Teachers' Retirement System of the State of Kentucky

TRS

KENTUCKY

The 83rd Annual Comprehensive Financial Report

A Component Unit of the Commonwealth of Kentucky
Fiscal Years Ended June 30, 2023 and 2022

479 Versailles Road
Frankfort, Kentucky 40601-3800

Gary L. Harbin, CPA
Executive Secretary

This report was prepared by the
Teachers' Retirement System staff.

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Chair's Letter

Teachers' Retirement System of the State of Kentucky

December 18, 2023

Dear Members:

On behalf of the Board of Trustees and staff, I am pleased to present this Annual Comprehensive Financial Report of the Teachers' Retirement System of the State of Kentucky for the years ending June 30, 2023, and 2022, the 83rd year of operation of the system. The accompanying reports from the independent auditor and the consulting actuary substantiate the financial integrity and the actuarial soundness of TRS.

TRS closed the 2023 fiscal year with 75,644 active members, 59,559 retirees and annual annuity and health insurance benefits of $2.5 billion.

The board is committed to managing retirement system funds in a prudent, professional manner. Every effort will be made to ensure that TRS continues to operate in a fiscally sound manner. In this vein, the actions of the board in recent years have resulted in a reduction of more than $8 billion in liabilities for the state through decisions related to investing and the implementation of the Shared Responsibility solution that prefunded retiree health care. Present and future members of the system deserve to be able to avail themselves of the retirement payments as promised by law.

We appreciate the support and cooperation extended by the governor and the legislature. This cooperation allows TRS to meet not only current challenges but also to make timely provisions for the future.

The board pledges to continue administering the affairs of the Teachers' Retirement System in the most competent and efficient manner possible.

Sincerely,

Brenda McGown

Brenda McGown
Chair
Board of Trustees

Letter of Transmittal

Teachers' Retirement System
of the State of Kentucky

December 18, 2023

Honorable Andrew G. Beshear, Governor
Commonwealth of Kentucky
Capitol
Frankfort, Kentucky

Dear Governor Beshear:

It is my pleasure to submit the 83rd Annual Comprehensive Financial Report (ACFR) of the Teachers' Retirement System of the State of Kentucky (TRS), a component unit of the Commonwealth of Kentucky, for the fiscal years ended June 30, 2023, and 2022. Allow me to begin this transmittal letter with my thanks for your support for continuing to fully fund the retirement system for Kentucky's teachers. With your help and the assistance of the General Assembly, we are in the sixth consecutive year of full pension funding for TRS of the actuarially determined employer contribution (ADEC). The importance of the consistent full funding of the retirement plan for Kentucky's teachers cannot be overstated. The funded ratios of the two major funds, as determined by the independent actuary, either held steady or improved in the year concluded June 30, 2023. The Retirement Annuity Trust funded ratio was 58.6% compared to 58.8% a year earlier. This is as anticipated by the actuary over the next several years before larger gains are projected. The Health Insurance Trust reached 71.3% from 63.7% a year before, continuing the gains seen since the 2010 Shared Responsibility law (2010 RS HB 540). Both funds, in the opinion of the actuary, continue to be on track for full funding within the amortization period for each.

As of June 30, 2023, TRS's total funds were, according to the independent auditor, $27.08 billion, a $1.8 billion improvement from a year ago.

TRS produced this annual report, which is required by state law and contains the system's annual audit and actuarial valuations, that provides you, the General Assembly and the public with information necessary to better understand TRS, which is the largest financial institution in the state. This report contains numerous examples of how retirement security for Kentucky teachers is being provided at a low cost and with a great economic benefit for those educators and the state's businesses. Many of the retirement dollars are spent in Kentucky across all 120 counties by the 87% of retirees who live here and receive 90% of the annuity benefits paid by TRS. TRS paid $2.5 billion in total benefits (retirement, health insurance, etc.) during the fiscal year.

This report conforms with the principles of governmental accounting and generally accepted accounting principles. Responsibility for both the accuracy of the data and the completeness and fairness of the presentation, including all disclosures, rests with TRS management. To the best of management's knowledge and belief, the enclosed data is accurate in all material aspects and reported in a manner designed to present fairly the financial position and results of operations of TRS for the years ended June 30, 2023, and 2022. Discussion and analysis of net assets and related additions and deductions are presented in Management's Discussion and Analysis in the report's Financial Section.

Management is responsible for maintaining a system of internal controls to establish reasonable assurance that assets are safeguarded, transactions are executed accurately, and financial statements are presented fairly. Limits are inherent in all internal control systems based on the recognition that the costs of such systems should be related to the benefits to be derived. Management believes TRS's controls provide the appropriate balance. The internal controls system includes policies, procedures and an internal audit department reporting to the Board of Trustees.

Profile of TRS
TRS began operations on July 1, 1940, as a cost-sharing, multiple-employer defined benefit plan. The primary purpose of the plan is to provide retirement annuity plan coverage and retiree health insurance for local school districts and other public educational agencies in the state.

The number of TRS active and retired members is in the board chair's preceding letter. From the $2.5 billion paid in total benefits, which is a record, the average annuity is $40,697 and, for most TRS retirees, replaces Social Security. TRS usually provides a higher benefit with a comparable normal cost to the federal program.

TRS is an independent agency and instrumentality of the commonwealth. An annual operating budget is prepared for the administration of the retirement system and approved by the 11-member board. Budget requests also are submitted to the General Assembly for adoption. The agency's administrative expenses, which are among the lowest of U.S. public pension plans, are paid from TRS's investment earnings.

The plan is described in the Notes to Financial Statements in the Financial Section of this report. Also, the Summary of Main System Provisions as Interpreted for Valuation Purposes in the Actuarial Section is useful in understanding benefit and contribution provisions.

Professional consultants are appointed by the board to perform essential services for TRS's effective and efficient operation. Reports from the board's independent auditor and independent actuary are enclosed in this ACFR. The system's consultants are listed in the Additional Supporting Schedules of the Financial Section and in the Investment Section's Professional Service Providers table and Health Insurance Trust Professional Service Providers table.

Major Initiatives

TRS is efficient, effective and always working to improve the retirement security of Kentucky's teachers. The highest levels of professionalism, integrity, performance and teamwork are required at all levels. The latest affirmation of this, elaborated upon later in this letter, came with the clean independent annual audit that resulted in no findings.

During the year, TRS continued several major initiatives concerning funding, investments, benefit administration and cost containment.

Personalized Medicine

Possibly the initiative that continues best to fit all the previously mentioned goals is TRS's leading-edge personalized medicine program under TRS's retiree health insurance program that improves the wellness of retirees. The program now has more than 11,400 enrollees, most of whom are in the Medicare Eligible Health Plan (MEHP). This pharmacogenomics program, which began in fall 2017, is focused on making sure that a retiree's medications are safe and will be beneficial from the beginning, avoiding traditional medicine's costly and sometimes harmful trial-and-error process without the DNA information. Coriell Life Sciences, which has been providing clinical research services for more than 65 years, is TRS's scientific partner in the program. Vital to the project is the link between retirees and doctors provided by the pharmacists of the Know Your Rx Coalition (KYRx). The coalition, a purchasing collaborative founded with TRS, reduces costs for members like TRS while providing personal service to customers. Initial results have shown widespread acceptance by prescribing physicians, reductions in medical spending for those involved and reductions in hospitalizations. This program is being expanded to include testing for a specific gene that recently was discovered can help detect a rare, but potentially severe, reaction to some cancer medications.

Retiree Health Care

Kentucky continues to be a national leader in prefunding retiree health care benefits as a result of the Shared Responsibility solution enacted in 2010 through the collective efforts of the board, the education community and elected officials. The plan immediately eliminated $3.1 billion in actuarial liability from the retired teacher health care plan. Combined with other cost control measures, more than $5 billion in actuarial accrued liability has been eliminated from the Health Insurance Trust. In more than a decade, the health insurance fund has achieved a 71.3% funded ratio compared to pay-as-you-go status before the law. This remarkable improvement confirms that the health insurance fund is well positioned if all statutory contributions are received and other assumptions are realized. Shared Responsibility's success for the retirement security of current and future retired teachers is a national model. It should be noted that the funded level also has benefited from prescription medication rebates and subsidies that were not anticipated at the outset of Shared Responsibility. If these rebates and subsidies that are in addition to Shared Responsibility contributions are lost, the full funding of the trust − currently projected to be in about five years − would be pushed beyond 2050, according to the actuary.

Beyond Shared Responsibility, the board regularly reviews the health care plan to contain costs and maintain a meaningful benefit for retired teachers. The 2007 move to Medicare Advantage continues to be stable and financially feasible for TRS's members and the medical plan.

Cost-saving initiatives have included moving the TRS-sponsored Medicare Part D Employer Group Waiver drug plan from fully insured to a self-funded plan to achieve the greatest federal subsidies. Additionally, as referenced previously, TRS is part of KYRx, which it joined in 2012. Through the coalition, TRS saves money leveraging greater prescription purchasing power, obtaining deeper drug discounts and increasing the rate at which prescriptions were filled with generic drugs to 90% for the fiscal year compared to 73% in 2012. Additionally, coalition pharmacists work with retired teachers and their physicians to maximize prescription dollars for the retiree and TRS, including supporting the personalized medicine program.

These successful efforts, including cost containment measures by staff, allow affordable retiree health care to continue being provided to members with premiums at the same levels they were at 20 years ago.

Investing
With a 10.61% year-over-year investment return, the long-term track record for the TRS investment program remains strong, outperforms average plans and provides income that aids progress toward full funding.

From 2008 to June 2023, TRS investment returns resulted in net assets of $24.24 billion, compared to the average plan's $19.13 billion. This out performance has generated $5.11 billion to the benefit of Kentucky's teachers and all taxpayers.

For the most recent year, as mentioned, the retirement annuity gained 10.61% while the health trust gained 11.94%, both gross of fees.

As of June 30, 2023, TRS achieved top 6% performance for the year, top quarter for five years and top 11% for the decade (as ranked by Aon covering public plans with assets over $1 billion). The 10-year return was 8.49% for the annuity trust, while the Health Insurance Trust saw a 7.71% gain for the same timeframe.

This performance — overseen by the board and its Investment Committee and managed by the TRS investment team, all working on teachers' behalf — is important because investment income provides about two thirds of annuity payments made by TRS. Also as noted earlier, these TRS annuities bolster Kentucky's economy as retirees cover the expenses of daily life in the state's cities and towns. The consistent contributions from members and employers are the cornerstone of these investments that provide the benefits upon which retired teachers rely.

This report's Investment Section includes asset allocations, target ranges, market environment discussion and historical performance schedules.

According to KRS 161.430, the board is responsible for investing TRS's assets. The board delegates investment authority to the Investment Committee. The committee works closely with experienced investment managers and TRS's professional staff in evaluating and selecting investment allocations.

The board's investment objectives ensure funds are invested solely in the interest of TRS's members and that investment income is used exclusively to provide benefits to the members and their beneficiaries with reasonable expenses in administering the plan and its trust funds. The investment program also provides a reasonable rate of return with a major emphasis being placed on the protection of the invested assets.

TRS regularly obtains independent reviews and always seeks to improve its investment program and continue the tradition of adhering to best governance practices that lead to reasonable investment returns.

A multiyear program of diversifying the portfolio continued in line with TRS's focus on investment fundamentals, including controls on risk and costs. These efforts are a continuation of a disciplined investment process and long-term focus on retirement security. This focus has generated exceptionally stable returns through TRS's history, and management has every confidence this will continue. TRS's investment program continues to be recognized as a leader in the public pension community for governance structure, trustee education and cost effectiveness.

The year ended June 30, 2023, was characterized by strong equity markets in the second half of the year that benefited from a cooling of inflation and overcame other economic headwinds. Equities rallied over the second half of the year as businesses and consumers saw inflation at 3% compared to 9.1% the year before. The inflation relief helped push domestic equities up 20% and non-domestic up 13%, despite ongoing monetary tightening by global central banks, a European financial crisis in the first quarter and a global banking crisis in the second quarter.

With the understanding that a one-year period is not determinative for a long-term investor like TRS, the performance for longer periods continues TRS's historical record of top-tier performance. Moreover, during the last 30 years, TRS retirement annuity investment returns of 7.71% have bettered the 7.1% assumed rate of return. Net returns, as well, exceeded assumed rates for the annuity and health insurance trusts over the standard measuring periods of one, three, five and 10 years for both trusts and 20 years for the retirement trust. This record validates policy changes by the board and implemented by the Investment Committee over the last several years. TRS's commitment to best practices, stringent risk controls and emphasis on fundamentals in investing helps ensure long-term retirement security for Kentucky's teachers.

TRS's investment portfolio experienced an increase in fair value during the fiscal year to $26.44 billion from $24.55 billion a year ago. The increase was the result of market conditions and employer and employee contributions of $1.87 billion that added to the portfolio.

The gross investment gain for all funds was $2.63 billion. The net appreciation in fair value of investments was $2.1 billion compared to a depreciation of $3.34 billion the prior year.

Legislation
During the 2023 regular session, TRS monitored legislation that directly and indirectly impacted TRS, including HB 180 that established biomarker testing coverage requirements for health benefit plans – a move that complements and could increase utilization of Personalized Medicine. Most importantly, budget revisions approved continued full funding of actuarially required contributions for TRS.

Benefits Administration
The year included the ongoing administration of the recently created TRS 4 hybrid retirement plan for members who began on or after Jan. 1, 2022. The plan is designed for the board to use risk controls to address any unfunded liability that could develop, limiting the state's responsibility to the payment of fixed statutory contributions.

Internal and External Reviews and Recognition
Independent outside reviews of the retirement system by auditors, the Public Pension Coordinating Council and the Government Finance Officers Association provide the board and TRS staff with important feedback.

TRS responds to legislative and executive inquiries and mandates throughout the year. In connection with pension legislation, TRS received — and responded to — numerous requests from legislators, the executive branch, constituent groups and others to provide accurate information about TRS. Many of these involved presentations to the Public Pension Oversight Board (PPOB) and General Assembly committees. Subjects included quarterly investment-return and cash-flow updates; sensitivity analyses, the use of sick leave in retirement, the biennial budget request; and annual valuations from the actuary.

Additionally, TRS's independent actuary conducted a review of economic assumptions in compliance KRS 161.400 (1)(b)(1), which resulted from HB 76 (2022 RS).

Separately, an actuarial audit conducted for the PPOB pursuant to KRS 7A.250 confirmed the assumptions used by TRS's independent actuary are reasonable and accurately calculate liabilities.

The independent review of TRS by Blue & Co. resulted in a clean audit that had no findings. The auditor issued an unqualified opinion on TRS's financial statements for the fiscal years ended June 30, 2023, and 2022.

The Government Finance Officers Association of the United States and Canada (GFOA) awarded TRS the Certificate of Achievement for Excellence in Financial Reporting for its ACFR for the year ended June 30, 2022. The certificate is a prestigious award recognizing conformance with the highest standards for preparation of state and local government financial reports.

To be awarded a one-year Certificate of Achievement, a government unit must publish an easily readable and efficiently organized annual comprehensive financial report, whose contents conform to program standards. Such ACFRs must satisfy both generally accepted accounting principles and applicable legal requirements.

TRS has received the certificate for 35 consecutive years (fiscal 1988-2022). TRS believes the current report, which is being submitted to GFOA, continues to conform to the Certificate of Achievement program requirements.

The Public Pension Coordinating Council (PPCC) recognized TRS with the Public Pension Standards Award for Funding and Administration for 2023. The award is based on compliance with principles judged to underlie exemplary retirement system achievements in the areas of benefits, actuarial valuation, financial reporting, investments, funding and disclosure. Those principles are acknowledged widely to be marks of excellence in the public pension industry.

The PPCC is a coalition of three national associations that represent public retirement systems and administrators. Combined, these associations serve retirement systems that provide pension coverage for most of the nation's 18 million employees of state and local government. The associations that form the PPCC are the National Association of State Retirement Administrators, the National Council on Teacher Retirement and the National Conference on Public Employee Retirement Systems.

Information Technology
Pathway — TRS's information technology system that allows members secure online access to account information anytime from anywhere — continued to be successful as TRS maintained and refined the system throughout the year. This included the implementation of multi factor authentication.

Communications and Outreach
TRS strives to treat every member fairly, with respect and dignity, and to foster a personal affinity for this system that is theirs. This is a culture that underpins communications and outreach efforts and has been in place for many years. In the fiscal year, TRS continued to reach members in a variety of methods as staff members, including me, delivered communications to members, retirees, the education community, political leaders and the public regarding the value of TRS.

On social media, TRS continued using Facebook and Twitter accounts to communicate information about the system on a timelier basis. Since its beginning, the Facebook account has 5,044 followers and posts that often reach more than 1,000 users — led this past year by more than 28,491 users who saw a post advising members that third-party solicitations about TRS benefits are not from TRS. Facebook posts during the fiscal year were viewed more than 68,000 times. Posts on X (formerly Twitter) were viewed 12,061 times.

TRS Kentucky YouTube traffic for videos, on a variety of member benefits and retiree insurance issues, reached nearly 6,150 views, with more than half of those views split between how-to explanations of the retirement process, registering for Pathway and enrolling in the Medicare-eligible health plan along with a video outlining temporary retired return-to-work changes.

Also, TRS continued seminar offerings for members. Member services webinars hosted hundreds of members in live broadcasts and views of recordings. This is in addition to speaking to hundreds interested in TRS at meetings of constituency groups.

Use of mass email continued to communicate about a host of operations. More than 460,000 emails were delivered representing a rate of 93% and with 46.6% opened. Of the 460,000, only 133 resulted in someone unsubscribing and only 26 were marked spam.

Finally, the 16 TRS counselors met with members in response to 6,272 meeting requests, and 28,446 retirement estimates were provided, including 17,578 created by counselors.

General Administration
TRS continued for the fifth year the option of electronic voting in trustee elections using Pathway. This has been the most significant change in the method of voting since the first election in 1939. Ballots cast electronically increased 10% to 1,759 from 1,601 last year, 1,411 the third year, 1,113 the second year and 308 the first year.

Also, TRS continued voting through Pathway in December for the Member Nominating Committee that met early this year for the two 2023 trustee elections.

Funding Progress
Retirement Annuity Trust
Teachers saw the continued benefits of increased funding by the state. The current fiscal year marks the end of the third biennium of full funding for the annuity trust, following the 2016-2018 biennium that saw nearly full funding. These marked the first full funding in a decade.

Financial and actuarial reports show, thanks to funding and investment returns, that the fiduciary net position of all TRS funds has improved $10.45 billion from a decade ago.

Based on board recommendations, the General Assembly establishes, by statute, the contribution levels that are to be made by members and employers to fund TRS's liabilities. Each year, an independent actuary performs a valuation to determine whether the current levels of contribution will be sufficient to cover the cost of benefits earned by members.

From fiscal 2009 through fiscal 2018, the state had not paid the full actuarially determined contributions necessary to prefund benefits. Over that time, because of not making the additional appropriation, the actuary determined the state's additionally required contributions have grown to $948 million (fiscal 2026).

The board always has acted as required by law and recommended employer contributions payable by the state to ensure the state meets its contractual obligations to members. Again, management is appreciative, and teachers can be as well, of the full funding provided in the 2018-2020 budget; in the fiscal 2021 and 2022 budgets; and in the 2022-2024 budget. The valuation for the Retirement Annuity Trust for the period ending June 30, 2022, reflects TRS's actuarial asset value of $24.73 billion and actuarial liabilities of $42.18 billion. The funded ratio of actuarial assets to liabilities is now 58.6% compared to 58.8% a year earlier. This is as anticipated by the actuary over the next several years before larger gains are projected.

The actuary reports: "If contributions by the employer to the system in subsequent fiscal years are less than those required, the assets are expected to become insufficient to pay promised benefits. However, assuming that contributions to the system are made by the employer and state from year to year in the future at rates recommended on the basis of the successive actuarial valuations, the continued sufficiency of the assets to provide the benefits called for under the system may be safely anticipated."

Annual required employer contributions for the retirement plan are shown in the Schedule of Employer Contributions in the Required Supplemental Information of this report's Financial Section. Based on the 2023 valuation, the actuary recommends a cumulative increase in employer contributions of 22.56% of pay for fiscal 2026 as detailed in the contribution rates tables in the Summary of Principal Results in this report's Actuarial Section.

Health Insurance Trust
The Shared Responsibility solution for funding retiree health care, which went into effect on July 1, 2010, provides a method of prefunding retiree health care over the next 20 years. In only 13 years, the Health Insurance Trust has reached 71.3% funding compared to pay-as-you-go status before the law took effect. The results confirm that the Health Insurance Trust is on schedule to be funded fully and that the 2010 solution is working when all parties contribute as the law requires. The Shared Responsibility solution for funding retiree health care will help ensure the retirement security of the state's teachers. An actuarial valuation of the Health Insurance Trust for the year ended June 30, 2023, indicated that the trust has an unfunded liability of $1.12 billion. Annual required employer contributions for the Health Insurance Trust are provided in the Schedule of Employer Contributions in the Required Supplemental Information of the Financial Section.

The actuary opines "if the contributions to the Health Insurance Trust continue at the current statutorily required levels, the funded ratio of the retiree medical plan will continue to increase, and the ability of the health trust to fund the benefits called for under the retiree medical plan will improve."

The 2022-2024 budget returned to full funding as set forth in statute for the retiree Health Insurance Trust after a fiscal 2022 budget that did not include the full amount under the 2010 law. With that one-year exception, retiree health insurance has received all required appropriations since Shared Responsibility was implemented in 2010.

Also, the board pursues cost containment at both the state and national levels to the benefit of teachers and taxpayers. As referenced previously, should the trust's revenues lose prescription medication rebates and subsidies that were not anticipated at the outset of Shared Responsibility, the full funding of the trust would be pushed beyond 2050, according to the actuary.

National Involvement
NCTR Executive Committee
I am past-president of the National Council on Teacher Retirement (NCTR). NCTR is a national, nonprofit organization with a mission to promote effective governance and benefits administration in state and local public pension systems in order that adequate and secure retirement benefits are provided to educators and other plan participants. NCTR membership includes 63 state, territorial, local and university pension systems with combined assets in excess of $2 trillion, serving more than 19 million active and retired teachers, non-teaching personnel and other public employees.

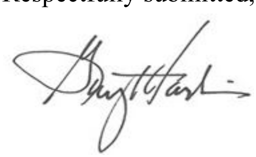
Public Sector HealthCare Roundtable
Additionally, I serve on the board of directors and as president of the Public Sector HealthCare Roundtable. The roundtable is a national coalition of public sector health care purchasers that was formed to ensure that the interests of the public sector are represented properly during the formulation, debate and implementation of federal health care policies. Membership is open to any statewide, regional or local governmental unit that provides health care coverage for public employees and retirees.

Acknowledgments
This report reflects the combined efforts of the TRS staff, under the leadership of the board. The report is intended to provide complete and reliable information that serves as a basis for making management decisions and for determining compliance with legal provisions. It also is used to determine responsible stewardship of the assets contributed by TRS members and their employers.

This report is at https://trs.ky.gov/financial-reports-information/#ACFR and is available to system employers. The cooperation of these employers continues to contribute significantly to TRS's success and forms the vital link between TRS and its active members.

TRS management and staff are committed to the continued operation of an actuarially sound and efficient system. Again, thanks to you and the General Assembly for your support for full funding that ensures teachers' retirement security. Your support is essential to this commitment, and we look forward to continuing to work with you.

Respectfully submitted,



Gary L. Harbin, CPA
Executive Secretary

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Executive Secretary

Robert B. Barnes, JD
General Counsel and
Deputy Executive Secretary
Operations

Eric Wampler, JD
Deputy Executive Secretary
Finance & Administration

Tom Siderewicz, CFA
Chief Investment Officer

Actuary
Cavanaugh Macdonald Consulting
3550 Busbee Parkway, Suite 250
Kennesaw, GA 30144

Auditor
Blue & Co.
250 West Main Street, Suite 2900
Lexington, KY 40507

See the Schedules of Contracted Investment Management Expenses, Transaction Commissions and Professional Service Providers on pages 112-115, 117, 119 and 126-129 for a list of investment fees and external asset managers.

Organizational Chart

Board of Trustees

Brenda McGown, Chair
John Boardman, Vice Chair
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Hollis Gritton
Robin Fields Kinney
Ben Littlepage, Ed.D.
Laura Schneider
Louis Straub
Josh Underwood
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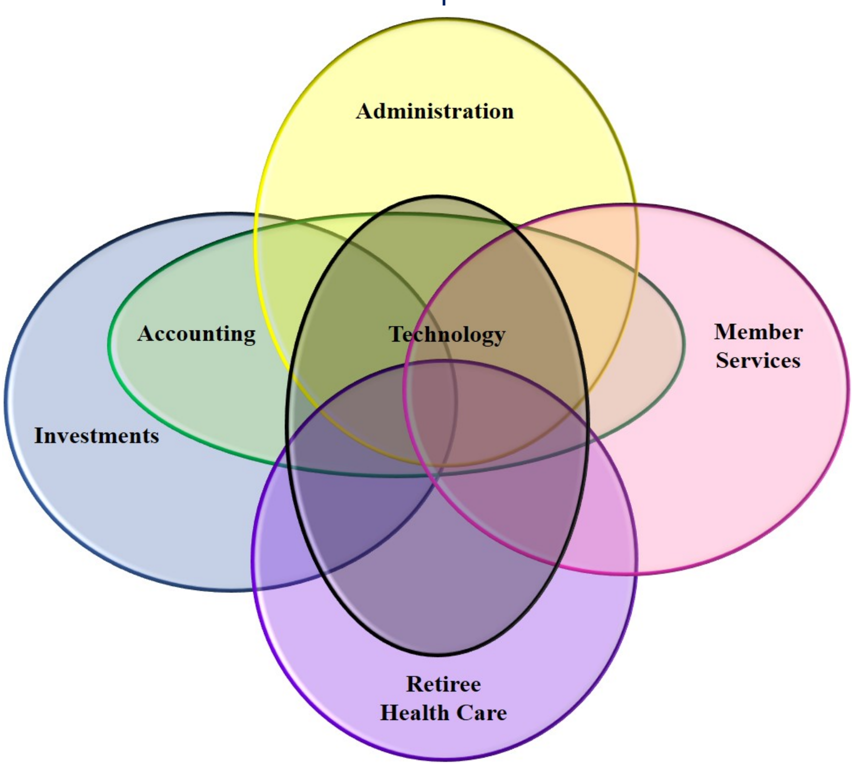
Internal Auditor



Administration

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Gary L. Harbin, CPA

Deputy Executive Secretary of Finance
Eric Wampler, JD

Deputy Executive Secretary of Operations and General Counsel
Robert B. Barnes, JD

Internal Auditor
Brad Cook

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Tom Siderewicz, CFA

Accounting
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Retiree Health Care
Grace Dotson

Technology
Jon Cordray

Member Services
Becky Niece

Business Operations
Nathan Van Sickel

GFOA Certificate of Achievement

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Teachers' Retirement System of the State of Kentucky

For its Annual Comprehensive Financial Report For the Fiscal Year Ended

June 30, 2022

Christopher P. Morrill

Executive Director/CEO

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the Teachers' Retirement System of the State of Kentucky. The TRS has received the Certificate of Achievement for the last 35 consecutive years (fiscal years ended 1988-2022).

PPCC Public Pension Standards Award

PPCC

Public Pension Coordinating Council

Public Pension Standards Award
For Funding and Administration
2023

Presented to

Teachers' Retirement System of the State of Kentucky

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

Presented by the Public Pension Coordinating Council, a confederation of

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

Alan H. Winkle

Alan H. Winkle
Program Administrator

The Public Pension Coordinating Council awarded a Public Pension Standards Award for Funding and Administration to the Teachers' Retirement System of the State of Kentucky for 2023 for implementing and maintaining high professional standards in administering the affairs of TRS. The award is based on compliance with principles judged to underlie exemplary retirement system achievements in the areas of benefits, actuarial valuation, financial reporting, investments, funding and disclosure. Those principles are acknowledged widely to be marks of excellence for retirement systems. It represents the highest standards of excellence in the public pension industry.

Financial Section

CPAs / ADVISORS

blue

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main 859.253.1100 fax 859.253.1384 email blue@blueandco.com

Report of Independent Auditors

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

Report on the Audit of Financial Statements

Opinion

We have audited the accompanying financial statements of Teachers' Retirement System of the State of Kentucky (TRS), a component unit of the Commonwealth of Kentucky, as of and for the years ended June 30, 2023 and 2022, and the related notes to the financial statements, which comprise the TRS's financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects the fiduciary net position of TRS, as of June 30, 2023 and 2022, and the respective changes in fiduciary net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audits 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. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of TRS and to meet our other ethical responsibilities in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for 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.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about TRS's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with generally accepted auditing standards and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards and *Government Auditing Standards*, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit 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, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgement, there are conditions or events, considered in the aggregate, that raise substantial doubt about TRS's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that management's discussion and analysis on pages 22 through 25, and the defined benefit pension plan and other postemployment benefit plan supplemental schedules on pages 75 through 87, 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 financial statements that collectively comprise TRS's basic financial statements. The additional supporting schedules (pages 87 through 89) 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 Schedule of Contracted Investment Management Expenses are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

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

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated November 15, 2023, on our consideration of 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 solely 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 the effectiveness of TRS's 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 TRS's internal control over financial reporting and compliance.

Blue & Co., LLC

Lexington, Kentucky
November 15, 2023

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 years ended June 30, 2023, and 2022. It should be read in conjunction with the respective financial statements, which begin on page 26. TRS is the fiduciary of funds held in trust for its members.

Using This Financial Report

Because of the long-term nature of the retirement annuity, health insurance and life insurance trusts, financial statements alone do not provide the complete scope of TRS. The notes, required supplemental information, supporting schedules and other sections of this annual comprehensive financial report (ACFR) relating to investments, actuarial valuations and statistical measures complete that scope.

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 26-29). 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 year ended June 30, 2023, the system's combined fiduciary net position increased by $1.8 billion — from $25.3 billion in 2022 to $27.1 billion in 2023. In 2021, the combined net position totaled $28.3 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		
	2023	2022	2021	2023	2022	2021	2023	2022	2021
Assets									
Cash and investments	$ 24,189.3	$ 22,846.5	$ 25,879.0	$2,714.1	$ 2,229.8	$2,288.2	$ 93.9	$ 88.3	$ 107.2
Receivables	128.5	122.8	157.8	66.1	57.8	54.7	0.4	0.3	0.4
Capital assets	7.5	9.3	10.3						
Total assets	24,325.3	22,978.6	26,047.1	2,780.2	2,287.6	2,342.9	94.3	88.6	107.6
Liabilities	(80.7)	(78.6)	(111.3)	(36.8)	(18.5)	(42.4)	(0.3)	(0.2)	(0.1)
Net position	$ 24,244.6	$ 22,900.0	$ 25,935.8	$2,743.4	$ 2,269.1	$2,300.5	$ 94.0	$ 88.4	$ 107.5

Trust Totals* **

(In millions)

		2023		2022		2021
Assets						
Cash and investments	$	26,997.3	$	25,164.6	$	28,274.4
Receivables		195.0		180.9		212.9
Capital Assets		7.5		9.3		10.3
Total assets		27,199.8		25,354.8		28,497.6
Liabilities		(117.8)		(97.3)		(153.8)
Net position	$	27,082.0	$	25,257.5	$	28,343.8

* 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 $1.3 million for 2023, $1.1 million for 2022 and $1.4 million for 2021.
** Amounts above may not agree to the financial statements due to rounding.

The fiduciary net position of the Retirement Annuity Trust increased by 5.9% ($24.24 billion compared to $22.9 billion in 2022). The fiduciary net position in 2021 was $25.94 billion. Net investment income was approximately $2.27 billion in 2023 versus a negative $2.73 billion in 2022. This compares to a positive $6.02 billion in 2021.

The fiduciary net position of the Health Insurance Trust increased by 20.9% ($2.74 billion compared to $2.27 billion in 2022) primarily due to investment income and contributions from members and employers being near the amount of insurance benefits paid out of the trust. This compares to 2021 when fiduciary net position was $2.3 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		
	2023	2022	2021	2023	2022	2021	2023	2022	2021
Additions									
Member contributions	$ 366.8	$ 357.0	$ 327.8	$ 149.2	$ 145.7	$ 128.1	$	$	$
Employer contributions	1,144.4	1,679.6	1,147.0	208.8	151.7	184.9	3.2	2.8	2.1
Net investment increase (decrease)	2,266.1	(2,727.8)	6,017.2	243.1	(219.5)	503.2	8.7	(15.6)	24.1
Total additions	3,777.3	(691.2)	7,492.0	601.1	77.9	816.2	11.9	(12.8)	26.2
Deductions									
Benefit payments	2,391.3	2,305.9	2,235.2				6.3	6.2	6.1
Refunds	26.9	26.7	25.4						
Administrative expense	14.5	12.0	12.6	2.0	2.1	1.7			
Insurance expenses				124.9	107.2	130.7			
Total deductions	2,432.7	2,344.6	2,273.2	126.9	109.3	132.4	6.3	6.2	6.1
Net increase (decrease)	$ 1,344.6	$(3,035.8)	$5,218.8	$ 474.2	$ (31.4)	$ 683.8	$ 5.6	$ (19.0)	$ 20.1

Trust Totals* **

(In millions)

	2023	2022	2021
Additions			
Member contributions	$ 516.0	$ 502.7	$ 455.9
Employer contributions	1,356.4	1,834.1	1,334.0
Net investment increase (decrease)	2,517.9	(2,962.9)	6,544.5
Total additions	4,390.3	(626.1)	8,334.4
Deductions			
Benefit payments	2,397.6	2,312.1	2,241.3
Refunds	26.9	26.7	25.4
Administrative expense	16.5	14.1	14.3
Insurance expenses	124.9	107.2	130.7
Total deductions	2,565.9	2,460.1	2,411.7
Net increase (decrease)	$ 1,824.4	$ (3,086.2)	$ 5,922.7

* 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 2023, employer contributions totaled $1.14 billion, a net decrease of $535.1 million from the prior fiscal year. The decrease was mainly due to the state paying additional employer contributions in fiscal year 2022 of $479 million to pay debt for previously awarded benefits. This also the reason that 2022 employer contributions increased $532.6 million compared to 2021.

The Retirement Annuity Trust experienced net investment income of $2.27 billion in 2023 and net investment loss of $2.73 billion for 2022. For 2021, net investment income totaled $6.02 billion. Increases in deductions of $88.1 million in 2023 and $71.4 million in 2022 can be attributed to increases in the number of benefit recipients. Members and beneficiaries on the retiree payroll as of June 30, 2023, increased by approximately 1,100 compared to the prior year and by 2,825 from two years ago.

Other Postemployment Benefit (OPEB) Activities

During 2023, the Health Insurance Trust member contributions increased $3.5 million from 2022, which followed a $17.6 million increase from 2021. This represented a continuing increase in member's salaries paid from federal assistance received by the local school district employers. Also, during 2023, employer contributions increased $57.2 million from 2022 as the state resumed its contribution of the health insurance premiums for members who retired after July 1, 2010, who participate in the Kentucky Employees' Health Plan (KEHP). That contribution not being appropriated in 2022 resulted in that contribution declining $33.2 million from 2021.

In 2023, the Health Insurance Trust experienced net investment income of $243.1 million compared to the previous year loss of $219.5 million net investment income. For 2021, net investment income totaled $503.2 million.

The Life Insurance Trust experienced net investment income of $8.7 million in 2023, net investment loss of $15.6 million in 2022 and $24.1 million in 2021. Life insurance benefits paid for 2023, 2022 and 2021 were $6.3 million, $6.2 million and $6.1 million respectively.

Funding

For the 2022-2024 biennium, the state budgeted $1.28 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 57.7% as of June 30, 2023, compared to 2022's 56.4%. 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 the actuarially determined employer contribution (ADEC) being made for 2023 and 2022. Assuming that contributions to the retirement trust are made by the state 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. Current obligations are being met by current funding and 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 required contributions for 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, in Note 8 for the Health Insurance Trust and in Note 9 for the Life Insurance Trust. 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 2021, which also confirmed the reasonableness of assumptions based upon the actual experience of the trusts. In 2023, the actuary completed a review of economic assumptions.

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.

Basic Financial Statements

Statement of Fiduciary Net Position
As of June 30, 2023

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Assets					
Cash	$ 256,046,235	$ 300,467,448	$ 490,418	$ 211,699	$ 557,215,800
Prepaid expenses	19,774				19,774
Receivables					
Contributions	48,576,918	12,068,376	60,464		60,705,758
Due from other trusts	7,977,383				7,977,383
Investment income	59,043,290	5,424,732	319,147	4,380	64,791,549
Investment sales receivable	12,850,729	1,682,228			14,532,957
Other receivables	24,157	46,973,359			46,997,516
Total receivables	128,472,477	66,148,695	379,611	4,380	195,005,163
Investments at fair value					
Short-term investments	568,572,723	77,221,128	5,069,152	356,519	651,219,522
Fixed income	2,971,945,560	153,143,085	17,942,483	214,946	3,143,246,074
Equity	14,287,643,121	1,406,514,939	56,182,952	493,746	15,750,834,758
Alternative investments	1,915,329,613	220,197,307	4,921,166		2,140,448,086
Real estate	1,777,282,982	159,444,210	6,513,395		1,943,240,587
Additional categories	2,412,438,221	397,083,937	2,795,704		2,812,317,862
Total investments	23,933,212,220	2,413,604,606	93,424,852	1,065,211	26,441,306,889
Capital assets	28,171,057				28,171,057
Accumulated depreciation	(20,705,010)				(20,705,010)
Net capital assets	7,466,047				7,466,047
Total assets	24,325,216,753	2,780,220,749	94,294,881	1,281,290	27,201,013,673
Liabilities					
Accrued expenses and other liabilities	2,949,984	13,062,293	72,653		16,084,930
Due to other trusts		7,823,792	149,111	4,480	7,977,383
State of Kentucky	29,211,585	10,443,709	39,839		39,695,133
Investment purchases payable	48,501,059	5,477,874	3,363		53,982,296
Total liabilities	80,662,628	36,807,668	264,966	4,480	117,739,742
Net position restricted for pension and other postemployment benefits	$ 24,244,554,125	$2,743,413,081	$ 94,029,915	$ 1,276,810	$ 27,083,273,931

The Combining Statement of Fiduciary Net Position — Other Funds is presented on page 30.

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

Statement of Fiduciary Net Position
As of June 30, 2022

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Assets					
Cash	$ 420,633,131	$ 196,003,638	$ 392,044	$ 110,373	$ 617,139,186
Prepaid expenses	28,458				28,458
Receivables					
Contributions	50,526,572	14,111,640	54,426		64,692,638
Due from other trusts	5,964,535				5,964,535
Investment income	49,654,767	3,099,024	290,175	3,160	53,047,126
Investment sales receivable	16,636,770	3,270,138	1,206		19,908,114
Other receivables	53,073	37,312,574			37,365,647
Total receivables	122,835,717	57,793,376	345,807	3,160	180,978,060
Investments at fair value					
Short-term investments	1,018,196,544	67,213,821	8,345,378	347,626	1,094,103,369
Fixed income	3,244,560,222	144,284,024	17,872,069	236,796	3,406,953,111
Equity	12,267,081,370	1,095,262,160	48,063,588	421,988	13,410,829,106
Alternative investments	2,292,264,807	204,919,107	3,283,908		2,500,467,822
Real estate	1,693,627,935	150,214,503	7,489,602		1,851,332,040
Additional categories	1,910,112,687	371,942,317	2,811,693		2,284,866,697
Total investments	22,425,843,565	2,033,835,932	87,866,238	1,006,410	24,548,552,145
Capital assets	27,905,021				27,905,021
Accumulated depreciation	(18,649,040)				(18,649,040)
Net capital assets	9,255,981				9,255,981
Total assets	22,978,596,852	2,287,632,946	88,604,089	1,119,943	25,355,953,830
Liabilities					
Accrued expenses and other liabilities	2,713,542	5,769,356	49,319		8,532,217
Due to other trusts		5,849,473	111,477	3,585	5,964,535
State of Kentucky	26,943,547	119,901	62,105		27,125,553
Investment purchases payable	48,987,393	6,718,527	685		55,706,605
Total liabilities	78,644,482	18,457,257	223,586	3,585	97,328,910
Net position restricted for pension and other postemployment benefits	$ 22,899,952,370	$ 2,269,175,689	$ 88,380,503	$ 1,116,358	$ 25,258,624,920

The Combining Statement of Fiduciary Net Position — Other Funds is presented on page 30.
The accompanying notes are an integral part of these financial statements.

Statement of Changes in Fiduciary Net Position
For the Year Ended June 30, 2023

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Additions					
Contributions					
State of Kentucky	$ 1,042,434,014	$ 85,328,285	$ 2,599,486	$	$ 1,130,361,785
Other employers	102,014,792	123,487,533	624,074	218,241	226,344,640
Members	366,774,504	149,209,656		9,575	515,993,735
Total contributions	1,511,223,310	358,025,474	3,223,560	227,816	1,872,700,160
Investment income (loss)					
Net appreciation (depreciation) in fair value of investments	1,883,455,471	211,338,355	7,393,136	49,908	2,102,236,870
Interest	199,435,778	26,865,804	858,773	23,270	227,183,625
Dividends	236,967,990	13,255,682	665,226	7,527	250,896,425
Rental income, net	22,628,975				22,628,975
Securities lending, gross earnings	30,155,932		828,198	10,371	30,994,501
Gross investment income (loss)	2,372,644,146	251,459,841	9,745,333	91,076	2,633,940,396
Less: investment expense	(78,893,843)	(8,407,600)	(285,154)		(87,586,597)
Less: securities lending expense	(27,665,143)		(777,694)	(9,678)	(28,452,515)
Net investment income (loss)	2,266,085,160	243,052,241	8,682,485	81,398	2,517,901,284
Total additions	3,777,308,470	601,077,715	11,906,045	309,214	4,390,601,444
Deductions					
Benefits	2,391,326,201		6,219,000	147,867	2,397,693,068
Refunds of contributions	26,909,781				26,909,781
Insurance expenses		124,866,005			124,866,005
Administrative expense	14,470,733	1,974,318	37,633	895	16,483,579
Total deductions	2,432,706,715	126,840,323	6,256,633	148,762	2,565,952,433
Net increase (decrease)	1,344,601,755	474,237,392	5,649,412	160,452	1,824,649,011
Net position restricted for pension and other postemployment benefits					
Beginning of year	22,899,952,370	2,269,175,689	88,380,503	1,116,358	25,258,624,920
End of year	$24,244,554,125	$2,743,413,081	$ 94,029,915	$ 1,276,810	$27,083,273,931

The Combining Statement of Changes in Fiduciary Net Position — Other Funds is presented on page 31.
The accompanying notes are an integral part of these financial statements.

