011 valuation and later, the expectation of retired life mortality was changed to the RP-2000 Mortality Tables projected to 2020 with projection scale AA, set back one year for females rather than the 1994 Group Annuity Mortality Tables which was used prior to 2016. For the 2011 valuation through the 2013 valuation, an interest smoothing methodology was used to calculate liabilities for purposes of determining the actuarially determined contributions.

Schedule of Net Pension Liability (Dollars in thousands)

	2020	2019	2018	2017
Total pension liability	\$ 35,552,041	\$ 34,666,795	\$ 33,708,555	\$ 46,966,822
Plan net position	20,717,000	20,371,910	19,981,633	18,707,699
Net pension liability	14,835,041	14,294,885	13,726,922	28,259,123
Ratio of plan net position to total pension liability	58.27 %	58.76 %	59.28 %	39.83 %
Covered payroll	\$ 3,569,262	\$ 3,497,216	\$ 3,455,660	\$ 3,415,432
Net pension liability as a percentage of covered payroll	415.61 %	408.75 %	397.23 %	827.40 %

	2016	2015	2014
Total pension liability	\$ 47,736,901	\$ 42,476,699	\$ 39,684,776
Plan net position	16,812,832	18,049,131	18,092,571
Net pension liability	30,924,069	24,427,568	21,592,205
Ratio of plan net position to total pension liability	35.22 %	42.49 %	45.59 %
Covered payroll	\$ 3,390,539	\$ 3,455,008	\$ 3,317,422
Net pension liability as a percentage of covered payroll	912.07 %	707.02 %	650.87 %

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Schedule of Employer Contributions
(Dollars in thousands)

Fiscal Year Ended June 30	Covered Payroll	Actual Employer Contributions	Actuarially Determined Employer Contributions	Annual Contribution Excess (Deficiency)	Actual Contributions as a % of Covered Payroll
2020	\$ 3,569,262	\$ 1,134,281	\$ 1,134,281	\$	31.78
2019	3,497,216	1,123,035	1,123,035		32.11
2018	3,455,660	1,048,671	1,083,466	(34,795)	30.35
2017	3,415,432	1,060,720	1,076,617	(15,897)	31.06
2016	3,390,539	565,455	999,270	(433,815)	16.68
2015	3,455,008	559,579	913,654	(354,075)	16.20
2014	3,317,422	563,326	823,446	(260,120)	16.98
2013	3,310,710	568,233	802,985	(234,752)	17.16
2012	3,310,176	557,340	757,822	(200,482)	16.84
2011	3,283,749	1,037,936	678,741	359,195	31.61

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

The actuarially determined contribution rates in the Schedule of Employer Contributions are calculated as of June 30 on the three years prior to the end of the fiscal year in which contributions are reported. The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of the schedule.

Actuarial cost method	Entry age
Amortization period	Level percentage of payroll, closed
Remaining amortization period	27.4 years
Asset valuation method	5-year smoothed market value
Inflation	3%
Salary increase	3.5 to 7.3%, including inflation
Investment rate of return	7.5%, net of pension plan investment expense, including inflation

Schedule of Investment Returns

Percentage shown is annual money-weighted rate of return, net of investment expense.

2020	2019	2018	2017	2016	2015	2014
5.47%	5.56%	10.50%	15.00%	(1.32)%	4.96%	17.95%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Health Insurance Trust

Schedule of Changes in the Net OPEB Liability
(In thousands)

	2020	2019	2018	2017
Total OPEB liability				
Service cost	\$ 82,572	\$ 93,792	\$ 95,382	\$ 95,625
Interest	341,430	366,254	355,491	333,990
Changes of benefit terms				8,926
Difference between expected and actual experience	(585,090)	(661,228)	(210,450)	
Changes of assumptions	106,575	45,659	56,483	
Benefit payments	(145,869)	(163,666)	(161,082)	(178,500)
Net change in OPEB liability	(200,382)	(319,189)	135,824	260,041
Total OPEB liability - beginning	4,340,807	4,659,996	4,524,172	4,264,131
Total OPEB liability - ending (a)	4,140,425	4,340,807	4,659,996	4,524,172
Plan net position				
Contributions - state	77,191	76,382	80,959	75,497
Contributions - other employers	107,434	106,764	106,143	104,879
Contributions - active members	133,471	131,677	130,778	128,819
Net investment income	32,475	74,385	76,841	95,453
Benefit payments	(145,869)	(163,666)	(161,082)	(178,500)
Administrative expense	(2,047)	(1,803)	(1,748)	(1,539)
Other				
Net change in plan net position	202,655	223,739	231,891	224,609
Plan net position - beginning	1,414,020	1,190,281	958,390	733,781
Plan net position - ending (b)	1,616,675	1,414,020	1,190,281	958,390
Net OPEB liability - ending (a) - (b)	\$ 2,523,750	\$ 2,926,787	\$ 3,469,715	\$ 3,565,782

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Net OPEB Liability — Health Trust

The net OPEB liability contained in the following schedule was provided by TRS's actuary, Cavanaugh Macdonald Consulting. The net OPEB liability is measured as the total OPEB liability less the amount of the fiduciary net position of the system.

Changes of benefit terms. None

Changes of assumptions. None

Schedule of Net OPEB Liability (Dollars in thousands)

Valuation Year June 30	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability	Plan Fiduciary Net Position as a % of Total OPEB Liability	Covered Payroll	Net OPEB Liability as a % of Covered Payroll
2020	\$4,140,425	\$ 1,616,675	\$2,523,750	39.1	\$ 3,569,262	70.7
2019	4,340,807	1,414,020	2,926,787	32.6	3,497,216	83.7
2018	4,659,996	1,190,281	3,469,715	25.5	3,455,660	100.4
2017	4,524,172	958,390	3,565,782	21.2	3,415,432	104.4

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Schedule of Employer Contributions (Dollars in thousands)

Valuation Year June 30	Actuarially Determined Employer Contribution	Contributions in Relation to the Actuarially Determined Contribution	Annual Contribution Deficiency/ (Excess)	Covered Payroll	Actual Contributions as a % of Covered Payroll
2020	\$ 43,909	\$ 184,625	\$ (140,716)	\$ 3,569,262	5.17
2019	76,597	183,146	(106,549)	3,497,216	5.24
2018	118,837	187,102	(68,265)	3,455,660	5.41
2017	102,854	180,376	(77,522)	3,415,432	5.28
2016	97,983	221,967	(123,984)	3,390,539	6.55
2015	106,606	168,084	(61,478)	3,455,008	4.86
2014	159,583	162,568	(2,985)	3,317,422	4.90
2013	186,726	166,611	20,115	3,310,710	5.03
2012	470,217	177,748	292,469	3,310,176	5.37
2011	477,723	188,735	288,988	3,283,749	5.75

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

The actuarially determined contribution rates in the Schedule of Employer Contributions are calculated as of June 30, 2019. The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of the schedule.

Actuarial cost method	Entry age normal
Amortization period	Level percentage of payroll
Amortization method	21 years, closed
Asset valuation method	5-year smoothed market value
Inflation	3%
Real wage growth	0.5%
Wage inflation	3.5%
Salary increase	3.5 to 7.2%, including wage inflation
Discount rate	8%
Health care cost trends	
KEHP group	7.25% at June 30, 2020, decreasing to an ultimate rate of 5% by June 30, 2029
MEHP group	5.25% at June 30, 2020, decreasing to an ultimate rate of 5% by June 30, 2022
Medicare Part B premiums	6.4% at June 30, 2020 with an ultimate rate of 5% by June 30, 2031
KEHP group claims	The current KEHP premium is used as the base cost and is projected forward using only the health care trend assumption (no implicit rate subsidy is recognized).

Schedule of Investment Returns

Percentage shown is annual money-weighted rate of return, net of investment expense.