Statement of Changes in Fiduciary Net Position
For the Year Ended June 30, 2022

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Additions					
Contributions					
State of Kentucky	$ 1,570,796,691	$ 31,400,674	$ 2,198,836	$	$ 1,604,396,201
Other employers	108,787,978	120,364,471	556,027	2,281	229,710,757
Members	356,966,620	145,681,855			502,648,475
Total contributions	2,036,551,289	297,447,000	2,754,863	2,281	2,336,755,433
Investment income (loss)					
Net appreciation (depreciation) in fair value of investments	(3,087,370,553)	(232,131,186)	(16,493,405)	(103,264)	(3,336,098,408)
Interest	152,692,923	16,095,897	616,005	9,830	169,414,655
Dividends	250,357,857	3,035,184	727,170	7,309	254,127,520
Rental income, net	16,230,826				16,230,826
Securities lending, gross earnings	4,028,545		90,539	1,182	4,120,266
Gross investment income (loss)	(2,664,060,402)	(213,000,105)	(15,059,691)	(84,943)	(2,892,205,141)
Less: investment expense	(63,972,448)	(6,499,956)	(502,071)		(70,974,475)
Less: securities lending expense	257,795		(20,515)	(592)	236,688
Net investment income (loss)	(2,727,775,055)	(219,500,061)	(15,582,277)	(85,535)	(2,962,942,928)
Total additions	(691,223,766)	77,946,939	(12,827,414)	(83,254)	(626,187,495)
Deductions					
Benefits	2,305,852,772		6,178,000	164,663	2,312,195,435
Refunds of contributions	26,745,203				26,745,203
Insurance expenses		107,201,439			107,201,439
Administrative expense	12,005,095	2,074,227	40,999	1,093	14,121,414
Total deductions	2,344,603,070	109,275,666	6,218,999	165,756	2,460,263,491
Net increase (decrease)	(3,035,826,836)	(31,328,727)	(19,046,413)	(249,010)	(3,086,450,986)
Net position restricted for pension and other postemployment benefits					
Beginning of year	25,935,779,206	2,300,504,416	107,426,916	1,365,368	28,345,075,906
End of year	$22,899,952,370	$2,269,175,689	$ 88,380,503	$ 1,116,358	$ 25,258,624,920

The Combining Statement of Changes in Fiduciary Net Position — Other Funds is presented on page 32.
The accompanying notes are an integral part of these financial statements.

Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2023

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	$ 10,825	$ 200,874	$	$ 211,699
Receivables				
Investment income	1,280		3,100	4,380
Investments at fair value				
Short-term investments	312,005		44,514	356,519
Fixed income			214,946	214,946
Equity			493,746	493,746
Total investments	312,005		753,206	1,065,211
Total assets	324,110	200,874	756,306	1,281,290
Liabilities				
Due to other trusts	83	3,945	452	4,480
Total liabilities	83	3,945	452	4,480
Net position restricted for pension and other postemployment benefits	$ 324,027	$ 196,929	$ 755,854	$ 1,276,810

Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2022

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	$	$ 110,373	$	$ 110,373
Receivables				
Investment income	259		2,901	3,160
Investments at fair value				
Short-term investments	303,859		43,767	347,626
Fixed income			236,796	236,796
Equity			421,988	421,988
Total investments	303,859		702,551	1,006,410
Total assets	304,118	110,373	705,452	1,119,943
Liabilities				
Due to other trusts	70	3,172	343	3,585
Total liabilities	70	3,172	343	3,585
Net position restricted for pension and other postemployment benefits	$ 304,048	$ 107,201	$ 705,109	$ 1,116,358

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

Combining Statement of Changes in Fiduciary Net Position — Other Funds
For the Year Ended June 30, 2023

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Additions				
Contributions				
Other employers	$ 1,203	$ 217,038	$	$ 218,241
Member	9,575			9,575
Total contributions	10,778	217,038		227,816
Investment income (loss)				
Net appreciation in fair value of investments			49,908	49,908
Interest	11,349	1,194	10,727	23,270
Dividends			7,527	7,527
Securities lending, gross			10,371	10,371
Gross investment income (loss)	11,349	1,194	78,533	91,076
Less: securities lending expense			(9,678)	(9,678)
Net investment income (loss)	11,349	1,194	68,855	81,398
Total additions	22,127	218,232	68,855	309,214
Deductions				
Benefits	2,134	127,733	18,000	147,867
Administrative expense	14	771	110	895
Total deductions	2,148	128,504	18,110	148,762
Net increase (decrease)	19,979	89,728	50,745	160,452
Net position restricted for pension and other postemployment benefits				
Beginning of year	304,048	107,201	705,109	1,116,358
End of year	$ 324,027	$ 196,929	$ 755,854	$ 1,276,810

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

Combining Statement of Changes in Fiduciary Net Position — Other Funds

For the Year Ended June 30, 2022

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Additions				
Contributions				
Other employers	$	$	$ 2,281	$ 2,281
Member				
Total contributions			2,281	2,281
Investment income (loss)				
Net appreciation in fair value of investments			(103,264)	(103,264)
Interest	564	183	9,083	9,830
Dividends			7,309	7,309
Securities lending, gross			1,182	1,182
Gross investment income (loss)	564	183	(85,690)	(84,943)
Less: securities lending expense			(592)	(592)
Net investment income (loss)	564	183	(86,282)	(85,535)
Total additions	564	183	(84,001)	(83,254)
Deductions				
Benefits	2,937	143,726	18,000	164,663
Administrative expense	20	953	120	1,093
Total deductions	2,957	144,679	18,120	165,756
Net increase (decrease)	(2,393)	(144,496)	(102,121)	(249,010)
Net position restricted for pension and other postemployment benefits				
Beginning of year	306,441	251,697	807,230	1,365,368
End of year	$ 304,048	$ 107,201	$ 705,109	$ 1,116,358

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

Notes to 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, 2023, a total of 202 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.

	2023	2022
Active contributing members:		
Vested	49,569	49,588
Non-vested	26,075	25,197
Inactive members, vested	11,331	10,690
Retirees and beneficiaries currently receiving benefits	59,559	58,438
Total members, retirees and beneficiaries	146,534	143,913

Because benefits are determined by a member's entry date, throughout this report, each grouping is referred to by a different name.

- TRS 1 is members who entered before July 1, 2002.
- TRS 2 is members who entered on or between July 1, 2002, and June 30, 2008.
- TRS 3 is members who entered on or between July 1, 2008, and Dec. 31, 2021.
- TRS 4 is members who entered on or after Jan. 1, 2022.

Benefit Provisions
For Members Before July 1, 2008 (TRS 1 and TRS 2): 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, and Before Jan. 1, 2022 (TRS 3): 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.

For Members On or After Jan. 1, 2022 (TRS 4): To qualify for monthly retirement benefits, payable for life, members must either:

1. Attain age 57 and complete 10 years of Kentucky service, or
2. Attain age 65 and complete five years of Kentucky service.

Foundational Benefit
The annual foundational benefit for members is equal to service times a multiplier times final average salary. The final average salary is the member's five highest annual salaries. The annual foundational benefit is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 30 years of service.

The multiplier for non-university members is shown in the following table:

	Years of Service			
Age	5-9.99	10-19.99	20-29.99	30 or more
57-60		1.70%	1.95%	2.20%
61		1.74%	1.99%	2.24%
62		1.78%	2.03%	2.28%
63		1.82%	2.07%	2.32%
64		1.86%	2.11%	2.36%
65 and over	1.90%	1.90%	2.15%	2.40%

The multiplier for university members is shown in the following table:

	Years of Service			
Age	5-9.99	10-19.99	20-29.99	30 or more
57-60		0.70%	0.95%	1.20%
61		0.74%	0.99%	1.24%
62		0.78%	1.03%	1.28%
63		0.82%	1.07%	1.32%
64		0.86%	1.11%	1.36%
65 and over	0.90%	0.90%	1.15%	1.40%

Supplemental Benefit
The annual supplemental benefit is equal to the account balance that includes member and employer contributions and interest credited annually on June 30. Options include annuitizing the balance or receiving the balance or a portion thereof as a lump sum either at the time of retirement or at a later date.

Other Benefits
TRS provides postemployment health insurance benefits to retirees as fully described in Note 8. For members who began participating prior to Jan. 1, 2022, TRS also provides disability benefits for vested members at the rate of 60% of the final average salary. TRS 4 members will receive a disability benefit to be determined by the board through administrative regulation.

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 for members who began participating before Jan. 1, 2022. For TRS 4 members, the life insurance benefit payable upon the death of a member is $5,000 for active contributing members and $10,000 for retired or disabled members

Cost of living increases as provided by law are 1.5% annually. Additional ad hoc increases and any other benefit amendments are provided if 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, 2023, the retirement annuity cash account totaled $173.4 million, the control cash account totaled $82.4 million and the capital project cash account totaled $274,003 for a total of $256 million as carrying value of cash in the retirement trust. The health insurance's Internal Revenue Code sec. 115 (IRC 115) trust cash account totaled $292.4

million, the health insurance 401(h) cash account totaled $8.1 million for a total of $300.5 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled $490,418. The Supplemental Benefit Fund cash account contained $200,875. The Voluntary Contribution 403(b) cash account totaled $10,828. Therefore, the carrying value of cash was $557.2 million, and the bank balance was $579.2 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2023.

At June 30, 2022, the retirement annuity cash account totaled $338.7 million, the control cash account totaled $81.7 million and the capital project cash account totaled $274,003 for a total of $420.6 million as carrying value of cash in the retirement trust. The health insurance's IRC 115 trust cash account totaled $182 million, the health insurance 401(h) cash account totaled $13.7 million for a total of $196 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled $392,044. The Supplemental Benefit Fund cash account contained $110,373. Therefore, the carrying value of cash was $617.1 million, and the bank balance was $642.6 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2022.

Capital Assets

Property and equipment are carried at cost, less accumulated depreciation. Buildings, improvements to land and equipment are capitalized when the acquisition is $5,000 or greater. Intangible capital assets are capitalized when the cost is $100,000 or more, except software, which has a threshold of $500,000. 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, 2023 and 2022, accrued compensated absences were included in accrued expenses and other liabilities on the statements of fiduciary net position amounting to $2.2 million and $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 consist 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, 2023, other receivables in the retirement trust were $24,157 and $53,073 in 2022.

In the Health Insurance Trust, other receivables consist primarily of Medicare subsidies and formulary rebates accrued, but not received. The June 30, 2023, other receivables in the health trust were $47 million and $37.3 million in 2022.

Accrued Expenses and Other Payables
TRS's accrued expenses and other payables consist primarily of administrative expenses incurred but not paid at year end and also from the state paying estimated retirement and health insurance contributions from the enacted budget that were in excess of actual contributions required.

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.

New Pronouncement
In May 2020, The Governmental Accounting Standards Board (GASB) issued Statement Number 96, Subscription-Based Information Technology Arrangements. This standard provides guidance on the accounting and financial reporting for government end users. GASB Statement No. 96 is effective for fiscal years beginning after June 15, 2022. Accordingly, management reviewed the statement and determined that it does not have a material impact on TRS's financial statements.

Reclassifications
Certain amounts in the 2022 financial statements have been reclassified to conform to the 2023 presentation with no impact on total assets, liabilities, net position and changes in net position.

Note 3
Contributions and Funds of the Plan

Contributions
Contribution rates are established by Kentucky Revised Statutes. For members who began participating before Jan. 1, 2022, non-university members are required to contribute 12.855% of their salaries to the system; university members are required to contribute 10.4% of their salaries. 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 on or after July 1, 2008, and before Jan. 1, 2022. Other participating employers are required to contribute the percentage contributed by members plus an additional 3.25% of members' gross salaries.

For TRS 4 members, non-university members contribute 14.75% and university members contribute 9.775% of their salaries to the system. Employers of non-university members, including the state (as a non-employer contributing entity), contribute 10.75% of salary. University employers contribute 9.775% of member's salary to the system.

The member and employer contributions consist of retirement annuity contributions and OPEB contributions to the health insurance and life insurance trusts. The member postemployment health insurance contribution is 3.75% of salary. The employer postemployment health insurance 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, 2023 and 2022 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]
2023	$ 42,029,935	$ 24,244,554	$ 17,785,381	57.7	$ 3,977,280	447.2
2022	40,598,288	22,899,952	17,698,336	56.4	3,876,491	456.6

Summary of Actuarial Assumptions

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

Valuation date	June 30, 2022
Actuarial cost method	Entry age
Investment rate of return	7.1%, net of pension plan investment expense, including inflation.
Projected salary increases	3 - 7.5%, including inflation
Inflation rate	2.5%
Post-Retirement adjustment	1.5%
Municipal bond index rate	3.66%
Single equivalent interest rate	7.1%

Mortality rates were based on the Pub2010 (Teachers Benefit-Weighted) Mortality Table projected generationally with MP-2020 with various set-forwards, set-backs and adjustments for each of the groups; service retirees, contingent annuitants, disabled retirees and active members. The actuarial assumptions used were based on the results of an actuarial experience study for the 5-year period ending June 30, 2020, adopted by the board on Sept. 20, 2021. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index.

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
Large cap U.S. equity	35.4	5.0
Small cap U.S. equity	2.6	5.5
Developed international equity	15.7	5.5
Emerging markets equity	5.3	6.1
Fixed income	15.0	1.9
High yield bonds	5.0	3.8
Other additional categories	5.0	3.6
Real estate	7.0	3.2
Private equity	7.0	8.0
Cash	2.0	1.6
Total	100.0	

Discount Rate

For 2023 and 2022, the discount rate used to measure the total pension liability was 7.1%. 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 2023. TRS's 2023 net pension liability is calculated using the discount rate of 7.1%, 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 (6.1%) or 1 percentage point higher (8.1%) than the current rate.

2023

(In thousands)	**1% Decrease (6.1%)**	**Current Discount (7.1%)**	**1% Increase (8.1%)**
Net pension liability	$ 22,852,220	$ 17,785,381	$ 13,563,822

The following table presents TRS's net pension liability for 2022. TRS's 2022 net pension liability is calculated using the discount rate of 7.1%, 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 (6.1%) or 1 percentage point higher (8.1%) than the current rate.

2022

(In thousands)	**1% Decrease (6.1%)**	**Current Discount (7.1%)**	**1% Increase (8.1%)**
Net pension liability	$ 22,587,405	$ 17,698,336	$ 13,623,659

June 30, 2022, is the actuarial valuation date upon which the total pension liability (TPL) is based for 2023. An expected TPL is determined as of June 30, 2023, using standard roll forward techniques. 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 expected investment rate of return for the year. In addition, the expected TPL as of June 30, 2022, has been determined based on the TPL roll-forward from June 30, 2021. The difference between the two roll-forward amounts as of June 30, 2023, is the experience gain or loss for the year. These procedures are shown in the following table.

TPL Roll Forward 2023

(Dollars in thousands)

	Expected (1)	**Actual (2)**
(a) Interest Rate	7.1%	7.1%
(b) TPL as of June 30, 2022	$ 40,598,288	$ 40,970,441
(c) Entry Age Normal Cost for the Year July 1, 2022 - June 30, 2023	654,676	654,676
(d) Actual Benefit Payments (including refunds) For the year July 1, 2022 - June 30, 2023	2,418,236	2,418,236
(e) TPL as of June 30, 2023 [(b) x (1 + (a))] + (c) - [(d) x (1 + (0.5 x (a)))]	41,631,359	42,029,935
(f) Experience (Gain)/Loss = (e2) - (e1)		398,576

June 30, 2021, is the actuarial valuation date upon which the TPL is based for 2022. An expected TPL is determined as of June 30, 2022, using standard roll-forward techniques for the actual TPL both before and after the assumption changes due to the experience study and the reduction in the assumed investment rate of return. The difference between these two amounts is shown as a change in assumptions. 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 expected investment rate of return for the year. The expected TPL as of June 30, 2021, has been determined based on the TPL roll-forward from June 30, 2020. The difference between the two roll-forward amounts as of June 30, 2021, is the experience gain or loss. The procedures are shown in the following table.

TPL Roll Forward 2022
(Dollars in thousands)

	Expected (1)	Actual (2)
(a) Interest Rate	7.10%	7.10%
(b) TPL as of June 30, 2021	$ 39,541,567	$ 39,581,704
(c) Entry Age Normal Cost for the Year July 1, 2021 - June 30, 2022	621,689	621,689
(d) Actual Benefit Payments (including refunds) For the year July 1, 2021 - June 30, 2022	2,332,598	2,332,598
(e) TPL as of June 30, 2022 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	40,555,302	40,598,288
(f) Experience (Gain)/Loss = (e2) - (e1)		42,986

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, 2023, was $579.2 million. TRS's total cash balance held at J.P. Morgan Chase on June 30, 2022, was $642.6 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, 2023, TRS's cash balance of $579.2 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of $896 million.

As of June 30, 2022, TRS's cash balance of $642.6 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of $302.3 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 $340.9 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 value of TRS's investments for June 30, 2023, and 2022.

Schedules of Investments

Retirement Annuity Trust

	Fair Value June 30, 2023	Fair Value June 30, 2022
Short-term investments		
Cash and cash equivalents	$ 568,929,242	$ 1,018,544,170
Subtotal	568,929,242	1,018,544,170
Fixed Income		
U.S. government	1,139,162,191	1,149,592,337
Agency bonds	94,136,785	73,829,978
Mortgage-backed securities	113,404,191	133,311,012
Asset-backed securities	28,882,848	30,303,278
Commercial mortgage-backed securities	26,589,385	31,473,511
Collateralized mortgage obligations	21,467,875	24,673,583
Municipal bonds	274,771,116	312,626,893
Corporate bonds	1,273,746,115	1,488,986,426
Subtotal	2,972,160,506	$ 3,244,797,018
Equity		
International	4,861,620,374	4,227,631,298
U.S.	9,426,516,493	8,039,872,060
Subtotal	14,288,136,867	12,267,503,358
Real estate	1,777,282,982	1,693,627,935
Private equity	1,915,329,613	1,808,795,204
Additional categories		
Opportunistic credit	753,842,564	813,467,573
Corporate bonds	752,292,803	751,414,788
Corporate loans	413,242,921	345,230,326
Timberland	485,158,413	483,469,603
U.S. government	7,901,520	
Subtotal	2,412,438,221	2,393,582,290
Total*	$ 23,934,277,431	$ 22,426,849,975

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

** The classification of timberland moved to additional categories from alternative investments in October 2022. For comparison, the timberland value for June 30, 2022, is shown in additional categories.

Health Insurance Trust

	Fair Value June 30, 2023	Fair Value June 30, 2022
Short-term investments		
Cash and cash equivalents	$ 77,221,128	$ 67,213,821
Subtotal	77,221,128	67,213,821
Fixed income		
U.S. government	43,405,938	37,651,068
Agency bonds	2,989,020	969,520
Mortgage-backed securities	3,051,772	5,087,374
Collateralized mortgage obligations	824,263	885,759
Municipal bonds	9,109,099	9,718,049
Corporate bonds	93,762,993	89,972,254
Subtotal	153,143,085	144,284,024
Equity		
Global		1,003,875,627
International	486,604,691	2,888,554
U.S.	919,910,248	88,497,979
Subtotal	1,406,514,939	1,095,262,160
Real estate equity	159,444,210	150,214,503
Private equity	220,197,307	204,919,107
Additional categories		
Opportunistic credit	119,854,518	129,749,917
Corporate bonds	191,497,563	173,323,332
Corporate loans	79,273,882	62,534,249
U.S. equity	6,457,974	6,334,819
Subtotal	397,083,937	371,942,317
Total	$ 2,413,604,606	$ 2,033,835,932

Life Insurance Trust

	Fair Value June 30, 2023	Fair Value June 30, 2022
Short-term investments		
Cash and cash equivalents	$ 5,069,152	$ 8,345,378
Subtotal	5,069,152	8,345,378
Fixed income		
U.S. government	8,591,791	7,590,127
Mortgage-backed securities	199,079	286,793
Municipal bonds	2,340,986	2,478,748
Corporate bonds	6,810,627	7,516,401
Subtotal	17,942,483	17,872,069
Equity		
International	19,667,059	17,248,072
U.S.	36,515,893	30,815,516
Subtotal	56,182,952	48,063,588
Real estate equity	6,513,395	7,489,602
Private equity	4,921,166	3,283,908
Additional categories		
Opportunistic credit	2,102,984	2,130,839
U.S equity	692,720	680,854
Subtotal	2,795,704	2,811,693
Total	$ 93,424,852	$ 87,866,238

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. Permissible investments within this fund include commercial paper; U.S. Treasury and agency obligations; certificates of deposit; bankers' acceptances; repurchase agreements; and time deposits.

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, 2023, cash collateral reinvestment securities acquired through securities lending for the Retirement Annuity Trust by TRS’s custodian amounted to $951 million in relation to the $931.9 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 $14.3 million in relation to the $14.2 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, 2023, and 2022, the Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust had the following investment fair value and weighted average maturities.

Retirement Annuity Trust

	2023			2022		
Investment Type	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**
U.S. government	$1,139,162,191	7,901,520	10.05	$1,149,592,337	$	11.18
Agency bonds	94,136,785		3.87	73,829,978		4.33
Mortgage-backed securities	113,404,191		15.29	133,311,012		15.00
Asset-backed securities	28,882,848		18.17	30,303,278		14.86
Commercial mortgage-backed securities	26,589,385		18.3	31,473,511		19.71
Collateralized mortgage obligations	21,467,875		7.42	24,673,583		8.56
Municipal bonds	274,771,116		10.43	312,626,893		11.16
Corporate bonds	1,273,746,115	752,292,803	8.83	1,488,986,426	751,414,788	9.40
Corporate loans		350,424,229	4.18		345,230,326	4.39
Total	$2,972,160,506	$1,110,618,552	9.07	$3,244,797,018	$1,096,645,114	9.79

Health Insurance Trust

	2023			2022		
Investment Type	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**
U.S. government	$ 43,405,938	$	5.57	$ 37,651,068	$	7.36
Agency bonds	2,989,020		0.53	969,520		1.17
Mortgaged-backed securities	3,051,772		15.62	5,087,374		11.01
Collateralized mortgage obligations	824,263		6.33	885,759		7.32
Municipal Bonds	9,109,099		7.47	9,718,049		8.41
Corporate bonds	93,762,993	191,497,563	4.40	89,972,254	173,323,332	6.49
Corporate loans		63,569,209	4.33		62,534,249	4.84
Total	$ 153,143,085	$ 255,066,772	4.64	$ 144,284,024	$ 235,857,581	6.40

Life Insurance Trust

Investment Type	2023 Fixed Income	2023 Additional Categories	2023 Average Maturity (years)	2022 Fixed Income	2022 Additional Categories	2022 Average Maturity (years)
U.S. government	$ 8,591,791	$	9.42	$ 7,590,127	$	12.41
Mortgage-backed securities	199,079		11.43	286,793		12.38
Municipal bonds	2,340,986		6.70	2,478,748		7.70
Corporate bonds	6,810,627		10.38	7,516,401		11.12
Total	$ 17,942,483	$	9.45	$ 17,872,069	$	12.09

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 $651.2 million and a weighted average maturity of 27 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 options 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 $113.4 million in mortgage-backed securities as of June 30, 2023, compared to $133.3 million as of June 30, 2022. The Health Insurance Trust held $3.1 million in mortgage-backed securities as of June 30, 2023, compared to $5.1 million as of June 30, 2022. The Life Insurance Trust held $199,079 in mortgage-backed securities as of June 30, 2023, compared to $286,793 as of June 30, 2022.

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 $21.5 million in collateralized mortgage obligations as of June 30, 2023, compared to $24.7 million as of June 30, 2022. The Health Insurance Trust held $824,263 in collateralized mortgage obligations as of June 30, 2023, compared to $885,759 as of June 30, 2022.

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 pass-throughs and as structures with multiple bond classes. The Retirement Annuity Trust held $28.9 million in asset-backed securities as of June 30, 2023, compared to $30.3 million as of June 30, 2022.

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 $26.6 million in commercial mortgage-backed securities investments as of June 30, 2023, compared to $31.5 million as of June 30, 2022.

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 value (net of cash equivalents) according to credit ratings as of June 30, 2023, and 2022.

2023 Retirement Annuity Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	$ 1,139,162,191	$ 7,901,520	$ 1,147,063,711	28.09
AAA	173,792,573		173,792,573	4.26
AA	553,239,834		553,239,834	13.55
A	515,146,109	391,717	515,537,826	12.63
BBB	523,350,414	54,030,118	577,380,532	14.14
BB	6,913,711	495,507,018	502,420,729	12.31
B		437,919,734	437,919,734	10.72
CCC		49,603,809	49,603,809	1.21
CC		249,000	249,000	0.01
C				
D		1,545,507	1,545,507	0.04
Not rated	60,555,674	63,470,129	124,025,803	3.04
Total	$ 2,972,160,506	$ 1,110,618,552	$ 4,082,779,058	100.00

2022 Retirement Annuity Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	$ 1,149,592,337	$	$ 1,149,592,337	26.48
AAA	187,112,695	2,798,409	189,911,104	4.38
AA	396,784,675	515,677	397,300,352	9.15
A	570,174,155	162,727	570,336,882	13.14
BBB	644,784,845	31,801,822	676,586,667	15.58
BB	8,232,374	461,790,627	470,023,001	10.83
B		445,632,980	445,632,980	10.26
CCC		45,478,066	45,478,066	1.05
CC		385,323	385,323	0.01
C		13,950	13,950	
D		99,560	99,560	
Not rated	288,115,937	107,965,973	396,081,910	9.12
Total	$ 3,244,797,018	$ 1,096,645,114	$ 4,341,442,132	100.00

2023 Health Insurance Trust

Rating		Fixed Income		Additional Categories		Total	Percent
U.S. government	$	43,405,938	$		$	43,405,938	10.63
AAA		5,556,616				5,556,616	1.36
AA		32,828,981				32,828,981	8.04
A		45,451,797		129,206		45,581,003	11.16
BBB		25,899,753		12,253,523		38,153,276	9.35
BB				111,590,871		111,590,871	27.34
B				105,144,906		105,144,906	25.76
CCC				14,778,120		14,778,120	3.62
CC				234,000		234,000	0.06
C							
D							
Not rated				10,936,146		10,936,146	2.68
Total	$	153,143,085	$	255,066,772	$	408,209,857	100.00

2022 Health Insurance Trust

Rating		Fixed Income		Additional Categories		Total	Percent
U.S. government	$	37,651,068	$		$	37,651,068	9.90
AAA		6,698,098		891,691		7,589,789	2.00
AA		29,600,787		408,030		30,008,817	7.89
A		37,796,136		39,183		37,835,319	9.95
BBB		26,564,802		7,495,309		34,060,111	8.96
BB				96,732,804		96,732,804	25.45
B				98,028,860		98,028,860	25.79
CCC				10,360,581		10,360,581	2.72
CC				217,106		217,106	0.06
C				4,108		4,108	
D				99,560		99,560	0.03
Not rated		5,973,133		21,580,349		27,553,482	7.25
Total	$	144,284,024	$	235,857,581	$	380,141,605	100.00

2023 Life Insurance Trust

Rating		Fixed Income		Additional Categories		Total	Percent
U.S. government	$	8,591,791	$		$	8,591,791	47.88
AAA		679,711				679,711	3.79
AA		2,738,115				2,738,115	15.26
A		1,093,660				1,093,660	6.10
BBB		4,147,116				4,147,116	23.11
BB		692,090				692,090	3.86
B							
Not Rated							
Total	$	17,942,483	$		$	17,942,483	100.00

2022 Life Insurance Trust

Rating		Fixed Income		Additional Categories		Total	Percent
U.S. government	$	7,590,127	$		$	7,590,127	42.47
AAA		681,318				681,318	3.81
AA		2,977,517				2,977,517	16.66
A		1,579,091				1,579,091	8.84
BBB		4,197,068				4,197,068	23.48
BB							
B		316,512				316,512	1.77
Not Rated		530,436				530,436	2.97
Total	$	17,872,069			$	17,872,069	100.00

Total fair value of the Retirement Annuity Trust's fixed income portfolio was $4.08 billion on June 30, 2023. The Health Insurance Trust's fixed income portfolio was valued at $408.2 million on June 30, 2023. Total fair value of the Life Insurance Trust's fixed income portfolio was $17.9 million on June 30, 2023. 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 $568.9 million in short-term investments through the Dreyfus Institutional Cash Advantage Fund. The Health Insurance Trust held $77.2 million in the Dreyfus Institutional Cash Advantage Fund. The Life Insurance Trust held $5.1 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. TRS holdings do not include foreign currency. The foreign currency tables shown are a comparative measure of the value of TRS's foreign investments, like stocks, expressed in U.S. dollars using the conversion rate for that currency on the day the fiscal year ended. As of June 30, 2023, TRS's exposure to foreign currency risk consisted of $5.28 billion in the Retirement Annuity Trust, $298.2 million in the Health Insurance Trust and $19.7 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 $898.5 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 equity, in the amount of $416.9 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.

The Retirement Annuity Trust's policy regarding foreign equity 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 in U.S. dollars the fair value of investments that are subject to foreign currency risk as a result of cash contributions to each portfolio manager as of June 30, 2023, and 2022.

Retirement Annuity Trust

	2023	2022
Commingled	$ 3,419,653,286	$ 3,029,556,395
Alternatives	288,041,664	277,842,260
American depository receipts	898,528,480	736,085,804
Cross-listed equity	416,869,084	382,244,110
Bonds	69,579,525	120,029,427
Additional categories (Fixed income)	130,166,338	118,089,954
Additional categories (Opportunistic)	59,967,536	98,744,254
Total	$ 5,282,805,913	$ 4,762,592,204

Health Insurance Trust

	2023	2022
Commingled	$ 176,735,816	$ 397,664,494
Alternatives	44,970,500	42,575,065
Cross-listed equity	24,522,404	2,888,554
Bonds	929,210	1,456,940
American depository receipts	3,064,662	1,368,805
Additional categories (Fixed income)	38,968,074	32,021,960
Additional categories (Opportunistic)	8,970,760	13,890,157
Total	$ 298,161,426	$ 491,865,975

Life Insurance Trust

	2023	2022
Commingled	$ 18,632,074	$ 16,579,034
Alternatives	585,914	420,996
Cross-listed equity	445,716	253,063
American depository receipts	82,283	39,893
Total	$ 19,745,987	$ 17,292,986

TRS's investments subject to foreign currencies and categorized in the preceding tables are illustrated further in the following tables by each country and its currency. As previously stated, TRS holdings do not include foreign currency. The amounts shown are the fair value in U.S. dollars of TRS's foreign investments. These foreign investments are made with U.S. dollars in the custody of American financial institutions. Foreign holdings not readily identifiable to a specific country are listed in the various category, which includes investment receivables, payables and new issues.

Retirement Annuity Trust

Currency	2023	2022	Currency	2023	2022
Argentine peso	$ 3,745,139	$ 107,236	Korean won	$ 121,139,877	$ 101,697,578
Australian dollar	122,545,872	130,644,553	Kuwaiti dinar	1,393,325	1,247,065
Bermudian dollar	25,646,337	30,071,729	Liberian dollar	8,606,275	4,361,250
Brazilian real	189,427,302	133,674,447	Malaysian ringgit	5,925,745	6,240,256
British pound sterling	562,799,745	482,751,292	Mexican peso	86,960,085	41,749,510
Canadian dollar	228,265,564	243,576,565	Netherlands Antillean guilder	58,692,934	9,915,826
Cayman Islands dollar	55,516,980	43,357,760	New Zealand dollar	4,060,842	4,089,333
Chilean peso	34,532,810	17,286,332	Norwegian krone	117,059,225	103,696,810
Chinese yuan	230,226,800	273,001,885	Panamanian balboa	6,842,893	4,149,702
Colombian peso	20,528,381	26,376,783	Peruvian nuevo sol		168,028
Czech koruna	477,133	445,307	Philippine peso	2,689,042	2,737,447
Danish krone	117,977,259	103,164,522	Polish zloty	3,165,484	1,560,230
Egyptian pound	165,073	134,404	Qatari riyal	1,446,234	1,569,598
Euro	1,799,896,439	1,627,884,474	Russian ruble	301	337
Gibraltar pound	1,783,106	710,219	Saudi riyal	6,752,614	6,196,328
Guernsey pound	21,534,472	17,345,142	Singapore dollar	43,230,003	43,773,717
Hong Kong dollar	133,387,146	166,944,875	South African rand	87,862,340	87,030,766
Hungarian forint	335,122	266,544	Swedish krona	87,214,257	73,633,424
Indian rupee	90,559,191	86,528,883	Swiss franc	209,313,511	198,861,473
Indonesian rupiah	16,123,347	9,169,449	Taiwan new dollar	77,929,562	67,236,355
Israeli new shekel	18,900,297	6,815,504	Thai baht	8,920,904	8,822,794
Jamaican dollar		126,527	Turkish lira	1,254,165	920,768
Japanese yen	632,034,559	558,763,004	United Arab Emirates dirham	2,026,440	1,793,558
Jersey pound	27,582,047	18,955,841	Various	6,329,734	13,036,774
			Total	$ 5,282,805,913	$ 4,762,592,204

Health Insurance Trust

Currency	2023	2022	Currency	2023	2022
Argentine peso	$ 75,338	$ 66,469	Kuwaiti dinar	$ 436,334	1,007,828
Australian dollar	8,650,271	21,728,364	Liberian dollar	2,576,523	963,599
Bermudian dollar	2,692,231	1,013,392	Malaysian ringgit	740,806	1,927,885
Brazilian real	2,722,645	5,856,948	Mexican peso	2,741,437	3,543,837
British pound sterling	23,024,709	42,889,159	Netherlands Antillean guilder	1,322,998	
Canadian dollar	27,939,627	43,053,573	New Zealand dollar	353,234	843,955
Cayman Islands dollar	7,697,318	5,184,756	Norwegian krone	977,089	2,510,126
Chilean peso	226,521	404,462	Panamanian balboa	1,671,845	823,842
Chinese yuan	8,695,471	11,371,846	Peruvian nuevo sol		168,028
Colombian peso	121,878	389,755	Philippine peso	416,479	956,299
Czech koruna	74,195	171,744	Polish zloty	917,195	949,724
Danish krone	3,608,514	6,786,186	Qatari riyal	438,340	1,222,823
Egyptian pound	58,267	94,248	Russian ruble	70	247
Euro	108,859,158	138,146,438	Saudi riyal	2,084,647	4,839,532
Gibraltar pound	423,381	168,334	Singapore dollar	1,634,530	3,818,762
Hong Kong dollar	12,158,439	34,606,661	South African rand	2,107,217	4,118,137
Hungarian forint	106,767	188,949	Swedish krona	4,335,880	9,280,891
Indian rupee	8,243,704	16,666,383	Swiss franc	12,378,667	24,219,205
Indonesian rupiah	1,020,251	2,252,921	Taiwan new dollar	8,209,243	17,939,329
Israeli new shekel	815,845	2,173,098	Thai baht	1,042,844	2,529,664
Japanese yen	27,576,850	59,632,917	Turkish lira	508,578	793,503
Jersey pound	1,460,840	1,289,699	United Arab Emirates dirham	629,333	1,415,910
Korean won	6,385,917	13,852,831	Various		3,716
			Total	$ 298,161,426	$ 491,865,975

Life Insurance Fund

Currency	2023	2022	Currency	2023	2022
Australian dollar	$ 787,747	$ 797,952	Kuwaiti dinar	$ 39,542	$ 35,391
Brazilian real	433,796	294,528	Malaysian ringgit	67,915	70,931
British pound sterling	1,724,878	1,546,974	Mexican peso	165,540	116,695
Canadian dollar	1,644,239	1,349,000	New Zealand dollar	30,883	30,442
Cayman Islands dollar	9,252	13,414	Norwegian krone	117,759	101,649
Chilean peso	20,624	14,049	Philippine peso	32,063	31,366
Chinese yuan	453,645	619,122	Polish zloty	40,834	28,027
Colombian peso	11,287	15,223	Qatari riyal	41,044	44,545
Czech koruna	6,557	7,249	Russian ruble	6	10
Danish krone	461,227	375,452	Saudi riyal	191,636	175,849
Egyptian pound	4,685	3,814	Singapore dollar	169,951	152,371
Euro	5,202,798	4,099,101	South African rand	189,940	149,844
Hong Kong dollar	1,213,576	1,353,409	Swedish krona	471,165	412,996
Hungarian forint	9,511	7,564	Swiss franc	863,941	846,621
Indian rupee	770,001	616,777	Taiwan new dollar	832,148	718,802
Indonesian rupiah	93,222	81,358	Thai baht	95,825	92,602
Israeli new shekel	97,685	72,390	Turkish lira	30,625	16,070
Japanese yen	2,703,254	2,352,561	United Arab Emirates dirham	57,510	50,900
Jersey pound	48,555	78,743	Various	1	
Korean won	611,120	519,195			
			Total	$ 19,745,987	$ 17,292,986

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 of 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 Value

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 timberland 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 timberland. 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, distributions are made 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 equity and domestic equity. 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 value 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 — 2023

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	$ 568,929,242	$	$	$ 568,929,242
Fixed income				
Asset-backed securities		28,882,848		28,882,848
Agency bonds		94,136,785		94,136,785
Commercial mortgage-backed securities		26,589,385		26,589,385
Collateralized mortgage obligations		21,467,875		21,467,875
Corporate bonds		1,273,746,115		1,273,746,115
Mortgage-backed securities		113,404,191		113,404,191
Municipal bonds		274,771,116		274,771,116
U.S. government	1,135,361,577	3,800,614		1,139,162,191
Subtotal	1,135,361,577	1,836,798,929		2,972,160,506
Equity				
International	2,030,127,648	1,745,797,429		3,775,925,077
U.S.	8,997,878,455			8,997,878,455
Subtotal	11,028,006,103	1,745,797,429		12,773,803,532
Real estate			401,370,072	401,370,072
Timberland		3,990	485,154,423	485,158,413
Additional categories				
Corporate bonds	876,478	751,416,325		752,292,803
Corporate loans		174,867	258,999,362	259,174,229
U.S.government	7,901,520			7,901,520
Subtotal	8,777,998	751,591,192	258,999,362	1,019,368,552
Total investments at fair value level	$ 12,741,074,920	$ 4,334,191,540	$ 1,145,523,857	$ 18,220,790,317
At Net Asset Value (NAV)				
Commingled European loan funds				$ 91,250,000
Commingled international equity funds				1,085,695,297
Commingled domestic equity funds				428,638,038
Private equity funds				1,915,329,613
Private real estate funds				1,375,912,910
Private Opportunistic Loan Funds				62,818,692
Private opportunistic credit funds				753,842,564
Total investments measured at NAV				5,713,487,114
Total investments at fair value				$ 23,934,277,431

Schedule of Investments at Net Asset Value (NAV) — 2023

	June 30, 2023	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European loan	$ 91,250,000	$	Daily	30 days
Commingled international equity	1,085,695,297		Daily	1-30 days
Commingled domestic equity	428,638,038		Daily	1-30 days
Private equity				
Open-ended*	487,090,328	114,908,844	Quarterly, annually	90 days
Closed-ended	1,428,239,285	1,188,329,589	N/A	N/A
Private real estate				
Open-ended	988,650,662		Quarterly	45-90 days
Closed-ended	387,262,248	546,863,320	N/A	N/A
Private Opportunistic loan	62,818,692	70,000,000	N/A	N/A
Private opportunistic credit				
Open-ended	570,428,269	25,500,000	Semiannually	75 days
Closed-ended	183,414,295	67,912,097	N/A	N/A
Total investments at NAV	$ 5,713,487,114			

Retirement Annuity Trust
Schedule of Investments at Fair Value Level — 2022

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	$ 1,018,544,170	$	$	$ 1,018,544,170
Fixed income				
Asset-backed securities		30,303,278		30,303,278
Agency bonds		73,829,978		73,829,978
Commercial mortgage-backed securities		31,473,511		31,473,511
Collateralized mortgage obligations		24,673,583		24,673,583
Corporate bonds		1,488,986,426		1,488,986,426
Mortgage-backed securities		133,129,052	181,960	133,311,012
Municipal bonds		312,626,893		312,626,893
U.S. government	1,145,619,271	3,973,066		1,149,592,337
Subtotal	1,145,619,271	2,098,995,787	181,960	3,244,797,018
Equity				
International	1,107,171,063	1,530,406,953		2,637,578,016
U.S.	7,697,139,844			7,697,139,844
Subtotal	8,804,310,907	1,530,406,953		10,334,717,860
Real estate			402,120,072	402,120,072
Timberland		4,256,528	479,213,075	483,469,603
Additional categories				
Corporate bonds	90,663	751,324,125		751,414,788
Corporate loans		1,141,349	251,748,977	252,890,326
Subtotal	90,663	752,465,474	251,748,977	1,004,305,114
Total investments at fair value level	$ 10,968,565,011	$ 4,386,124,742	$ 1,133,264,084	$ 16,487,953,837
At NAV				
Commingled European loan funds				$ 92,340,000
Commingled international equity funds				1,590,053,281
Commingled domestic equity funds				342,732,216
Private equity funds				1,808,795,204
Private real estate funds				1,291,507,864
Private opportunistic credit funds				813,467,573
Total investments measured at NAV				5,938,896,138
Total investments at fair value				$ 22,426,849,975

Health Insurance Trust

Schedule of Investments at Fair Value Level — 2023

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	$ 77,221,128	$	$	$ 77,221,128
Fixed income				
Agency bonds		2,989,020		2,989,020
Collateralized mortgage obligations		824,263		824,263
Corporate bonds		93,762,993		93,762,993
Mortgage-backed securities		3,051,772		3,051,772
Municipal bonds		9,109,099		9,109,099
U.S. government	43,405,938			43,405,938
Subtotal	43,405,938	109,737,147		153,143,085
Equity				
International	24,887,225	461,717,466		486,604,691
U.S.	919,910,248			919,910,248
Subtotal	944,797,473	461,717,466		1,406,514,939
Additional categories				
Corporate bonds	161,913	191,335,650		191,497,563
Corporate loans		174,867	63,394,342	63,569,209
U.S. equity	6,457,974			6,457,974
Subtotal	6,619,887	191,510,517	63,394,342	261,524,746
Total investments at fair value level	$ 1,072,044,426	$ 762,965,130	$ 63,394,342	$ 1,898,403,898
At NAV				
Private equity funds				220,197,307
Private opportunistic loan funds				15,704,673
Private opportunistic credit funds				119,854,518
Private real estate funds				159,444,210
Total investments measured at NAV				515,200,708
Total investments at fair value				$ 2,413,604,606

Schedule of Investments at NAV — 2023

	June 30, 2023	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private real estate				
Open-ended	$ 102,446,925	$	Quarterly	45-90 days
Closed-ended	56,997,285	80,144,168	N/A	N/A
Private equity				
Closed-ended	220,197,307	182,663,743	N/A	N/A
Private opportunistic loan	15,704,673	5,000,000		
Private opportunistic credit				
Open-ended	99,730,078		Semiannually	75 days
Closed-ended	20,124,440	9,021,502	N/A	N/A
Total investments at NAV	$ 515,200,708			

Health Insurance Trust
Schedule of Investments at Fair Value Level — 2022

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	$ 67,213,821	$	$	$ 67,213,821
Fixed income				
Agency bonds		969,520		969,520
Collateralized mortgage obligations		885,759		885,759
Corporate bonds		89,972,254		89,972,254
Mortgage-backed securities		5,087,374		5,087,374
Municipal bonds		9,718,049		9,718,049
U.S. government	37,651,068			37,651,068
Subtotal	37,651,068	106,632,956		144,284,024
Equity				
Global		1,003,875,627		1,003,875,627
International	2,888,554			2,888,554
U.S.	88,497,979			88,497,979
Subtotal	91,386,533	1,003,875,627		1,095,262,160
Additional categories				
Corporate bonds	(1,396)	173,311,116	13,612	173,323,332
Corporate loans			62,534,249	62,534,249
U.S. equity	6,334,819			6,334,819
Subtotal	6,333,423	173,311,116	62,547,861	242,192,400
Total investments at fair value level	$ 202,584,845	$ 1,283,819,699	$ 62,547,861	$ 1,548,952,405
At NAV				
Private equity funds				$ 204,919,107
Private real estate funds				150,214,503
Private opportunistic credit funds				129,749,917
Total investments measured at NAV				484,883,527
Total investments at fair value				$ 2,033,835,932

Life Insurance Trust

Schedule of Investments at Fair Value Level — 2023

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	$ 5,069,152	$	$	$ 5,069,152
Fixed income				
Corporate bonds		6,810,627		6,810,627
Mortgage-backed securities		199,079		199,079
Municipal bonds		2,340,986		2,340,986
U.S. government	8,591,791			8,591,791
Subtotal	8,591,791	9,350,692		17,942,483
Equity				
International	445,716	19,221,343		19,667,059
U.S.	36,515,893			36,515,893
Subtotal	36,961,609	19,221,343		56,182,952
Additional categories				
U.S. equity	692,720			692,720
Subtotal	692,720			692,720
Total investments at fair value level	$ 51,315,272	$ 28,572,035	$	$ 79,887,307
At NAV				
Private equity funds				$ 4,921,166
Private real estate funds				6,513,395
Private opportunistic credit funds				2,102,984
Total investments measured at NAV				13,537,545
Total investments at fair value				$ 93,424,852

Schedule of Investments at NAV — 2023

	June 30, 2023	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private equity				
Closed-ended	$ 4,921,166	$ 5,224,326	N/A	N/A
Private real estate				
Closed-ended	1,054,361	4,428,712	N/A	N/A
Open-ended	5,459,034	$	Quarterly	45 days
Private opportunistic credit				
Open-ended	2,102,984	178,500	Semiannually	75 days
Total investments at NAV	$ 13,537,545			

Life Insurance Trust
Schedule of Investments at Fair Value Level — 2022

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	$ 8,345,378	$	$	$ 8,345,378
Fixed income				
Corporate bonds		7,516,401		7,516,401
Mortgage-backed securities		286,793		286,793
Municipal bonds		2,478,748		2,478,748
U.S. government	7,590,127			7,590,127
Subtotal	7,590,127	10,281,942		17,872,069
Equity				
International	253,063	16,995,009		17,248,072
U.S.	30,815,516			30,815,516
Subtotal	31,068,579	16,995,009		48,063,588
Additional Categories				
U.S. equity	680,854			680,854
Subtotal	680,854			680,854
Total investments at fair value level	$ 47,684,938	$ 27,276,951	$	$ 74,961,889
At NAV				
Private equity funds				$ 3,283,908
Private real estate funds				7,489,602
Private opportunistic credit funds				2,130,839
Total investments measured at NAV				12,904,349
Total investments at fair value				$ 87,866,238

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 year ended June 30, 2023, 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, 2023, and 2022.

Securities Lending Net Earnings

	Retirement Annuity*		Life Insurance	
	2023	2022	2023	2022
Gross earnings (interest and fees)	$30,166,303	$4,029,726	$828,198	$90,539
Gross borrower rebates	(26,607,262)	2,094,160	(756,056)	9,485
Bank fees	(1,067,559)	(1,836,957)	(21,638)	(30,000)
Net earnings	$2,491,482	$4,286,929	$50,504	$70,024

* 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, 2023, 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 value of the underlying securities and the value of the collateral pledged at June 30, 2023, and 2022.

Retirement Annuity Trust

2023

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	$ 156,962,966	$ 20,520,408	$ 139,676,351	$ 160,196,759
Equity	774,911,630	573,245,216	217,578,251	$ 790,823,467
Total	$ 931,874,596	$ 593,765,624	$ 357,254,602	$ 951,020,226

2022

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	$ 162,749,533	$ 22,472,768	$ 143,350,952	$ 165,823,720
Equity	1,082,537,400	925,265,090	199,439,318	$ 1,124,704,408
Total	$ 1,245,286,933	$ 947,737,858	$ 342,790,270	$ 1,290,528,128

Life Insurance Trust

2023

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	$ 1,760,859	$	$ 1,795,453	$ 1,795,453
Equity	12,411,525	4,067,643	8,464,558	$ 12,532,201
Total	$ 14,172,384	$ 4,067,643	$ 10,260,011	$ 14,327,654

2022

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	$ 586,917	$	$ 588,343	$ 588,343
Equity	27,389,601	21,869,913	6,578,936	$ 28,448,849
Total	$ 27,976,518	$ 21,869,913	$ 7,167,279	$ 29,037,192

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

	2023	2022
Retirement Annuity Trust	10.24 %	(10.91)%
Health Insurance Trust	11.52 %	(9.70)%
Life Insurance Trust	9.63 %	(14.96)%

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 2023 and 2022 were $1.4 million and $1.2 million, 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 Kentucky Retirement Systems board (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). TRS is required to contribute 9.97% plus a monthly amount determined by the KERS actuary for TRS's portion of the total unfunded liability over a set period regardless of covered payroll. TRS's total contributions to KERS were $887,844 and $916,821 for fiscal 2023 and 2022. 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 administered a salary deferral program as permitted by section 403(b) of the Internal Revenue Code. Under this program members voluntarily deferred a portion of their compensation within the limits established by the applicable laws and regulations. The board subsequently discontinued offering the program. Members who were not receiving annuities were able to transfer their accounts into other tax-sheltered plans. As of June 30, 2023, three members remained who are receiving annuities under the plan. Effective Jan. 1, 2022, the board restated the plan to allow TRS 4 members and employers to make voluntary contributions to the plan to comply with the requirements of the legislation that created TRS 4. As of June 30, 2023, 9 TRS 4 members participated in the voluntary plan. The combined balance of those accounts was $9,725.

Basis of Accounting
The Tax-Sheltered Annuity Plan financial statements are prepared using an accrual basis of accounting.

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 2023 and 2022 were $63.3 million and $60.7 million, respectively. The Commonwealth of Kentucky bears risk for excess claims expenses that exceed the premium equivalents charged for the KEHP.

At June 30, 2023, TRS insurance covered 41,055 retirees and 6,555 dependents, and at June 30, 2022, TRS insurance covered 41,177 retirees and 6,661 dependents. The medical plan has 202 participating employers with 75,644 and 74,785 active members contributing at June 30, 2023, and 2022, 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.

	2023	2022
MEHP group expenditures	$ 222,852,822	$ 206,386,429
KEHP group expenditures	110,701,357	106,170,919
Subtotal	333,554,179	312,557,348
Less: amounts paid by retirees	(63,329,256)	(60,680,394)
Less: formulary rebates	(63,433,922)	(54,158,379)
Less: Medicare subsidies and other recovery income	(81,924,996)	(90,517,136)
Net insurance expenditures	$ 124,866,005	$ 107,201,439

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, 2023, and 2022 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]
2023	$ 5,179,049	$ 2,743,413	$ 2,435,636	53.0	$ 3,977,280	61.2
2022	4,751,706	2,269,176	2,482,530	47.8	3,876,491	64.0

*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, 2022
Investment rate of return	7.1%, net of OPEB plan investment expense, including inflation
Projected salary increases	3.0 - 7.5%, including wage inflation
Inflation rate	2.5%
Real wage growth	0.25%
Wage inflation	2.75%
Municipal bond index rate	3.66%
Discount rate	7.1%
Single equivalent interest rate	7.1%, net of OPEB plan investment expense, including price inflation
Health care cost trends	
Medical trend	6.75% for fiscal year 2023, decreasing to an ultimate rate of 4.5% by fiscal year 2032
Medicare Part B premiums	1.55% for fiscal year 2023, with an ultimate rate of 4.5% by 2034

Mortality rates were based on the Pub2010 (Teachers Benefit-Weighted) Mortality Table projected generationally with MP-2020 with various set-forwards, set-backs and adjustments for each of the groups; service, retirees, contingent annuitants, disabled retirees and active members. The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation and rates of plan election used in the June 30, 2022, valuation were based on the results of the most recent actuarial experience study for the system, which covered the five-year period ending June 30, 2020, adopted by the board on September 20, 2021. The remaining actuarial assumptions (e.g., initial per capita costs, health care cost trends) used in the June 30, 2022, valuation of the health trust were based on a review of recent plan experience done concurrently with the June 30, 2022, valuation. The health care cost trend rate assumption was updated for the June 30, 2022, 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	Long-Term Expected Real Rate Percentage of Return
U.S. large cap equity	35.4	5.0
U.S. small cap equity	2.6	5.5
Developed international equity	15.0	5.5
Emerging markets equity	5.0	6.1
Fixed income	9.0	1.9
High yield bonds	8.0	3.8
Other additional categories	9.0	3.7
Real estate	6.5	3.2
Private equity	8.5	8.0
Cash	1.0	1.6
Total	100.0	

Discount Rate

The discount rate used to measure the TOL as of the measurement date was 7.1%. 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, 2022. In addition to the actuarial methods and assumptions of the June 30, 2022, 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 2.75%.
- 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 $8.00 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
- School district and university 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. 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.
  - For the purposes of developing estimates for new entrants, active headcounts were assumed to remain flat for all future years.

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 single equivalent interest rate (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 2023

(In thousands)

		Health Care Cost Trend Rates		
		1% Decrease	**Current**	**1% Increase**
	1% Increase (8.1%)	$	$ 1,859,473	$
Discount Rate	**Current (7.1%)**	1,753,458	2,435,636	3,285,081
	1% Decrease (6.1%)		3,132,761	

Schedule of Net OPEB Liability and Health Care Cost Trend Rates 2022

(In thousands)

		Health Care Cost Trend Rates		
		1% Decrease	**Current**	**1% Increase**
	1% Increase (8.1%)	$	$ 1,959,121	$
Discount Rate	**Current (7.1%)**	1,861,066	2,482,530	3,255,435
	1% Decrease (6.1%)		3,114,745	

The TOL of the Health Insurance Trust for 2023 is based upon an actuarial valuation performed as of the valuation date, June 30, 2022. An expected TOL is determined as of June 30, 2023, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2022, 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, 2023, is shown in the following table.

TOL Roll-Forward 2023

(In thousands)

		Expected	Actual
(a)	TOL as of June 30, 2022*	$ 4,751,706	$ 4,660,037
(b)	Actual benefit payments and refunds for July 1, 2022-June 30, 2023	(124,866)	(124,866)
(c)	Interest on TOL = [(a) x (0.071)] + [(b) x (0.0355]	332,938	326,430
(d)	Service cost for July 1, 2022-June 30, 2023 at the end of the year	120,458	120,458
(e)	Changes of benefit terms		
(f)	Changes of assumptions**	196,990	196,990
(g)	TOL rolled forward to June 30, 2023 = (a) + (b) + (c) + (d) + (e) + (f)	5,277,226	5,179,049
(h)	Difference between expected and actual experience (gain) loss		$ (98,177)

* The TOL used in the roll-forward as of June 30, 2022, is calculated using the discount rate as of the prior measurement date.

** The health care trend rates, as well as the Tier 4 retirement decrements, were updated to reflect future anticipated experience.

The TOL of the Health Insurance Trust for 2022 is based upon an actuarial valuation performed as of the June 30, 2021, valuation date. An expected, TOL was determined as of June 30, 2022, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2021, 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, 2022, is shown in the following table.

TOL Roll-Forward 2022

(In thousands)

		Expected	Actual
(a)	TOL as of June 30, 2021*	$ 4,446,211	$ 4,381,853
(b)	Actual benefit payments and refunds for July 1, 2021-June 30, 2022	(107,201)	(107,201)
(c)	Interest on TOL = [(a) x (0.08)] + [(b) x (0.04]	311,875	307,305
(d)	Service cost for July 1, 2021-June 30, 2022 at the end of the year	109,082	109,082
(e)	Changes of benefit terms		
(f)	Changes of assumptions	60,667	60,667
(g)	TOL rolled forward to June 30, 2022 = (a) + (b) + (c) + (d) + (e) + (f)	4,820,634	4,751,706
(h)	Difference between expected and actual experience (gain) loss		$ (68,928)

* The TOL used in the roll-forward as of June 30, 2021, 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 202 participating employers. The benefit is $5,000 for members who are retired for service or disability and $2,000 for active contributing members who began participating before Jan. 1, 2022. For TRS 4 members, the life insurance benefit payable upon the death of a member is $5,000 for active contributing members and $10,000 for retired or disabled 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, 2023, and 2022 follows.

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

Year Ended 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]
2023	$ 122,254	$ 94,030	$ 28,224	76.9	$ 3,977,280	0.7
2022	119,484	88,381	31,103	74.0	3,876,491	0.8

Actuarial Assumptions

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

Valuation date	June 30, 2022
Investment rate of return	7.1%, net of OPEB plan investment expense, including inflation.
Projected salary increases	3 - 7.5%, including wage inflation
Inflation rate	2.5%
Real wage growth	0.25%
Wage inflation	2.75%
Municipal bond index rate	3.66%
Discount rate	7.1%
Single equivalent interest rate	7.1%, net of OPEB plan investment expense, including price inflation

Mortality rates were based on the Pub2010 (Teachers Benefit-Weighted) Mortality Table projected generationally with MP-2020 with various set-forwards set-backs and adjustments for each of the groups: service, retirees, contingent annuitants, disabled retirees and active members. The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation and rates of plan election used in the June 30, 2022, valuation were based on the results of the most recent actuarial experience study for the system, which covered the five-year period ending June 30, 2020, adopted by the board on September 20, 2021. 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	Long-Term Expected Real Rate Percentage of Return
U.S. equity	40.0	5.2
International equity	15.0	5.5
Emerging markets equity	5.0	6.1
Fixed income	21.0	1.9
Real estate	7.0	3.2
Private equity	5.0	8.0
Additional categories	5.0	4.0
Cash	2.0	1.6
Total	100.0	

Discount Rate

The discount rate used to measure the total OPEB liability (TOL) as of the measurement date was 7.1%. 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, 2022. In addition to the actuarial methods and assumptions of the June 30, 2022, 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 2.75%.
- The employer will contribute the 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 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 2023
(In thousands)

1% Decrease (6.1%)	Current Discount Rate (7.1%)	1% Increase (8.1%)
$45,402	$28,224	$14,326

Schedule of Net OPEB Liability 2022
(In thousands)

1% Decrease (6.1%)	Current Discount Rate (7.1%)	1% Increase (8.1%)
$48,059	$31,103	$17,390

The TOL of the Life Insurance Trust for 2023 is based upon an actuarial valuation performed as of the valuation date, June 30, 2022. An expected TOL is determined as of June 30, 2023, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2022, 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, 2023, is shown in the following table.

TOL Roll-Forward 2023
(In thousands)

		Expected	Actual
(a)	TOL as of June 30, 2022*	$ 119,484	$ 119,197
(b)	Actual benefit payments and refunds for July 1, 2022-June 30, 2023	(6,219)	(6,219)
(c)	Interest on TOL = [(a) x (0.071)] + [(b) x (0.0355]	8,263	8,242
(d)	Service cost for July 1, 2022-June 30, 2023	1,035	1,035
(e)	Changes of benefits terms		
(f)	Changes of assumptions**	(1)	(1)
(g)	TOL rolled forward to June 30, 2023 =(a)+(b)+(c)+(d)+(e)+(f)	$ 122,562	$ 122,254
(h)	Difference between expected and actual experience (gain) loss		$ (308)

* The TOL used in the roll-forward as of June 30, 2022, is calculated using the discount rate as of the prior measurement date.

** Tier 4 retirement decrements were updated to reflect future anticipated experience.

The TOL of the Life Insurance Trust for 2022 is based upon an actuarial valuation performed as of the June 30, 2021, valuation date. An expected TOL is determined as of June 30, 2022, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2021, 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, 2022, is shown in the following table.

TOL Roll-Forward 2022
(In thousand)

		Expected	Actual
(a)	TOL as of June 30, 2021*	$ 120,505	$ 116,656
(b)	Actual benefit payments and refunds for July 1, 2021-June 30, 2022	(6,178)	(6,178)
(c)	Interest on TOL = [(a) x (0.071)] + [(b) x (0.0355]	8,337	8,063
(d)	Service cost for July 1, 2021-June 30, 2022	943	943
(e)	Changes of benefits terms		
(f)	Changes of assumptions	—	—
(g)	TOL rolled forward to June 30, 2022 =(a)+(b)+(c)+(d)+(e)+(f)	$ 123,607	$ 119,484
(h)	Difference between expected and actual experience (gain) loss		$ (4,123)

* The TOL used in the roll-forward as of June 30, 2021, is calculated using the discount rate as of the prior measurement date.

Required Supplementary Information

Retirement Annuity Trust

Schedule of Changes in Net Pension Liability

(In thousands)

	2023	2022	2021	2020	2019
Total pension liability					
Service cost	$ 654,676	$ 621,689	$ 563,188	$ 552,625	$ 542,970
Interest	2,796,631	2,724,644	2,581,630	2,517,671	2,448,387
Difference between expected and actual experience	398,576	42,986	32,475	10,661	93,650
Changes of assumptions	—	—	3,072,848	—	—
Benefit payments	(2,391,326)	(2,305,853)	(2,235,241)	(2,167,239)	(2,094,364)
Refunds of contributions	(26,910)	(26,745)	(25,374)	(28,472)	(32,403)
Net change in total pension liability	1,431,647	1,056,721	3,989,526	885,246	958,240
Total pension liability — beginning	40,598,288	39,541,567	35,552,041	34,666,795	33,708,555
Total pension liability — ending (a)	42,029,935	40,598,288	39,541,567	35,552,041	34,666,795
Plan net position					
Contributions — state	1,042,434	1,570,118	1,060,257	1,048,193	1,051,452
Contributions — other employers	102,015	109,467	86,720	86,088	71,583
Contributions — members	366,775	356,967	327,833	324,664	321,172
Net investment income	2,266,085	(2,727,776)	6,017,186	1,094,023	1,085,189
Benefit payments	(2,391,326)	(2,305,853)	(2,235,241)	(2,167,239)	(2,094,364)
Administrative expense	(14,471)	(12,005)	(12,602)	(12,167)	(12,352)
Refunds of contributions	(26,910)	(26,745)	(25,374)	(28,472)	(32,403)
Net change in plan net position	1,344,602	(3,035,827)	5,218,779	345,090	390,277
Plan net position — beginning	22,899,952	25,935,779	20,717,000	20,371,910	19,981,633
Plan net position — ending (b)	24,244,554	22,899,952	25,935,779	20,717,000	20,371,910
Net pension liability — ending (a)-(b)	$ 17,785,381	$ 17,698,336	$ 13,605,788	$ 14,835,041	$ 14,294,885

See accompanying independent auditor's report.

Schedule of Changes in Net Pension Liability
(In thousands)

	2018	2017	2016	2015	2014
Total pension liability					
Service cost	$ 1,104,102	$ 1,332,587	$ 1,120,893	$ 1,015,080	$ 1,002,338
Interest	2,063,109	1,964,107	2,027,457	2,029,372	1,956,610
Difference between expected and actual experience	(222,473)	199,471	-58,035		
Changes of assumptions	(14,167,315)	(2,321,327)	4,030,834	1,511,960	(353,043)
Benefit payments	(2,004,617)	(1,918,612)	(1,833,199)	(1,741,456)	(1,654,376)
Refunds of contributions	(31,073)	(26,305)	(27,748)	(23,033)	(25,462)
Net change in total pension liability	(13,258,267)	(770,079)	5,260,202	2,791,923	926,067
Total pension liability — beginning	46,966,822	47,736,901	42,476,699	39,684,776	38,758,709
Total pension liability — ending (a)	33,708,555	46,966,822	47,736,901	42,476,699	39,684,776
Plan net position					
Contributions — state	969,698	981,417	484,987	480,073	483,330
Contributions — other employers	78,973	79,303	80,468	79,506	79,996
Contributions — members	319,127	313,625	313,044	308,160	304,982
Net investment income	1,953,214	2,475,753	(245,215)	862,179	2,803,249
Benefit payments	(2,004,617)	(1,918,612)	(1,833,199)	(1,741,456)	(1,654,376)
Administrative expense	(11,388)	(10,314)	(8,636)	(8,869)	(7,956)
Refunds of contributions	(31,073)	(26,305)	(27,748)	(23,033)	(25,462)
Net change in plan net position	1,273,934	1,894,867	(1,236,299)	(43,440)	1,983,763
Plan net position — beginning	18,707,699	16,812,832	18,049,131	18,092,571	16,108,808
Plan net position — ending (b)	19,981,633	18,707,699	16,812,832	18,049,131	18,092,571
Net pension liability — ending (a)-(b)	$ 13,726,922	$ 28,259,123	$ 30,924,069	$ 24,427,568	$ 21,592,205

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. The TRS 4 benefit tier was added for members joining the system on and after Jan. 1, 2022.

Changes of assumptions. In the 2020 experience study, rates of withdrawal, retirement, disability, mortality and salary increase were adjusted to more closely reflect actual experience. The expectation of mortality was changed to the Pub2010 Mortality Tables (Teachers Benefit-Weighted) projected generationally with MP-2020 with various set forwards, set-backs and adjustments for each of the groups: service retirees, contingent annuitants, disabled retirees and actives. The assumed long-term investment rate of return was changed from 7.5% to 7.1% and the price inflation assumption was lowered from 3% to 2.5%.

In the 2016 valuation, rates of withdrawal, retirement, disability, mortality and 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)

	2023	2022	2021	2020	2019
Total pension liability	$42,029,935	$40,598,288	$39,541,567	$35,552,041	$34,666,795
Plan net position	24,244,554	22,899,952	25,935,779	20,717,000	20,371,910
Net pension liability	17,785,381	17,698,336	13,605,788	14,835,041	14,294,885
Ratio of plan net position to total pension liability	57.68 %	56.41 %	65.59 %	58.27 %	58.76 %
Covered payroll	$3,977,280	$3,876,491	$3,638,905	$3,569,262	$3,497,216
Net pension liability as a percentage of covered payroll	447.17 %	456.56 %	373.90 %	415.61 %	408.75 %

	2018	2017	2016	2015	2014
Total pension liability	$33,708,555	$46,966,822	$47,736,901	$42,476,699	$39,684,776
Plan net position	19,981,633	18,707,699	16,812,832	18,049,131	18,092,571
Net pension liability	13,726,922	28,259,123	30,924,069	24,427,568	21,592,205
Ratio of plan net position to total pension liability	59.28 %	39.83 %	35.22 %	42.49 %	45.59 %
Covered payroll	$3,455,660	$3,415,432	$3,390,539	$3,455,008	$3,317,422
Net pension liability as a percentage of covered payroll	397.23 %	827.40 %	912.07 %	707.02 %	650.87 %

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
2023	$ 3,977,280	$ 1,144,449	$ 1,144,449	$ —	28.77
2022	3,876,491	1,679,585	1,200,385	479,200	43.33
2021	3,638,905	1,146,977	1,146,977		31.52
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

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	24.4 years
Asset valuation method	5-year smoothed fair 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.

2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
10.24%	(10.91)%	29.57%	5.5%	6%	10.50%	15.00%	(1.32)%	4.96%	17.95%

See accompanying independent auditor's report.

Health Insurance Trust

Schedule of Changes in Net OPEB Liability
(In thousands)

	2023	2022	2021
Total OPEB liability			
Service cost	$ 120,458	$ 109,082	$ 84,727
Interest	332,938	311,875	326,008
Changes of benefit terms			
Difference between expected and actual experience	(98,177)	(68,928)	(490,732)
Changes of assumptions	196,990	60,667	516,431
Benefit payments	(124,866)	(107,201)	(130,648)
Net change in OPEB liability	427,343	305,495	305,786
Total OPEB liability — beginning	4,751,706	4,446,211	4,140,425
Total OPEB liability — ending (a)	5,179,049	4,751,706	4,446,211
Plan net position			
Contributions — state	853,328	31,349	78,217
Contributions — other employers	123,488	120,416	106,670
Contributions — active members	149,210	145,682	128,117
Net investment income	243,051	(219,500)	503,201
Benefit payments	(124,866)	(107,201)	(130,648)
Administrative expense	(1,974)	(2,074)	(1,728)
Other			
Net change in plan net position	474,237	(31,328)	683,829
Plan net position — beginning	2,269,176	2,300,504	1,616,675
Plan net position — ending (b)	2,743,413	2,269,176	2,300,504
Net OPEB liability — ending (a) - (b)	$ 2,435,636	$ 2,482,530	$ 2,145,707

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 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
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.

June 30, 2022 (Valuation Date: June 30, 2021)
- The TRS 4 benefit tier was added for members joining the system on and after Jan. 1, 2022.

Changes of assumptions.

June 30, 2022 (Valuation Date: June 30, 2021)
- The health care trend rates were updated to reflect future anticipated experience.

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
2023	$ 5,179,049	$ 2,743,413	$ 2,435,636	53.0 %	$ 3,977,280	61.2 %
2022	4,751,706	2,269,176	2,482,530	47.8	3,876,491	64.0
2021	4,446,211	2,300,504	2,145,707	51.7	3,638,905	59.0
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	0.3	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

GASB 74 (Dollars in thousands)

	2023	2022	2021	2020	2019
Statutorily required contributions					
Employer	$ 123,488	$ 120,416	$ 106,670	$ 107,434	$ 106,764
State					
Pre-65 health insurance premiums	60,958	56,312	55,061	54,034	53,707
SEEK 0.75%	24,370	23,507	23,156	23,157	22,675
Total state	85,328	79,819	78,217	77,191	76,382
Total	$ 208,816	$ 200,235	$ 184,887	$ 184,625	$ 183,146
Actual contributions					
Employer	$ 123,488	$ 120,416	$ 106,670	$ 107,434	$ 106,764
State	85,328	31,349	78,217	77,191	76,382
Total	208,816	151,765	184,887	184,625	183,146
Contribution deficiency (excess)	$ —	$ 48,470	$ —	$ —	$ —
Percent of statutorily required contributed	100.0	75.8	100.0	100.0	100.0
Covered payroll	$ 3,977,280	$ 3,876,491	$ 3,638,905	$ 3,569,262	$ 3,497,216
Actual contributions as a percentage of covered payroll	5.25	3.92	5.08	5.17	5.24

	2018	2017	2016	2015	2014
Shared responsibility contributions					
Employer	$ 106,143	$ 104,879	$ 104,271	$ 77,656	$ 52,247
State					
Pre-65 health insurance premiums	58,535	53,454	52,542	46,233	84,600
SEEK 0.75%	22,424	22,043	21,825	21,375	20,841
Total state	80,959	75,497	74,367	67,608	105,441
Total	$ 187,102	$ 180,376	$ 178,638	$ 145,264	$ 157,688
Actual contributions					
Employer	$ 106,143	$ 104,879	$ 104,271	$ 77,656	$ 52,247
State	80,959	75,497	74,367	67,608	105,441
Total	187,102	180,376	178,638	145,264	157,688
Contribution deficiency (excess)	$ —	$ —	$ —	$ —	$ —
Percent of shared responsibility contributed	100.0	100.0	100.0	100.0	100.0
Covered payroll	$ 3,455,660	$ 3,415,432	$ 3,390,539	$ 3,455,008	$ 3,317,422
Actual contributions as a percentage of covered payroll	5.41	5.28	5.27	4.20	4.75

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

The Health Insurance Trust is funded based on statutorily determined amounts as described in Note 8. The Schedule of Employer Contributions details the statutorily determined amounts for the Health Trust.

Schedule of Investment Returns

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

2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
11.5%	(9.7)%	31.10%	2.30%	6.11%	8.4%	14.37%	(2.20)%	1.38%	15.38%

See accompanying independent auditor's report.

Life Insurance Trust

Schedule of Changes in Net OPEB Liability

(In thousands)

	2023	2022	2021
Total OPEB liability			
Service cost	$ 1,035	$ 943	$ 1,289
Interest	8,263	8,337	8,926
Changes of benefit terms			
Difference between expected and actual experience	(308)	(4,123)	122
Changes of assumptions	(1)		(5,792)
Benefit payments	(6,219)	(6,178)	(6,120)
Net change in OPEB liability	2,770	(1,021)	(1,575)
Total OPEB liability — beginning	119,484	120,505	122,080
Total OPEB liability — ending (a)	122,254	119,484	120,505
Plan Net Position			
Contributions — state	2,599	2,194	1,852
Contributions — other employers	624	561	286
Net investment income	8,683	(15,582)	24,075
Benefit payments	(6,219)	(6,178)	(6,120)
Administrative expense	(38)	(41)	(34)
Net change in plan net position	5,649	(19,046)	20,059
Plan net position — beginning	88,381	107,427	87,368
Plan net position — ending (b)	94,030	88,381	107,427
Net OPEB liability — ending (a) - (b)	$ 28,224	$ 31,103	$ 13,078

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 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
Changes of benefit terms				
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
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)
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)	$ 34,712	$ 31,072	$ 28,198	$ 21,959

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

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.

June 30, 2022 (Valuation Date: June 30, 2021)

- The TRS 4 benefit tier was added for members joining the system on and after Jan. 1, 2022.

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
2023	$ 122,254	$ 94,030	$ 28,224	76.9	$3,977,280	0.7
2022	119,484	88,381	31,103	74.0	3,876,491	0.8
2021	120,505	107,427	13,078	89.2	3,638,905	0.4
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
2023	$ 3,269	$ 3,223	$ 46	$ 3,977,280	0.08
2022	2,736	2,755	(19)	3,876,491	0.07
2021	2,252	2,138	114	3,638,905	0.06
2020	1,843	1,796	47	3,569,262	0.05
2019	1,082	1,421	(339)	3,497,216	0.04
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

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, 2018 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	24 years, closed
Asset valuation method	5-year smoothed fair value
Inflation	3%
Real wage growth	0.5%
Wage inflation	3.5%
Salary increase	3.5 to 7.2%, including wage inflation
Discount rate	7.5%

Schedule of Investment Returns

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

2023	2022	2021	2020	2019
9.63%	(14.96)%	28.17%	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, 2023 and 2022

	2023	2022
Salaries	$ 8,720,717	$ 7,871,232
Other personnel costs	793,003	691,560
Professional services and contracts	566,604	621,380
Utilities	91,979	88,939
Rentals	17,738	16,899
Maintenance	68,477	99,552
Postage and related services	553,724	337,894
Printing	121,430	112,322
Insurance	195,171	195,498
Miscellaneous services	173,737	233,914
Telecommunications	22,318	25,430
Computer services	31,419	77,775
Supplies	25,314	24,421
Depreciation	2,055,970	2,181,001
Travel	47,500	8,418
Dues and subscriptions	135,220	116,794
Miscellaneous commodities	51,400	46,256
Office systems and equipment	2,604,647	890,111
Compensated absences	207,211	482,018
Total	$ 16,483,579	$ 14,121,414

See accompanying independent auditor's report.

Schedule of Professional Services and Contracts
For the Year Ended June 30, 2023 and 2022

	Nature of Service	2023	2022
Cavanaugh Macdonald Consulting	Actuarial	$ 237,871	$ 282,964
Blue & Co.	Auditing	96,720	102,184
Milliman	Auditing	54,200	
Ice Miller	Attorney	9,239	79,808
Stoll Keenon and Ogden	Attorney	12,137	8,240
Williams & Jensen	Attorney	45,000	26,250
Wyatt, Tarrant & Combs	Attorney	9,437	19,365
Other	Attorney		569
MulloyBorland	Communications	102,000	102,000
Total		$ 566,604	$ 621,380

See accompanying independent auditor's report.

Schedule of Contracted Investment Management Expenses
Year Ended June 30, 2023

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity managers	$ 19,128,270	$ 544,385	$ 32,157	$ 19,704,812
Fixed income managers	534,711			534,711
Real estate	16,538,710	2,285,720	115,600	18,940,030
Additional categories	10,261,835	1,567,032	1,788	11,830,655
Alternative investments	26,148,410	3,477,929	76,086	29,702,425
Custodian	676,584	186,517	46,130	909,231
Consultant	493,850			493,850
Legal and research	269,676			269,676
Other (administrative and operational)	4,841,797	346,017	13,393	5,201,207
Total	$ 78,893,843	$ 8,407,600	$ 285,154	$ 87,586,597

* 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, 2022

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity managers	$ 21,571,603	$ 834,290	$ 39,454	$ 22,445,346
Fixed income managers	653,519			653,519
Real estate	13,579,018	1,737,052	66,907	15,382,977
Additional categories	7,262,039	1,379,698	1,901	8,643,639
Alternative investments	15,754,621	1,980,745	58,462	17,793,829
Custodian	705,535	143,029	42,569	891,132
Consultant	468,850			468,850
Legal and research	102,691			102,691
Other (administrative and operational)	3,874,572	425,142	292,778	4,592,492
Total	$ 63,972,448	$ 6,499,956	$ 502,071	$ 70,974,475

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

CPAs / ADVISORS

blue

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INDEPENDENT AUDITORS 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*

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, 2023, 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 15, 2023.

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 or significant deficiencies may exist that have not been identified.

Report on 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 15, 2023

Investment Section

Report on Investment Activity

This report is prepared by the investment staff of the Teachers' Retirement System of the State of Kentucky (TRS).

The basis of presentation for this section is data made available through Broadridge Investment Accounting systems, the Bank of New York Mellon and Segal Marco Advisors. Rates of return are time-weighted and are gross of fees unless otherwise indicated. Returns of periods longer than one year are annualized.

Investment Committee

Hollis Gritton
Chair

Brenda McGown
Vice Chair

John Boardman, III
Member

Paul Bruce
Member

Ben Littlepage
Member

Louis Straub
Member

Josh Underwood
Member

Bevis Longstreth
Investment Adviser to TRS
Kentucky Investment Committee

George Philip
Investment Adviser to TRS
Kentucky Investment Committee

Executive Investment Staff

Gary L. Harbin, CPA
Executive Secretary

Tom Siderewicz, CFA
Chief Investment Officer

Philip L. Webb
Director of Investment Accounting

Consultant's Letter

October 1, 2023

To the members of the Board of Trustees and participants of the Teachers' Retirement System of Kentucky:

The Teachers' Retirement System of Kentucky (TRS) investment program produced a total return of 10.6% for the fiscal year ended June 30, 2023, but lagged the return of the Policy Benchmark by 1.4 percentage points. On an absolute basis, the public equity portfolio contributed to results as high interest rate concerns subsided and inflation slowed over the past 12 months. The relative performance was mainly driven by the overweight to the real estate allocation relative to policy and private equity portfolio's performance relative to its benchmark (i.e., public equity market proxy plus a premium). Despite the short-term underperformance, the investment program has outperformed its Policy Benchmark and ranked near the top of a universe of public pensions with assets greater than $1 billion, over the trailing 10-year period (11th percentile ranking).

Over the past fiscal year, the equity markets performed well as inflation slowed across major economies. Inflation, as measured by the Consumer Price Index, rose by 3% annually in June 2023, which was down from the 9.1% recorded in June 2022. Within the global equity market, growth stocks significantly outperformed value stocks as economically sensitive sectors such as technology and consumer discretionary stocks performed strongly over the past 12 months. The TRS U.S. equity portfolio advanced 19.1% for the fiscal year but slightly underperformed its benchmark by 10 basis points due to the mixed performance from growth- and value-oriented strategies. Baillie Gifford U.S. Equity Growth, a growth-oriented strategy, outperformed its benchmark, while Todd Large Cap, a value-oriented equity strategy, underperformed its benchmark for the fiscal year. The international equity component returned 14.9% over the fiscal year, outperforming its benchmark by 1.6 percentage points.

In the bond market, the 10-year U.S. Treasury yield ended the fiscal year at 3.81%, 92 basis points higher than the beginning of the fiscal year. To combat elevated inflation, the U.S. Federal Reserve increased its benchmark interest rate by 3.5% over the past fiscal year. The rise in interest rates resulted in a return of -0.3% for the fixed income portfolio, which outperformed the Bloomberg U.S. Government/Credit Index by approximately 40 basis points for the fiscal year. The additional categories asset class, which is generally comprised of alternative fixed income, private credit and below investment grade bonds, produced a positive return of 4.3% for the fiscal year as credit spreads tightened.

The real estate market struggled during the fiscal year due to an increase in the cost of debt. TRS's real estate allocation returned -0.1% in the fiscal year but outperformed its benchmark by 4.8 percentage points. Over the past 10 years, TRS has diversified its alternatives portfolio across different private equity and infrastructure strategies, resulting in a fiscal year return of 3.1% on a time-weighted basis.

We would like to thank the Board of Trustees, Investment Committee, and Investment Staff for their confidence. We appreciate the opportunity to assist TRS in meeting its investment goals.

Respectfully,

Patrick J. Kelly

Brandon Patterson

Patrick J. Kelly, CFA, CAIA
Partner

Brandon J. Patterson, CAIA
Associate Partner

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Investment advice and consulting services provided by Aon Investments USA Inc.

Retirement Annuity Trust

Investment Policy Summary

The TRS Board of Trustees has a statutory obligation under KRS 161.430 to invest the members' assets in a manner consistent with the fiduciary standards set forth in the prudent person rule. Consistent with this statute, 102 Kentucky Administrative Regulation (KAR) 1:175 establishes investment policies for this trust. In conjunction with these standards, the board has recognized certain principles that guide investment-related decisions. First, the board will preserve the long-term corpus of the fund. Second, the board will seek to maximize total investment return within prudent risk parameters. Third, the board will act in the exclusive interest of the members and beneficiaries of the system. This broad summary is a reference point for management of retirement assets and outlines the investment philosophy and practice of TRS.

Investment Objectives

TRS invests the members' funds in several diverse classes of assets, including equities, bonds and real estate. This diversification helps us earn the highest possible long-term rate of return within appropriate risk levels. In turn, this enables TRS to pay guaranteed benefits to members and their beneficiaries at the lowest possible cost to participating employers and taxpayers. Generally, the retirement system's liabilities will not be paid for as many as 30 to 40 years. Therefore, as a long-term investor, TRS holdings can withstand some short-term volatility. The Retirement Annuity Trust's long-term investment objective is to achieve an annualized rate of return of 7.1%.

Risk Controls

The TRS investment program faces various risks; however, the primary risk to TRS is that the assets will not support liabilities over long periods of time. In order to control this risk and any other risks, the board has taken the following steps on an ongoing basis:

- Actuarial valuations are performed each year to evaluate the funding objectives of TRS. In addition, every 10 years an external audit of the actuary is conducted to ensure that the assumptions made and calculation methods used are resulting in properly computed liabilities of the system. Also, every two years, the actuary conducts a review of economic assumptions and incorporates any changes into valuations.
- Asset-liability modeling studies are conducted approximately every five years. These studies ensure that the portfolio design is structured to meet the liabilities of TRS.
- In accordance with 102 KAR 1:175, the Investment Committee adopts and regularly reviews detailed investment strategies for implementation of the investment policy.

Asset Allocation

Operating within relevant regulatory limitations, TRS's investment consultant annually presents for approval to the Investment Committee target percentages and ranges for the system's various asset classes. These regulatory limitations include both the Retirement Annuity Trust and the Life Insurance Trust. Annually approved asset allocation parameters serve to balance TRS's liquidity requirements, volatility tolerance and return requirements to meet both short-term and long-term obligations. TRS's assets are diversified across a variety of asset classes, investment management styles and individual securities in order to reduce volatility and enhance the potential of the investment portfolio to achieve the system's long-term goals.

Asset allocation decisions for pension plans are dependent on the unique characteristics of a particular plan. Factors such as liability requirements, the level of funding and statutory investment restrictions are considerations within the context of the asset allocation decision-making process. Consequently, asset allocations may differ between various pension plans due to their unique circumstances.

The information that follows shows the system's asset allocation by fair value for the Retirement Annuity Trust and the Life Insurance Trust as of June 30, 2023, and June 30, 2022, as well as the target and strategic range for each asset class for fiscal 2023.

Retirement Annuity Trust

	June 30, 2023*	Percent	June 30, 2022**	Percent
Cash equivalents***	$ 210,929,901	0.9	418,588,882	1.9
Fixed income	3,121,066,788	13.0	3,697,099,774	16.4
Domestic equity	9,877,444,011	41.3	8,408,434,038	37.5
International equity	4,567,321,913	19.1	3,965,562,156	17.7
Real estate	1,777,282,982	7.4	1,693,627,935	7.6
Private equity	1,915,329,613	8.0	1,808,795,204	8.1
Timberland	485,158,413	2.0	483,469,603	2.1
Additional categories	1,978,990,604	8.3	1,950,569,832	8.7
Totals	$ 23,933,524,225	100	$ 22,426,147,424	100

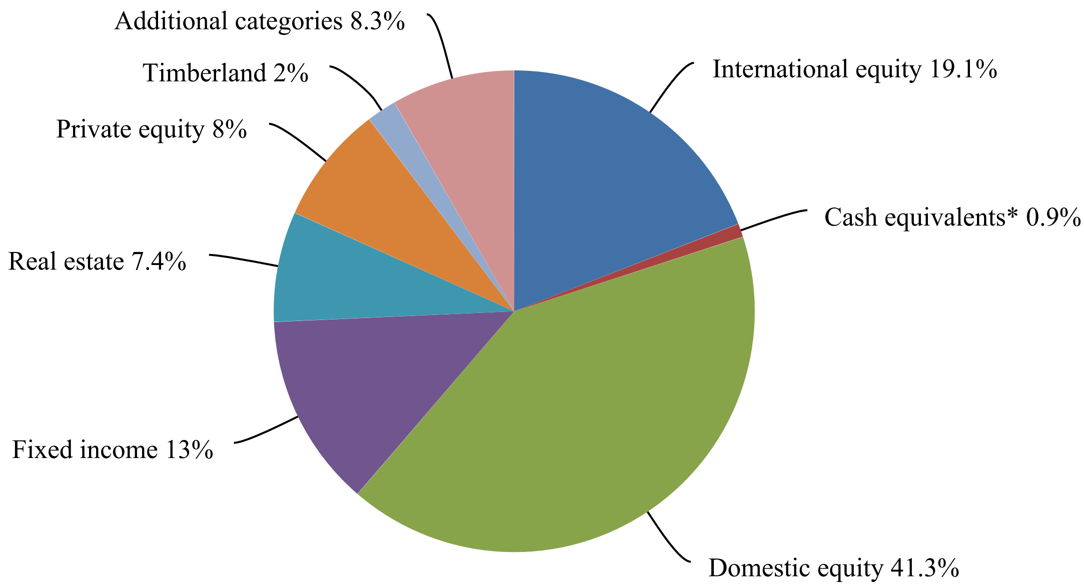
* Includes Tax Shelter Annuity value of $312,005
** Includes Tax Shelter Annuity value of $303,859
*** Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Life Insurance Trust

	June 30, 2023	Percent	June 30, 2022	Percent
Cash equivalents*	704,838	0.7	1,740,624	2.0
Fixed income	21,733,703	23.3	21,754,900	24.8
Domestic equity	37,386,108	40.0	33,692,712	38.4
International equity	19,221,343	20.6	16,995,009	19.3
Real estate	6,513,394	7.0	7,489,602	8.5
Alternative investments	4,921,166	5.3	3,283,908	3.7
Additional categories	2,944,300	3.1	2,909,483	3.3
Totals	$ 93,424,852	100	$ 87,866,238	100

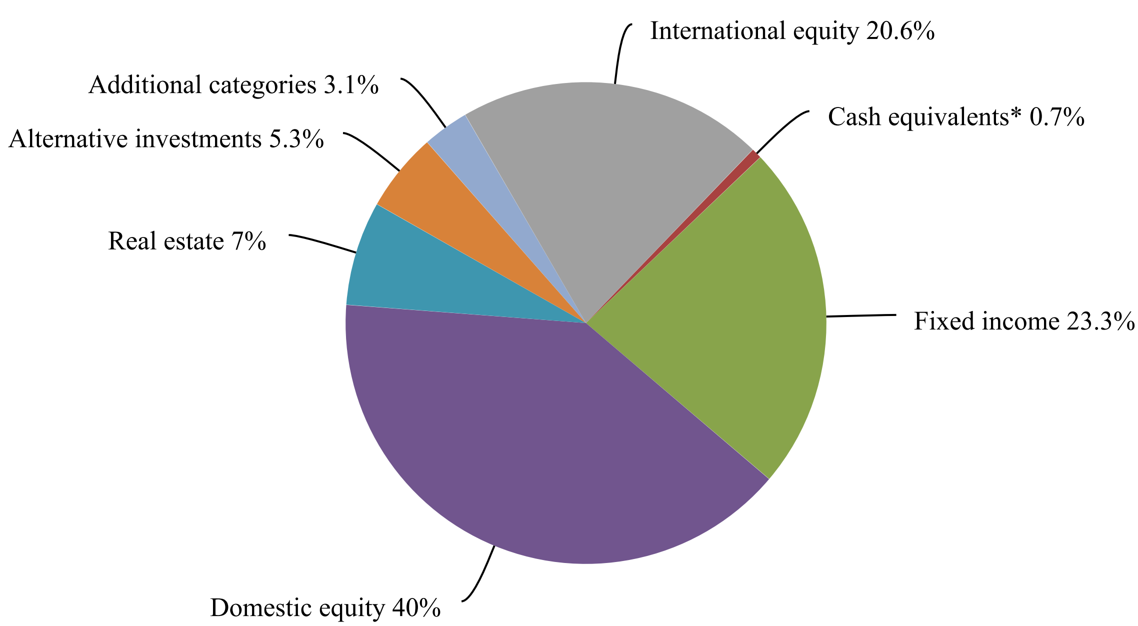
* Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Retirement Annuity Trust
Distribution of Investments — Fair Value as of June 30, 2023



* Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in asset class of the respective managers.