2020	2019	2018	2017	2016	2015	2014
2.30%	6.11%	8.44%	14.4%	(2.20)%	1.38%	15.38%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Life Insurance Trust
Schedule of Changes in the Net OPEB Liability
(In thousands)

	2020	2019	2018	2017
Total OPEB liability				
Service cost	\$ 1,299	\$ 1,271	\$ 1,068	\$ 1,067
Interest	8,563	8,256	8,026	7,761
Difference between expected and actual experience	705	(204)	(717)	
Changes of assumptions				
Benefit payments	(5,317)	(5,153)	(5,453)	(5,151)
Net change in OPEB liability	5,250	4,170	2,924	3,677
Total OPEB liability - beginning	116,830	112,660	109,736	106,059
Total OPEB liability - ending (a)	122,080	116,830	112,660	109,736
Plan Net Position				
Contributions - state	1,543	1,209	897	882
Contributions - other employers	253	212	161	168
Contributions - active members				
Net investment income	5,167	5,058	1,111	915
Benefit payments	(5,317)	(5,153)	(5,453)	(5,151)
Administrative expense	(36)	(30)	(31)	(28)
Other				
Net change in plan net position	1,610	1,296	(3,315)	(3,214)
Plan net position - beginning	85,758	84,462	87,777	90,991
Plan net position - ending (b)	87,368	85,758	84,462	87,777
Net OPEB liability - ending (a) - (b)	<u>\$ 34,712</u>	<u>\$ 31,072</u>	<u>\$ 28,198</u>	<u>\$ 21,959</u>

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Net OPEB Liability — Life Insurance

The net OPEB liability contained in the following schedule was provided by TRS's actuary, Cavanaugh Macdonald Consulting. The net OPEB liability is measured as the total OPEB liability less the amount of the fiduciary net position of the system.

Changes of benefit terms. None

Changes of assumptions. None

Schedule of Net OPEB Liability
(Dollars in thousands)

Valuation Year June 30	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability	Plan Fiduciary Net Position as a % of Total OPEB Liability	Covered Payroll	Net OPEB Liability as a % of Covered Payroll
2020	\$ 122,080	\$ 87,368	\$ 34,712	71.6	\$3,569,262	1.0
2019	116,830	85,758	31,072	73.4	3,497,216	0.9
2018	112,660	84,462	28,198	75.0	3,455,660	0.8
2017	109,736	87,777	21,959	80.0	3,415,432	0.6

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.
See accompanying independent auditor's report.

Schedule of Employer Contributions
(Dollars in thousands)

Valuation Year June 30	Actuarially Determined Employer Contribution	Contributions in Relation to the Actuarially Determined Contribution	Annual Contribution Deficiency/(Excess)	Covered Payroll	Actual Contributions as a % of Covered Payroll
2020	\$ 1,843	\$ 1,796	\$ 47	\$ 3,569,262	0.05
2019	1,082	1,421	(339)	3,497,216	0.00
2018	1,075	1,058	17	3,455,660	0.03
2017	1,065	1,050	15	3,415,432	0.03
2016	1,058	1,038	20	3,390,539	0.03
2015	1,050	1,020	30	3,455,008	0.03
2014	1,045	1,006	39	3,317,422	0.03
2013	1,740	1,680	60	3,310,710	0.05
2012	1,733	1,685	48	3,310,176	0.05
2011	1,726	1,669	57	3,283,749	0.05

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

The actuarially determined contribution rates in the schedule of employer contributions are calculated as of June 30, 2017 valuation date. The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of the schedule.

Actuarial cost method	Entry age normal
Amortization method	Level percentage of payroll
Amortization period	30 years
Asset valuation method	5-year smoothed market
Inflation	3%
Real wage growth	0.5%
Wage inflation	3.5%
Salary increase	3.5 to 7.45%, including wage inflation
Discount rate	7.5%

Schedule of Investment Returns

Percentage shown is annual money-weighted rate of return, net of investment expense.

2020	2019
6.32%	6.49%

TRS began separate reporting of its Life Insurance Trust effective February 1, 2018. Previously, it was reported as part of the pension fund's gross and net performance. This schedule will show more history of the trust as it becomes available.
See accompanying independent auditor's report.

Additional Supporting Schedules

Schedule of Administrative Expenses For the Year Ended June 30, 2020 and 2019

	2020	2019
Salaries	\$ 7,348,155	\$ 7,364,326
Other personnel costs	699,974	715,252
Professional services and contracts	537,184	668,483
Utilities	99,046	103,202
Rentals	22,701	23,114
Maintenance	243,029	102,570
Postage and related services	387,799	330,510
Printing	118,356	96,892
Insurance	186,381	194,601
Miscellaneous services	143,650	149,267
Telecommunications	20,073	20,255
Computer services	101,283	92,823
Supplies	46,002	45,050
Depreciation	2,026,708	2,251,469
Travel	30,464	49,890
Dues and subscriptions	128,202	56,860
Miscellaneous commodities	15,842	13,950
Office systems and equipment	1,913,388	1,870,795
Compensated absences	183,186	38,025
Total	<u>\$ 14,251,423</u>	<u>\$ 14,187,334</u>

See accompanying independent auditor's report.