Life Insurance Trust
Distribution of Investments — Fair Value as of June 30, 2023



* Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in asset class of the respective managers.

Retirement Annuity Trust
Asset Class Strategic Weighting by Fair Value

	Regulatory Limits	Strategic Range	Target	June 30, 2023
Cash equivalents*		1-5%	2%	0.9%
Fixed income		8-22	15	13.0
Government/agency/other	Unlimited			7.6
Corporate	35%			5.4
Equity	65%	53-65	62	60.4
Domestic large cap		30-40	35	36.0
Domestic mid cap		1-5	3	3.2
Domestic small cap		1-3	2	2.1
International****	30%	16-27	22	19.1
Real estate	10%	4-10	7	7.4
Alternative investments**	10%	4-10	7	8.0
Additional categories***	15%	4-15	7	10.3
Total			100%	100%

* Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

** Includes private equity

*** Includes timberland

**** As of June 30, 2023, 22.1% of total international equity was invested in emerging markets.

Life Insurance Trust
Asset Class Strategic Weighting by Fair Value

	Strategic Range	Target	June 30, 2023
Cash equivalents	0-10%	2%	0.7%
Fixed income	15-25%	18	23.3
Equity	52-65%	63	60.6
Domestic large cap	34-45%	40	33.8
Domestic mid cap			4.9
Domestic small cap			1.3
International	18-28%	23	20.6
Real estate	0-9%	6	7.0
Alternative investments	0-8%	5	5.3
Additional categories	0-10%	6	3.1
Total		100%	100.0%

Portfolio Results

The Retirement Annuity Trust returns were generated by the Segal Marco Advisors performance reporting system using a time-weighted rate of return calculation based upon fair value. For the fiscal year, the Retirement Annuity Trust portfolio generated a total return of 10.61%, trailing the policy benchmark return of 11.8%. Domestic equity rose 19.04% versus 19.24% for the Standard & Poor's 1500 Index, while international equity rose 14.9% versus 13.33% for the MSCI All Country World ex-U.S. Index. Fixed income investments fell 0.32% versus a 0.7% decline for the Bloomberg Barclay's U.S. Government/Credit Index. Less traditional asset classes such as real estate, private equity, timberland and alternative credit are beginning to contribute meaningfully to total return as those programs are expanded.

General partner profit sharing, known as carried interest, for the Retirement Annuity Trust for fiscal year 2023 was a $14.6 million decline, consisting by asset class of $1.6 million in private equity, a decline of $17 million in private real estate and $800,000 in private credit.

General partner profit sharing, known as carried interest, for the Life Insurance Trust for fiscal year 2023 was $35,900, consisting by asset class of $67,700 in private equity and a decline of $31,800 in private credit.

The tables below detail historical performance for the Retirement Annuity Trust and the Life Insurance Trust and their component asset classes for the period ended June 30, 2023.

Retirement Annuity Trust
Schedule of Investment Results — Gross

	1-Year	3-Year*	5-Year*	10-Year*	20-Year*
Total plan	**10.61**	**8.68**	**7.54**	**8.49**	**7.45**
Policy benchmark**	11.80	9.32	7.91	8.44	
Equity	**17.7**	**11.07**	**8.64**	**10.26**	**8.69**
Domestic equity	**19.04**	**13.83**	**10.86**	**12.14**	**9.90**
S&P 1500 Index	19.24	14.67	11.83	12.61	10.13
All cap equity	**23.09**	**17.23**	**13.64**		
Russell 3000 Index	18.95	13.89	11.39		
Large cap equity	**19.66**	**14.00**	**11.45**	**12.39**	
S&P 500 Index	19.59	14.60	12.31	12.86	
Mid cap equity	**14.52**	**10.31**	**6.68**	**10.39**	
S&P 400 Index	17.61	15.44	7.79	10.21	
Small cap equity	**11.84**	**13.17**	**5.49**	**9.84**	
S&P 600 Index	9.75	15.19	5.22	9.81	
International equity	**14.90**	**5.56**	**4.31**	**6.35**	
MSCI AC World ex U.S. Index	13.33	7.75	4.01	5.24	
Fixed income	**-0.32**	**-3.67**	**1.40**	**2.09**	**3.65**
Bloomberg Barclay's U.S. Government/Credit Index	-0.70	-4.11	1.03	1.66	3.03
Total real estate	**-0.13**	**10.60**	**9.00**	**10.16**	**8.83**
In-house real estate equity	**5.59**	**4.5**	**4.85**	**7.19**	**8.03**
CPI plus 2%	5.15	7.86	5.97	4.77	4.62
Core real estate	**-0.36**	**10.91**	**9.55**	**10.57**	
NCREIF ODCE Index (VW)	-9.97	7.99	6.50	8.74	
Non-core real estate	**-3.98**	**16.49**	**12.59**	**14.48**	
NCREIF Property Index	-6.60	6.79	5.90	7.82	
Alternative investments					
Private equity	**2.48**	**21.65**	**15.10**	**14.24**	
Mature private equity	**2.47**	**21.22**	**13.79**	**12.51**	
S&P 500 Index plus 3%	23.18	18.04	15.68	16.25	
Private equity < 5 years	**4.06**	**25.02**	**17.69**		
Timberland	**5.31**	**3.00**	**3.29**	**3.25**	
NCREIF Timberland Index	11.13	8.67	5.80	5.90	
Additional categories	**4.28**	**6.05**	**4.52**	**4.67**	
BofA Merrill Lynch U.S. High Yield Master II Index	8.87	3.20	3.17	4.33	
Cash (unallocated)	**3.45**	**1.27**	**1.47**	**0.97**	**1.68**
90-day Treasury Bill	3.59	1.27	1.55	0.97	1.32
Total 30-year trust return*	**7.71**				

* Rates of return are time-weighted based upon fair value. Returns are annualized for periods longer than one year.

** Overall fund performance is compared to a board-approved benchmark, first established in July 2008, that represents the returns of appropriate benchmarks for the various asset classes weighted by the midpoint of the strategic range for the current fiscal year.

Life Insurance Trust
Schedule of Investment Results — Gross

	1-Year	3-Year*	5-Year*
Total plan	**10.45**	**6.70**	**6.68**
Policy benchmark **	10.81	8.79	7.76
Total equity	**17.64**	**9.67**	**8.33**
Domestic equity	**20.09**	**11.63**	**10.88**
S&P 1500 Index	19.24	14.67	11.83
International equity	**13.14**	**6.04**	**3.39**
MSCI AC World Ex US	13.33	7.75	4.01
Fixed income	**-0.77**	**-2.92**	**1.94**
Barclay's Govt./Credit Index	-0.70	-4.11	1.03
Real estate	**1.59**	**14.92**	**13.07**
Core real estate	**2.11**	**14.93**	**13.09**
NCREIF ODCE (VW)	-9.97	7.99	6.5
Non-core real estate	**-0.91**	**16.03**	
NCREIF Property Index	-6.6	6.79	
Private equity < 5 years	**5.81**	**22.34**	
Additional categories:	**-1.29**	**6.81**	**4.35**
B of A Merrill Lynch High Yield Master II	8.87	3.20	3.17
Cash (Unallocated)	**3.76**	**1.43**	**1.54**
90-day Treasury Bill	3.59	1.27	1.55

* Rates of return are time-weighted based upon fair value. Returns are annualized for periods longer than one year.

** Overall fund performance is compared to a board-approved benchmark that represents the returns of appropriate benchmarks for the various asset classes weighted by the midpoint of the strategic range for the current fiscal year.

Retirement Annuity Trust
Schedule of Investment Results — Net of Investment Fees and Expenses

2023	10.24 %
2022	-10.91
2021	29.57
2020	5.47
2019	5.56
2018	10.50
2017	15.00
2016	-1.32
2015	4.96
2014	17.95

Life Insurance Trust
Schedule of Investment Results — Net of Investment Fees and Expenses

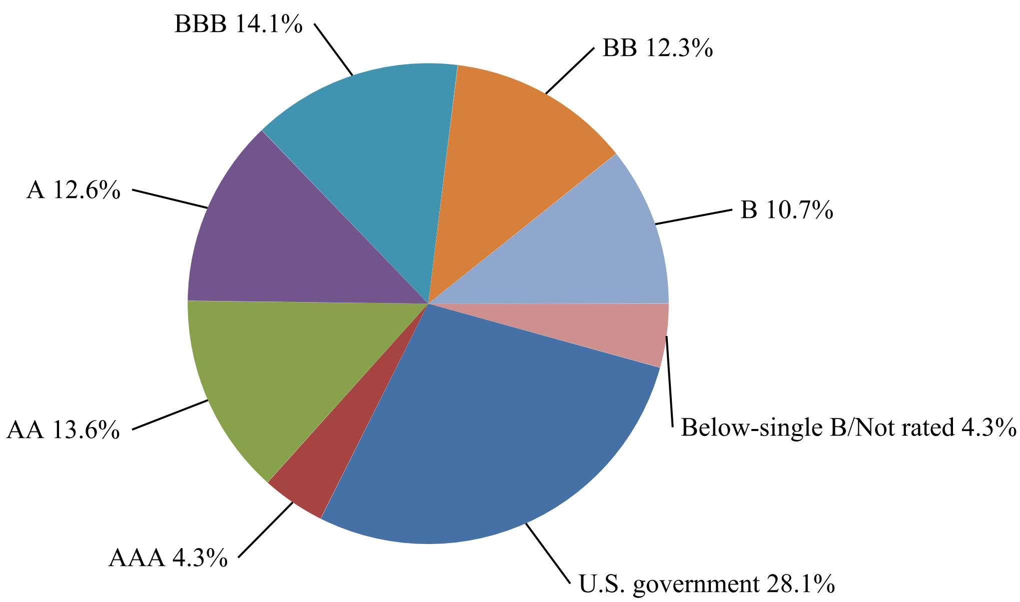
2023	9.63%
2022	-14.96
2021	28.16
2020	6.32
2019	6.49

Fixed Income Investments
As of June 30, 2023, the Retirement Annuity Trust had about $3.1 billion in fixed income, which is 13% of total assets. The fund's fixed income investments as of June 30, 2023, maintained the average investment grade rating required by administrative regulation.

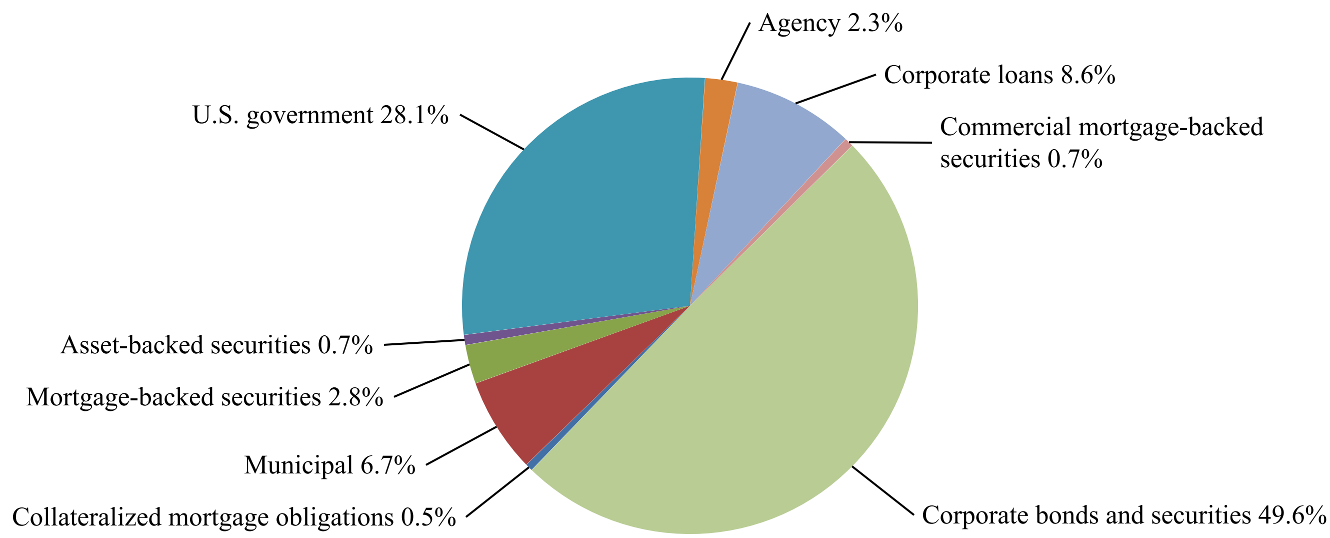
In addition, the trust had $1.98 billion, which is 8.3% of total assets, in other debt-related investments under a regulatory provision that allows for up to 15% of assets in additional categories approved by the board. Investments under this authorization included four high-yield bond portfolios and two syndicated bank loan portfolios. Several alternative credit portfolios also are under this additional categories provision, including distressed-debt and specialty-lending funds and a multiple strategy opportunistic credit portfolio.

The credit quality distribution for the annuity trust is illustrated below. This chart includes fixed income as well as the high-yield bonds, alternative credit portfolios and the syndicated bank loan portfolios that are included in additional categories. Also illustrated below is the distribution of fixed income assets by sector.

Fixed Income Quality Distribution By Rating



Fixed Income Sector Distribution



Fixed Income Market Overview

The Retirement Annuity Trust's investment-grade fixed income portfolios declined 0.32% for the year ended June 30, 2023. This compared favorably to the trust's fixed income benchmark, the Bloomberg Barclays U.S. Government/Credit Index, which fell 0.7%. The outperformance was driven by TRS's overweighting in corporate bonds, which provided a higher coupon than government bonds of similar duration. Interest rate sensitive investments performed poorly in the fiscal year's final quarter as increasing interest rates drove Treasury prices down.

The Fed continued its hawkish monetary stance, raising the federal funds rate 0.25% in May while pausing in June. The Fed funds target range ended the fiscal year at 5% to 5.25%. The Fed continued to be data dependent as strong labor market indicators contrasted with weak manufacturing surveys. Tightening monetary policy to slow consumer price increases extended beyond the United States, as major central banks such as Bank of England, Bank of Canada and the European Central Bank all have taken significant steps to tighten policy. With the Fed's approach, year-over-year consumer price increases moderated from more than 9% to just under 3% over the course of the fiscal year.

The U.S. Treasury curve continued to be volatile as the final quarter marked a year of yield curve inversion as measured by the spread of the 10-year Treasury over two-year Treasury. The two-year closed the quarter at 4.9% up 1.95% for the fiscal year while the 10-year closed at 3.84%, up 0.83% for the year. In contrast to the inverted Treasury curve, credit spreads tightened, with investment grade corporates coming in by 0.19% during the year to 1.89% over Treasurys. The narrowing of credit risk premiums is viewed generally as an indication of a favorable business climate.

The fiscal year started poorly for fixed income investors as the first quarter saw the continuation of declines seen in prior quarters. The 10-year U.S. Treasury yields rose 0.85% to 3.83%. The Federal funds rate increased 0.75% twice during the quarter, as the Fed continued to respond to consumer price pressures. However, long-term rates remained anchored by expectations for an eventual curbing of inflation and the risk of recession. The Bloomberg U.S. Aggregate Bond Index ended the quarter with a 4.8% decline. Despite a rebound of 1.9% in the second quarter, the Bloomberg U.S. Aggregate Index finished down 13% for the previous year, the index's most negative calendar year ever.

In the third quarter, declining yields across Treasury notes and bonds produced a tailwind for fixed income markets, as the Bloomberg U.S. Aggregate Bond experienced its best quarter in three years returning 3%. However, volatility from earlier quarters continued into the third quarter as the Fed maintained its focus on fighting inflation, despite multiple bank failures and other signs of potential economic weakness. After initially declining in January, intermediate and long-term Treasury yields rose in February before falling again in March, ending the wild quarter at least 0.3% lower on all Treasury maturities between two years and 30 years. Corporate credit rallied to start the year amid expectations for a more dovish Fed. The optimism proved to be short-lived, however, as the banking crisis pushed spreads wider again in March. Nevertheless, corporate credit was resilient over the quarter, boosted by already higher yields and the rally in Treasurys. The Bloomberg U.S. Credit Index returned 3.5% in the quarter.

The Bloomberg U.S. Aggregate Bond fell 0.8% in final quarter. One trend observed in earlier quarters persisted, with lower rated bonds delivering better performance. The Bloomberg U.S. Corporate Investment Grade Index declined 0.3% in the quarter, lagging the Bloomberg U.S. Corporate High Yield Index return of 1.7%.

Equity Investments

As of June 30, 2023, the Retirement Annuity Trust's public equity investments had a fair value of $14.4 billion, representing 60.4% of total assets. The trust's U.S. equity portfolio returned 19.04% for the year and underperformed its policy benchmark by 0.2 percentage points. The annuity trust divides its public equity into two broad categories: domestic and international.

The domestic portfolio had a fair value of $9.3 billion as of June 30, 2023, representing 39% of assets. The benchmark for the domestic portfolio is the Standard & Poor's (S&P) 1500. The S&P 1500 consists of three well-known component indices based upon market capitalization: the S&P 500 Large Cap, the S&P 400 Mid Cap, and the S&P 600 Small Cap. Thirteen portfolios comprise the trust's domestic equity holdings. Three are internal passively managed index portfolios benchmarked to the S&P 400, S&P 500 and S&P 600. The other 10 are managed externally by six different asset managers, with each portfolio representing a specific strategy and measured against an appropriate benchmark. The collective array of portfolios provides diversification by market capitalization, manager, style and strategy.

The fair value of the international equity holdings as of June 30, 2023, was $5.1 billion, representing 21.4% of assets. The Retirement Annuity Trust's international equity portfolio returned 14.9%, a 1.57 percentage point outperformance of its policy benchmark, the MSCI All Country World ex-U.S. Index that represents the markets of 22 developed countries and 24 emerging market countries. Five external asset managers manage the Retirement Annuity Trust's six international equity portfolios, one of which is a passively managed international index fund.

Equity Investments Overview

In the fiscal year's first quarter, inflation remained a prominent concern for investors. Initially, an optimistic outlook on inflation led to strong gains for risk assets. However, investor sentiment shifted as the quarter progressed, largely due to comments made by members of the Federal Open Market Committee (FOMC). These comments reinforced their commitment to reduce inflation, as measured by the Consumer Price Index (CPI), from its peak of 9.1% in June 2022 back to the committee's target of 2%. Speaking during the quarter, Fed Chairman Jerome Powell emphasized the need to avoid prolonged inflation as seen in the 1970s and 1980s and vowed to take "forceful and rapid steps to moderate demand." As a result, the effective federal funds rate increased by 1.5 percentage points to 3.08%, causing the global equity market to fall by 6.8%. In the quarter, CPI decreased to 8.2% from 9.1%, and the Producer Price Index decreased to 11.5% from 18.3%, although both indexes remained well above their 10-year averages of 2.35% and 2.5%, respectively. The unemployment rate improved slightly, decreasing to 3.5% from the previous quarter's 3.6%. The S&P 500 declined 4.9%, with positive returns observed only in the consumer discretionary and energy sectors. Most size and style groups saw negative returns, except for small-cap growth stocks. On the international front, the MSCI EAFE Index declined by 9.4%, and emerging markets fell 11.6%. Commodity markets experienced slight declines due to negative perceptions of growth. The U.S. Dollar Total Weighted Index appreciated.

During the second quarter, investor attention remained fixed on the state of the economy. U.S. gross domestic product (GDP) growth for calendar year 2022 was 2.1% while estimates for 2023 averaged only 0.7%. Some economists predicted a global recession, citing potential drivers such as tighter monetary policy, persistent inflation, supply chain disruptions and energy shortages in Europe. Indicators of an economic slowdown included an inverted yield curve and both the manufacturing and services ISM Purchasing Managers Index (PMI) below 50, signaling a contraction. Nonetheless, the unemployment rate remained at only 3.5%. Inflation declined throughout the quarter and ended the second quarter at 6.5%, marking the lowest reading in more than a year. The FOMC began to moderate its rate hikes, with only a 0.5% increase in the quarter compared to the four previous 0.75% hikes, and the federal funds rate ended the quarter at 4.5%. The S&P 500 gained 7.6% in the quarter, with energy and utilities being the only sectors that had positive returns for the calendar year. Internationally, the MSCI EAFE gained 17.3%, while emerging markets saw an increase of 9.7%. In Asia, the Bank of Japan raised its policy interest rate from 0.25% to 0.5%, surprising observers given their prior accommodative stance. Concerns in China about social unrest and political power consolidation added a note of caution. The U.S. Dollar Total Weighted Index depreciated.

In the third quarter, broad equity market indexes posted positive results despite the volatility caused by bank failures. These included Silicon Valley Bank, Signature Bank and, eventually, First Republic, the latter two of which at the time represented the second- and third-largest bank failures in U.S. history, respectively. However, both moderating inflation and a renewed focus on growth-oriented policies in China improved sentiment in equity markets. The S&P 500 gained 7.5% with growth equity providing positive returns while value and small cap depreciated sharply due to higher exposure to the failed banks. The Russell 1000 Index finished the quarter up 7.5% while the Russell 2000 was up 2.7%. CPI reported 6% inflation year-over-year in February and 5% in March. The FOMC increased the target federal funds rate by 0.25% to 4.75% to 5%, indicating its continued focus on combating inflation. Labor markets showed that payroll growth was higher in February but moderated in March. Recessionary risks remained a concern, with the manufacturing ISM PMI finishing the quarter at 46.3%. Internationally, developed markets showed a strong quarter with the MSCI EAFE returning 8.5%, outperforming U.S. markets. The International Monetary Fund (IMF) revised its global GDP growth forecast to 2.8% for the third quarter from 2.9%. Its estimate showed developing economies growing faster than advanced economies. The IMF forecasted continued banking sector stress, leading to further tightening of global financial conditions and lower global GDP growth of 2.5% for calendar 2023 — with developed economies sinking to 1% growth. The IMF estimated global inflation would moderate to 7% in calendar 2023, a decline from 8.7% in calendar 2022. The U.S. Dollar Total Weighted Index depreciated.

During the fourth quarter, CPI was 3% year-over-year, the lowest level since March 2021. The unemployment rate increased to 3.6% from 3.5% in the previous quarter, and the labor force participation rate remained steady at 62.6%, still lower than pre-pandemic levels. Wage growth was 4.4% year-over-year, coming in above expectations. U.S. equity markets delivered strong results for the fourth quarter, driven by the largest growth equity and bank earnings. The S&P 500 increased by 8.7% with growth equity outperforming value and large-cap equity outperforming small-cap. With the Federal Reserve holding the target federal funds rate steady in June while central banks of other advanced economies increased rates, the U.S. dollar weakened against most developed currencies near the end of the quarter. Internationally, developed equity underperformed U.S. equity with the MSCI EAFE returning 3%. Investors waited on China's economic rebound, which remained lackluster relative to expectations although China had released plans to provide stimulus and support for its economy. Meanwhile, more investors began to view India and other Southeast Asian countries as the region's growth drivers. The 2023 Global Economic Prospects report by the World Bank forecasted subdued global GDP growth of 2.1% in calendar 2023 and 2.4% in 2024. The drag on growth included tightening financial conditions and expected declines in overall demand due to continued elevated inflation. The expected GDP growth rate for developed economies was estimated to be 0.7% in 2023, while growth in emerging economies was 4%.

In summary, the U.S. equity markets struggled at the beginning of the fiscal year as the Fed took a forceful stance to moderate high inflation – 9.1% at its peak in June 2022 – by increasing the target federal funds rate. Inflation declined throughout the second quarter and ended at 6.5%, and, as a result, the FOMC moderated its rate hikes to 0.5% increases from 0.75% hikes. The effective federal funds rate ended at 4.5%, up from 1.58% at the beginning of the fiscal year. The unemployment rate remained a positive at 3.5%, while the S&P 500 gained 7.6% in the fiscal year's second quarter and had similar gains in the third quarter – despite an inverted yield curve, economists' predictions of a recession and bank failures. Inflation decreased further in the third quarter and finally hit its lowest level in more than two years at 3% in the final quarter. The Fed increased its target rate to 5% to5.25%. The U.S. equity markets continued to rise, leading to a 19.6% increase for the S&P 500 in the fiscal year. Internationally, developed markets returned slightly less than the U.S. market while largely outperforming emerging markets.

Real Estate

The Retirement Annuity Trust's real estate investments had a fair value of $1.78 billion as of June 30, 2023, representing 7.4% of total assets. The trust's real estate investments seek to provide attractive long-term returns, generate reliable cash flow and provide diversification, thereby reducing volatility in the overall portfolio. TRS's real estate portfolio showed positive returns versus its benchmarks for the fiscal year in each of its respective categories despite underperforming last year's results year over year. The In-House Real Estate Equity Fund returned 5.59%, beating its benchmark, the Consumer Price Index plus 2%, that returned 5.15%. Core funds declined 0.36% to best the NCREIF ODCE's decline of 9.97%. TRS's non-core funds fell 3.98%, also beating the NCREIF Property Index's (NPI) 6.6% decline. TRS's combined real estate investments yielded an essentially flat decline of 0.13% for the fiscal year compared to the previous year's 26.93% gain.

The trust's real estate exposure is provided through 23 portfolios. The fund maintains an internally managed portfolio of directly owned properties under long-term leases with high-credit quality tenants. TRS Kentucky also is invested in three commingled, evergreen core real estate funds. Two are managed by Prudential Real Estate Investors (PRISA) and TA Realty (TA Core Property Fund). These funds are core real estate equity funds, which invest primarily in existing, income-producing properties with strong cash flows and the potential for capital appreciation. The third is invested in Carlyle Property Investors, a core-plus commingled fund. The funds are diversified across several property types, including office, retail, industrial, apartment, self-storage and hotel.

Additionally, the annuity trust is invested in 19 real estate limited partnerships: Carlyle Realty Partners VI, Carlyle Realty Partners VII, Carlyle Realty Partners VIII, Carlyle Realty Partners IX, Blackstone Real Estate Partners VII, Blackstone Real Estate Partners VIII, Blackstone Real Estate Partners IX, Blackstone Real Estate Partners X, Rockwood Capital Real Estate IX, Rockwood Capital Real Estate X, Rockwood Capital Real Estate XI, TA Realty Associates X, TA Realty Associates XI, TA Realty Associates XII, AG Net Lease Realty III, AG Net Lease Realty IV, Angelo Gordon Realty Value XI, Landmark Real Estate Partners VII and Landmark Real Estate Partners VIII.

Real Estate Overview

U.S. real estate fundamentals remained relatively strong during the fiscal year despite moderating from the post-pandemic highs reached in 2021. Except for the office sector, most real estate sectors saw continued, if tempered, rent growth and tailwinds for continued demand.

The U.S. industrial market saw another strong year despite some challenges. Key fundamentals remained healthy even as elevated levels of new supply coincided with slower demand. The national vacancy rate increased moderately to 4.6%, still more than 2.5% below the 20-year average. A total of 108 million square feet (msf) of new space was added during the fiscal year's final quarter, near a three-decade high, but was met with a notable deceleration in demand. Net absorption in the final quarter was 30% below pre-pandemic levels as some retailers paused inventory accumulation out of caution over the economic outlook.

Rent growth continued to be strong and held near 9%.

U.S. multifamily saw demand improve in the last half of fiscal 2023, which was an improvement from late calendar 2022 when renter household formation slowed as consumer confidence waned in response to peak levels of inflation. Annual rent growth fell below pre-pandemic levels to 1.2%, a deceleration from 3.8% at calendar year-end 2022.

The office market downturn deepened. The first half of the year added an additional 40 msf to the 140 msf net absorption lost since the end of 2019, driving the vacancy rate beyond the peak reached during the Great Recession to a record 13.2%. Even as the economy outperforms expectations, office tenants are using less space. Slow return-to-office policies have driven the occupied square foot per employee 8% below its pre-pandemic level and the average size of a lease signed in the final fiscal quarter was 20% lower than pre-pandemic norms.

U.S. retail property fundamentals continued to show resilience. Strong retail sales coupled with several years of closures of underperforming stores have driven greater efficiency for retail space across the country. The quarter ended Dec. 31, 2022, marked the ninth straight quarter of positive net absorption following the pandemic-related declines in 2020. Neighborhood centers anchored by necessity-based retailers continued to show the strongest rent gains, at 4.7% year-over-year.

Retail performance continued to be aided by a limited amount of construction activity. Only 50 msf of new retail space was delivered over the past year, 35% less than the pre-pandemic average, and nearly 80% was leased at delivery. The combination of solid demand and limited new supply has kept vacancy rates low. The vacancy rate held steady at 4.2% as calendar 2022 closed, the lowest rate recorded since 2018 and 0.7% below year-end 2021.

Alternative Investments

As of June 30, 2023, the Retirement Annuity Trust's alternatives portfolio of private equity investments had a fair value of $1.915 billion, representing 8% of the trust's assets.

Private Equity

The annuity trust has exposure to venture, buyout, infrastructure, energy, mezzanine and several other private equity sectors via participation in limited partnerships as well as investments in funds of funds. The trust has a robust private equity investment program, which is intended to continue growing with a disciplined plan of commitments each year. The trust looks to diversify its private equity portfolio by manager, country, strategy and vintage year. Vintage year diversification is achieved with disciplined levels of commitments over time. A commitment to any given partnership shall not exceed 20% of the partnership's total commitments.

The board, Investment Committee and staff understand that private equity investments (along with many other forms of alternative assets) are illiquid and have a long-term holding period. When added to a portfolio with other publicly traded assets, this asset class can help to diversify and reduce risk for the Retirement Annuity Trust's overall portfolio while enhancing returns. Private equity returns for the first several years of a partnership's life routinely are negative due to the J-curve effect (initial losses followed by significant gains). Positive returns typically are realized only several years into a partnership's existence, during the harvesting period.

Private Equity Market Overview

The Federal Reserve's push to increase interest rates over the last year and uncertainty over the state of the economy influenced private markets in several ways. Deal volume and exit activity have declined, and fundraising cycles have become elongated. Growth-oriented investments and venture capital have been particularly influenced. Secondary market activity slowed in the first half of the fiscal year but picked up meaningfully in the last half of the year as managers sought liquidity for their investors.

Timberland

As of June 30, 2023, the Retirement Annuity Trust owned about 225,000 acres of timberland outright and about 27,000 acres in a timberland joint venture located across four southern states. Timberland is, by nature, a long-term investment as the anticipated time horizon in this asset category generally is a minimum of 10 to 15 years. Timberland provides valuable diversification, current income and a balance against inflation. Due to the low correlation of returns with other asset classes, timberland investments generally lessen the overall volatility of the annuity trust's portfolio. Timberland should earn real returns comparable to traditional equity investments with volatility between equity and fixed income over the long term.

The trust diversifies its timberland investments by geography, species of trees and maturity of timber stands. Investment returns from timberland primarily are driven from net cash flow generated from the sale of trees (referred to as stumpage sales) and capital appreciation from the biological growth of the trees. These return factors depend to some degree upon the direction of forest commodity prices (paper goods and lumber products). Gains also can be seen from the timely sale of timberland from the conversion of timberland into higher and better uses, such as vacation property sales.

Timberland Market Overview

The fiscal year proved positive for timber returns with the NCREIF Timberland Index returning 11.13%. Appreciation accounted for 8.23% of the return, while income was 2.73%. Appreciation across the four regions was strong as many appraisers noted higher timber prices and inflationary pressures on bare land values. The evolving view of timber and all the other components of a timberland investment seem to be driving up valuations. Timber no longer is just a source of raw material, but it is viewed as a key component in climate change potential solutions. The market for carbon mitigation and sequestration projects has grown exponentially.

While the rapid rise in interest rates has slowed home building in some areas, the United States generally still is underbuilt for single-family homes. Despite the rise in rates, home pricing in many areas remained resilient as the single-family home market stayed strong. On the multi-family side, activity picked up as the deficit in single-family homes pushed more families to multi-family units, driving up timber prices in certain areas.

Finally, available timberland assets recently have attracted interest from some non-traditional buyers. Solar development companies and other energy groups also have been aggressive in securing land, easements and rights-of-way to support future projects. Furthermore, in some cases, capital commitments into timberland have become more focused on non-timber revenue streams, with investors eager to participate in climate-related or other related opportunities.

Retirement Annuity Trust
Fair Value as of June 30, 2023

Internally managed	
Cash equivalents (unallocated)	$ 210,929,901
Fixed income	
Broad Market Bond	684,083,097
Intermediate Bond	426,143,837
Internal Bond	155,850,117
Long Term Bond	709,781,982
403(b) Tax-Sheltered Trust	312,005
Equity	
S&P 400 Stock Index	327,606,806
S&P 500 Stock Index	2,642,072,357
S&P 600 Stock Index	285,737,019
In-house Real Estate	401,370,072
In-house High Yield	201,912,711
Subtotal	$6,045,799,904
Externally managed	
Fixed income	
Galliard Capital Management Core Fixed	567,268,260
Fort Washington Core Fixed Income	577,627,490
Domestic equity	
Baillie Gifford US Equity Growth	334,533,541
Fort Washington Focused Equity	593,658,986
State Street US Premier Growth Equity	1,017,118,108
Todd Asset Intrinsic Value Opportunity	637,682,633
Todd Asset Large Cap Intrinsic Value	1,213,724,964
UBS Alpha Equity	428,638,038
UBS Value Oriented (Global)	920,664,545
Wellington Large Cap Equity	813,934,023
Wellington Mid Cap Equity	436,605,474
Wellington Small Cap Equity	225,467,518
International equity	
Baillie Gifford International	1,161,179,939
Barings All Country World Ex US	739,149,694
BlackRock MSCI ACWI Ex US IMI Index	584,617,489
Todd Asset International Intrinsic Value	906,069,454
Todd Asset International Intrinsic	90,610,040
UBS All Country World Ex US Equity	1,085,695,297
Real estate	
Angelo Gordon Net Lease Realty III	41,608,423
Angelo Gordon Net Lease Realty IV	46,479,001
Angelo Gordon Realty Value XI	5,793,802
Blackstone Partners VII	9,375,105
Blackstone Partners VIII	38,095,529
Blackstone Partners IX	59,197,621
Blackstone Partners X	2,537,273
Carlyle Realty Partners VI	4,157,290
Carlyle Realty Partners VII	12,066,824
Carlyle Realty Partners VIII	26,988,174
Carlyle Realty Partners IX	5,835,468
Carlyle Property Investors	$ 193,630,972
Landmark Real Estate Partners VII	7,456,575
Landmark Real Estate Partners VIII	26,914,457
Prudential PRISA	477,834,413
Rockwood Capital Real Estate IX	8,746,052
Rockwood Capital Real Estate X	27,478,817
Rockwood Capital Real Estate XI	64,531,836
TA Realty Core Property	225,833,757
The Realty Associates X	2,087
The Realty Associates XI	23,372,673
The Realty Associates XII	67,976,760
Alternative investments	
Actis Global IV	26,869,119
Alinda Infrastructure II	215,722
Alpine Investors Co-Investment VIII	33,758,176
Alpine Investors Secondaries VII	25,148,198
Apax Credit Opportunities	5,121,590
Apax VIII	5,841,857
Apax IX	48,642,995
Apax X	46,542,654
Apax Digital	55,086,651
Apax Digital II	359,678
Audax Mezzanine III	1,364,450
Audax Mezzanine IV	9,837,179
Audax Mezzanine V	11,220,158
Audax Private Equity IV	85,605
Audax Private Equity V	19,507,257
Audax Private Equity VI-A	45,684,671
Baillie Gifford Private Companies II	22,664,354
CapitalSouth Partners III	1,014,652
Carlyle Asia Partners V	33,290,934
Carlyle Europe Partners IV	18,994,622
Carlyle Europe Partners V	34,021,390
Carlyle Partners VIII	13,306,390
Carlyle Renewable and Sustainable Energy	49,513,699
Carlyle Renewable and Sustainable Energy II	9,274,542
Fort Washington VIII	26,737,823
Fort Washington IX	41,643,713
Fort Washington IX-K	40,698,452
Fort Washington X	26,854,422
Fort Washington X-S	23,485,019
Fort Washington XI	700,000
Fort Washington XI-K	2,000,000
Fort Washington Opportunities IV	16,937,404
Fort Washington Opportunities IV-K	19,865,236
Fort Washington II	2,520,000
Fort Washington II-K	7,220,000
Gavea Investments V	3,852,822
Hellman & Friedman Capital VII	10,193,455
Hellman & Friedman Capital VIII	61,119,838

IFM Global Infrastructure	$ 243,683,494	Oaktree Mezzanine V	30,614,804
J.P. Morgan Global Maritime	16,595,173	Public Pension Capital	165,550,350
J.P. Morgan Global Maritime II		Riverstone/Carlyle Energy and Power IV	44,744
J.P. Morgan Global Transport Income	77,856,484	Riverstone Energy and Power V	7,604,585
KKR 2006	18,464	Riverstone Energy and Power VI	30,399,485
KKR European III	1,471,473	Silver Lake Alpine II	27,846,717
KKR European IV	37,067,520	Stepstone Pioneer Capital III	6,838,776
KKR European V	45,349,197	**Additional categories**	
KKR Americas XII	57,362,628	Avenue Special Situations VI	10,943,233
KKR Health II	6,302,916	Barings European Loan	91,250,000
Landmark Equity Partners XIV	2,138,827	Columbia High Yield Bond	151,699,877
Landmark Equity Partners XV	6,364,907	Deerpath Capital Direct Lending	62,818,692
Landmark Equity Partners XVI	30,614,893	Fort Washington High Yield Bond	280,008,995
Landmark Equity Partners XVII	8,968,720	Highbridge Specialty Loan III	702,482
Lexington Capital Partners VII	3,651,862	Lord Abbett High Yield Core	99,739,317
Lexington Capital Partners VIII	23,056,058	Marathon European Credit Opportunities II	1,552,085
Lexington Capital Partners IX	47,603,222	Marathon European Credit Opportunities III	41,149,811
Lexington Capital Partners X	5,330,055	Marathon TRS Credit	570,428,269
Manulife Cropland States	23,203,417	Molpus Lake Superior Timberlands	435,355,990
NGP ETP IV	5,871,101	Molpus Seven States	49,802,424
NGP Natural Resources X	5,108,651	Oaktree European Capital Solutions	16,914,505
NGP Natural Resources XI	37,045,489	Oaktree European Dislocation	351,135
NGP Natural Resources XII	37,949,295	Oaktree Opportunities IX	41,125,517
Oaktree European Principal III	8,691,753	Oaktree Opportunities X	15,258,369
Oaktree European Principal IV	50,563,336	Oaktree Opportunities Xb	55,417,158
Oaktree European Principal V	58,591,439	Shenkman Capital Management	337,718,448
Oaktree Mezzanine III	15,049	**Subtotal**	$ 17,887,724,321
Oaktree Mezzanine IV	4,760,001		
		Total*	$ 23,933,524,225

* Includes 403(b) Tax-Sheltered Trust of $312,005

Life Insurance Trust
Fair Value as of June 30, 2023

Internally managed			**Alternative investments**	
			AlpInvest Co-Investment VIII	340,700
Cash equivalents (unallocated)	$	704,838	AlpInvest Secondaries VII	251,582
			Apax X	465,429
			Audax Mezzanine V	112,203
Fixed income			Baillie Gifford Private Companies II	119,615
Broad Market Bond		21,733,703	Carlyle Renewable and Sustainable	495,138
			Fort Washington PE Opportunities IV	263,003
Equity			Fort Washington PE Opportunities IV-K	262,768
S & P 400 Stock Index		4,574,645	Fort Washington Small Market II	105,000
S & P 500 Stock Index		24,797,938	Fort Washington X	383,638
S & P 600 Stock Index		1,212,984	Fort Washington X-S	335,501
			Fort Washington XI	20,000
Additional categories			Landmark Equity Partners XVII	89,687
In-House High Yield Bond		841,315	Lexington Capital Partners IX	476,072
			Lexington Capital Partners X	53,300
Subtotal	$	53,865,423	Oaktree European Principal V	585,914
			Oaktree Mezzanine V	306,147
Externally managed			Silver Lake Alpine II	255,469
Domestic equity			**Additional categories**	
Baillie Gifford US Equity Growth		4,874,570	Marathon TRS Credit	2,102,984
Fort Washington Focused Equity		1,925,971	**Subtotal**	$ 39,559,429
International equity			**Total**	$ 93,424,852
Baillie Gifford International		2,629,019		
BlackRock All Country World ex US IMI		16,592,324		
Real estate				
Angelo Gordon Net Lease Realty IV		464,789		
Angelo Gordon Realty Value XI		44,568		
Blackstone Partners X		19,518		
Carlyle Property Investors		2,141,269		
Carlyle Realty Partners IX		145,887		
Rockwood Capital Real Estate Partners XI		379,599		
TA Realty Core Property		2,637,998		
The Realty Associates XII		679,767		

Retirement Annuity Trust
Investment Summary — Fair Value
as of June 30, 2023

	Fair Value June 30, 2022	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2023	Percent
Cash equivalents	$ 1,018,196,544	$ 3,195,095,891		$ 3,644,719,712	$ 568,572,723	2.4
Fixed income	3,244,560,222	1,170,703,239	(136,347,728)	1,306,970,173	2,971,945,560	12.4
Real estate	1,693,627,935	273,099,786	(57,509,771)	131,934,968	1,777,282,982	7.4
Alternative investments	2,292,264,807	839,921,798	(429,943,862)	786,913,130	1,915,329,613	8.0
Equity	12,267,081,370	2,479,579,463	2,006,519,195	2,465,536,907	14,287,643,121	59.7
Additional categories	1,910,112,687	606,455,539	500,737,637	604,867,642	2,412,438,221	10.1
Total	$ 22,425,843,565	$ 8,564,855,716	$ 1,883,455,471	$ 8,940,942,532	$ 23,933,212,220	100.0

Life Insurance Trust
Investment Summary — Fair Value
as of June 30, 2023

	Fair Value June 30, 2022	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2023	Percent
Cash equivalents	$ 8,345,378	$ 8,327,232	$	$ 11,603,458	$ 5,069,152	5.4
Fixed income	17,872,068	1,973,829	(931,419)	971,995	17,942,483	19.2
Equity	48,063,589	792,006	8,128,461	801,104	56,182,952	60.1
Real estate	7,489,602	1,287,949	17,659	2,281,815	6,513,395	7.0
Alternative investments	3,283,908	1,829,201	265,814	457,757	4,921,166	5.3
Additional categories	2,811,693	125,324	(87,379)	53,934	2,795,704	3.0
Total	$ 87,866,238	$ 14,335,541	$ 7,393,136	$ 16,170,063	$ 93,424,852	100.0

Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2023
(Dollars in thousands)

Investment counselor fees	Assets Under Management	Expense
Equity manager(s)	$ 11,189,350	$ 19,128
Fixed income manager(s)	1,144,896	535
Real estate	1,375,913	16,539
Additional categories	2,262,236	10,262
Alternative investments	1,915,330	26,148
Subtotal	$ 17,887,725	$ 72,612
Administrative expenses		6,282
Total		$ 78,894
Basis Points*		33.0

* One basis point is one hundredth of 1% or the equivalent of 0.0001. Total basis points is weighted. Basis points for administrative expenses are calculated against the $23.9 billion in assets under management for the trust.

Life Insurance Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2023
(Dollars in thousands)

Investment counselor fees	Assets Under Management	Expense
Equity manager(s)	$ 26,022	$ 32
Real estate	6,513	116
Alternative investments	4,921	76
Additional categories	2,103	2
Subtotal	$ 39,559	$ 226
Administrative expenses		59
Total		$ 285
Basis Points*		30.5

* One basis point is one hundredth of 1% or the equivalent of 0.0001. Total basis points is weighted. Basis points for administrative expenses are calculated against the $93.4 million in assets under management for the trust.

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Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2023

Investment counselor fees	
Fixed income	
Galliard Capital Core Fixed Income	$ 292,404
Fort Washington Core Fixed Income	242,307
Total fixed income	534,711
Domestic equity	
Baillie Gifford US Equity Growth	566,088
Fort Washington Focused Equity	1,832,681
State Street US Premier Growth Equity	800,000
Todd Asset Management	607,733
UBS Global Asset Management	2,318,683
Wellington Management Company	3,839,040
Total domestic equity	9,964,225
International equity	
Baillie Gifford EAFE	3,861,990
Barings All Country World ex US	2,882,132
BlackRock MSCI ACWI Ex US IMI Index	271,244
Todd Asset Management	828,679
UBS Global Asset Management	1,320,000
Total international equity	9,164,045
Real estate	
Angelo Gordon Net Lease Realty III	892,365
Angelo Gordon Net Lease Realty IV	676,144
Angelo Gordon Realty Value XI	643,092
Blackstone Partners VII	
Blackstone Partners VIII	407,805
Blackstone Partners IX	622,645
Blackstone Partners X	701,459
Carlyle Realty Partners VI	36,654
Carlyle Realty Partners VII	160,318
Carlyle Realty Partners VIII	431,722
Carlyle Realty Partners IX	1,441,974
Carlyle Property Investors	1,573,870
Landmark Real Estate Partners VII	87,612
Landmark Real Estate Partners VIII	374,119
Prudential PRISA	3,645,828
Rockwood Capital Real Estate IX	198,390
Rockwood Capital Real Estate X	655,000
Rockwood Capital Real Estate XI	955,764
TA Realty Core Property	1,605,470
The Realty Associates X	
The Realty Associates XI	$ 322,639
The Realty Associates XII	1,105,840
Total real estate	16,538,710
Alternative investments	
Actis Global IV	590,025
Alinda Infrastructure II	37,839
Alpine Investors Co-Investment VIII	495,285
AlpInvest Secondaries VII	431,923
Apax Credit Opportunities	94,644
Apax VIII	125,654
Apax IX	392,318
Apax X	485,917
Apax Digital	504,513
Apax Digital II	1,922,226
Audax Mezzanine III	(4,662)
Audax Mezzanine IV	140,183
Audax Mezzanine V	572,029
Audax Private Equity IV	
Audax Private Equity V	
Audax Private Equity VI	
Baillie Gifford Private Companies II	174,158
CapitalSouth Partners III	
Carlyle Asia Partners V	713,042
Carlyle Europe Partners IV	182,784
Carlyle Europe Partners V	637,755
Carlyle Renewable and Sustainable Energy	478,686
Carlyle Renewable and Sustainable Energy II	350,240
Carlyle Partners VIII	1,389,239
Fort Washington II	21,604
Fort Washington II-K	68,411
Fort Washington VIII	98,438
Fort Washington IX	126,000
Fort Washington IX-K	126,000
Fort Washington X	126,000
Fort Washington X-S	126,000
Fort Washington XI	18,981
Fort Washington XI-K	35,250
Fort Washington Opportunities IV	273,700
Fort Washington Opportunities IV-K	321,300
Gavea Investments V	62,270
Hellman & Friedman Capital Partners VII	17,034

Hellman & Friedman Capital Partners VIII	$ 272,940
IFM Global Infrastructure	2,281,263
J.P. Morgan Global Maritime	233,878
J.P. Morgan Global Transport Income	639,126
KKR 2006	
KKR European III	16,928
KKR European IV	233,053
KKR European V	489,003
KKR Americas XII	440,375
KKR Health II	560,623
Landmark Equity Partners XIV	29,044
Landmark Equity Partners XV	149,486
Landmark Equity Partners XVI	500,000
Landmark Equity Partners XVII	1,313,938
Lexington Capital Partners VII	
Lexington Capital Partners VIII	232,248
Lexington Capital Partners IX	495,959
Lexington Capital Partners X	695,347
Manulife Cropland Plus	96,569
NGP ETP IV	654,452
NGP Natural Resources X	110,878
NGP Natural Resources XI	459,924
NGP Natural Resources XII	724,506
Oaktree European Principal III	98,020
Oaktree European Principal IV	737,251
Oaktree European Principal V	612,794
Oaktree Mezzanine III	
Oaktree Mezzanine IV	98,727
Oaktree Mezzanine V	380,277
Public Pension Capital	1,736,425
Riverstone/Carlyle Energy and Power IV	3,387
Riverstone Energy and Power V	119,966
Riverstone Energy and Power VI	339,021
Silver Lake Alpine II	221,553
Stepstone Pioneer Capital III	36,663
Total alternative investments	26,148,410

Additional categories	
Avenue Special Situations VI	
Barings European Loan	$ 407,117
Columbia High Yield Bond	701,279
Deerpath Capital Direct Lending	1,215,054
Fort Washington High Yield Bond	551,536
Highbridge Specialty Loan III	(13,220)
Lord Abbett High Yield Core	337,139
Marathon European Credit Opportunities II	
Marathon European Credit Opportunities III	682,005
Marathon TRS Credit	930,174
Molpus Lake Superior Timberlands	2,195,683
Molpus Seven States	408,814
Oaktree European Capital Solutions	275,728
Oaktree European Dislocation	9,145
Oaktree Opportunities IX	343,991
Oaktree Opportunities X	223,296
Oaktree Opportunities Xb	675,609
Shenkman Capital Management	1,318,485
Total additional categories	10,261,835
Total investment counselor fees	**$ 72,611,936**
Administrative expenses	
Custodian	
Bank of New York Mellon	676,584
Legal and research	
Ice Miller	76,680
Seyfarth	192,996
Other	
Other administrative and operational	4,841,797
Consultant	
Aon Hewitt	413,850
Bevis Longstreth	50,000
George Philip	30,000
Total consultant	493,850
Total administrative expenses	**$ 6,281,907**
Grand total	**$ 78,893,843**

Life Insurance Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2023

Investment counselor fees	
Domestic equity	
Baillie Gifford US Equity Growth	$ 8,248
Fort Washington Focused Equity	5,934
Total domestic equity	14,182
International equity	
Baillie Gifford EAFE Alpha	8,744
BlackRock All Country World ex US IMI	9,231
Total international equity	17,975
Real estate	
Angelo Gordon Net Lease Realty IV	6,172
Angelo Gordon Realty Value XI	4,947
Blackstone X	5,396
Carlyle Property Investors	20,803
Carlyle Realty Partners IX	36,049
Rockwood Capital Real Estate Partners XI	5,624
TA Realty Core Property	25,551
The Realty Associates XII	11,058
Total real estate	115,600
Alternative investments	
AlpInvest Co-Investment VIII	4,952
AlpInvest Secondaries VII	4,319
Apax X	4,860
Audax Mezzanine V	5,718
Baillie Gifford Private Equity Companies II	899
Carlyle Renewable and Sustainable Energy	4,786
Fort Washington PE Opportunities IV	4,251
Fort Washington PE Opportunities IV-K	4,251

Investment counselor fees		
Fort Washington X		1,800
Fort Washington X-S		1,800
Fort Washington XI		543
Fort Washington Small Markets II		900
Landmark Equity Partners XVII		13,139
Lexington Capital Partners IX		4,958
Lexington Capital Partners X		6,953
Oaktree European Principal V		6,128
Oaktree Mezzanine V		3,801
Silver Lake Alpine II		2,028
Total alternative investments		76,086
Additional categories		
Marathon TRS Credit		1,788
Total investment counselor fees	**$**	**225,631**
Administrative expenses		
Custodian		
Bank of New York Mellon	$	46,130
Other		
Other administrative and operational		13,393
Total administrative expenses	**$**	**59,523**
Grand total	**$**	**285,154**

Retirement Annuity Trust
Ten Largest Stock Holdings Ranked by Fair Value*
June 30, 2023

		Fair Value	Percent of Total Fair Value
1	Microsoft Corp.	$ 470,001,389	3.25
2	Apple	410,100,297	2.84
3	Amazon.com	266,530,015	1.85
4	Nvidia Corp.	175,505,499	1.22
5	United Health Group	159,832,506	1.11
6	Alphabet Class C	156,977,573	1.09
7	Alphabet Class A	127,405,483	0.88
8	Meta Platforms	120,024,219	0.83
9	Tesla	104,734,439	0.72
10	Visa	98,653,229	0.68

* Includes only actively managed separate accounts. A complete list of investments is available from TRS.

Retirement Annuity Trust
Ten Largest Fixed Income Holdings Ranked by Fair Value*
June 30, 2023

		Maturity	Coupon	Par Value	Fair Value	Percent of Total Fair Value
1	U.S. Treasury Note	Feb. 15, 2031	1.125	$ 65,000,000	$ 53,422,200	1.70
2	Federal Home Loan Mortgage Corp.	Sep. 8, 2023	0.250	53,000,000	52,517,700	1.67
3	U.S. Treasury Note	Oct. 31, 2025	0.250	57,300,000	51,708,666	1.64
4	U.S. Treasury Note	Aug. 31, 2024	3.250	45,000,000	43,910,100	1.40
5	U.S. Treasury Note	Feb. 15, 2033	3.500	44,815,000	43,631,436	1.39
6	U.S. Treasury Bond	Feb. 15, 2051	1.875	60,000,000	39,658,800	1.26
7	U.S. Treasury Bond	Aug. 15, 2023	6.250	31,900,000	31,932,857	1.01
8	U.S. Treasury Bond	Aug. 15, 2050	1.375	55,000,000	31,893,400	1.01
9	U.S. Treasury Note	May 15, 2024	2.500	31,000,000	30,226,240	0.96
10	U.S. Treasury Note	Sep. 15, 2025	3.500	28,000,000	27,238,680	0.87

*A complete list of investments is available from TRS.

Transaction Commissions for the Year Ended June 30, 2023

Broker Name	Shares Traded	Commissions	Commission Per Share	Percent of Total
ConvergEx ADR Conversions	8,820,775	$ 123,829	$ 0.014	13.57
Investment Tech Grp Transition	13,911,796	104,339	0.008	11.43
Virtu Americas	7,867,264	77,928	0.010	8.54
ConvergEx - Transitions	9,890,354	49,452	0.005	5.42
ConvergEx - Algos	8,889,796	44,449	0.005	4.87
Raymond James & Assoc	1,325,502	39,677	0.030	4.35
Liquidnet	3,873,772	38,497	0.010	4.22
RBC Capital Markets	5,028,382	34,249	0.007	3.75
Piper Jaffray	1,078,369	32,351	0.030	3.54
Merrill Lynch	1,022,090	30,522	0.030	3.34
Credit Suisse Sec.	880,019	22,254	0.025	2.44
ISI Group	695,100	20,853	0.030	2.28
Liquidnet Inc - Transition	3,918,653	19,594	0.005	2.15
ConvergEx - FS	3,853,795	19,269	0.005	2.11
Tradebook	3,639,830	18,199	0.005	1.99
Morgan Stanley	1,411,101	18,045	0.013	1.97
UBS Financial Services	1,289,261	15,855	0.012	1.73
Jefferies & Co.	1,554,703	15,797	0.010	1.73
Abel Noser	1,485,939	14,859	0.010	1.63
Stifel, Nicolaus & Co .	468,640	14,059	0.030	1.54
Abel Noser - Transitions	1,769,541	13,268	0.007	1.45
ISI Algos	1,170,189	11,702	0.010	1.28
Cowen & Co .	899,868	11,088	0.012	1.21
JP Morgan & Chase	697,061	11,049	0.016	1.21
Goldman Sachs	908,950	10,501	0.012	1.15
BTIG	318,572	10,132	0.032	1.11
BMO Capital Markets	290,811	10,094	0.035	1.10
Barclays	953,097	9,393	0.010	1.03
Other <1%	5,117,642	71,202	0.014	7.80
Totals*	93,030,872	$ 912,506	$ 0.010	100

* The acquisition of initial public offerings (IPOs) represented a portion of small-capitalization stock purchases. IPOs usually have a high commission rate; however, the security issuers and not the investors pay the commissions. In fiscal year 2023, the Retirement Annuity Trust bought small capitalization IPOs that generated $123,829 in commissions. Although these commissions were not paid by TRS, they resulted from the annuity trust's investment activities and are included in the total commissions. Typical stock transactions occur at lower commission rates than IPO transactions, frequently at $0.03 per share or less. Investment companies usually provide investment research for brokerage clients. Total commissions per share are calculated using total shares traded and total commissions.

Proxy Voting and Corporate Behavior
TRS votes proxy statements in accordance with KRS 161.430 and the board's Proxy Voting Guidelines. TRS shares are voted solely in the best interest of the membership using only pecuniary factors and not to further any nonpecuniary interest. Stock ownership is an implicit endorsement of company management, and, consequently, TRS shares in most cases are voted in support of company management. TRS expects the companies in which it acquires stock to abide by federal, state and local laws.

TRS's fiduciary duty is to obtain the highest investment return within acceptable levels of risk. In fulfilling this duty and regarding corporate behavior, TRS may correspond with the company, meet with company officials, sponsor shareholder resolutions or liquidate TRS's holdings in the company.

Securities Lending
TRS operates its securities lending program through its custodian, Bank of New York Mellon (BNYM), under contract. Securities lending occurs when TRS transfers a security to the borrower, such as a broker-dealer or bank, for cash collateral pursuant to an agreement to return the identical security in the future. Securities are borrowed for a variety of reasons including: settlement of short sales and to cover hedges, options, arbitrage positions and settlement fails. Consequently, the borrower receives custody of the transferred security. The borrower, however, is obligated to return the exact same security at the end of the loan period and to make the retirement system whole for dividends, interest and other distributions as if the security remained in the retirement system's portfolio.

The restrictions applying to loanable securities are as follows:
- There is no limit on the amount of government securities that can be loaned.
- There will be a limit of 30% of the equity portfolio. Securities may be loaned from any equity portfolio.
- A maximum of 50 corporate bonds may be on loan at any time.

TRS maintains with BNYM an approved borrowers list to which TRS will lend securities. The approved borrowers list is comprised of large, high-quality brokers and TRS has discretion to add or remove names from the list.

BNYM acts as lending agent in exchanging securities for collateral. The collateral provided in exchange for securities may include cash or non-cash collateral. For a loan of U.S. securities, collateralization of 102% or greater of the fair value of the securities lent is required. For a loan of foreign securities, collateralization of 105% or greater of the fair value of the securities lent is required. BNYM bears the risk of loss of any cash or non-cash collateral.

Cash collateral may be invested in any of the following:
- Government securities
- Repurchase and reverse repurchase transactions with approved counterparties

Staff closely monitors the lending program to make sure that BNYM is in compliance with lending restrictions. BNYM provides a detailed listing of all securities that are on loan on a daily basis. They also provide a summary report that lists the fair value of securities on loan with a particular borrower and the collateral value that the borrower has provided to cover the loan. The collateralization percentage for each broker also is listed.

Kentucky Investments
The retirement system always is cognizant of its significant role in the commonwealth's economy. Over $2 billion in benefits are distributed annually to members and annuitants living in Kentucky. The Retirement Annuity Trust has invested about $312.1 million directly in Kentucky. These investments include: commercial real estate; bonds issued by public agencies of the commonwealth and those of local municipalities; pools of single-family mortgages in Kentucky; financing for multi-family housing; and investments in global companies that contribute to the commonwealth's economy. Fiduciary duty requires that investments, including any in the commonwealth, be made solely for the benefit of TRS's members and annuitants.

Professional Service Providers

Investment consultant
Aon Investments USA

Investment custodian
Bank of New York Mellon

Fixed income managers
Fort Washington Investment Advisors
Galliard Capital Management

Domestic equity managers
Baillie Gifford
Fort Washington Investment Advisors
State Street Global Advisors Trust Co.
Todd Asset Management
UBS Global Asset Management
Wellington Management Co.

International equity managers
Baillie Gifford Overseas Ltd.
Barings Asset Management
BlackRock Institutional Trust Co.
Todd Asset Management
UBS Global Asset Management

Real Estate managers
Angelo Gordon & Co.
Blackstone Real Estate Advisors
The Carlyle Group
Landmark Partners
Prudential Real Estate Investors
Rockwood Capital
TA Realty

Alternatives managers
Actis
Alinda Capital Partners
AlpInvest Partners
Apax Partners
Audax Group
Baillie Gifford
CapitalSouth Partners
The Carlyle Group
Fort Washington Private Equity Investors
Gavea Investimentos
Hellman & Friedman Capital Partners
IFM Investors
J.P. Morgan Asset Management
Kohlberg Kravis Roberts & Co.
Landmark Partners
Lexington Capital Partners
Molpus Woodlands Group
Natural Gas Partners
Oaktree Capital Management
Public Pension Capital
Riverstone Holdings
Silver Lake Partners
Stepstone Group

Additional categories managers
Avenue Capital Group
Barings Asset Management
Columbia Threadneedle Investments
Deerpath Capital Management
Fort Washington Investment Advisors
Highbridge Principal Strategies
Lord, Abbett & Co.
Marathon Asset Management
Oaktree Capital Management
Shenkman Capital Management

Attorneys
Ice Miller
Reinhart, Boerner, Van Deuren
Seyfarth

Health Insurance Trust

Investment Policy Summary
KRS 161.677 created the Health Insurance Trust on July 1, 2010, and obliges the board to "manage the assets of the fund in the same general manner in which it administers the retirement funds, except that the asset allocation may differ and separate accounting and financial reporting shall be maintained for the trust fund." KRS 161.430, which governs the investment of funds for the retirement trust, requires that members' assets be managed in a manner consistent with fiduciary standards set forth in the prudent person rule. Further, 102 KAR 1:178 establishes investment policies for the Health Insurance Trust. This regulation requires the board and Investment Committee to diversify assets prudently and to consider the fund's "liquidity and its capability of meeting both short and long-term obligations" in setting asset allocation policy.

Due to an imbalance of required distributions over contributions early in the fund's existence, liquidity needs historically dominated investment policy. This has evolved as contribution rate increases provided in statute have improved cash flow, and the focus now is on establishing an investment policy that achieves the required rate of return and matches the health insurance liability.

Investment Objectives
The definitive objective of the health insurance fund is to provide for beneficiaries' health insurance benefit obligations, both short and long term. In support of this, investment policy is designed, on an ongoing basis, to meet all liquidity needs, achieve the actuarially assumed 7.1% rate of return over the long term and do so within appropriate risk levels.

Risk Controls
Any investment program faces various risks; as with the retirement funds, the primary risk is that the assets will not support liabilities long term. Risk control measures for the Health Insurance Trust mirror those of the Retirement Annuity Trust, but are customized to reflect the fund's unique liability. Primary risk control measures include:

- Actuarial valuations are performed each year to evaluate the funding objectives of the Health Insurance Trust. Every 10 years an external audit of the actuary is conducted to ensure that the assumptions made, and calculation methods used, are resulting in properly computed liabilities of the fund.
- Asset-liability studies are conducted about every five years. These studies ensure that the portfolio is designed to meet the fund's liabilities.
- In accordance 102 KAR 1:178, which governs investment policies for the fund, the Investment Committee adopts and regularly reviews an asset allocation policy designed to meet the fund's needs.

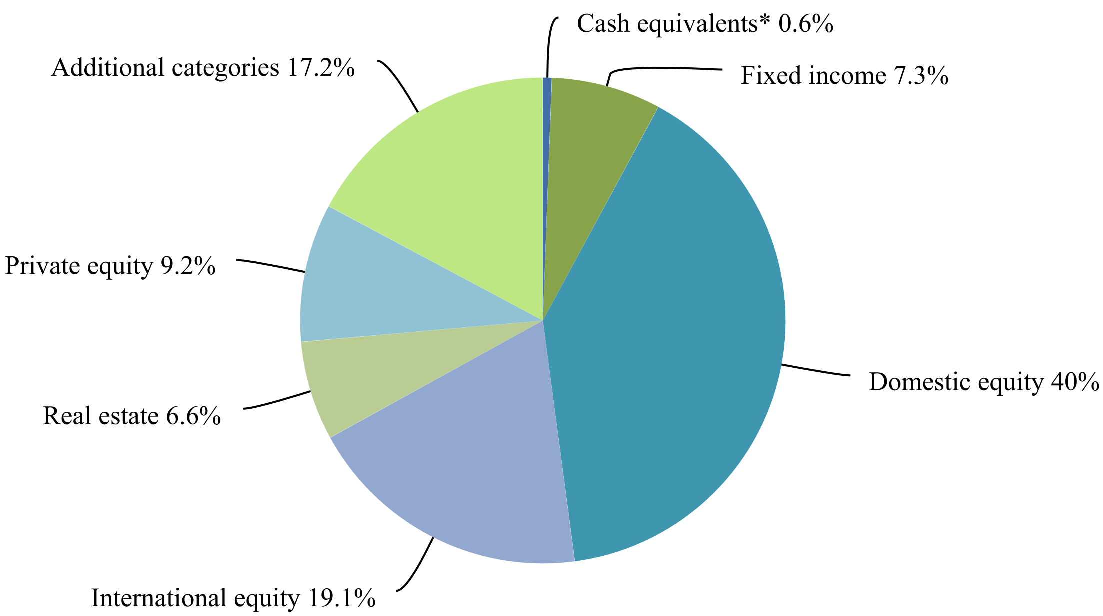
Asset Allocation
As of June 30, 2023, the Health Insurance Trust had $2.41 billion in assets. This included $176.7 million in investment-grade bonds. This trust also had $199.3 million in high-yield bonds, $1.43 billion in public equity investments, $220.2 million in private equity, $80.6 million in bank loans, $135.5 million in alternative credit funds and $159.4 million in real estate.

Asset allocation is adjusted annually by the Investment Committee to reflect changing liquidity needs and actuarial funding status. Due to the trust being cash flow positive, liquidity needs are declining as funding status has improved. The information below shows the health insurance fund's asset allocation by fair value as of June 30, 2023 and 2022.

	June 30, 2023	Percent	June 30, 2022	Percent
Cash equivalents*	$ 14,919,707	0.6	$ 16,585,256	0.8
Fixed income	176,694,577	7.3	176,287,536	8.7
Equity	1,426,960,263	59.1	1,099,199,886	54.0
Real estate	159,444,210	6.6	150,214,503	7.4
Private equity	220,197,307	9.2	204,919,106	10.1
Additional categories	415,388,542	17.2	386,629,645	19.0
Totals	$ 2,413,604,606	100.0	$ 2,033,835,932	100.0

* Reflects only cash balances not allocated to other asset classes. Uninvested cash balances allocated to various asset classes are represented in those classes.

Distribution of Investments — Fair Value
As of June 30, 2023



* Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Health Insurance Trust
Asset Class Strategic Weighting by Fair Value

	Strategic Range	Target	June 30, 2023
Cash equivalents	0-5%	1 %	0.6 %
Fixed income	6-14	9	7.3
Equity	51-64	58	59.1
Domestic large cap	28-38	33	35.2
Domestic mid cap	1-5	3	3.3
Domestic small cap	1-3	2	1.5
International	15-25	20	19.1
Real estate	4-12	6.5	6.6
Alternative investments*	5-12	8.5	9.2
Additional categories	14-25	17	17.2
Total		100 %	100 %

* Includes private equity, venture capital, and infrastructure investments.

Portfolio Results

The Health Insurance Trust returns were generated by the Segal Marco Advisors performance reporting system using a time-weighted rate of return calculation based upon fair value. For fiscal year 2023, the Health Insurance Trust's portfolio returned 11.94% versus a policy index return of 11.53%. The fund's public equity returned 20.12% versus 16.76% for the MSCI All Country World IMI Index. A high-quality bond fund returned 0.39% versus a 0.7% decline for the Barclays Government/Credit Index. Private real estate declined 1.82% versus a decline of 9.97% for the NCREIF ODCE. Private equity returned 1.68%. Additional categories returned 4.57% versus an 8.87% return for the benchmark, Bank of America Merrill Lynch High Yield Master II.

General partner profit sharing, known as carried interest, for the Health Insurance Trust for fiscal year 2023 was a $1.9 million decline, consisting by asset class of $500,000 in private equity, a decline of $2.5 million in private real estate and $90,000 in private credit.

Schedule of Investment Results — Gross

	1-year	3-year*	5-year*	10-year*
Total plan	**11.94**	**10.07**	**7.86**	**7.71**
Policy benchmark**	11.53	9.24	7.27	
Equity	**20.12**	**11.53**	**8.46**	**9.20**
Domestic equity	**24.26**	**4.99**	**7.33**	
S&P 500 Index	19.59	14.60	12.31	
Russell 3000	18.95	13.89	11.39	
International equity	**N/A**			
MSCI AC World ex-USA IMI				
Fixed income	**0.39**	**-2.76**	**1.85**	**1.54**
Barclays Government Credit	-0.70	-4.11	1.03	1.66
Total real estate	**-1.83**	**16.00**	**12.80**	
Core real estate	**0.92**	**13.44**	**11.31**	
NCREIF ODCE (VW)	-9.97	7.99	6.50	
Non-core real estate	**-4.68**	**18.25**	**14.12**	
NCREIF Property Index	-6.60	6.79	5.90	
Private equity	**1.68**	**23.81**	**15.88**	**16.00**
Mature private equity	**1.95**	**25.22**	**18.10**	**16.10**
S&P 500 plus 3%	23.18	18.04	15.68	16.25
Private equity < 5 years	**2.11**	**20.74**	**13.77**	
Additional categories	**4.57**	**5.44**	**4.19**	**4.35**
B of A Merrill Lynch High Yield Master II	8.87	3.20	3.17	4.33
Cash (unallocated)	**3.54**	**1.59**	**1.71**	**1.09**
90-day Treasury Bill	3.59	1.27	1.55	0.97

* Rates of return are time-weighted based upon fair value. Returns are annualized for periods longer than one year.
** Overall fund performance is compared to a board-approved benchmark, first established in July 2015, that represents the returns of appropriate benchmarks for the various asset classes weighted by the midpoint of the strategic range for the current fiscal year.

Schedule of Investment Results — Net of Investment Fees and Expenses

2023	11.52 %
2022	-9.70
2021	31.10
2020	2.30
2019	6.11
2018	8.44
2017	14.37
2016	-2.20
2015	1.38
2014	15.38

Portfolio Fair Value
as of June 30, 2023

Internally managed	
Cash collections (unallocated)	$ 14,919,707
Fixed income	
Internal Bond	176,694,577
In-house High Yield	7,549,598
Equity	
S&P 400 stock index	79,720,139
S&P 500 stock index	729,342,168
S&P 600 stock index	34,769,087
Subtotal	$ 1,042,995,276
Externally managed	
Domestic equity	
Baillie Gifford US Equity Growth	55,508,473
Fort Washington Focused Equity	65,902,931
International equity	
BlackRock MSCI ACWI IMI	461,717,466
Real estate	
Angelo Gordon Net Lease Realty IV	9,295,800
Angelo Gordon Realty Value IX	891,354
Blackstone Partners VIII	7,619,104
Blackstone Partners IX	5,919,762
Blackstone Partners X	390,350
Carlyle Realty Partners VII	2,413,363
Carlyle Realty Partners VIII	5,397,630
Carlyle Realty Partners IX	1,312,980
Carlyle Property Advisors	28,992,928
Landmark Real Estate Partners VII	1,491,316
Landmark Real Estate Partners VIII	5,382,892
Prudential PRISA	16,992,820
Rockwood Capital Real Estate X	5,494,763
Rockwood Capital Real Estate XI	11,387,971
The Realty Associates XI	4,674,535
The Realty Associates XII	13,595,355
TA Realty Core Property	38,191,287
Alternative investments	
Actis Global IV	2,687,012
Alpine Investor Co-Invest VIII	6,751,679
Alpine Investor Secondaries VII	5,029,721
APAX IX	9,728,604
APAX X	9,308,531
APAX Credit Opportunities	1,024,318
Apax Digital	$ 11,017,331
Apax Digital II	71,937
Audax Mezzanine V	1,122,016
Audax Private Equity V	6,502,419
BG Private Companies II	2,392,302
Carlyle Asia V	6,658,186
Carlyle Europe Partners IV	3,798,787
Carlyle Europe V	6,593,295
Carlyle Partners VIII	2,661,278
Carlyle Renewable & Sustainable Energy	9,902,741
Carlyle Renewable & Sustainable Energy II	1,854,908
Fort Washington PE Opportunities III	1,718,688
Fort Washington VII	1,716,507
Fort Washington VIII	7,639,380
Fort Washington IX	11,898,064
Fort Washington IX-K	11,628,129
Fort Washington X	3,836,344
Fort Washington X-S	3,355,002
Fort Washington XI	200,000
Fort Washington IV	2,630,032
Fort Washington IV-K	2,627,677
Fort Washington PE Small Market II	1,050,000
KKR European IV	7,413,504
KKR European V	4,534,915
KKR Americas XII	11,472,527
KKR Health II	900,421
Landmark Equity Partners XV	1,060,817
Landmark Equity XVI	6,122,979
Landmark Equity XVII	1,793,744
Lexington Capital Partners IX	4,760,341
Lexington Capital Partners X	533,004
NGP ETP IV	978,517
NGP Natural Resources XI	7,409,107
NGP Natural Resources XII	7,589,861
Oaktree European Principal IV	10,112,669
Oaktree European Principal V	5,859,144
Oaktree Mezzanine V	3,061,480
Riverstone E & P VI	6,079,899
Silver Lake Alpine II	5,109,490
Additional categories	
Columbia High Yield	63,077,343
Fort Washington High Yield Bond	66,510,177

Highbridge Principal Strategies III	$ 70,248
Lord Abbett High Yield Core	62,131,900
Marathon European Credit Opportunities II	103,472
Marathon European Credit Opportunities III	5,486,641
Marathon TRS Credit	99,730,078
Oaktree European Capital Solutions	3,380,646
Oaktree Opportunities Xb	11,083,432
Shenkman Capital Management	80,560,333
Deerpath Direct Lending	15,704,673
Subtotal	$ 1,370,609,330
Total	$ 2,413,604,606

Investment Summary — Fair Value as of June 30, 2023

	Fair Value June 30, 2022	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2023	Percent
Cash equivalents	$ 67,213,821	$ 1,588,732,620	$	$ 1,578,725,313	$ 77,221,128	3.2
Fixed income	144,284,024	27,363,894	(4,458,701)	14,046,132	153,143,085	6.3
Real estate	150,214,503	44,815,432	(5,960,096)	29,625,629	159,444,210	6.6
Equity	1,095,262,160	1,683,920,755	215,956,265	1,588,624,241	1,406,514,939	58.3
Alternative investments	204,919,107	71,288,175	4,432,558	60,442,533	220,197,307	9.1
Additional categories	371,942,317	156,291,497	1,368,329	132,518,206	397,083,937	16.5
Total	$ 2,033,835,932	$ 3,572,412,373	$ 211,338,355	$ 3,403,982,054	$ 2,413,604,606	100.0

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2023

(Dollars in thousands)

Investment counselor fees	Assets Under Management	Expense
Equity manager(s)	$ 583,129	$ 544
Fixed income manager(s)		
Real estate	159,444	2,286
Additional categories	407,839	1,567
Alternative investments	220,197	3,478
Subtotal	$ 1,370,609	$ 7,875
Administrative expenses**		533
Total		$ 8,408
Basis Points*		34.8

* One basis point is one hundredth of one percent or the equivalent of 0.0001. Total basis points is weighted.
** Basis points for administrative expenses are calculated against the $2.41 billion in assets under management for the trust.

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2023

Investment counselor fees	
Domestic equity	
Baillie Gifford US Equity Growth	$ 93,947
Fort Washington Focused Equity	203,486
Total domestic equity	297,433
International equity	
BlackRock MSCI ACWI IMI	246,952
Total international equity	246,952
Real estate	
Angelo Gordon Net Lease Realty IV	135,229
Angelo Gordon Realty Value XI	98,937
Blackstone Partners VIII	81,562
Blackstone IX	62,264
Blackstone X	107,916
Carlyle Realty Partners IX	324,444
Carlyle Realty Partners VII	32,064
Carlyle Realty Partners VIII	86,344
Carlyle Property Advisors	274,209
Landmark Real Estate Partners VII	17,522
Landmark Real Estate Partners VIII	74,824
Prudential PRISA	129,539
Rockwood Capital Real Estate X	135,000
Rockwood Capital Real Estate XI	168,665
The Realty Associates XI	64,528
The Realty Associates XII	221,168
TA Realty Core Property	271,505
Total real estate	2,285,720
Alternative investments	
Actis Global IV	59,202
AlpInvest Secondaries VII	86,384
AlpInvest Co-Investment VIII	99,057
APAX Credit Opportunities	18,930
APAX IX	78,463
APAX X	97,183
Apax Digital	100,901
Apax Digital II	384,445
Audax Mezzanine V	57,202
Audax Private Equity V	0
Baillie Gifford Private Companies II	17,987
Carlyle Asia V	142,608
Carlyle Europe Partners IV	36,556
Carlyle Europe V	123,596
Carlyle Renewable and Sustainable Energy	95,736
Carlyle Renewable and Sustainable Energy II	70,048
Carlyle Partners VIII	277,848
Fort Washington PE Small Market II	9,001
Fort Washington PE Opportunities III	7,423
Fort Washington PE Opportunities IV	42,500
Fort Washington PE Opportunities IV-K	42,500
Fort Washington VII	17,935
Fort Washington VIII	28,125
Fort Washington IX	36,000
Fort Washington IX-K	36,000
Fort Washington X	18,000
Fort Washington X-S	18,000
Fort Washington XI	5,423
KKR Americas XII	88,078
KKR IV	46,622
KKR European V	48,899
KKR Health II	80,088
Landmark Equity Partners XV	24,914
Landmark Equity Partners XVI	100,000
Landmark Equity Partners XVII	262,788
Lexington Capital Partners IX	49,597
Lexington Capital Partners X	69,535
NGP ETP IV	109,075
NGP Natural Resources XI	91,985
NGP Natural Resources XII	144,902
Oaktree European Principal IV	147,449
Oaktree European Principal V	61,279
Oaktree Mezzanine V	38,028
Riverstone E & P VI	67,123
Silver Lake Alpine II	40,514
Total alternative investments	3,477,929
Additional categories	
Columbia High Yield Bond	229,282
Deerpath Capital Direct Lending	303,764
Fort Washington High Yield Bond	128,296
Highbridge Specialty Loan III	(1,322)
Lord Abbett High Yield Core	184,055
Marathon European Credit Opportunities II	
Marathon European Credit Opportunities III	90,934
Marathon TRS Credit	127,981
Oaktree European Capital Solutions	55,146
Oaktree Opportunities Xb	135,121
Shenkman Capital Management	313,775
Total additional categories	1,567,032
Total investment counselor fees	**$ 7,875,066**
Administrative expenses	
Custodian	
Bank of New York Mellon	186,517
Other	
Other administrative and operational	346,017
Total administrative expenses	**$ 532,534**
Grand total	**$ 8,407,600**

Health Insurance Trust
Ten Largest Stock Holdings Ranked by Fair Value*
June 30, 2023

		Fair Value	Percent of Total Fair Value
1	Apple	$ 60,103,738	6.22
2	Microsoft Corp.	52,977,808	5.49
3	Amazon.com	27,550,934	2.85
4	Nvidia	24,096,488	2.50
5	Tesla	16,166,392	1.67
6	Alphabet	15,721,866	1.63
7	Meta Platforms	15,411,400	1.60
8	Berkshire Hathaway	14,505,799	1.50
9	Alphabet	13,727,076	1.42
10	UnitedHealth Group	10,320,302	1.07

* Includes only actively managed separate accounts. A complete list of investments is available from TRS.

Health Insurance Trust
Ten Largest Fixed Income Holdings Ranked by Fair Value*
June 30, 2023

		Maturity	Coupon	Par Value	Fair Value	Percent of Total Fair Value
1	U.S. Treasury Note	Feb. 15, 2031	1.125	15,000,000	$ 12,328,200	6.93
2	U.S. Treasury Note	Aug. 31, 2024	3.250	7,000,000	6,830,460	3.84
3	U.S. Treasury Note	Feb. 15, 2027	2.250	5,000,000	4,647,850	2.61
4	U.S. Treasury Note	Sep. 30, 2023	1.375	3,750,000	3,714,375	2.09
5	U.S. Treasury Bond	May 15, 2047	3.000	3,750,000	3,151,313	1.77
6	BMW US Capital LLC 144A	April 1, 2031	2.550	3,000,000	2,549,970	1.43
7	Amazon.com	May 12, 2031	2.100	3,000,000	2,521,380	1.42
8	New York City NY Transitional	Nov. 1, 2027	2.370	2,500,000	2,264,825	1.27
9	Federal Home Loan Bank	Mar. 13, 2024	5.375	2,000,000	1,998,120	1.12
10	Mercedes-Benz Finance NOR 144A	Nov. 27, 2024	5.500	2,000,000	1,995,720	1.12

* A complete list of investments is available from TRS.

Health Insurance Trust
Transaction Commissions for the Year Ended June 30, 2023

Broker Name	Shares Traded	Commissions	Commission Per Share	Percent of Total
Investment Tech Grp Transition	7,451,560	$ 55,889	0.008	75.81
Virtu Americas	1,772,426	17,674	0.010	23.98
Investment Technology Grp	15,680	157	0.010	0.21
Totals	9,239,666	$ 73,720	0.008	100

Professional Service Providers

Investment consultant
Aon Investments USA

Investment custodian
Bank of New York Mellon

Equity managers
Baillie Gifford
BlackRock Institutional Trust Co.
Fort Washington Investment Advisors

Additional categories managers
Columbia Threadneedle Investments
Deerpath Capital Management
Fort Washington Investment Advisors
Highbridge Principal Strategies
Marathon Asset Management
Oaktree Capital Management
Shenkman Capital Management

Real estate managers
Angelo Gordon & Co.
Blackstone Real Estate Advisors
The Carlyle Group
Landmark Partners
Prudential Real Estate Investors
Rockwood Capital
TA Realty

Alternatives managers
Actis
AlpInvest Partners
Apax Partners
Audax Group
Baillie Gifford
The Carlyle Group
Fort Washington Private Equity Investors
Kohlberg Kravis Roberts & Co.
Landmark Partners
Lexington Capital Partners
Natural Gas Partners
Oaktree Capital Management
Riverstone Holdings
Silver Lake Partners

Attorneys
Ice Miller
Reinhart, Boerner, Van Deuren
Seyfarth

Actuarial Section

Annual Valuation of the Retirement Annuity Trust

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 14, 2023

Board of Trustees
Teachers' Retirement System of the
State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:
Kentucky Revised Statutes (KRS) 161.400 of the law governing the operation of the Teachers' Retirement System of the State of Kentucky (TRS) provides that the actuary shall make an actuarial valuation of the Retirement Annuity Trust. We are pleased to submit the results of the annual actuarial valuation prepared as of June 30, 2023. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

During the 2021 valuation, a new set of economic and demographic assumptions was adopted by the TRS Board of Trustees (Board) that resulted in an increase in liabilities and contribution requirements. To help alleviate the pressure on increased contributions, a direct-rate smoothing technique was implemented to phase-in the required contribution increase, estimated at 8.59% of payroll, over a five-year period beginning with the 2021 valuation. For this 2023 valuation, and each of the next two valuations, we will recognize an increase in contributions of at least 1.72% of payroll as a result of the cost of the change in assumptions.

The total combined member and employer contribution rates broken down for members hired before July 1, 2002 (TRS 1), members hired between July 1, 2002 and June 30, 2008 (TRS 2) and members hired between July 1, 2008 and December 31, 2021 (TRS 3), as a percentage of payroll for the fiscal years ending June 30, 2026 and June 30, 2025, required to support the total benefits are as follows:

Group	Total Combined Contributions for FYE 2026	Total Combined Contributions for FYE 2025
University TRS 1, TRS 2 and TRS 3 members	40.98%	37.34%
Non-University TRS 1 and TRS 2 members	43.94%	40.30%
Non-University TRS 3 members	44.94%	41.30%

The rates shown in the table above represent an increase since the previous valuation in the total pension actuarially determined employer contribution rates (ADEC) of 3.64% of payroll for the fiscal year ending June 30, 2026.

A breakdown of the changes in the components of the ADEC are as follows:

- an expected increase of 1.72% of payroll for the direct rate smoothing technique of phasing-in contribution requirements due to the 2021 assumption changes,
- no change in the percent of payroll due to the amount required for life insurance benefits, and
- an increase of 1.92% of payroll due to the overall experience of the System for the fiscal year ending June 30, 2023.

Board of Trustees
November 14, 2023
Page 2

The total combined member and employer statutorily required contributions for TRS 4 members are as follows:

Group	Foundational Component	Supplemental Component
University TRS 4 members	10.695%	4.00%
Non-University TRS 4 members	16.920%	4.00%

The financing objective of the system is that contribution rates will remain relatively level over time as a percentage of payroll, except as otherwise noted. The promised benefits of the system are included in the actuarially calculated contribution rates which are developed using the entry age normal cost method.