**Schedule of Professional Services and Contracts
For the Year Ended June 30, 2020 and 2019**

	Nature of Service	2020	2019
Cavanaugh Macdonald Consulting	Actuarial	\$ 194,108	\$ 238,199
Mountjoy Chilton Medley	Auditing		36,454
Blue & Co.	Auditing		88,200
Auditor of Public Accounts	Auditing	164,767	54,284
Ice Miller	Attorney	20,895	31,388
Reinhart Boerner VanDeuren	Attorney	114	
Stoll Keenon and Ogden	Attorney	12,157	2,353
Attorney General	Attorney	12,281	8,344
Williams & Jensen	Attorney	30,862	12,000
Aon Hewitt	Consulting		90,761
MulloyBorland	Communications	102,000	76,500
Peritus	Communications		30,000
Total		<u>\$ 537,184</u>	<u>\$ 668,483</u>

See accompanying independent auditor's report.

**Schedule of Contracted Investment Management Expenses
Year Ended June 30, 2020**

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity managers	\$ 17,744,026	\$ 497,652	\$ 15,900	\$ 18,257,579
Fixed income managers	514,525			514,525
Real estate	11,148,831	1,348,170	30,837	12,527,838
Additional categories	9,322,443	1,381,062	12,657	10,716,162
Alternative investments	21,058,757	2,036,849	11,740	23,107,345
Custodian	529,220	95,575	20,197	644,992
Consultant	497,377			497,377
Legal and research	73,818			73,818
Other (administrative and operational)	3,173,837	300,288	144,687	3,618,811
Total	<u>\$ 64,062,834</u>	<u>\$ 5,659,596</u>	<u>\$ 236,018</u>	<u>\$ 69,958,448</u>

*Does not include expenses for the 403(b) Tax-Sheltered Trust and Losey Scholarship Fund.
See accompanying independent auditor's report.

Schedule of Contracted Investment Management Expenses
Year Ended June 30, 2019

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity managers	\$ 16,437,286	\$ 367,283	\$	\$ 16,815,101
Fixed income managers	467,031			467,031
Real estate	10,239,260	1,155,465	9,731	11,404,456
Additional categories	9,040,647	1,103,845	12,567	10,157,059
Alternative investments	20,899,483	2,310,360		23,210,271
Custodian	539,741	81,648	28,623	650,012
Consultant	499,317			499,317
Legal and research	88,923			88,923
Other (administrative and operational)	2,954,564	276,532	110,823	3,341,920
Total	<u>\$ 61,166,252</u>	<u>\$ 5,295,133</u>	<u>\$ 172,703</u>	<u>\$ 66,634,088</u>

*Does not include expenses for the 403(b) Tax-Sheltered Trust and Losey Scholarship Fund.
See accompanying independent auditor's report.



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**INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND
ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED
IN ACCORDANCE WITH GOVERNMENT AUDITING STANDARDS**

Independent Auditor's Report

To the Board of Trustees
Kentucky Teachers Retirement System
Frankfort, Kentucky

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Kentucky Teachers Retirement System, which comprise the statement of fiduciary net position as of June 30, 2020, and the related statement of changes in fiduciary net position for the year then ended, and the related notes to the financial statements, which collectively comprise the Kentucky Teachers Retirement System's basic financial statements, and have issued our report thereon dated November 13, 2020.

Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Kentucky Teachers Retirement System's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Kentucky Teachers Retirement System's internal control. Accordingly, we do not express an opinion on the effectiveness of the Kentucky Teachers Retirement System's internal control.

A *deficiency* in internal control exists when the design or operation of a control does not allow management or employees in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over financial reporting that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Kentucky Teachers Retirement System's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Kentucky Teachers Retirement System's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Kentucky Teachers Retirement System's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Blue & Co., LLC

Lexington, Kentucky
November 13, 2020