Five-year market related value of plan assets is used for actuarial valuation purposes. Gains and losses are reflected in the total unfunded actuarial accrued liability that is being amortized by regular annual contributions as a level percentage of payroll in accordance with the funding policy adopted by the board, on the assumption that payroll will increase by 2.75% annually. The assumptions recommended by the actuary and adopted by the board are reasonably related to the experience under the system and to reasonable expectations of anticipated experience under the system.

We have prepared the trend information shown in the Schedule of Funding Progress in the Financial Section of the Annual Comprehensive Financial Report (ACFR) and Schedule A, Schedule B, Schedule C, Solvency Test and Analysis of Financial Experience shown in the Actuarial Section of the ACFR. We have also included a sensitivity analysis that is required under Actuarial Standards of Practice Statement No. 51 (ASOP 51) and the Low Default Risk Obligation Measure that is required under ASOP 4.

This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the assumptions and methods used for funding purposes meet the parameters set by Actuarial Standards of Practice, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the system.

In order to prepare the results in the report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan’s funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the recommended funding amount for the system. The asset values used to determine unfunded actuarial accrued liabilities and funded ratios are not fair values but less volatile market related values. A smoothing technique is applied to fair values to determine the market-related values. The unfunded actuarial accrued liability amounts and funded ratios using the fair value of assets would be different. The interest rate used for determining liabilities is based on the expected return of assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

Board of Trustees
November 14, 2023
Page 3

For fiscal years ending 2007 through 2018, the system was not funded on an actuarially sound basis as the full actuarially determined employer contributions were not made by the State. However, since that time, the State has appropriated enough to satisfy the actuarially determined employer contributions. Also, it is our understanding that the state budget includes an additional appropriation to the pension plan equal to the ADEC for the 2024 fiscal year.

If contributions by the employer to the system in subsequent fiscal years are less than those required, the assets are expected to become insufficient to pay promised benefits. However, assuming that contributions to the system are made by the employer and state from year to year in the future at rates recommended on the basis of the successive actuarial valuations, the continued sufficiency of the assets to provide the benefits called for under the system may be safely anticipated.

Respectfully submitted,

Edward J. Koebel

Edward J. Koebel, EA , FCA MAAA
Chief Executive Officer

Alisa Bennett

Alisa Bennett,FSA,EA,FCA,MAAA
President

Cathy Turcot

Cathy Turcot
Principal and Managing Director

Micki R. Taylor

Micki R. Taylor, ASA, EA, FCA, MAAA
Consulting Actuary

Section I — Summary of Principal Results

1. For convenience of reference, the principal results of the aggregate valuation (TRS 1, TRS 2, TRS 3 and TRS 4) and a comparison with the results of the previous valuation are summarized below (dollar amounts in thousands):

Valuation Date		June 30, 2023		June 30, 2022
Number of active members		75,644		74,785
Annual salaries	$	4,138,909	$	4,033,509
Number of annuitants and beneficiaries		59,559		58,438
Annual allowances	$	2,423,589	$	2,340,475
Assets				
Fair value	$	24,244,554	$	22,899,952
Actuarial value		24,725,018		24,090,355
Actuarial accrued liability	$	42,179,888	$	40,970,441
Unfunded actuarial accrued liability (UAAL)	$	17,454,870	$	16,880,086
Funded ratio		58.6 %		58.8 %
Amortization period (years)		20.9	$	21.9

2. KRS 161.633 requires that the actuary assess the funding levels, unfunded liabilities, and the actuarially required employer contributions rates payable solely on behalf of individuals who first become members on or after Jan. 1, 2022. The following table shows the results of the valuation as of June 30, 2023, for TRS 4 members:

Group	University				Non-University			
Number of active members	263				7,746			
Annual salaries	$9,138,477				$146,979,448			
		Foundational		Supplemental		Foundational		Supplemental
Fair value of assets	$	1,031,283	$	390,376	$	25,848,015	$	6,122,480
Actuarial accrued liability	$	632,615	$	194,740	$	18,912,660	$	3,312,757
Unfunded actuarial accrued liability	$	(398,668)	$	(195,636)	$	(6,935,355)	$	(2,809,723)
Funded ratio		163.0 %		200.5 %		136.7 %		184.8 %
Actuarial determined contribution rate		— %		— %		— %		— %

3. Contribution rates are shown separately for university and non-university members, as well as by member group (TRS 1 through TRS 4) on the following pages.

Contribution Rates for University Members — Other Than TRS 4

Valuation Date	**June 30, 2023**		**June 30, 2022**	
For year ending	June 30, 2026		June 30, 2025	
	TRS 1 & TRS 2	TRS 3	TRS 1 & TRS 2	TRS 3
Retirement Annuity Trust:				
Normal*	12.130 %	12.130 %	12.230 %	12.230 %
Actuarial accrued liability	28.850	28.850	25.110	25.110
Total**	40.980 %	40.980 %	37.340 %	37.340 %
Member	7.625 %	7.625 %	7.625 %	7.625 %
State (ARC)	33.355	33.355	29.715	29.715
Total**	40.980 %	40.980 %	37.340 %	37.340 %
Life Insurance Trust:				
State	0.080 %	0.080 %	0.080 %	0.080 %
Health Insurance Trust:				
Member	2.775 %	2.775 %	2.775 %	2.775 %
State match	2.775	2.775	2.775	2.775
Total	5.550 %	5.550 %	5.550 %	5.550 %
Total contributions	46.610 %	46.610 %	42.970 %	42.970 %
Member fixed	10.400 %	10.400 %	10.400 %	10.400 %
State fixed	13.650	13.650	13.650	13.650
Required increase	22.560	22.560	18.920	18.920
State special	—	—	—	—
Total	46.610 %	46.610 %	42.970 %	42.970 %

** Includes a load for administrative expenses.*
*** Total contribution rates for year ending June 30, 2025, and June 30, 2026, shown above apply a five-year contribution direct rate smoothing methodology and are anticipated to increase each year until the full funding rates are achieved in not more than five years from the 2021 valuation. See Schedule H for anticipated contribution rate increases.*

Contribution Rates for Non-University Members — Other Than TRS 4

Valuation Date	**June 30, 2023**		**June 30, 2022**	
For year ending	June 30, 2026		June 30, 2025	
	TRS 1 & TRS 2	TRS 3	TRS 1 & TRS 2	TRS 3
Retirement Annuity Trust:				
Normal*	16.150 %	16.150 %	16.210 %	16.210 %
Actuarial accrued liability	27.790	28.790	24.090	25.090
Total**	43.940 %	44.940 %	40.300 %	41.300 %
Member	9.105 %	9.105 %	9.105 %	9.105 %
State (ARC)	34.835	35.835	31.195	32.195
Total**	43.940 %	44.940 %	40.300 %	41.300 %
Life Insurance Trust:				
State	0.080 %	0.080 %	0.080 %	0.080 %
Health Insurance Trust:				
Member	3.750 %	3.750 %	3.750 %	3.750 %
State match	3.750	3.750	3.750	3.750
Total	7.500 %	7.500 %	7.500 %	7.500 %
Total Contributions	51.520 %	52.520 %	47.880 %	48.880 %
Member fixed	12.855 %	12.855 %	12.855 %	12.855 %
State fixed	16.105	17.105	16.105	17.105
Required increase	22.560	22.560	18.920	18.920
State special	—	—	—	—
Total	51.520 %	52.520 %	47.880 %	48.880 %

** Includes a load for administrative expenses.*

*** Total contribution rates for year ending June 30, 2025, and June 30, 2026, shown above apply a five-year contribution direct rate smoothing methodology and are anticipated to increase each year until the full funding rates are achieved in not more than five years from the 2021 valuation. See Schedule H for anticipated contribution rate increases.*

Contribution Rates for TRS 4 Members

Group	**University**		**Non-University**	
For year ending	June 30, 2026		June 30, 2026	
	Foundational	Supplemental	Foundational	Supplemental
Retirement Annuity Trust:				
Normal*	7.170 %	2.200 %	11.380 %	2.130 %
Actuarial accrued liability	3.525	1.800	5.540	1.870
Total	10.695 %	4.000 %	16.920 %	4.000 %
Member	5.000 %	2.000 %	9.000 %	2.000 %
Employer	5.695	2.000	7.920	2.000
Total	10.695 %	4.000 %	16.920 %	4.000 %
Life Insurance Trust:				
Employer	0.080 %	— %	0.080 %	— %
Health Insurance Trust:				
Member	2.775 %	— %	3.750 %	— %
Employer	2.000	—	3.750	—
Total	4.775 %	— %	7.500 %	— %
Total Contributions	15.550 %	4.000 %	24.500 %	4.000 %
Member fixed	7.775 %	2.000 %	12.750 %	2.000 %
Employer fixed	7.775	2.000	11.750	2.000
Total	15.550 %	4.000 %	24.500 %	4.000 %

** Includes a load for administrative expenses.*

4. The valuation includes only the assets and liabilities associated with the Retirement Annuity Trust. The valuation of the Health Insurance Trust and the active and retired life insurance benefits has been prepared separately.
5. Comments on the valuation results as of June 30, 2023, are given in Section IV and further discussion of the contribution levels is set out in Sections V and VI.
6. Schedule B shows the development of the actuarial value of assets. The assumed investment rate of return is 7.1%
7. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation. There have been no changes since the previous valuation. Direct rate smoothing is being used to phase in the impact of the June 30, 2021 assumption changes to the required contributions over a five-year period. The cost of the assumption changes was estimated at 8.59% of payroll beginning with the June 30, 2021 valuation, which represents an expected increase of at least 1.72% of payroll each year over a five-year period to cover the cost of the change in assumptions.
8. Provisions of the system, as summarized in Schedule F, were taken into account in the current valuation. There have been no changes since the previous valuation.
9. The aggregate funded ratio for TRS 1 through TRS 4, shown in the Summary of Principal Results, is the ratio of actuarial value of assets to the actuarial accrued liability. The funded status would be different based on the fair value of assets. The funded ratio is an indication of progress in funding the promised benefits. Since the ratio is less than 100% for TRS 1 through TRS 3, there is a need for additional contributions toward the payment of the unfunded actuarial accrued liability. For TRS 4, the ratio is above 100%, so there is no need for additional contributions. In addition, this funded ratio does not have any relationship to measuring the sufficiency if the plan had to settle its liabilities.

Section II — Membership Data

1. Data regarding the membership of the system for use as a basis of the valuation were furnished by the retirement system office. The following table shows the number of active members and their annual salaries as of June 30, 2023, on the basis of which the valuation was prepared.

Group	Number	Annual Salaries *(In thousands)*
University active members		
TRS 1 and TRS 2	1,339	$ 98,265
TRS 3	1,410	85,225
TRS 4	263	9,138
Total university active members	3,012	192,628
Non-university active members		
Full-time TRS 1 and TRS 2	27,454	2,050,698
Full-time TRS 3	29,812	1,673,453
Full-time TRS 4	3,290	124,536
Part-time TRS 1 & 2	1,050	10,450
Part-time TRS 3	6,570	64,701
Part-time TRS 4	4,456	22,443
Total non-university active members	72,632	3,946,281
Grand total	75,644	$ 4,138,909

2. The following table shows the number and annual retirement allowances payable to annuitants and beneficiaries on the roll of the retirement system as of the valuation date.

Number and Annual Retirement Allowances of Annuitants and Beneficiaries on the Roll as of June 30, 2023

Group	Number	Annual Retirement Allowances* *(In thousands)*
Service retirements	51,961	$ 2,205,384
Disability retirements	2,781	89,811
Beneficiaries of deceased members	4,817	128,664
Total	59,559	$ 2,423,859

* *Includes cost-of-living adjustments effective through July 1, 2023.*

3. In addition, there are 11,331 terminated vested employees entitled to benefits in the future and 51,609 inactive non-vested members.
4. Table 1 of Schedule G shows a distribution by age and years of service of the number and annual salaries of active members included in the valuation, while Table 2 shows the number and annual retirement allowances of annuitants and beneficiaries included in the valuation, distributed by age.

Section III — Assets

1. As of June 30, 2023, the fair value of Retirement Annuity Trust assets for valuation purposes held by the system amounted to $24.2 billion. This value excludes assets in the Health Insurance Trust, the 403(b) Tax Sheltered Trust and the Life Insurance Trust, which are not included in the assets used for Retirement Annuity Trust valuation purposes. The investment return for the plan year ending June 30, 2023, on a fair value basis was 10.2%. Schedule C shows the receipts and disbursements for the year preceding the valuation date and a reconciliation of the asset balances for the Retirement Annuity Trust.
2. The five-year fair related value of Retirement Annuity Trust assets used for valuation purposes as of June 30, 2023, was $24.72 billion. The estimated investment return for the plan year ending June 30, 2023, on an actuarial value of assets basis was 6.6%, compared to the assumed investment rate of return for the period of 7.1%. Schedule B shows the development of the actuarial value of assets as of June 30, 2023.
3. Below is a history of actual investment rates of return for the Retirement Annuity Trust over the past five years:

Fiscal Year	Fair Value Rate of Return	Actuarial Value Rate of Return
2023	10.2%	6.6%
2022	(10.9)%	7.9%
2021	29.6%	12.9%
2020	5.5%	7.0%
2019	5.6%	7.1%

Section IV — Comments on Valuation

1. Schedule A of this report contains the valuation balance sheet which shows the present and prospective assets and liabilities of the system for TRS 1 through TRS 4 as of June 30, 2023. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule D and Schedule E.
2. The valuation balance sheet shows that the system has total prospective liabilities of $20.9 billion for benefits expected to be paid on account of the present active members. The liability on account of benefits payable to annuitants and beneficiaries amounts to $26.2 billion of which there are no remaining special appropriations to be made toward funding ad hoc increases and sick leave allowances granted after 1981. The liability for benefits expected to be paid to inactive members and to members entitled to deferred vested benefits is $589 million. The total prospective liabilities of the system amounts to $47.7 billion. Against these liabilities, the system has present assets for valuation purposes of $24.7 billion. When this amount is deducted from the total liabilities of $47.7 billion, there remains $23 billion as the present value contributions to be made in the future.
3. The contributions to the system consist of normal contributions and actuarial accrued liability contributions. The valuation indicates that employer normal contributions are required at the rate of 12.13% of payroll for university other than TRS 4 and 9.37% of payroll for university TRS 4 members for both foundational and supplemental plans. The valuation indicates that employer normal contributions at the rate of 16.15% of payroll for non-university members other than TRS 4 and 13.51% of payroll for non-university TRS members for both foundational and supplemental plans are required. This includes a load for administrative expenses of 0.32% of payroll.
4. Prospective normal employer and employee contributions have a present value of $5.49 billion. When this amount is subtracted from $22.95 billion, which is the present value of the total future contributions to be made by the employer, there remains $17.46 billion as the amount of future unfunded actuarial accrued liability contributions.
5. The unfunded actuarial accrued liability increased by approximately $574.8 million for the plan year ending June 30, 2023, and the funded ratio decreased from 58.8% to 58.6%. These results were primarily due to investment earnings on actuarial value of assets being less than expected (6.6% vs. 7.1%) and actual salary increases greater than expected. See Section VII for a complete breakdown of the experience of the system.

Section V — Contributions Payable Under the System

Employee Contributions

1. KRS 161.540 provides that each university member hired before Jan. 1, 2022 will contribute 10.4% of annual salary to the system and each non-university member contribute 12.855% of annual salary. Of this amount, for each university member, 2.775% is paid to the Health Insurance Trust for medical benefits and for each non-university member, 3.75% is paid to the Health Insurance Trust for medical benefits. The remainder, 7.625% for university members and 9.105% for non-university members, is applicable for the retirement benefits taken into account in the valuation.

2. KRS 161.540 also provides for each university member hired on and after Jan. 1, 2022, will contribute 9.775% of annual compensation to the system for both foundation and supplemental plans and each non-university member will contribute 14.75% of annual compensation for both foundational and supplemental. Of this amount, for each university member, 2.775% is paid to the Health Insurance Trust for medical benefits and for each non-university member, 3.75% is paid to the Health Insurance Trust for medical benefits. Of the remainder, 5% for university members and 9% for non-university members, is applicable to the foundational benefit component of the retirement benefits. Finally, an additional 2% is applicable to the supplemental benefit component of the retirement benefits for all TRS 4 members.

Employer Contributions

3. KRS 161.550 provides that for members hired before Jan. 1, 2022, each employer will contribute an amount to fund pension and life insurance benefits equal to 10.875% of the total annual compensation of university members, 12.355% of the total compensation of non-university members hired prior to July 1, 2008 and 13.355% of the total annual compensation of non-university members hired on and after July 1, 2008. Additional contributions are made to the Health Insurance Trust as required under 161.550(3).
4. KRS 161.550 also provides that for members hired on and after Jan. 1, 2022 each employer will contribute an amount to fund pension and life insurance benefits equal to 5.775% for university members and 8% for non-university members.
5. Based on the results of the current valuation, of the amounts shown above, 0.08% of payroll will be allocated to the Life Insurance Trust.
6. Based on the results of the current valuation, an additional 26.00% of payroll for both university and non-university members other than TRS 4, will be required in order to maintain the amortization of the unfunded actuarial accrued liability of the Retirement Annuity Trust based on the funding policy adopted by the board. However, due to the results of the experience study adopted by the board, direct-rate smoothing of contribution rates will be used to phase in the impact over a five-year period. The resulting required increase based on direct-rate smoothing is 22.56% of payroll for the year ending June 30, 2026.
7. The total actuarially determined employer contribution (ADEC) rate to the Retirement Annuity Trust is 33.355% for university members other than TRS 4. The total ADEC rate to the pension plan is 34.835% for non-university TRS 1 and TRS 2 members and 35.835% for non-university TRS 3 members. The total member and employer contribution rates to the Retirement Annuity Trust for members other than TRS 4, are shown in the following tables.

Contribution Rates by Source
University — Other Than TRS 4

Member	TRS 1, TRS 2 and TRS 3 Members
Fixed total	10.400 %
Fixed Health Insurance Trust	(2.775 %)
Contribution to Retirement Annuity Trust	7.625 %
Employer	
Fixed total	13.650 %
Fixed Health Insurance Trust	(2.775 %)
Subtotal	10.875 %
Life Insurance Trust	(0.080 %)
Additional to comply with board funding policy using Direct-Rate Smoothing of the Impact of the Assumption Changes over five years	22.560 %
Special appropriation	— %
Contribution to Retirement Annuity Trust	33.355 %
Total contribution to Retirement Annuity Trust	40.980 %

Contribution Rates by Source
Non-University — Other Than TRS 4

	TRS 1 and TRS 2 Members	TRS 3 Members
Member		
Fixed total	12.855 %	12.855 %
Fixed Health Insurance Trust	(3.750 %)	(3.750 %)
Contribution to Retirement Annuity Trust	9.105 %	9.105 %
Employer		
Fixed total	16.105 %	17.105 %
Fixed Health Insurance Trust	(3.750 %)	(3.750 %)
Subtotal	12.355 %	13.355 %
Life Insurance Trust	(0.080 %)	(0.080 %)
Additional to comply with board funding policy using Direct-Rate Smoothing of the Impact of the Assumption Changes over five years	22.560 %	22.560 %
Special appropriation	— %	— %
ADEC contribution to Retirement Annuity Trust	34.835 %	35.835 %
Total contribution to Retirement Annuity Trust	43.940 %	44.940 %

8. The valuation indicates that normal contributions at the rate of 12.13% of active university members' salaries and 16.15% of active non-university members' salaries are required for members other than TRS 4. In addition, the valuation indicates that normal contributions at the rate of 9.37% of active university members' salaries and 13.51% of active non-university members' salaries are required for TRS 4 members. The difference between the total contribution rate and the normal rate remains to be applied toward the liquidation of the unfunded actuarial accrued liability. This actuarial accrued liability rate, based on the assumptions set forth in the board's funding policy and including the impact of direct-rate smoothing of contributions, is 28.85% for university members other than TRS 4, 27.79% for non-university TRS 1 and TRS 2 members, and 28.79% for non-university TRS 3 members. The actuarial accrued liability rate for TRS 4 members is 5.325% for university members and 7.41% for non-university members. These rates are shown in the following table.

Combined Member and Employer Contribution Rates — Members Other Than TRS 4

	Percentage of Active Members' Salaries			
	University		Non-University	
Rate	TRS 1 and TRS 2 Members	TRS 3 Members	TRS 1 and TRS 2 Members	TRS 3 Members
Total normal cost*	12.13 %	12.13 %	16.15 %	16.15 %
Actuarial accrued liability	28.85	28.85	27.79	28.79
Total**	40.98 %	40.98 %	43.94 %	44.94 %

** Includes a load for administrative expenses.*

*** Total contribution rates shown above apply a five-year contribution direct rate smoothing methodology and are anticipated to increase each year until the full funding rates are achieved in not more than five years from the 2021 valuation. Please see the projections in Schedule H of the report for anticipated increases to the total contribution rates.*

Fixed Contribution Rates — TRS 4 Members

	Percentage of Active Members' Salaries			
	University		Non-University	
Rate	Foundational	Supplemental	Foundational	Supplemental
Total normal cost*	7.170 %	2.200 %	11.380 %	2.130 %
Actuarial accrued liability	3.525	1.800	5.540	1.870
Total	10.695 %	4.000 %	16.920 %	4.000 %

** Includes a load for administrative expenses.*

9. The following table shows the components of the total Unfunded Actuarial Accrued Liability (UAAL) and the derivation of the UAAL contribution rate in accordance with the funding policy.
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Total UAAL and UAAL Contribution Payment
(Dollars in thousands)

	Original UAAL	Current UAAL	Remaining Amortization Period (years)	Amortization Payment
Legacy	$ 14,010,205	$ 15,343,668	21	$ 1,117,354
New incremental June 30, 2015	(351,610)	(315,670)	12	(34,093)
New incremental June 30, 2016*	340,766	313,734	13	31,876
New incremental June 30, 2017	(428,468)	(403,379)	14	(38,779)
New incremental June 30, 2018	(192,240)	(184,144)	15	(16,834)
New incremental June 30, 2019	53,306	51,728	16	4,516
New incremental June 30, 2020	112,464	110,142	17	9,218
New incremental June 30, 2021*	2,042,379	2,011,916	18	161,960
New incremental June 30, 2022	(79,030)	(78,542)	19	(6,099)
New incremental June 30, 2023	605,417	605,417	20	45,474
Total UAAL		$ 17,454,870		$ 1,274,593 **
Blended amortization period (years)				20.9

** Includes assumption changes*

*** The UAAL payment provided above is the total payment before any consideration of the direct rate smoothing technique per the Board's funding policy.*

Section VI — Comments on Level of Funding

1. Our calculations indicate that the contribution rates shown in the previous section will be sufficient to cover the benefits of the system and the annual 1.5% increases in the allowances of retired members and beneficiaries.
2. The valuation indicates that the present fixed contribution rates if continued at the current level percentage, along with an additional required contribution for members other than TRS 4 members, are sufficient to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability in accordance with the board funding policy and the direct rate smoothing methodology of phasing in the additional required contribution.
3. The ADEC is determined based on the board's funding policy, and the amortization and direct rate smoothing methodologies. Each year, we determine the required increase percentage needed, in addition to the present fixed

contribution rates to fund the ADEC over the closed amortization period. The table below provides a historical view of the special appropriations and required increase as a percentage of payroll.

Valuation Date	Year	Special Appropriations Rate	Cumulative Required Increase Rate	Cumulative Total State Additional Contribution Rate	Cumulative Total State Required Contribution Amounts
June 30, 2005	June 30, 2008	4.17 %	1.32 %	5.49 %	$ 162,062,900
June 30, 2006	June 30, 2009	4.25	1.88	6.13	197,267,800
June 30, 2007	June 30, 2010	4.28	2.46	6.74	225,574,200
June 30, 2008	June 30, 2011	4.15	3.59	7.74	261,860,000
June 30, 2009	June 30, 2012	3.88	5.81	9.69	347,988,000
June 30, 2010	June 30, 2013	3.69	7.27	10.96	393,444,000
June 30, 2011	June 30, 2014	3.50	8.02	11.52	430,090,000
June 30, 2012	June 30, 2015	3.00	10.42	13.42	497,648,000
June 30, 2013	June 30, 2016	2.90	12.97	15.87	596,397,000
June 30, 2014	June 30, 2017	2.70	13.80	16.50	622,184,000
June 30, 2015	June 30, 2018	2.94	13.49	16.43	624,660,000
June 30, 2016	June 30, 2019	2.83	14.61	17.44	660,830,000
June 30, 2017	June 30, 2020	3.00	14.10	17.10	652,775,000
June 30, 2018	June 30, 2021	2.89	14.27	17.16	662,701,000
June 30, 2019	June 30, 2022	3.05	14.82	17.87	698,411,000
June 30, 2020	June 30, 2023	2.61	15.78	17.39	733,520,000
June 30, 2021	June 30, 2024	2.38	16.18	18.56	741,547,000
June 30, 2022	June 30, 2025	—	18.92	18.92	805,690,000
June 30, 2023	June 30, 2026	—	22.56	22.56	948,600,000

4. The amounts above are calculated by the actuary as the minimum additional dollar amount to be contributed by the state in order to comply with the board’s funding policy and include the impact of direct-smoothing of the cost of assumption changes over five years beginning with the 2021 valuation. For the years shaded in light and dark gray, the state required contribution amounts were made or are expected to be made in full.
5. As can be seen from the table, the total state additional contribution rate increase is 3.64% of payroll from FY25 to FY26. This increase is based on:
   - an expected increase of 1.72% of payroll for the direct rate smoothing technique of phasing in contribution requirements due to the 2021 assumption changes,
   - an increase of 1.92% of payroll due to the overall experience of the system for the year ending June 30, 2023.
6. Effective Sept. 21, 2020, the amount to be provided by the state shall not be less than the prior year's dollar amount until the plan (TRS 1 through TRS 3) reaches a funded ratio of 100%. Any further benefit improvements or return to work changes must be accompanied by the entire additional contributions necessary to support the benefits.

Section VII — Analysis of Financial Experience

The following table shows the estimated gain or loss from various factors that resulted in an increase of $574.8 million in the unfunded actuarial accrued liability from $16.88 billion to $17.46 billion during the year ending June 30, 2023. The increase in the unfunded actuarial accrued liability was primarily due to a loss due to investment return on an actuarial value basis that was less than expected (6.6% vs 7.1%) and a loss due to salary increases that were more than expected. These losses were partially offset by gains due to mortality (more deaths than expected) and gains due to turnover and retirements.

Analysis of Financial Experience
(In thousands)

Item	Amount of Increase/ (Decrease)
Interest (7.1%) added to previous unfunded accrued liability	$ 1,198,486
Expected actuarially accrued liability contribution	(910,196)
Experience:	
Valuation asset growth	121,556
Pensioners' mortality	(8,625)
Turnover and retirements	(15,951)
New entrants	57,772
Salary increases	131,742
Amendments	0
Assumption changes	0
Data changes	—
Total	$ 574,784

Section VIII — Accounting Information

The information required under Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 is issued in separate reports. The following information is provided for informational purposes only.

1. The following is a distribution of the number of employees by type of membership.

Number of Active and Retired Members as of June 30, 2023

Group	Number
Retirees and beneficiaries currently receiving benefits	59,559
Terminated vested employees entitled to benefits but not yet receiving benefits	11,331
Inactive non-vested members	51,609
Active plan members	75,644
Total	198,143

2. The schedule of funding progress is shown below.

Schedule of Funding Progress
(Dollars in thousands)

Actuarial Valuation Date June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) /c)
2014	$ 16,174,199	$ 30,184,404	$ 14,010,205	53.6 %	$ 3,486,327	401.9 %
2015	17,219,520	31,149,962	13,930,442	55.3	3,515,113	396.3
2016*	17,496,894	32,028,227	14,531,333	54.6	3,537,226	410.8
2017	18,514,638	32,819,887	14,305,249	56.4	3,563,584	401.4
2018*	19,496,056	33,795,671	14,299,615	57.7	3,605,116	396.6
2019	20,154,161	34,676,713	14,522,552	58.1	3,648,428	398.0
2020	20,796,494	35,582,250	14,785,756	58.4	3,723,482	397.1
2021	22,624,398	39,581,704	16,957,306	57.2	3,784,400	448.1
2022	24,090,355	40,970,441	16,880,086	58.8	4,033,509	418.5
2023*	24,725,018	42,179,888	17,454,870	58.6	4,138,909	421.7

** Reflects change in assumptions and methods.*

3. The information presented above was determined as part of the actuarial valuation at June 30, 2023. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2023
Actuarial cost method	Entry age
Amortization method	Level percent of pay, closed
Remaining amortization period	20.9 years
Asset valuation method	Five-year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.1%
Projected salary increases**	3% - 7.5%
Cost-of-living adjustments	1.5% annually

** Includes price inflation at 2.5%*

*** Includes wage inflation at 2.75%*

Schedule of Employer Contributions

Fiscal Year Ended June 30	Actuarially Determined Employer Contributions	Actual Employer Contributions	Percentage Contributed
2014	$ 823,446,156	$ 563,326,249	68
2015	913,653,854	559,579,290	61
2016	999,270,174	565,454,590	57
2017	1,076,617,093	1,060,719,993	99
2018	1,080,892,201	1,048,671,201	97
2019	1,123,034,823	1,123,034,823	100
2020	1,134,281,095	1,134,281,095	100
2021	1,146,977,669	1,146,977,669	100
2022	1,200,342,369	1,679,584,669	140
2023	1,144,448,806	1,144,448,806	100

Section IX — Risk Assessment

Actuarial Standards of Practice (ASOP) No. 51, issued by the Actuarial Standards Board, provides guidance on assessing and disclosing risks related to pension plan funding. This guidance is binding on all credentialed actuaries practicing in the United States. This standard was issued as final in September 2017 with application to measurement dates on or after Nov. 1, 2018.

The term "risk" frequently has a negative connotation, but from an actuarial perspective, it may be thought of as simply the fact that what actually happens in the real world will not always match what was expected, based on actuarial assumptions. Of course, when actual experience is better than expected, the favorable risk is easily absorbed. The risk of unfavorable experience will likely be unpleasant, and so there is an understandable focus on aspects of risk that are negative.

Risk usually can be reduced or eliminated at some cost. Consumers, for example, buy auto and home insurance to reduce the risk associated with accidents or catastrophes. Another way to express this concept, however, is that there is generally some reward for assuming risk. Thus, retirement plans invest not just in U.S. Treasury bonds which have almost no risk, but also in equity, which is considerably riskier — because those investments have an expected reward of a higher return that justifies the risk.

Under ASOP 51, the actuary is called on to identify the significant risks to the pension plan and provide information to help those sponsoring and administering the plan understand the implications of these risks. In this section, we identify some of the key risks for the Plan and provide information to help interested parties better understand these risks.

Sensitivity Analysis

The valuation results are a projection of expected benefit payments based on the actuarial assumptions. Actual experience will differ from these assumptions, either increasing or decreasing liabilities and valuation results. The charts on the following pages provide a simple analysis on how the costs are sensitive to changes in the assumed discount rate, the assumed price inflation rate and the rate of wage inflation. The charts show the actuarial accrued liability, the unfunded actuarial accrued liability, the funded ratio and the employer contribution rate under each of the following scenarios:

- **Table 1** - The discount rate assumption sensitivity analysis shows the valuation results with the baseline discount rate assumption, 7.1%, together with an increase and a decrease of 1% in the discount rate. Under this scenario, the underlying price inflation rate assumption is held constant at 2.5% and the wage inflation assumption is held constant at 2.75%.
- **Table 2** - The price inflation assumption sensitivity analysis shows the valuation results with the baseline underlying price inflation rate assumption, 2.5%, together with decreases in the price inflation rate to 2.25% and 2%. Under this scenario, the decrease in the underlying price inflation rate assumption leads to corresponding decreases in the discount rate (6.85% and 6.6%, respectively), the wage inflation assumption (2.5% and 2.25%, respectively), and the assumed rates of salary increase for active members.
- **Table 3** - The wage inflation assumption sensitivity analysis shows the valuation results with the baseline underlying wage inflation assumption, 2.75%, together with decreases in the wage inflation assumption to 1.25% and 0%. Under this scenario, all other assumptions, including the individual member salary scale, are held constant so that the only impact is in the amortization of the unfunded actuarial accrued liability, leading to higher employer contribution rates.

Table 1
Assumed Discount Rate Sensitivity Analysis
as of June 30, 2023
(Dollars in thousands)

	Decrease Discount Rate	Valuation Results	Increase Discount Rate
Actuarial accrued liability	$ 47,304,539	$ 42,179,888	$ 37,921,719
Actuarial value of assets	24,725,018	24,725,018	24,725,018
Unfunded actuarial accrued liability	$ 22,579,521	$ 17,454,870	$ 13,196,701
Funded ratio	52.3 %	58.6 %	65.2 %
Employer ADEC — university	47.395 %	36.795 %	27.595 %
Employer ADEC — non-university*	49.875 %	39.275 %	30.075 %
Discount rate	6.1 %	7.1 %	8.1 %
Wage inflation rate	2.75 %	2.75 %	2.75 %
Price inflation rate	2.5 %	2.5 %	2.5 %

** Less 1% for TRS 1 and TRS 2 members. The ADEC rates do not include the impact of direct-rate smoothing.*

Table 2
Price Inflation Assumption Sensitivity Analysis
As of June 30, 2023
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 42,179,888	$ 43,224,905	$ 44,316,639
Actuarial value of assets	24,725,018	24,725,018	24,725,018
Unfunded actuarial accrued liability	$ 17,454,870	$ 18,499,887	$ 19,591,621
Funded ratio	58.6 %	57.2 %	55.8 %
Employer ADEC — university	36.795 %	39.335 %	41.985 %
Employer ADEC — non-university*	39.275 %	41.815 %	44.465 %
Discount rate	7.10 %	6.85 %	6.60 %
Wage inflation rate	2.75 %	2.50 %	2.25 %
Price inflation rate	2.5 %	2.3 %	2.0 %

** Less 1% for TRS 1 and TRS 2 members. The ADEC rates do not include the impact of direct-rate smoothing.*

Table 3
Wage Inflation Assumption Sensitivity Analysis
As of June 30, 2023
(Dollars in thousands)

	Valuation Results	Decrease Wage Inflation to 1.25%	No Wage Inflation
Actuarial accrued liability	$ 42,179,888	$ 42,179,888	$ 42,179,888
Actuarial value of assets	24,725,018	24,725,018	24,725,018
Unfunded actuarial accrued liability	$ 17,454,870	$ 17,454,870	$ 17,454,870
Funded ratio	58.6 %	58.6 %	58.6 %
Employer ADEC — university	36.795 %	41.435 %	45.635 %
Employer ADEC — non-university*	39.275 %	43.915 %	48.115 %
Discount rate	7.1 %	7.1 %	7.1 %
Wage inflation rate	2.75 %	1.25 %	0.00 %
Price inflation rate	2.5 %	2.5 %	2.5 %

** Less 1% for TRS 1 and TRS 2 members. The ADEC rates do not include the impact of direct-rate smoothing.*

Low-Default-Risk Obligation Measure

Under the revised Actuarial Standards of Practice (ASOP) No.4 effective for valuations after February 15, 2023, we are required to include a low-default-risk obligation measure of the system's liability in our funding valuation report. This is an informational disclosure as described below and would not be appropriate for assessing the funding progress or health of the plan. This measure uses the unit credit cost method and reflects all the assumptions and provisions of the funding valuation (including the assumed COLA paid), except that the discount rate is derived from considering low-default risk fixed income securities. We considered the FTSE Pension Discount Curve based on market bond rates published by the Society of Actuaries as of June 30, 2023 and with the 30-year spot rate used for all the durations beyond 30 because this provides an appropriate set of discount rates for this intended purpose.

Using these assumptions, we calculate a liability of approximately $48.8 billion. This amount approximates the termination liability if the plan (or all covered employment) ended on the valuation date and all of the accrued benefits had to be paid with cash-flow matched bonds. If the plan were funded with the intent of being able to be terminated at any valuation date, contribution requirements may need to increase and would also be more volatile. This assurance of funded status and benefit security is typically more relevant for corporate plans than for governmental plans since governments rarely have the need or option to completely terminate the plan. However, this informational disclosure is required for all plans whether corporate or governmental and care should be taken to ensure the one size fits all metric is not misconstrued.

Schedule A

Valuation Balance Sheet
Showing the Present and Prospective Assets and Liabilities
As of June 30, 2023
(In thousands)

Actuarial Liabilities

(1)	Present value of prospective benefits payable on account of present active members					
	-	Service retirement benefits	$	19,793,302		
	-	Disability retirement benefits		723,808		
	-	Death and survivor benefits		118,835		
	-	Refunds of member contributions		246,522		
		Total			$	20,882,467
(2)	Present value of prospective benefits payable on account of present retired and disabled members, and beneficiaries of deceased members					
	-	Service retirement benefits	$	24,130,871		
	-	Disability retirement benefits		1,001,191		
	-	Death and survivor benefits		1,067,497		
		Total			$	26,199,559
(3)	Present value of prospective benefits payable on account of inactive members and members entitled to deferred vested benefits				$	589,039
(4)	Total Actuarial Liabilities				$	47,671,065

Present and Prospective Assets

(5)	Actuarial value of assets			$	24,725,018
(6)	Present value of total future contributions = (4)-(5)	$	22,946,047		
(7)	Present value of future member contributions and employer normal contributions			$	5,491,177
(8)	Prospective unfunded accrued liability contributions = (6)-(7)			$	17,454,870
(9)	Total Present and Prospective Assets			$	47,671,065

Solvency Test for TRS 1 through TRS 4
(Dollars in millions)

	Aggregate Actuarial Accrued Liability for				Portion of Accrued Liabilities Covered by Assets		
Valuation Date June 30	**(1) Active Member Contributions**	**(2) Retirants and Beneficiaries**	**(3) Active Members (Employer Financed Portion)**	**Valuation Assets**	**(1)**	**(2)**	**(3)**
2014	$3,629.7	$18,676.3	$7,878.3	$16,174.2	100 %	67 %	0 %
2015	3,700.6	19,522.5	7,926.8	17,219.5	100	69	0
2016	3,756.0	20,416.4	7,855.8	17,496.9	100	67	0
2017	3,849.9	21,108.0	7,862.1	18,514.6	100	69	0
2018	3,927.8	21,922.5	7,945.4	19,496.1	100	71	0
2019	4,022.4	22,601.6	8,052.7	20,154.2	100	71	0
2020	4,158.7	23,158.6	8,265.0	20,796.5	100	72	0
2021	4,282.8	25,367.6	9,931.3	22,624.4	100	72	0
2022	4,420.7	26,002.2	10,547.5	24,090.4	100	76	0
2023	4,511.0	26,788.6	10,880.3	24,725.0	100	75	0

Schedule B

Development of Actuarial Value of Assets
For TRS 1 through TRS 4

(1)	Actuarial value of assets beginning of year		$24,090,355,038
(2)	Net position at fair value at end of year		24,244,554,125
(3)	Net position at fair value at beginning of year		22,899,952,370
(4)	Cash flow		
	a.	Contributions	1,511,223,310
	b.	Benefit payments	2,418,235,982
	c.	Administrative expense	14,470,733
	d.	Net: (4)a - (4)b - (4)c	(921,483,405)
(5)	Investment income		
	a.	Fair value total: (2) - (3) - (4)d	2,266,085,160
	b.	Assumed rate	7.1 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	1,593,183,957
	d.	Amount for phased-in recognition: (5)a - (5)c	672,901,203
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	134,580,241
	b.	First prior year	(911,655,908)
	c.	Second prior year	898,669,898
	d.	Third prior year	(81,156,976)
	e.	Fourth prior year	(77,474,783)
	f.	Total recognized investment gain	(37,037,528)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		$24,725,018,062
(8)	Difference between fair & actuarial values: (2) - (7)		$ (480,463,937)
(9)	Net investment rate of return on actuarial value		6.6 %

Schedule C

Summary of Receipts & Disbursements*
For TRS 1 through TRS 4 (Fair Value)

	For the Year Ending	
Receipts for the year	**June 30, 2023**	**June 30, 2022**
Contributions		
Members	$ 366,774,504	$ 356,966,620
Employers	1,144,448,806	1,679,584,669
Total	1,511,223,310	2,036,551,289
Net investment income	2,266,085,160	(2,727,775,055)
Total	3,777,308,470	(691,223,766)
Disbursements for the year		
Benefit payments	2,391,326,201	2,305,852,772
Refunds to members	26,909,781	26,745,203
Miscellaneous, including expenses	14,470,733	12,005,095
Total	2,432,706,715	2,344,603,070
Excess of receipts over disbursements	1,344,601,755	(3,035,826,836)
Reconciliation of net position		
Net position as of the beginning of the year	22,899,952,370	25,935,779,206
Excess of receipts over disbursements	1,344,601,755	(3,035,826,836)
Net position as of the end of the year	$ 24,244,554,125	$ 22,899,952,370
Net investment rate of return on fair value	10.2 %	(10.9)%

** Excludes assets of the Health Insurance Trust, the 403(b) Tax-Sheltered Trust and the Life Insurance Trust.*

Schedule D

Outline of Actuarial Assumptions and Methods

The assumptions and methods used in the valuation were selected based on the actuarial experience study prepared as of June 30, 2020, submitted to and adopted by the board on September 20, 2021.

Investment Rate of Return: 7.1% per annum, compounded annually, including price inflation at 2.5% per annum.

Salary increases: Representative values of the assumed annual rates of future salary increases are as follows and include wage inflation at 2.75% per annum:

Service	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	≥17
Annual Rate %	7.5	5.5	5	5	5	4.75	4.5	4.25	4	4	4	3.75	3.5	3.5	3.25	3.25	3

Separations From Service: Representative values of the assumed annual rates of death, disability, withdrawal, service retirement and early retirement are as follows:

Males: Annual Rate of

Age	Death*	Disability	Withdrawal Service 0 - 4	Withdrawal Service 5 - 9	Withdrawal Service 10+	Retirement Before 27 Years of Service	Retirement After 27 Years of Service**
20	0.030 %	0.01 %	20.00 %				
25	0.017	0.01	11.00	3.25 %			
30	0.024	0.01	10.00	3.60	2.80 %		
35	0.032	0.02	11.00	3.60	1.55		
40	0.046	0.07	12.50	4.00	1.25		
45	0.074	0.18	11.50	4.00	1.10		17.0 %
50	0.122	0.28	14.25	4.50	1.10		25.0
55	0.187	0.40	15.00	6.00	1.25	5.25 %	40.0
60	0.291	0.50	15.00	0.00	0.00	13.50	33.0
62	0.354	0.50	15.00	0.00	0.00	15.00	30.0
65	0.481	0.50	20.00	0.00	0.00	20.00	30.0
70	0.774	0.50	20.00	0.00	0.00	25.00	30.0
75	1.234	0.50	20.00	0.00	0.00	100.00	100.0

** Base rates.*

*** Plus 8.5% in year when first eligible for unreduced retirement with 27 years of service.*

Females: Annual Rate of

Age	Death*	Disability	Withdrawal Service 0 - 4	Withdrawal Service 5 - 9	Withdrawal Service 10+	Retirement Before 27 Years of Service	Retirement After 27 Years of Service**
20	0.013 %	0.01 %	13.00 %				
25	0.009	0.01	9.00	4.50 %			
30	0.011	0.02	11.00	4.25	1.00 %		
35	0.017	0.06	11.00	3.50	1.60		
40	0.026	0.10	12.50	4.00	1.20		
45	0.040	0.24	13.50	4.00	1.00		17.0 %
50	0.062	0.38	15.00	4.50	1.25		20.0
55	0.090	0.50	15.00	5.00	1.60	5.0 %	50.0
60	0.132	0.60	17.50	0.00	0.00	15.0	40.0
62	0.158	0.62	17.50	0.00	0.00	15.0	40.0
65	0.213	0.65	25.00	0.00	0.00	25.0	40.0
70	0.372	0.65	25.00	0.00	0.00	30.0	35.0
75	0.696	0.65	25.00	0.00	0.00	100.0	100.0

** Base rates.*

*** Plus 10% in year when first eligible for unreduced retirement with 27 years of service.*

Deaths After Retirement

Mortality Assumption: All mortality rates use Pub-2010 benefit-weighted tables.

Mortality Projection: All mortality rates are projected from 2010 using generational improvement with Scale MP-2020 adjusted to 75% of the standard rates.

Service Retirements: Mortality rates are based on the Teachers Mortality Table for Retirees. Rates for male members are set forward 2 years and multiplied by 102%. Rates for female members are set forward 2 years and multiplied by 98%.

Survivors of Deceased Members: Mortality rates are based on the Teachers Mortality Table for Contingent Survivors. Rates for male members are set forward 2 years and multiplied by 101%.

Disabled Members at Retirement: Mortality rates are based on the Teachers Mortality Table for Disabled Retirees. Rates for male members are set forward 1 year and multiplied by 96%. Rates for female members are set back 2 years and multiplied by 94%.

Representative values of the assumed annual rates of death after service retirement and after disability retirement are shown in this table.

Annual Rate of Death After*

	Service Retirement		Disability Retirement		Survivors of Deceased Members	
Age	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
45	0.0836 %	0.0568 %	1.0646 %	0.7755 %	0.6020 %	0.2620 %
50	0.1357	0.0843	1.6435	1.1910	0.7545	0.3200
55	0.2744	0.2215	2.1130	1.5416	0.8959	0.4460
60	0.4427	0.3322	2.4806	1.7616	1.1413	0.6220
65	0.7579	0.5351	3.0653	1.9834	1.6443	0.8990
70	1.4066	0.9682	3.9485	2.4149	2.5876	1.3530
75	2.6816	1.8649	5.3155	3.2562	4.1006	2.1510
80	5.0500	3.5819	7.6118	4.7705	6.5630	3.5730
85	9.4585	6.8071	11.2109	7.3423	10.7717	6.3160
90	16.9116	12.6077	16.9738	11.1653	17.7306	11.3290
95	26.9423	21.5110	24.2170	15.7356	26.8670	18.5900

** Base Rates*

Assets — Five-year market related actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the fair value of assets and the expected actuarial value of assets, based on the ultimate assumed valuation rate of return of 7.1%. The amount recognized each year is 20% of the difference between fair value and expected actuarial value.

Administrative Expense Load — 0.32% of payroll added to the normal cost rate.

Percent Married — 100%, with females three years younger than males.

Loads — Unused sick leave: 3% of active liability at the time of retirement for members other than TRS 4.

Level Percentage of Payroll Growth Assumption — 2.75%

Schedule E

Actuarial Cost Method

1. The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future, of each active member's expected benefit at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability or survivor's benefit. Future salary increases and post-retirement cost-of-living adjustments are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries and inactive members to obtain the present value of all expected benefits payable from the system on account of the present group of members and beneficiaries.

2. The employer contributions required to support the benefits of the system are determined following a level funding approach, and consist of a normal contribution and an actuarial accrued liability contribution.

3. Under the entry age normal cost method, the actuarial present value of each member's projected benefits is allocated on a level basis over the member's compensation between the entry age of the member the assumed exit ages. The portion of the actuarial present value allocated to the valuation year is called the normal cost. The actuarial present value of benefits allocated to prior years of service is called the actuarial liability. The unfunded actuarial liability represents the difference between the actuarial liability and the actuarial value of assets as of the valuation date. The unfunded actuarial liability is calculated each year and reflects experience gains/losses. The accrued liability contribution amortizes the balance of the unfunded actuarial accrued liability over a period of years from the valuation date.

Schedule F

Summary of Main System Provisions

The Teachers' Retirement System of the State of Kentucky began operations on July 1, 1940. The valuation took into account amendments to the system effective through June 30, 2023. The following summary describes the main benefit and contribution provisions of the system as interpreted for the valuation.

Definitions

Final average salary means the average of the five highest annual salaries which the member has received for service in a covered position and on which the member has made contributions or on which the public board, institution or agency has picked up the member contributions. For a member who retires after attaining age 55 with 27 years of service, final average salary means the average of the three highest annual salaries.

Benefits

Service Retirement Allowance for TRS 1 and TRS 2 Members

Condition for Allowance — Completion of 27 years of service or attainment of age 55 and five years of service.

Amount of Allowance — The annual retirement allowance for non-university members is equal to:

- 2% of final average salary multiplied by service before July 1, 1983, plus
- 2.5% of final average salary multiplied by service after July 1, 1983.
- For individuals who become members of the retirement system on or after July 1, 2002 and have less than 10 years of service at retirement, the retirement allowance is 2% of final average salary multiplied by service. If, however, they have 10 or more years, they receive a benefit percentage of 2.5% for all years of service up to 30 years.
- For members retiring on or after July 1, 2004, the retirement allowance formula is 3% of final average salary for each year of service credit earned in excess of 30 years.

The annual retirement allowance for university members is equal to 2% of final average salary multiplied by all years of service.

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.

Service Retirement Allowance for TRS 3 Members
Condition for Allowance — Completion of 27 years of service; attainment of age 60 and five years of service; or attainment of age 55 and 10 years of service.

Amount of Allowance — The annual retirement allowance for non-university members is equal to:
- 1.7% of final average salary if service is 10 years or less.
- 2% of final average salary if service is greater than 10 years and no more than 20 years.
- 2.3% of final average salary if service is greater than 20 years but no more than 26 years.
- 2.5% of final average salary if service is greater than 26 years but no more than 30 years.
- 3% of final average salary for years of service greater than 30 years.

The annual retirement allowance for university members is equal to:
- 1.5% of final average salary if service is 10 years or less.
- 1.7% of final average salary if service is greater than 10 years and no more than 20 years.
- 1.85% of final average salary if service is greater than 20 years but less than 27 years.
- 2% of final average salary if service is greater than or equal to 27 years.

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.

Service Retirement Allowance for TRS 4 Members
Condition for Allowance — Attainment of age 57 and 10 years of service; or attainment of age 65 and 5 years of service.

Amount of Allowance — Foundational Benefit
The annual foundational benefit for members is equal to service times a multiplier times final average salary. The multiplier for non-university members is shown in the following table:

	Years of Service			
Age	**5-9.99**	**10-19.99**	**20-29.99**	**30 or more**
57-60		1.70 %	1.95 %	2.20 %
61		1.74 %	1.99 %	2.24 %
62		1.78 %	2.03 %	2.28 %
63		1.82 %	2.07 %	2.32 %
64		1.86 %	2.11 %	2.36 %
65 & over	1.90 %	1.90 %	2.15 %	2.40 %

The multiplier for university members is shown in the following table:

	Years of Service			
Age	**5-9.99**	**10-19.99**	**20-29.99**	**30 or more**
57-60		0.70 %	0.95 %	1.20 %
61		0.74 %	0.99 %	1.24 %
62		0.78 %	1.03 %	1.28 %
63		0.82 %	1.07 %	1.32 %
64		0.86 %	1.11 %	1.36 %
65 & over	0.90 %	0.90 %	1.15 %	1.40 %

The annual foundational benefit is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 30 years of service.

Amount of Allowance — Supplemental Benefit
The annual supplemental benefit is equal to the account balance which includes member and employer contributions and interest credited annually on June 30. Options include annuitizing the balance or receiving the balance as a lump sum either at the time of retirement or at a later date.

Disability Retirement Allowance
Condition for Allowance — For members hired before January 1, 2022, totally and permanently incapable of being employed as a teacher and under 27 years of service but after completing five years of service.

Amount of Allowance — The disability allowance is equal to 60% of the member's final average salary. The disability allowance is payable over an entitlement period equal to 25% of the service credited to the member at the date of disability or five years, whichever is longer. After the disability entitlement period has expired and if the member remains disabled, he will be retired under service retirement. The service retirement allowance will be computed with service credit given for the period of disability retirement. The allowance will not be less than $6,000 per year. The service retirement allowance will not be reduced for commencement of the allowance before age 60 or the completion of 27 years of service.

Benefits Payable on Separation from Service — Any member who ceases to be in service is entitled to receive his contributions with allowable interest. A member who has completed five years of creditable service and leaves his contributions with the system may be continued in the membership of the system after separation from service, and file application for service retirement after the attainment of age 60.

Life Insurance
A separate life insurance fund has been created as of June 30, 2000, to pay benefits on behalf of deceased TRS active and retired members.

Death Benefits
A surviving spouse of an active member with less than 10 years of service may elect to receive an annual allowance of $2,880 except that if income from other sources exceeds $6,600 per year the annual allowance will be $2,160.

A surviving spouse of an active member with 10 or more years of service may elect to receive an allowance which is the actuarial equivalent of the allowance the deceased member would have received upon retirement. The allowance will commence on the date the deceased member would have been eligible for service retirement and will be payable during the life of the spouse. If the deceased member is survived by unmarried children under age 18 the following schedule of annual allowances applies.

Number of Children	Annual Allowance
1	$2,400
2	4,080
3	4,800
4 or more	5,280

The allowances are payable until a child attains age 18 or age 23 if a full-time student. If the member has no eligible survivor, a refund of his accumulated contributions is payable to his estate.

Options
In lieu of the regular Option 1, a retirement allowance payable in the form of a life annuity with refundable balance, any member before retirement may elect to receive a reduced allowance which is actuarially equivalent to the full allowance, in one of the following forms:
Option 2. A single life annuity payable during the member's lifetime with payments for 10 years certain.
Option 3. At the death of the member his allowance is continued throughout the life of his beneficiary.

Option 3(a). At the death of the beneficiary designated by the member under Option 3, the member's benefit will revert to what would have been paid had he not selected an option.

Option 4. At the death of the member one half of his allowance is continued throughout the life of his beneficiary.

Option 4(a). At the death of the beneficiary designated by the member under Option 4, the member's benefit will revert to what would have been paid had he not selected an option.

Postretirement Adjustments

The retirement allowance of each retired member and of each beneficiary shall be increased by 1.5% each July 1.

Contributions

Member Contributions — University members other than TRS 4 contribute 7.625% of salary to the retirement trust. Non-university members other than TRS 4 contribute 9.105% of salary to the retirement trust. University TRS 4 members contribute 7% of salary to the retirement trust. Non-university TRS 4 members contribute 11% of salary to the retirement trust. 2% of each is for the supplemental plan.

Schedule G

Table 1
Age — Service Table
Distribution of Active Members as of June 30, 2023
by Age and Service Groups

Attained Age	Completed Years of Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 26	27 to 29	30 to 34	35 & Over	Number	Number
Under 25	2,534	2,100	5								4,639	106,550,341
25 to 29	932	4,814	2,001								7,747	332,977,424
30 to 34	648	2,058	4,198	1,386	3						8,293	419,080,912
35 to 39	602	1,515	2,011	4,081	1,472	2					9,683	555,118,755
40 to 44	635	1,466	1,548	1,948	4,432	1,403	4	1			11,437	717,111,512
45 to 49	409	916	1,103	1,232	1,962	3,977	893	151	3		10,646	728,927,098
50 to 54	643	911	767	963	1,432	2,019	1,326	1,433	382	1	9,877	669,251,901
55 to 59	877	970	467	522	816	1,026	444	417	321	37	5,897	339,713,715
60 to 64	687	1,006	354	316	359	460	162	187	123	56	3,710	169,433,771
65 to 69	558	725	240	110	114	139	67	58	57	33	2,101	66,003,305
70 & Over	446	623	257	78	55	46	23	25	28	33	1,614	34,740,258
Total Count	8,971	17,104	12,951	10,636	10,645	9,072	2,919	2,272	914	160	75,644	4,138,908,992

Average Age: 43.6

Average Service: 11.1

Retirement Eligible: 9,452

Table 2
Schedule of Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2014	73,407	$ 3,486,326,799	$ 47,493	2.12
2015	72,246	3,515,113,127	48,655	2.45
2016	71,848	3,537,226,348	49,232	1.19
2017	72,130	3,563,584,342	49,405	0.35
2018	72,205	3,605,115,787	49,929	1.06
2019	72,647	3,648,427,710	50,221	0.58
2020	73,151	3,723,481,576	50,901	1.35
2021	69,256	3,784,400,223	54,644	7.35
2022	74,785	4,033,509,178	53,935	(1.30)
2023	75,644	4,138,908,992	54,716	1.45

Table 3
Number of Retired Members, Beneficiaries and their Benefits by Age

Attained Age	Number of Members	Total Annual Payments	Average Annual Benefits
49 & Under	803	$ 9,190,797	$ 11,446
50 - 54	1,719	72,828,780	42,367
55 - 59	4,541	211,482,877	46,572
60 - 64	6,877	301,218,461	43,801
65 - 69	9,795	412,035,747	42,066
70 - 74	13,279	553,094,189	41,652
75 - 79	11,228	450,370,878	40,111
80 - 84	6,368	245,606,307	38,569
85 - 89	3,137	111,127,842	35,425
90 - 94	1,382	44,637,018	32,299
95 & Over	430	12,266,501	28,527
Total	59,559	$ 2,423,859,397	$ 40,697

Average Current Age: **71.2**

Average Age at Retirement for All Retirees and Beneficiaries: **56.3**

Table 4

**Schedule of Retirees, Beneficiaries and Survivors
Added to and Removed from Rolls**

	Add to Rolls		Removed from Rolls		Rolls at End of Year			
Year Ended June 30	**Number**	**Annual Allowances** *(In millions)*	**Number**	**Annual Allowances** *(In millions)*	**Number**	**Annual Allowances** *(In millions)*	**Increase In Annual Allowances**	**Average Annual Allowances**
2014	2,146	$ 99.6	976	$ 23.4	48,576	$ 1,684.9	4.7%	$ 34,685
2015	2,917	119.1	1,671	36.3	49,822	1,767.6	4.9%	35,479
2016	2,753	128.2	1,012	26.9	51,563	1,868.9	5.7%	36,244
2017	2,638	119.8	1,235	35.2	52,966	1,953.5	4.5%	36,881
2018	2,499	120.0	1,088	30.0	54,377	2,043.5	4.6%	37,581
2019	2,355	113.8	1,119	32.8	55,613	2,124.5	4.0%	38,201
2020	2,145	107.6	1,129	34.0	56,629	2,198.1	3.5%	38,816
2021	2,137	108.3	1,301	41.1	57,465	2,265.3	3.1%	39,421
2022	2,308	117.2	1,335	42.0	58,438	2,340.5	3.3%	40,051
2023	2,421	125.9	1,300	42.5	59,559	2,423.9	3.6%	40,697

Schedule H

30-Year Baseline Projections

The results of actuarial valuations are a snapshot of the financial position on the valuation date, based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (30 years in this case) by creating future new hires and performing valuations using the projected membership. The following items are assumed for the projected results.

Active Employee Growth Rate — 0%

Valuation Discount Rate — 7.1%

Investment Rate of Return — 7.1% each year

Actuarial Value of Assets — five year smoothing, no corridor

Amortization Method — Level percent of payroll, closed

Amortization Bases —

Legacy amortization from 2014 valuation amortized over closed 30-year period

Subsequent bases amortized over closed 20-year period from date of valuation

Amortization Period — Weighted 20.9-year period as of valuation date

Future Contributions — Based on expected actuarially determined contributions including the impact of direct-rate smoothing of the impact of the assumption changes over a five-year period beginning with the 2021 valuation

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.

30-Year Baseline Projection

(Dollars in millions)

Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Actuarially Determined Contribution using Direct Rate Smoothing	Salary Percentage Contribution in Dollars	Additional for Unfunded Accrued Liability
2026	4,088	190	4,278	17,455	58.6	1,474	525	949
2027	4,161	192	4,353	17,622	59.1	1,587	536	1,051
2028	4,235	194	4,429	17,701	59.8	1,714	547	1,167
2029	4,311	197	4,508	18,583	58.7	1,834	559	1,275
2030	4,386	200	4,586	18,427	59.9	1,880	571	1,309
2031	4,464	204	4,668	18,272	61.0	1,933	583	1,350
2032	4,546	208	4,754	17,951	62.5	1,981	596	1,385
2033	4,631	212	4,843	17,558	64.0	2,030	609	1,421
2034	4,718	216	4,934	17,082	65.5	2,079	622	1,457
2035	4,809	221	5,030	16,524	67.2	2,130	636	1,494
2036	4,905	225	5,130	15,874	69.0	2,184	650	1,534
2037	5,007	231	5,238	15,128	70.9	2,240	665	1,575
2038	5,115	236	5,351	14,277	73.0	2,347	681	1,666
2039	5,230	243	5,473	13,311	75.2	2,365	697	1,668
2040	5,350	250	5,600	12,219	77.5	2,486	714	1,772
2041	5,478	257	5,735	10,940	80.1	2,579	732	1,847
2042	5,612	265	5,877	9,554	82.9	2,647	751	1,896
2043	5,753	274	6,027	7,946	85.9	2,704	770	1,934
2044	5,901	282	6,183	6,130	89.3	2,496	790	1,706
2045	6,055	292	6,347	4,118	92.9	2,550	811	1,739
2046	6,216	303	6,519	1,909	96.8	2,510	833	1,677
2047	6,383	313	6,696	—	100.0	—	856	—
2048	6,559	325	6,884	—	100.0	—	880	—
2049	6,742	336	7,078	—	100.0	—	905	—
2050	6,931	348	7,279	—	100.0	—	931	—
2051	7,135	360	7,495	—	100.0	—	958	—
2052	7,349	372	7,721	—	100.0	—	985	—
2053	7,572	383	7,955	—	100.0	—	1,015	—
2054	7,799	394	8,193	—	100.0	—	1,046	—
2055	8,035	406	8,441	—	100.0	—	1,078	—

Annual Valuation of the Health and Life Insurance Trusts

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 14, 2023

Board of Trustees
Teachers' Retirement System of the State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:
This report covers the retiree medical plan funded by the Health Insurance Trust and OPEB liabilities related to the life insurance plan funded by the Life Insurance Trust. Cavanaugh Macdonald Consulting, LLC (CMC) has submitted the results of the annual actuarial valuation prepared as of June 30, 2023. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

In order to prepare the results in this report, we have utilized actuarial models. that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

The valuation covers benefits for members hired before July 1, 2002 (TRS 1), members hired between July 1, 2002 and June 30, 2008 (TRS 2), members hired between July 1, 2008 and December 31, 2021 (TRS 3), and members hired on or after January 1, 2022 (TRS 4).

The valuation indicates a total actuarially determined contribution of 4.21% as of percentage of active member payroll for the health trust payable for the fiscal year ending June 30, 2024 is required to support the benefits of the Kentucky Employees' Health Plan (KEHP) and the Medicare Eligible Health Plan (MEHP). This actuarially determined contribution reflects the actuarial value of assets of the Health Insurance Trust and a 7.1% discount rate for valuing liabilities.

The initial per capita costs of health care and the rates of health care inflation used to project the per capita health care costs have been revised since the previous valuation to reflect recent experience and revised expectations. In addition, we have updated our morbidity factors used for Medicare-eligible retirees to the relative value factors developed from the Society of Actuaries' June 2013 research report, "Health Care Costs - From Birth to Death" by Dale Yamamoto and from the ASOP 6 practice note developed by the American Academy of Actuaries. We have made no specific changes to the valuation results due to the Inflation Reduction Act, but we have included scenarios in our sensitivity analysis section in Schedule G to illustrate the potential impact of changes to the Medicare Part D plan design.

The impact of the COVID-19 pandemic was considered in this valuation; however, no changes were incorporated at this time due to the level of uncertainty regarding the impact on both plan costs and contribution levels going forward. Given the uncertainty regarding COVID-19, (e.g., the impact of routine care being deferred, direct COVID-19 treatment and prevention costs, changes in contribution and budget projections), continued monitoring of the impact on the Plans' liability will be required.

We recommend that the life insurance plan maintain a total actuarially determined contribution of 0.08% of active member payroll payable for the fiscal year ending June 30, 2026 to support the benefits of the Life Insurance Trust. This actuarially determined contribution reflects the actuarial value of assets of the Life Insurance Trust and a 7.1% discount rate for valuing liabilities.

Board of Trustees
November 14, 2023
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The promised benefits of the retiree medical and life insurance plans are included in the actuarially calculated contribution rates that are developed using the entry age normal actuarial cost method. Five-year market related value of plan assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded actuarial accrued liability that is being amortized by regular annual contributions as a level percentage of payroll within a 17-year period for the retiree medical plan and a 21-year period for the life insurance plan, on the assumption that payroll will increase by 2.75% annually. The assumptions recommended by the actuary and adopted by the board are in aggregate reasonably related to the experience under the retiree medical and life insurance plans and to reasonable expectations of anticipated experience under the retiree medical and life insurance plans.

CMC has prepared the trend information shown in the Schedule of Funding Progress in the Financial Section of the Annual Comprehensive Financial Report (ACFR) and Section VII shown in the Actuarial Section of the ACFR.

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the assumptions and methods used for funding purposes meet the parameters set by Actuarial Standards of Practice, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retiree health and life insurance trusts and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the plans.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the recommended funding amount for the system. The asset values used to determine unfunded liabilities and funded ratios are not fair values, but less volatile market-related values. A smoothing technique is applied to fair values to determine the market-related values. The unfunded liability amounts and funded ratios using the fair value of assets would be different. The interest rate used for determining liabilities is based on the expected return of assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

In our opinion, if the contributions to the Health Insurance Trust continue at the current statutorily required levels, the funded ratio of the retiree medical plan will continue to increase, and the ability of the Health Insurance Trust to fund the benefits called for under the retiree medical plan will improve.

Respectfully submitted,

Alisa Bennett, FSA, EA, FCA, MAAA
President

Edward J. Koebel, EA, FCA, MAAA
CEO

Section I — Summary of Principal Results

1. For convenience of reference, the principal results of the valuation and a comparison with the results of the previous valuation are summarized below.

Health Insurance Trust
(Dollars in thousands)

Valuation Date	June 30, 2023	June 30, 2022
Number of active members	71,005	70,427
Annual salaries	$ 4,138,909	$ 4,033,509
Number of deferred vested members	7,917	7,665
Number of annuitants in medical plans	41,055	41,177
Number of spouses and beneficiaries in medical plans*	6,555	6,661
Total	47,610	47,838
Assets:		
Fair value	$ 2,743,413	$ 2,269,176
Actuarial value	$ 2,788,970	$ 2,401,147
Actuarial accrued liability	$ 3,909,612	$ 3,768,713
Unfunded actuarial accrued liability	$ 1,120,642	$ 1,367,566
Funded ratio based on actuarial value of assets	71.3 %	63.7 %
Amortization period (years)	17	18
Discount rate	7.1 %	7.1 %

* *Spouses of post-65 retirees, and surviving spouses of deceased retirees on or after July 1, 2002, pay 100% of the full contribution. The full contribution for non-Medicare-eligible dependents is paid through a combination of payments from beneficiaries and the state. There are 1,087 surviving spouses reflected in these headcounts.*

Health Insurance Trust Contribution Rates for University Members

Valuation Date	June 30, 2023			June 30, 2022		
Contribution For Year Ending	June 30, 2024			June 30, 2023		
	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4
Normal	2.04 %	2.04 %	2.04 %	2.00 %	2.00 %	2.00 %
Accrued liability	2.17	2.17	2.17	2.62	2.62	2.62
Total	4.21 %	4.21 %	4.21 %	4.62 %	4.62 %	4.62 %
Member	2.775 %	2.775 %	2.775 %	2.775 %	2.775 %	2.775 %
Employer (ARC)	2.775	2.775	2.00	2.775	2.775	2.00
State (ARC)*	1.87	1.87	1.87	1.57	1.57	1.57
Statutorily Required Prefunding**	(3.210)	(3.210)	(2.435)	(2.500)	(2.500)	(1.725)
Total	4.21 %	4.21 %	4.21 %	4.62 %	4.62 %	4.62 %

** This represents funding by the state to pay the cost of health insurance for retirees who are not eligible for Medicare and who retired on or after July 1, 2010, less the amounts that are otherwise required to be paid by the retirees under KRS 161.675. See KRS 161.550(2).*

*** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5)*

Health Insurance Trust Contribution Rates for School District Employees (Non-Federal)

Valuation Date	June 30, 2023			June 30, 2022		
Contribution For Year Ending	June 30, 2024			June 30, 2023		
	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4
Normal	2.04 %	2.04 %	2.04 %	2.00 %	2.00 %	2.00 %
Accrued liability	2.17	2.17	2.17	2.62	2.62	2.62
Total	4.21 %	4.21 %	4.21 %	4.62 %	4.62 %	4.62 %
Member	3.75 %	3.75 %	3.75 %	3.75 %	3.75 %	3.75 %
Employer (ARC)	3.00 %	3.00 %	3.00 %	3.00 %	3.00 %	3.00 %
State (ARC)*	2.62 %	2.62 %	2.62 %	2.32 %	2.32 %	2.32 %
Statutorily Required Prefunding**	(5.16)	(5.16)	(5.16)	(4.45)	(4.45)	(4.45)
Total	4.21 %	4.21 %	4.21 %	4.62 %	4.62 %	4.62 %

** This represents funding by the state to pay the cost of health insurance for retirees who are not eligible for Medicare and who retired on or after July 1, 2010, less the amounts that are otherwise required to be paid by the retirees under KRS 161.675. See KRS 161.550(2).*

*** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

Health Insurance Trust Contribution Rates for Other Employees

Valuation Date	**June 30, 2023**			**June 30, 2022**		
Contribution for Year Ending	June 30, 2024			June 30, 2023		
	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4
Normal	2.04 %	2.04 %	2.04 %	2.00 %	2.00 %	2.00 %
Accrued liability	2.17	2.17	2.17	2.62	2.62	2.62
Total	4.21 %	4.21 %	4.21 %	4.62 %	4.62 %	4.62 %
Member	3.75 %	3.75 %	3.75 %	3.75 %	3.75 %	3.75 %
Employer (ARC)	3.75	3.75	3.75	3.75	3.75	3.75
State (ARC)*	1.87	1.87	1.87	1.57	1.57	1.57
Statutorily Required Prefunding**	(5.16)	(5.16)	(5.16)	(4.45)	(4.45)	(4.45)
Total	4.21 %	4.21 %	4.21 %	4.62 %	4.62 %	4.62 %

** This represents funding by the state to pay the cost of health insurance for retirees who are not eligible for Medicare and who retired on or after July 1, 2010, less the amounts that are otherwise required to be paid by the retirees under KRS 161.675. See KRS 161.550(2).*

*** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

We recommend maintaining the Total Employer Contribution rate at 0.08% by rounding the normal contribution up to 0.03% for fiscal year 2026 (from actual amount of 0.024%) and holding the accrued liability contribution at 0.05%. The resulting contribution is equivalent to using an effective amortization period of 15 years.

Life Insurance Trust

(Dollars in thousands)

Valuation Date	**June 30, 2023**	**June 30, 2022**
Number of active members	70,528	70,427
Annual salaries	$ 4,138,909	$ 4,033,509
Number of vested former members	11,216	10,573
Number of retirees in life insurance plan	53,379	52,213
Assets:		
Fair value	$ 94,030	$ 88,381
Actuarial value	$ 99,027	$ 96,926
Actuarial accrued liability	$ 122,611	$ 119,197
Unfunded actuarial accrued liability*	$ 23,584	$ 22,271
Funded ratio based on actuarial value of assets	80.8%	81.3%
Amortization period (years)	21	22
Effective amortization period (years)	15	16
Discount rate	7.1%	7.1%

Life Insurance Contribution Rates

Contribution for year ending	**June 30, 2026**	**June 30, 2025**
Normal	0.03%	0.03%
Accrued liability	0.05	0.05
Total	0.08%	0.08%

** Includes liability for death in active service. This amount could be segregated from the OPEB liability and assets could be split for active and post-employment purposes. However, since this could be administratively burdensome and since death in active service liabilities can be considered de minimis, we will consider the entire liability an OPEB liability under GASB 74 and 75.*

2. The valuation indicates combined member, employer and state contributions of 4.21% of active member payroll would be sufficient to support the current benefits of the retiree medical plan and state contributions of 0.08% of active member payroll would be sufficient to support the current benefits of the life insurance plan. Comments on the valuation results as of June 30, 2023, are given in Section IV and further discussion of the contribution levels is set out in Sections VI and VII.
3. Schedule B shows the development of the actuarial value of assets. The assumed investment rate of return is 7.1% for Health Insurance Trust and 7.1% for Life Insurance Trust.
4. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation. Since the previous valuation, the initial per capita costs of health care and the rates of health care inflation used to project the per capita health care costs have been revised to reflect recent experience. Additionally, the morbidity factors have been updated based on the Society of Actuaries' June 2013 research report Health Care Costs-From Birth to Death by Dale Yamamoto and from the ASOP 6 practice note developed by the American Academy of Actuaries.
5. The impacts of the COVID-19 pandemic, the ACA and the Inflation Reduction Act were considered in this valuation; however, no explicit changes were incorporated at this time due to the level of uncertainty regarding the impact on both plan costs and contribution levels going forward. We considered scenarios regarding economic factors, healthcare trend adjustments and changes to Medicare part D federal reimbursements and coverage gap discounts in our sensitivity analysis in Schedule G. Continued monitoring of the impact of these and any future such events on the plan's liability will be required.
6. Provisions of the system, as summarized in Schedule E, were taken into account in the current valuation. As in the previous valuation, the phase out of the KEHP dependent subsidies offered to retirees has been reflected.

7. The funded ratio shown in the Summary of Principal Results, is the ratio of actuarial value of assets to the actuarial accrued liability. The funded status would be different based on the fair value of assets. The funded ratio is an indication of progress in funding the promised benefits. Since the ratio is less than 100%, there is a need for additional contributions toward the payment of the unfunded actuarial accrued liability. In addition, this funded ratio does not have any relationship to measuring the sufficiency if the plan had to settle its liabilities.

Section II — Membership Data

1. Data regarding the membership of the retiree medical and life insurance plans for use as a basis of the valuation were furnished by the system's office. The following tables summarize the membership of the system as of June 30, 2023, upon which the valuation was based. Detailed tabulations of the data are given in Schedule F.

Active Members as of June 30, 2023

(Dollars in thousands)

Group	Number*	Annual Salaries
University TRS 1 and TRS 2	1,339	$ 98,265
University TRS 3	1,410	85,225
University TRS 4	263	9,138
Non-University Full Time TRS 1 and TRS 2	27,454	2,050,698
Non-University Full Time TRS 3	29,812	1,673,453
Non-University Full Time TRS 4	3,290	124,536
Non-University Part Time TRS 1 and TRS 2	1,050	10,450
Non-University Part Time TRS 3	6,570	64,701
Non-University Part Time TRS 4	4,456	22,443
Total	75,644	$ 4,138,909

2. The following tables show the number of retired members and their beneficiaries receiving health care as of the valuation date as well as average ages.

Retirees Receiving Health Benefits as of June 30, 2023

	Under Age 65	Age 65 and Over	Total
Number	8,692	32,363	41,055
Average Age	59.7	75.5	72.1

Spouses Receiving Health Benefits as of June 30, 2023

	Under Age 65	Age 65 and Over	Total
Number	1,336	5,219	6,555
Average Age	60.0	75.1	72.1

3. The retiree health plan valuation includes 71,005 active members eligible for health care and the life insurance plan valuation includes 70,528 active members eligible for life insurance. There were initially 75,644 active members eligible for health care and life insurance. However, 4,639 were ultimately excluded from the retiree health plan active headcounts and 5,116 from the life insurance plan active headcounts as they are either retirees returning to work or members working an additional active position. They are already reflected in the active or retiree headcounts.
4. The retiree health plan valuation includes 7,917 deferred vested members eligible for health care at age 60 and the life insurance plan valuation includes 11,216 deferred vested members eligible for retiree life insurance at age 60. There were initially 7,975 deferred vested members eligible for health care at age 60, and 11,331 deferred vested members eligible for retiree life insurance at age 60. However, 58 were ultimately excluded from the retiree health plan deferred vested headcounts and 115 from the life insurance plan deferred vested headcounts as they are either retirees returning

to work or members working an additional active position. They are already reflected in the active or retiree headcounts

5. The life insurance plan valuation includes 53,379 retired members eligible for life insurance. There were initially 54,742 retired members eligible for life insurance. However, 1,363 were ultimately excluded from the life insurance plan retiree headcounts as they were listed multiple times, reflecting different pension benefits earned under multiple roles as an employee. They are already reflected in the retiree headcounts.

Section III — Assets

1. As of June 30, 2023, the fair value of Health Insurance Trust assets held by the retiree medical plan amounted to $2.74 billion and the fair value of Life Insurance Trust assets held by the life insurance plan amounted to $94 million. The estimated market investment return for the plan year was 11.52% for the Health Insurance Trust and 9.63% for the Life Insurance Trust.
2. The five-year market related value of health trust assets used for valuation purposes as of June 30, 2023 was $2.8 billion and the five-year market related value of Life Insurance Trust assets used for valuation purposes as of June 30, 2023 was $99 million. Schedule B shows the development of the actuarial value of assets as of June 30, 2023.
3. Schedule C shows the receipts and disbursements for the year preceding the valuation date and a reconciliation of the asset balances for the Health Insurance Trust and the Life Insurance Trust.

Section IV — Comments on Valuation

1. Schedule A of this report outlines the results of the actuarial valuation. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule D.
2. The valuation shows the retiree medical plan has an actuarial accrued liability of $2.07 billion for benefits expected to be paid on account of the present active membership, based on service to the valuation date. The liability on account of deferred vested members amounts to $82 million. The liability on account of benefits payable to retirees and covered spouses amounts to $1.75 billion. The total actuarial accrued liability of the retiree medical plan amounts to $3.91 billion. Against these liabilities, the retiree medical plan has present assets for valuation purposes of $2.8 billion. When this amount is deducted from the actuarial accrued liability of $3.91 billion, there remains $1.12 billion as the unfunded actuarial accrued liability for the retiree medical plan.
3. The normal contribution is equal to the actuarial present value of benefits accruing during the current year. The normal contribution for the retiree medical plan is determined to be $84.5 million, or 2.04% of payroll.
4. The valuation shows that the life insurance plan has an actuarial accrued liability of $16.54 million for benefits expected to be paid on account of the present active membership, based on service to the valuation date. The liability on account of deferred vested members amounts to $4.56 million. The liability on account of benefits payable to retirees amounts to $101.5 million. The total actuarial accrued liability of the life insurance plan amounts to $122.6 million. This amount includes liability for death in active service. The liability for death in active service could be segregated from the OPEB liability and assets could be split for active and post-employment purposes. As this could be administratively burdensome and, as death in active service liabilities can be considered de minimis, we will consider the entire liability an OPEB liability under GASB 74 and 75. Against these liabilities, the life insurance plan has present assets for valuation purposes of $99 million. When this amount is deducted from the actuarial accrued liability of $122.6 million, there remains $23.6 million as the unfunded actuarial accrued liability for the life insurance plan.
5. The normal contribution is equal to the actuarial present value of benefits accruing during the current year. The normal contribution for the life insurance plan is determined to be $1,006,942, or 0.03% of payroll.

Section V — Derivation of Experience Gains and Losses

1. Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) for the year ended June 30, 2023, is shown below (dollars in thousands).

	Experience Gain/(Loss)* of the:	Health Insurance Trust	Life Insurance Trust
(1)	UAAL as of June 30, 2022	$ 1,367,566	$ 22,271
(2)	Normal cost from last valuation	80,558	966
(3)	Expected employer contributions	186,176	3,065
(4)	Interest accrual: [(1) + (2)] x .071 - (3) x .071/2 for MIF [(1) + (2)] x .071 - (3) x .071/2 for LIF	96,207	1,541
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	$ 1,358,155	$ 21,713
(6)	Change due to updated Medicare Part B health care trend rates and aging	85,832	—
(7)	Change due to claims experience	(113,305)	—
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 1,330,682	$ 21,713
(9)	Actual UAAL as of June 30, 2023	1,120,642	23,584
(10)	Total gain/(loss): (9) - (8)	(210,040)	1,871
	(a) Contribution and investment gain/(loss)	(153,855)	1,515
	(b) Experience gain/(loss) (10) - (10a)	(56,185)	356
(11)	Accrued liabilities as of June 30, 2022	$ 3,768,713	$ 119,197
(12)	Experience gain/(loss) as percent of actuarial accrued liabilities at start of year (10b) / (11)	(1.5 %)	0.3 %

** Rows labeled as a change, rather than a gain/(loss), are expressed as negative if the UAAL is decreased and positive if the UAAL is increased.*

Section VI — Contributions Payable Under the Plans

1. KRS 161.420 and 161.550 provide the amounts employers and the state are required to contribute to the Health Insurance Trust. These contribution amounts vary by date of membership and employee type.

Employer Percentage of Payroll Contributions Made to Medical Insurance Trust

University Employees			School District Employees (Non-Federal)*			Other Employees		
TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4
2.775 %	2.775 %	2.000 %	3.000 %	3.000 %	3.000 %	3.750 %	3.750 %	3.750 %

** In addition to the amounts contributed by school districts on behalf of non-federal employees, the state contributes 0.75%*

2. For the year ending June 30, 2023, member contributions will be 2.775% for university employees and 3.75% for all other members. Based upon the amortization of the unfunded actuarial accrued liability over a 17-year period as a level percentage of payroll, the valuation indicates employer and state contributions of 1.435% of payroll for university employees and 0.460% of payroll for all other members.

3. The state is scheduled to contribute 0.08% of salary to the Life Insurance Trust for the year ending June 30, 2025. CMC recommends maintaining this rate for the year ending June 30, 2026, to support sufficiently the benefits of the life insurance plan.

Required Contribution Rates
For Year Ending June 30, 2023
Health Insurance Trust

Normal	2.04 %
Accrued liability	2.17 %
Total	4.21 %

	University Employees			School District Employees (Non-Federal)			Other Employees		
	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4
Members	2.775 %	2.775 %	2.775 %	3.750 %	3.750 %	3.750 %	3.750 %	3.750 %	3.750 %
Employer	2.775	2.775	2.000	3.000	3.000	3.000	3.750	3.750	3.750
State*	1.870	1.870	1.870	2.620	2.620	2.620	1.870	1.870	1.870
Statutorily Required Prefunding**	(3.210)	(3.210)	(2.435)	(5.160)	(5.160)	(5.160)	(5.160)	(5.160)	(5.160)
Total	4.210 %	4.210 %	4.210 %	4.210 %	4.210 %	4.210 %	4.210 %	4.210 %	4.210 %

** This represents funding by the state to pay the cost of health insurance for retirees who are not eligible for Medicare and who retired on or after July 1, 2010, less the amounts that are otherwise required to be paid by the retirees under KRS 161.675. See KRS 161.550(2). Includes the state contribution of 0.75% on behalf of non-federal school district employees.*

*** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) and 161.550(5).*

Required Contribution Rates
Life Insurance Trust
For Year Ending June 30, 2023

Normal	0.03 %
Accrued liability	0.05
Total	0.08 %
Member	0.00 %
State	0.08
Total	0.08 %

4. The valuation indicates that a total normal contribution of 2.04% of payroll is required to meet the cost of benefits currently accruing under the retiree medical plan and 0.03% of payroll is required to meet the cost of benefits currently accruing under the life insurance plan. The difference between the total contribution and the normal contribution remains to be applied toward the liquidation of the unfunded actuarial accrued liability. This accrued liability payment is 2.17% of payroll for the retiree medical plan and 0.05% of payroll for the life insurance plan.
5. The unfunded actuarial accrued liability amounts to $1.12 billion for the retiree medical plan and $23.6 million for the life insurance plan as of the valuation date. An accrued liability contribution rate of 2.17% of payroll for the retiree medical plan and 0.05% of payroll for the life insurance plan is sufficient to amortize the unfunded actuarial accrued liabilities over an 17-year period for the retiree medical plan and a 21-year period for the life insurance plan, based on the assumption that the payroll will increase by 2.75% annually.

Section VII — Comments on the Level of Funding

1. Beneficiary contributions and the system's monthly contribution for retirees who opt into the retiree medical plan is based upon date of hire, date of attaining age 65, years of service at retirement, plan election, Medicare eligibility and tobacco use. Beneficiary contributions for dependents are targeted to be 100% of the cost of expected claims and/or insured premiums for spouses age 65 and older. Historically, this target has been achieved. The full cost for non-Medicare eligible dependents is paid through a combination of payments from beneficiaries and the state on a current disbursement basis. Current employer and state contributions have been determined to be sufficient to fund the cost of the benefits to be provided. Benefits for university, school district (non-federal), and other members are identical, although active employee contributions collected from university, school district (non-federal) and other members differ. A listing of active member retiree medical plan contributions by fiscal year, date of membership and employer type is provided in Schedule E.
2. This valuation provides the contributions required to fund sufficiently the retiree medical plan and to ensure the future solvency of the Health Insurance Trust. For all membership, a combined member contribution together with the employer and state contributions totaling 4.21% of payroll is required to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability over a period of 17 years.

Section VIII — Accounting Information

1. The information required under Governmental Accounting Standards Board (GASB) Statements No. 74 and 75 will be issued in separate reports. The following information is provided for informational purposes only.

Number of Active and Retired Members in Retiree Medical Plan as of June 30, 2023

Group	Number*
Retirees currently receiving health benefits	41,055
Spouses of retirees currently receiving health benefits	6,555
Terminated employees entitled to benefits but not yet receiving benefits	7,917
Active plan members	71,005
Total	126,532

Number of Active and Retired Members in Life Insurance Plan as of June 30, 2023

Group	Number*
Retirees	53,379
Terminated employees	11,216
Active plan members	70,528
Total	135,123

Schedule of Funding Progress
Health Insurance Trust
(Dollars in thousands)

Actuarial Valuation Date June 30	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)	Unfunded AAL (UAAL)	Funded Ratio	Covered Payroll	UAAL as a % of Covered Payroll
	A	B	(B-A)	(A/B)	C	[(B-A)/C]
2014	$ 508,913	$ 3,194,689	$ 2,685,776	15.9 %	$ 3,486,327	77.0 %
2015	637,839	3,525,584	2,887,745	18.1	3,515,113	82.2
2016*	795,055	3,634,073	2,839,018	21.9	3,537,226	80.3
2017	985,694	3,691,719	2,706,025	26.7	3,563,584	75.9
2018	1,213,918	3,340,709	2,126,791	36.3	3,605,116	58.9
2019	1,442,522	3,133,202	1,690,680	46.0	3,648,428	46.3
2020	1,700,968	2,757,653	1,056,685	61.7	3,723,482	28.4
2021	2,072,648	3,456,677	1,384,029	60.0	3,784,400	36.6
2022	2,401,147	3,768,713	1,367,566	63.7	4,033,509	33.9
2023	2,788,970	3,909,612	1,120,642	71.3	4,138,909	27.1

** Reflects change in decrement and participation assumptions.*

Schedule of Funding Progress
Life Insurance Trust
(Dollars in thousands)

Actuarial Valuation Date June 30	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)	Unfunded AAL (UAAL)	Funded Ratio	Covered Payroll	UAAL as a % of Covered Payroll
	A	B	(B-A)	(A/B)	C	[(B-A)/C]
2014	$ 96,130	$ 97,354	$1,224	98.7 %	$ 3,486,327	0.04 %
2015	97,186	98,739	1,553	98.4	3,515,113	0.04
2016*	97,269	106,059	8,790	91.7	3,537,226	0.25
2017	95,730	109,069	13,339	87.8	3,563,584	0.37
2018	93,808	112,471	18,663	83.4	3,605,116	0.52
2019	92,506	117,485	24,979	78.7	3,648,428	0.68
2020	92,229	122,194	29,965	75.5	3,723,482	0.80
2021	95,483	116,656	21,173	81.9	3,784,400	0.56
2022	96,926	119,197	22,271	81.3	4,033,509	0.55
2023	99,027	122,611	23,584	80.8	4,138,909	0.57

** Reflects change in decrement and participation assumptions.*

2. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2023. Additional information as of the latest actuarial valuation follows.

Valuation date	6/30/2023
Actuarial cost method	Entry age
Amortization method	Level percent of pay, closed
Remaining amortization period	17 years Health Insurance Trust
	21 years Life Insurance Trust
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.1% Health Insurance Trust
	7.1% Life Insurance Trust
Medical trend assumption**	6.50%
Ultimate trend rate	4.5%
Year of ultimate trend rate	2031

** Includes price inflation at 2.5%.*

*** Alternate trend rates were used for Medicare Part B premiums and are disclosed in Schedule D.*

Schedule of Employer Contributions
Health Insurance Trust

Year Ended June 30	Statutorily Required Contribution	Actual Employer Contribution	Percentage of Statutory Contributed
	(A)	(B)	(B) / (A)
2014	$ 157,688,414	$ 157,688,414	100.0 %
2015	$ 145,263,926	$ 145,263,926	100.0
2016	178,638,370	178,638,370	100.0
2017	180,375,986	180,375,986	100.0
2018	187,102,413	187,102,413	100.0
2019	183,146,155	183,146,155	100.0
2020	184,625,474	184,625,474	100.0
2021	184,887,065	184,887,065	100.0
2022	200,235,203	151,765,145	75.8
2023	208,815,818	208,815,818	100.0

Schedule of Employer Contributions
Life Insurance Trust

Year Ended June 30	Actuarially Determined Contribution (ADC)	Actual Employer Contribution	Percentage of ADC Contributed
	(A)	(B)	(B) / (A)
2014	$ 1,044,959	$ 1,006,091	96.3 %
2015	1,050,216	1,019,519	97.1
2016	1,057,851	1,037,769	98.1
2017	1,065,122	1,049,683	98.6
2018	1,075,305	1,058,329	98.4
2019	1,081,535	1,421,227	131.4
2020	1,842,977	1,796,389	97.5
2021	2,252,365	2,138,375	94.9
2022	2,736,268	2,754,863	100.7
2023	3,268,967	3,223,560	98.6

Schedule A

Results of the Valuation
June 30, 2023
(Dollars in thousands)

	Health Insurance Trust	Life Insurance Trust
Payroll	$ 4,138,909	$ 4,138,909
Actuarial Accrued Liability		
Present value of prospective benefits payable in respect of:		
(a) Present active members	$ 2,072,777	$ 16,543
(b) Present terminated vested members	82,002	4,563
(c) Present retired members and covered spouses	1,754,833	101,505
(d) Total actuarial accrued liability	$ 3,909,612	$ 122,611
Present Assets for Valuation Purposes	$ 2,788,970	$ 99,027
Unfunded Actuarial Accrued Liability	$ 1,120,642	$ 23,584

Contributions	Year Ended June 30, 2024	Year Ended June 30, 2026
Normal	2.04 %	0.03 %
Accrued liability	2.17	0.05
Total	4.21 %	0.08 %

Health Insurance Trust
Solvency Test
(Dollars in millions)

	Accrued Liability for				Portion of Accrued Liabilities Covered by Assets		
Valuation Date June 30	(1) Active Member Contributions	(2) Deferred Vested, Retirants and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	(1)	(2)	(3)
2014	n/a	$ 1,771.9	$ 1,422.8	$ 508.9	n/a	29 %	0 %
2015	n/a	1,982.2	1,543.4	637.8	n/a	32	0
2016	n/a	1,950.9	1,683.2	795.1	n/a	41	0
2017	n/a	1,985.1	1,706.6	985.7	n/a	50	0
2018	n/a	1,692.3	1,648.4	1,213.9	n/a	72	0
2019	n/a	1,604.3	1,528.9	1,442.5	n/a	90	0
2020	n/a	1,354.0	1,403.7	1,701.0	n/a	100	25
2021	n/a	1,690.3	1,766.3	2,072.6	n/a	100	22
2022	n/a	1,832.1	1,936.6	2,401.1	n/a	100	29
2023	n/a	1,836.8	2,072.8	2,789.0	n/a	100	46

Life Insurance Trust
Solvency Test
(Dollars in millions)

Valuation Date June 30	Accrued Liability for: (1) Active Member Contributions	(2) Deferred Vested, Retirants and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets: (1)	(2)	(3)
2014	n/a	$ 81.0	$ 16.3	$ 96.1	n/a	100 %	93 %
2015	n/a	82.7	16.0	97.2	n/a	100	91
2016	n/a	89.0	17.1	97.3	n/a	100	49
2017	n/a	92.1	17.0	95.7	n/a	100	21
2018	n/a	94.2	18.3	93.8	n/a	99	0
2019	n/a	99.1	18.4	92.5	n/a	93	0
2020	n/a	103.5	18.7	92.2	n/a	89	0
2021	n/a	100.7	16.0	95.5	n/a	95	0
2022	n/a	102.8	16.4	96.9	n/a	94	0
2023	n/a	106.1	16.5	99.0	n/a	93	0

Schedule B

Development of the Actuarial Value of Assets
Health Insurance Trust
June 30, 2023

(1)	Actuarial value of assets beginning of year		$2,401,147,269
(2)	Fair value of assets end of year		2,743,413,081
(3)	Fair value of assets beginning of year		2,269,175,689
(4)	Cash flow		
	a.	Contributions	503,384,392
	b.	Benefit payments	270,224,923
	c.	Administrative expense	1,974,318
	d.	Net: (4)a - (4)b - (4)c	231,185,151
(5)	Investment Income		
	a.	Fair value total: (2) - (3) - (4)d	243,052,241
	b.	Assumed rate	7.1 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	169,318,547
	d.	Amount for phased-in recognition: (5)a - (5)c	73,733,694
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	14,746,739
	b.	First prior year	(77,903,191)
	c.	Second prior year	73,328,318
	d.	Third prior year	(17,490,773)
	e.	Fourth prior year	(5,362,225)
	f.	Total recognized investment gain	(12,681,132)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		2,788,969,835
(8)	Difference between fair & actuarial values: (2) - (7)		$ (45,556,754)
(9)	Rate of return on actuarial value		6.22 %

Development of the Actuarial Value of Assets
Life Insurance Trust
June 30, 2023

(1)	Actuarial value of assets beginning of year		$ 96,925,895
(2)	Fair value of assets end of year		94,029,915
(3)	Fair value of assets beginning of year		88,380,503
(4)	Cash flow		
	a.	Contributions	3,223,560
	b.	Benefit payments	6,219,000
	c.	Administrative expense	37,633
	d.	Net: (4)a - (4)b - (4)c	(3,033,073)
(5)	Investment Income		
	a.	Fair value total: (2) - (3) - (4)d	8,682,485
	b.	Assumed rate	7.1 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	6,167,342
	d.	Amount for phased-in recognition: (5)a - (5)c	2,515,143
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	503,029
	b.	First prior year	(4,617,322)
	c.	Second prior year	3,534,632
	d.	Third prior year	(226,459)
	e.	Fourth prior year	(227,080)
	f.	Total recognized investment gain	(1,033,200)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		99,026,963
(8)	Difference between fair & actuarial values: (2) - (7)		$ (4,997,048)
(9)	Rate of return on actuarial value		5.38 %

Schedule C

Health Insurance Trust
Summary of Receipts & Disbursements
(Fair Value)

	For the Year Ended June 30, 2023	For the Year Ended June 30, 2022
Receipts for the Year		
Contributions		
Members statutory	$ 149,209,656	$ 145,681,855
Payment by retired members	63,329,256	60,680,394
Total members	212,538,912	206,362,249
State statutory contributions	24,370,180	23,507,666
Employer contributions	123,487,533	120,415,757
State shared responsibility	60,958,105	7,841,722
Total employer	208,815,818	151,765,145
Total receipts	421,354,730	358,127,394
Recovery income	145,358,918	144,675,514
Net investment income	243,052,241	(219,500,061)
Total	809,765,889	283,302,847
Disbursements for the Year		
Administrative expense	1,974,318	2,074,227
Medical insurance expense	333,554,179	312,557,347
Total disbursements	335,528,497	314,631,574
Excess of Receipts Over Disbursements	474,237,392	(31,328,727)
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	2,269,175,689	2,300,504,416
Excess of receipts over disbursements	474,237,392	(31,328,727)
Asset balance as of the end of the year	$2,743,413,081	$ 2,269,175,689
Investment rate of return on fair value	11.52%	(9.70)%

Life Insurance Trust
Summary of Receipts & Disbursements
(Fair Value)

	For the Year Ended	
	June 30, 2023	June 30, 2022
Receipts for the Year		
Contributions		
Members	$	$
State	2,599,486	2,194,049
Employer	624,074	560,814
Total	3,223,560	2,754,863
Net investment income	8,682,485	(15,582,277)
Total	11,906,045	(12,827,414)
Disbursements for the Year		
Benefit payments	6,219,000	6,178,000
Miscellaneous, including expenses	37,633	40,999
Total	6,256,633	6,218,999
Excess of Receipts Over Disbursements	5,649,412	(19,046,413)
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	88,380,503	107,426,916
Excess of receipts over disbursements	5,649,412	(19,046,413)
Asset balance as of the end of the year	$ 94,029,915	$ 88,380,503
Investment rate of return on fair value	9.63 %	(14.96)%

Schedule D

Statement of Actuarial Assumptions and Methods
The rates of retirement, disability, mortality, termination, salary increases, and rates of future benefit participation used in the valuation were selected based on the actuarial experience study prepared as of June 30, 2020, submitted to and adopted by the board on September 20, 2021. The health care cost trend rates, and expected plan costs were determined by the actuary based on recent experience.

Valuation Date — June 30, 2023

Discount Rate — 7.1% per annum, compounded annually for Health Insurance Trust.
7.1% per annum, compounded annually for Life Insurance Trust.

Health Care Cost Trend Rates — Following is a chart detailing trend assumptions.

	Annual Trend Rate	
Fiscal Year Ended	**Medicare Part B**	**Medical**
2024	5.92 %	6.50 %
2025	6.03	6.25
2026	6.71	6.00
2027	6.86	5.75
2028	6.78	5.50
2029	6.27	5.25
2030	5.82	5.00
2031	6.17	4.75
2032	5.61	4.50
2033	4.87	4.50
2034	4.62	4.50
2035 and beyond	4.50	4.50

Expected Annual Claims — For retirees ages 65 and older, per capita health care costs are adjusted to reflect expected health care cost changes related to age. The relative value factors used were developed from the Society of Actuaries' June 2013 research report Health Care Costs-From Birth to Death by Dale Yamamoto and from the ASOP 6 practice note developed by the American Academy of Actuaries. Representative values of the expected annual claims based on a blended 2024 MEHP rate of $207 per month, or $2,484 per year, are as follows:

Participant Age	Male	Female
65	$1,709	$1,629
70	2,078	2,002
75	2,467	2,338
80	2,864	2,694
85	3,226	3,039
90	3,543	3,300

For the retiree health care liabilities of those under age 65, the current premium charged by the Kentucky Employees' Health Plan (KEHP) is used as the base cost and is projected forward using the health care trend assumption. No implicit rate subsidy is calculated or recognized as the implicit rate subsidy is deemed the responsibility of the KEHP. Under Actuarial Standard of Practice No. 6 (ASOP No. 6), aging subsidies (or implicit rate subsidies) should be recognized, as the differences in health care utilization and cost due to age have been demonstrated and well quantified.

The impact of aging on a valuation's results can be as significant as the use of mortality, trend, and discounting. It has been the long-standing position that the responsibility for compliance with GASB Statement No. 43, when it relates to KEHP implicit subsidies, rests with KEHP, not the system, as the system has no operational authority over KEHP. As such, KEHP implicit subsidies are excluded from the OPEB valuation process of the retiree medical plan. As GASB 74 and 75 prohibit such a deviation from ASOP No. 6, additional consideration to the current treatment of KEHP implicit rate subsidies may be needed in the future. Valuing the KEHP implicit subsidies will increase the actuarial accrued liability for GASB 74 and 75 purposes.

Retiree Medical Plan Costs — Assumed per capita health care costs were based on past experience and trended based on the assumptions. Following are charts detailing retiree per capita assumptions. These amounts include medical, drug, and administrative costs and represent the amount that the system pays as the full contribution amount. An additional $8 per month is paid to the Department of Employee Insurance (DEI) and is not included in the under-age-65 costs listed below. For retirees ages 65 and older, the average costs shown are normalized to age 65, and then age adjusted in calculating liabilities.

Monthly Under Age 65 (KEHP) Full Costs as of Jan. 1, 2023

Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP
Single	$ 930.76	$ 949.04	$ 901.04
Parent Plus	1,269.28	1,320.40	1,234.80
Couple	1,866.24	1,981.62	1,863.04
Family	2,078.08	2,185.78	2,069.88
Family Cross-Reference	1,068.66	1,126.28	1,057.40

Retiree Medical Plan Contribution — The portion of the medical plan premiums paid by participants is composed of a Plan Option Cost, a Time-Specific Adjustment Cost and a Shared Responsibility Cost. Retirees under the age of 65 who do not complete their LivingWell Promise will be charged an additional $40 per month above the Plan Option Cost detailed below. An additional contribution is required to be paid by retirees under the age of 65 who use tobacco ($40 for Single or Family Cross-Reference, and $80 for Parent Plus, Couple or Family).

Monthly Under Age 65 (KEHP) Plan Option Costs as of Jan. 1, 2023

Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP
Single	$ 53.46	$ 89.14	$ 28.34
Parent Plus	137.06	254.10	67.52
Couple	339.34	571.76	281.42
Family	398.92	716.64	337.68
Family Cross-Reference*	86.90	170.48	31.50
Spouse - Single	938.76	957.04	909.04
Spouse - Parent Plus	1,277.28	1,328.40	1,242.80

** Per employee/retiree*

Time-specific adjustment plus Shared Responsibility Cost — The following charts are the Time-Specific Adjustment Costs paid by retirees in addition to the Plan Option Costs shown prior.

Time-Specific Adjustments for Retirees Employed Before July 1, 2002, as of Jan. 1, 2023

Plan	Years of Service	Single	Parent Plus	Couple	Family	Family C-R
Living Well CDHP	5-9.99	$ 701.65	$ 956.57	$ 1,351.25	$ 1,503.51	$ 806.11
	10-14.99	526.00	780.92	1,175.60	1,327.86	630.46
	15-19.99	350.35	605.27	999.95	1,152.21	454.81
	20 or More	174.70	429.62	824.30	976.56	279.16
Living Well PPO	5-9.99	688.60	890.65	1,234.21	1,293.49	780.15
	10-14.99	517.30	715.00	1,058.56	1,117.84	604.50
	15-19.99	346.00	539.35	882.91	942.19	428.85
	20 or More	174.70	363.70	707.26	766.54	253.20
Living Well Basic	5-9.99	698.20	991.63	1,405.97	1,556.55	850.25
	10-14.99	523.70	815.98	1,230.32	1,380.90	674.60
	15-19.99	349.20	340.33	1,054.67	1,205.25	498.95
	20 or More	174.70	464.68	879.02	1,029.60	323.30

Time-Specific Adjustments for Retirees Employed On/After July 1, 2002, as of Jan. 1, 2023

Plan	Years of Service	Single	Parent Plus	Couple	Family	Family Cross-Reference
Living Well CDHP	5-9.99	$ 807.04	$ 1,061.96	$ 1,456.64	$ 1,608.90	$ 911.50
	10-14.99	701.65	956.57	1,351.25	1,503.51	806.11
	15-19.99	561.13	816.05	1,210.73	1,362.99	665.59
	20-24.99	420.61	675.53	1,070.21	1,222.47	525.07
	25-25.99	244.96	499.88	894.56	1,046.82	349.42
	26-26.99	209.83	464.75	859.43	1,011.69	314.29
	27 or More	174.70	429.62	824.30	976.56	279.16
Living Well PPO	5-9.99	791.38	996.04	1,339.60	1,398.88	885.54
	10-14.99	688.60	890.65	1,234.21	1,293.49	780.15
	15-19.99	551.56	750.13	1,093.69	1,152.97	639.63
	20-24.99	414.52	609.61	953.17	1,012.45	499.14
	25-25.99	243.22	433.96	777.52	836.80	323.46
	26-26.99	208.96	398.83	742.39	801.67	288.33
	27 or More	174.70	363.70	707.26	766.54	253.20
Living Well Basic	5-9.99	802.90	1,097.02	1,511.36	1,661.94	955.64
	10-14.99	698.20	991.63	1,405.97	1,556.55	850.25
	15-19.99	558.60	851.11	1,265.45	1,416.03	709.73
	20-24.99	419.00	710.59	1,124.93	1,275.51	569.21
	25-25.99	244.50	534.94	949.28	1,099.86	393.56
	26-26.99	209.60	499.81	914.15	1,064.73	358.43
	27 or More	174.70	464.68	879.02	1,029.60	323.30

Current Retiree Medical Plan Participation — Actual census data and current plan elections (including waivers) provided by the system were used for those retirees currently participating in the retiree medical plan. Current participants are assumed to maintain their current retiree medical plan coverage until they are no longer eligible.

Anticipated Retiree Medical Plan Participation — The assumed annual rates of health care plan participation for future retirees are as follows.

Member Participation

Years of Service	TRS 1	TRS 2	TRS 3 & TRS 4
5-9.99	20 %	20%	Not Eligible
10-14.99	40	20	Not Eligible
15-19.99	70	40	40%
20-24.99	90	50	50
25-25.99	90	80	80
26-26.99	90	85	85
27 or more	90	90	90

TR

Anticipated Retiree Medical Plan Elections — The assumed rates of plan election for future retirees participating in the KEHP plans are provided in the following table. As the assumed plan election rates are estimates and actual results may be materially different, this assumption will need to be revised as experience evolves.

LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP
58%	39%	3%

Spouse Coverage in Medical Plan — Actual census data and current plan elections were used for MEHP- and KEHP-covered spouses (including beneficiaries) of current retirees. For spouses of future retirees, 30% of future male retirees are assumed to cover their spouse and 25% of future female retirees are assumed to cover their spouse. Male retirees are assumed to be three years older than their spouse and female retirees are assumed to be one year younger than their spouse.

Disabled Dependent Children in Retiree Medical Plan — The liability associated with disabled dependent children was determined to be de minimis and was therefore excluded from this valuation.

Withdrawal Assumption — Future vested members who terminate employment prior to retirement are assumed to elect to withdraw their contributions based upon their age and service at termination of employment as follows.

Rates of Withdrawal Upon Termination of Employment

Age at Termination of Employment	Years of Service 5 - 10	10 - 15	15+
Under Age 55	20%	15%	10%
Ages 55+	10%	10%	10%

All vested members who terminate employment prior to retirement are assumed to elect to withdraw their contributions prior to receiving a pension benefit based upon their service as follows.

Rates of Withdrawal Prior to Receiving a Pension Benefit

Years of Service

5 - 9	10 - 14	15 - 26	27+
25%	15%	10%	25%

All vested members who terminate employment prior to retirement and who are assumed to elect to receive a pension benefit are assumed to begin receiving their benefit at age 60.

Salary Increases — Representative values of the assumed annual rates of future salary increases are as follows and include wage inflation at 2.75% per annum.

Service	Annual Rate
1	7.5 %
2	5.5
3	5
4	5
5	5
6	4.75
7	4.5
8	4.25
9	4
10	4
11	4
12	3.75
13	3.5
14	3.5
15	3.25
16	3.25
≥17	3 %

Payroll Growth — 2.75% per annum, compounded annually.

Price Inflation — 2.5% per annum, compounded annually.

Federal Legislation — The impacts of the Affordable Care Act (ACA) and the Inflation Reduction Act (IRA) were addressed in this valuation. Review of the information currently available did not identify any specific provisions of the legislation that are anticipated to directly impact results other than plan design features and fees currently mandated by the ACA and incorporated in the plan designs, which are included in the current baseline claims costs, and the anticipation of potential changes to Medicare due to the IRA, which are included in our trend assumption and considered in our sensitivity analysis section in Schedule G. Continued monitoring of the impact on the plan's liability due to this and other legislation, if applicable, will be required.

COVID-19 — The impact of COVID-19 pandemic was considered in this valuation, however, no changes were incorporated at this time due to the level of uncertainty regarding the impact on both plan costs and contribution levels going forward. Given the uncertainty regarding COVID-19 (e.g., the impact of routine care being deferred, direct COVID-19 treatment and prevention costs, changes in contribution and budget projections), continued monitoring of the impact on the plan’s liability will be required.

Asset Valuation Method — Five-year market related actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the fair value of assets and the expected actuarial value of assets, based on the ultimate assumed valuation rate of return. The amount recognized each year is 20% of the difference between fair value and expected actuarial value. The ultimate assumed valuation rate of return is assumed to be 7.1% for the Health Insurance Trust and 7.1% for the Life Insurance Trust.

Actuarial Cost Method — The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future, of each active member’s expected benefit at retirement or death is determined, based on his/her age, service, and gender. The calculations take into account the probability of a member’s death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability or survivor’s benefit. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries and deferred vested members to obtain the present value of all expected benefits payable from the system on account of the present group of members and beneficiaries.

The employer contributions required to support the benefits of the system are determined following a level funding approach and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the entry age normal method. Under this method, a calculation is made to determine the uniform and constant percentage rate of employer contribution, which, if applied to the compensation of the average new member during the entire period of his/her anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his or her behalf.

The unfunded actuarial accrued liability is determined by subtracting the present value of prospective employer normal contributions and member contributions, together with the current actuarial value of assets held, from the present value of expected benefits to be paid from the system.

Separations From Service — Representative values of the assumed annual rates of salary increases, death, disability, withdrawal, service retirement and early retirement are as follows.

Members Prior to January 1, 2022

Males: Annual Rate of							
			Withdrawal			Retirement	
			Years of Service				
Age	Death*	Disability	0 - 4	5 - 9	10+	Before 27 Years of Service	After 27 Years of Service **
20	0.031 %	0.01 %	20.00 %				
25	0.020	0.01	11.00	3.25 %			
30	0.032	0.01	10.00	3.60	2.80 %		
35	0.042	0.02	11.00	3.60	1.55		
40	0.052	0.07	12.50	4.00	1.25		
45	0.072	0.18	11.50	4.00	1.10		17.0 %
50	0.115	0.28	14.25	4.50	1.10		25.0
55	0.187	0.40	15.00	6.00	1.25	5.25 %	40.0
60	0.304	0.50	15.00	0.00	0.00	13.5	33.0
62	0.366	0.50	15.00	0.00	0.00	15.0	30.0
65	0.478	0.50	20.00	0.00	0.00	20.0	30.0
70	0.723	0.50	20.00	0.00	0.00	25.0	30.0
75	1.141	0.50	20.00	0.00	0.00	100.0	100.0

** Base Rates*

*** Plus 8.5% in year when first eligible for unreduced retirement with 27 years of service*

TRS 1, TRS 2 & TRS 3 Members

			Females: Annual Rate of				
			Withdrawal			Retirement	
			Years of Service			Before 27 Years of Service	After 27 Years of Service **
Age	Death*	Disability	0 - 4	5 - 9	10+		
20	0.014 %	0.01 %	13.00 %				
25	0.010	0.01	9.00	4.50 %			
30	0.013	0.02	11.00	4.25	1.00 %		
35	0.022	0.06	11.00	3.50	1.60		
40	0.030	0.10	12.50	4.00	1.20		
45	0.041	0.24	13.50	4.00	1.00		17.0 %
50	0.058	0.38	15.00	4.50	1.25		20.0
55	0.091	0.50	15.00	5.00	1.60	5.0 %	50.0
60	0.141	0.60	17.50	0.00	0.00	15.0	40.0
62	0.166	0.62	17.50	0.00	0.00	15.0	40.0
65	0.212	0.65	25.00	0.00	0.00	25.0	40.0
70	0.344	0.65	25.00	0.00	0.00	30.0	35.0
75	0.639	0.65	25.00	0.00	0.00	100.0	100.0

** Base rates*

***Plus 10% in year when first eligible for unreduced retirement with 27 years of service*

TRS 4 Members

	Annual Rate for Males			Annual Rates for Females		
Age	Before 20 Years of Service	20-29 Years of Service	30 or More Years of Service*	Before 20 Years of Service	20-29 Years of Service	30 or More Years of Service*
57	3.0 %	5.0 %	25.0 %	3.0 %	5.0 %	30.0 %
60	8.5	13.5	25.0	10.0	15.0	30.0
62	12.0	15.0	25.0	12.0	15.0	25.0
65	20.0	20.0	25.0	25.0	25.0	30.0
70	25.0	25.0	25.0	30.0	30.0	30.0
75	100.0	100.0	100.0	100.0	100.0	100.0

** Plus 20% in the first year attaining 30 years of service; plus 25% at age 65 in the first year attaining 30 years of service*

Deaths After Retirement

Mortality Assumption — All mortality rates use Pub-2010 benefit-weighted tables.

Mortality Projection — All mortality rates are projected from 2010 using generational improvement with Scale MP-2020 adjusted to 75% of the standard rates.

Service Retirements — Mortality rates are based on the Teachers Mortality Table for Retirees. Rates for male members are set forward 2 years and multiplied by 102%. Rates for female members are set forward 2 years and multiplied by 98%.

Survivors of Deceased Members — Mortality rates are based on the Teachers Mortality Table for Contingent Survivors. Rates for male members are set forward 2 years and multiplied by 101%

Disabled Members at Retirement — Mortality rates are based on the Teachers Mortality Table for Disabled Retirees. Rates for male members are set forward 1 year and multiplied by 96%. Rates for female members are set back 2 years and multiplied by 94%.

Representative values of the assumed annual rates of death after service retirement and after disability retirement are shown here.

Annual Rate of Death After*

	Service Retirement		Disability Retirement		Survivors of Deceased Members	
Age	Male	Female	Male	Female	Male	Female
45	0.0836 %	0.0568 %	1.0646 %	0.7755 %	0.6020 %	0.2620 %
50	0.1357	0.0843	1.6435	1.1910	0.7545	0.3200
55	0.2744	0.2215	2.1130	1.5416	0.8959	0.4460
60	0.4427	0.3322	2.4806	1.7616	1.1413	0.6220
65	0.7579	0.5351	3.0653	1.9834	1.6443	0.8990
70	1.4066	0.9682	3.9485	2.4149	2.5876	1.3530
75	2.6816	1.8649	5.3155	3.2562	4.1006	2.1510
80	5.0500	3.5819	7.6118	4.7705	6.5630	3.5730
85	9.4585	6.8071	11.2109	7.3423	10.7717	6.3160
90	16.9116	12.6077	16.9738	11.1653	17.7306	11.3290
95	26.9423	21.5110	24.2170	15.7356	26.8670	18.5900

** Base Rates*

Schedule E

Summary of Main Plan Provisions

Eligibility for Access to Retiree Medical Coverage

Service Retirement — For employees hired prior to July 1, 2008, retiree medical plan coverage eligibility is attained when an employee retires, which is possible after the completion of 27 years of service or attainment of age 55 and five years of service with reduced pension benefits. For employees hired on or after July 1, 2008, employees may retire after the completion of 27 years of service; the attainment of age 55 and 10 years of service with reduced pension benefits; or the attainment of age 60 and five years of service with unreduced pension benefits, but must complete a minimum of 15 years of service to be eligible for retiree medical plan coverage. For employees hired on or after Jan. 1, 2022, employees may retiree after the attainment of age 57 and ten years of service; or the attainment of age 65 and five years of service, but must complete a minimum of 15 years of service to be eligible for retiree medical plan coverage.

Disability Retirement — Disabled employees hired prior to July 1, 2008, with at least five years of service, who are totally and permanently incapable of being employed as a teacher, are eligible for retiree medical plan coverage upon approval for TRS disability retirement benefits. Disabled employees hired after July 1, 2008, must have 15 years of service to be eligible for retiree medical plan coverage upon approval for TRS disability retirement benefits.

Members and dependents under age 65 and eligible for Medicare due to a disability after Jan. 1, 2013, are only eligible to enroll in the MEHP. Under-age-65 members who retired prior to Jan. 1, 2013, are grandfathered from this requirement and allowed a choice of KEHP or MEHP coverage. Actual census data and current plan elections were used for current disabled retirees. All future disabled members under the age of 65 with Medicare are placed on the MEHP and not the KEHP. This has been consistently applied since 2013.

Survivors — Spouses of employees who die in service while eligible to retire, as well as survivors of service and disabled retirees, are eligible for retiree medical plan coverage if elected within 30 days of the employee's/retiree's death with no future remarriage. Otherwise, survivor is not eligible for retiree medical plan coverage.

Spousal Shared Risk Waiver for MEHP — Beginning in 2013, eligible spouses who waive the MEHP coverage, will no longer have the opportunity to enroll during any annual MEHP open enrollment so most spousal waivers on the MEHP are now permanent waivers unless a TRS-specific qualifying event is met. This does not apply to the KEHP. This MEHP eligibility rule became necessary to mitigate spousal adverse selection with zero premium Medicare Advantage plans on the individual and open market.

Termination — For employees hired prior to July 1, 2008, and who terminated with at least five years of service, retiree medical plan coverage eligibility is attained at age 60 with unreduced pension benefits. For employees hired on or after July 1, 2008, and who terminated with at least 15 years of service, retiree medical plan coverage is assumed to begin at age 60.

Reemployed Retirees — Effective Jan. 1, 2019, and because of the Affordable Care Act (ACA) and Medicare secondary payer (MSP) federal rules, if a TRS retiree returns to work and is offered the same health insurance coverage as any full time employee (whether the KEHP, MEHP or another plan), then the member must waive coverage through TRS. For valuation purposes, active employees identified as currently receiving retiree health care through the system are valued as retirees. Retirees making active contributions into a second account do not qualify for insurance on that second account.

Covered Member Retiree Medical Plan Contributions

Under Age 65 Retiree Shared Responsibility Contribution — Effective July 1, 2010, retirees under the age of 65 began a three-year phase-in of the Shared Responsibility contribution. This contribution reduces the applicable amount of the full contribution provided by the system to retirees, by adjusting the Shared Responsibility Contribution amount by 100% less the appropriate percentage from the Retiree Percentage Contribution table below. Effective July 1, 2012, the full Shared Responsibility Contribution equals the Standard Medicare Part B premium paid by retirees ages 65 and older.

Monthly Under Age 65 Shared Responsibility Contribution Timeline

Effective Date	Medicare Part B Monthly Cost	Shared Responsibility Contribution
July 1, 2010	$ 110.50	$ 37.00
Jan. 1, 2011	115.40	39.00
July 1, 2011	115.40	77.00
Jan. 1, 2012	99.90	66.00
July 1, 2012	99.90	99.90
Jan. 1, 2013	104.90	104.90
Jan. 1, 2014	104.90	104.90
Jan. 1, 2015	104.90	104.90
Jan. 1, 2016	121.80	121.80
Jan. 1, 2017	134.00	134.00
Jan. 1, 2018	134.00	134.00
Jan. 1, 2019	135.50	135.50
Jan. 1, 2020	144.60	144.60
Jan. 1, 2021	148.50	148.50
Jan. 1, 2022	170.10	170.10
Jan. 1, 2023	164.90	164.90
Jan. 1, 2024	174.70	174.70

Retiree Years of Service Percentage Contribution — Retirees contribute percentages based on years of service at retirement, which are then applied to the Retiree Contribution Rate Basis as shown on the table on the next page.

Retiree Percentage Contribution*

Years of Service	TRS 1: Age 65 or Older and Covered Before Jan.1, 2005	TRS 1: Age 65 After or Covered After Dec.31, 2004	TRS 2	TRS 3 & TRS 4
5 - 9.99	30	75	90	Not Eligible
10 - 14.99	20	50	75	Not Eligible
15 - 19.99	10	25	55	55
20 - 24.99	0	0	35	35
25 - 25.99	0	0	10	10
26 - 26.99	0	0	5	5
27 or more	0	0	0	0

** 0% for disabled retirees that retired prior to 1/1/2002.*

Covered Member Retiree Retiree Medical Plan — For 2023, the TRS Board of Trustees approved a single contributions amount of up to $877.30, as well as an additional $8.00 per month paid to the Department of Employee Insurance (DEI) for participants on the Kentucky Employees' Health Plan (KEHP). TRS will contribute this amount towards insurance costs, less the Shared Responsibility cost of $174.70. Under-65 retirees who are not Medicare eligible and continue on the KEHP are responsible for the remaining costs left from the total premium costs. The total premium costs are shown below.

Monthly Under Age 65 Plan Full Costs*
Effective Jan. 1, 2023

Tier Elected	Under Age 65 (KEHP): LivingWell CDHP	Under Age 65 (KEHP): LivingWell PPO	Under Age 65 (KEHP): LivingWell Basic CDHP	Ages 65 and Older (MEHP)
Single	$ 930.76	$ 949.04	$ 901.04	$ 207.00
Parent Plus	1,269.28	1,320.40	1,234.80	
Couple	1,866.24	1,981.62	1,863.04	
Family	2,078.08	2,185.78	2,069.88	
Family Cross-Reference	1,068.66	1,126.28	1,057.40	

** Does not include the additional contribution required to be paid by retirees under the age of 65 who use tobacco ($40 for Single or Family Cross-Reference, and $80 for Parent Plus, Couple or Family). Also, this does not include the additional contribution required to be paid by retirees under the age of 65 who do not complete their LivingWell Promise, which is an additional $40 per month for all levels of coverage-single, parent +, couple, and family. Approximately 1,500 retirees across all four KEHP plans did not complete their LivingWell Promise for 2019. The additional contribution for these retirees will begin in 2020. For valuation purposes, it is conservatively assumed that, over time, 100% of KEHP retirees will complete their LivingWell Promise. This assumption will be monitored in future experience studies.*

Spouse Contributions — 100% of the full cost for non-Medicare eligible dependents is paid through a combination of payments from beneficiaries and the state. Neither the state nor TRS will pay any subsidy for family style coverage.

Survivors — Spouses of employees who die in service while eligible to retire, as well as survivors of service and disabled retirees, are eligible for retiree medical plan coverage if elected within 30 days of the employee's/retiree's death with no future remarriage. Otherwise, survivor is not eligible for retiree medical plan coverage.

Spousal Shared Risk Waiver for MEHP — Beginning in 2013, eligible spouses who waive the MEHP coverage, will no longer have the opportunity to enroll during any annual MEHP open enrollment so most spousal waivers on the MEHP are now permanent waivers unless a TRS-specific qualifying event is met. This does not apply to the KEHP. This MEHP eligibility rule became necessary to mitigate spousal adverse selection with zero premium Medicare Advantage plans on the individual and open market.

Monthly Surviving Spouse Contribution
Effective Jan. 1, 2023

	Under Age 65 (KEHP)			
Tier Elected by Surviving Spouse	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	Age 65 and Older (MEHP)
Single	$ 938.76	$ 957.04	$ 909.04	$ 207.00
Parent Plus	1,277.28	1,328.40	1,242.80	n/a

System Retiree Medical Plan Contributions — The system Contribution Rate Basis is determined annually by the system; and the full cost is projected based on historical claims data. For retirees, the following percentages are based on years of service at retirement and are then applied to the system Contribution Rate Basis.

Percentage of System Contribution Rate Provided to Retirees*

	TRS 1			
Years of Service	Age 65 or Older & Covered Before Jan. 1, 2005	Age 65 After or Covered After Dec. 31, 2004	TRS 2	TRS 3 & TRS 4
5 - 9.99	70	25	10	Not Eligible
10 - 14.99	80	50	25	Not Eligible
15 - 19.99	90	75	45	45
20 - 24.99	100	100	65	65
25 - 25.99	100	100	90	90
26 - 26.99	100	100	95	95
27 or more	100	100	100	100

** 100% for disabled retirees that retired prior to Jan. 1, 2002.*

Active Member Retiree Medical Plan Contributions — Actively employed members make payroll contributions to the Health Insurance Trust based upon the following schedule.

Active Member Percentage of Payroll Contribution Made to Health Insurance Trust

University Employees			School District Employees (Non-Federal)			Other Employees		
TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4	TRS 1 & TRS 2	TRS 3	TRS 4
2.775 %	2.775 %	2.775 %	3.750 %	3.750%	3.750%	3.750 %	3.750 %	3.750 %

Life Insurance Plan Benefits — Effective July 1, 2000, the Teachers' Retirement System shall:

(a) Provide a life insurance benefit in a minimum amount of $5,000 for its members who are retired for service or disability if hired prior to Jan. 1, 2022. Provide a life insurance benefit in a minimum amount of $10,000 for its members who are retired for service or disability if hired on or after Jan. 1, 2022.This life insurance benefit shall be payable upon the death of a member retired for service or disability to the member's estate or to a party designated by the member on a form prescribed by the retirement system; and

(b) Provide a life insurance benefit in a minimum amount of $2,000 for its active contributing members if hired prior to Jan. 1, 2022. Provide a life insurance benefit in a minimum amount of $5,000 for its active contributing members if hired on or after Jan. 1, 2022. This life insurance benefit shall be payable upon the death of an active contributing member to the member's estate or to a party designated by the member on a form prescribed by the retirement system.

Note — Members employed on a substitute or part-time basis and working at least 69% of a full contract year in a single fiscal year will be eligible for a life insurance benefit for the balance of the fiscal year or the immediately succeeding fiscal year under certain conditions. For non-vested members employed on a substitute or part-time basis, the life insurance benefit is provided if death occurs as the result of a physical injury on the job. For vested members employed on a substitute or part-time basis, death does not have to be the result of a physical injury on the job for life insurance benefits to be provided.

Schedule F

Table 1
Age - Service Table
Distribution of Active Members as of June 30, 2023
by Age and Service Groups

Attained Age	Completed Years of Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 26	27 to 29	30 to 34	35 & Over	Number	Payroll
Under 25	2,534	2,100	5								4,639	$ 106,550,341
25 to 29	932	4,814	2,001								7,747	332,977,424
30 to 34	648	2,058	4,198	1,386	3						8,293	419,080,912
35 to 39	602	1,515	2,011	4,081	1,472	2					9,683	555,118,755
40 to 44	635	1,466	1,548	1,948	4,432	1,403	4	1			11,437	717,111,512
45 to 49	409	916	1,103	1,232	1,962	3,977	893	151	3		10,646	728,927,098
50 to 54	643	911	767	963	1,432	2,019	1,326	1,433	382	1	9,877	669,251,901
55 to 59	877	970	467	522	816	1,026	444	417	321	37	5,897	339,713,715
60 to 64	687	1,006	354	316	359	460	162	187	123	56	3,710	169,433,771
65 to 69	558	725	240	110	114	139	67	58	57	33	2,101	66,003,305
70 & Over	446	623	257	78	55	46	23	25	28	33	1,614	34,740,258
Total Count	8,971	17,104	12,951	10,636	10,645	9,072	2,919	2,272	914	160	75,644	$4,138,908,992

Average Age: 43.5 Average Service: 11.1

Retirement Eligible: 9,452

Table 2

Schedule of Total Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	Percentage Increase in Average Pay
2014	73,407	$ 3,486,326,799	$ 47,493	2.12 %
2015	72,246	3,515,113,126	48,655	2.45
2016	71,848	3,537,226,348	49,232	1.19
2017	72,130	3,563,584,342	49,405	0.35
2018	72,205	3,605,115,787	49,929	1.06
2019	72,647	3,648,427,710	50,221	0.58
2020	73,151	3,723,481,576	50,901	1.35
2021	69,256	3,784,400,223	54,644	7.35
2022	74,785	4,033,509,178	53,935	(1.3)
2023	75,644	4,138,908,992	54,716	1.45

Table 3

Eligible Deferred Vested Members
Male and Female Demographic Breakdown
as of June 30, 2023
Health Insurance Trust

Attained Age	Number of Males	Number of Females	Total Number
Under 30	1	0	1
30-34	27	35	62
35-39	172	562	734
40-44	397	1152	1,549
45-49	356	1,106	1,462
50-54	363	1369	1,732
55-59	247	954	1,201
60 & Over	265	911	1,176
Total	1,828	6,089	7,917

Life Insurance Trust

Attained Age	Number of Males	Number of Females	Total Number
Under 30	21	101	122
30-34	203	612	815
35-39	353	1,200	1,553
40-44	505	1,530	2,035
45-49	450	1,408	1,858
50-54	442	1,636	2,078
55-59	299	1,124	1,423
60 & Over	343	1,104	1,447
Total	2,616	8,715	11,331

Table 4
All Retirees and Spouses Receiving Health Care Benefits
as of June 30, 2023
Male and Female Demographic Breakdown

Attained Age	Number of Males	Number of Females	Total Number
Under 40	0	3	3
40-44	2	18	20
45-49	27	78	105
50-54	347	873	1,220
55-59	1053	2,351	3,404
60-64	1,625	3,857	5,482
65-69	2,376	5,936	8,312
70-74	3,562	8,016	11,578
75-79	3,043	5,803	8,846
80-84	1,704	3,269	4,973
85-89	802	1,572	2,374
90-94	272	712	984
95-99	51	216	267
100 and over	8	34	42
Total	14,872	32,738	47,610

Table 5
Schedule of Retirees, Beneficiaries and Survivors Added To and Removed From Rolls *
Health Insurance Trust

Year Ended June 30	Members Added	Spouses** Added	Total Added	Members Removed	Spouses** Removed	Total Removed	Members at Year End	Spouses** at Year End	Total at Year End
2014	1,663	638	2,301	1,165	660	1,825	37,275	7,031	44,306
2015	1,990	731	2,721	1,190	633	1,823	38,075	7,129	45,204
2016	2,045	726	2,771	1,305	674	1,979	38,815	7,181	45,996
2017	1,835	699	2,534	1,153	691	1,844	39,497	7,189	46,686
2018	1,903	828	2,731	1,170	422	1,592	40,230	7,595	47,825
2019	1,701	666	2,367	1,220	692	1,912	40,711	7,569	48,280
2020	1,500	487	1,987	1,057	1,173	2,230	41,154	6,883	48,037
2021	1,548	448	1,996	1,527	603	2,130	41,175	6,728	47,903
2022	1,600	466	2,066	1,598	533	2,131	41,177	6,661	47,838
2023	1,619	369	1,988	1,741	475	2,216	41,055	6,555	47,610

** Reflects members, spouses and beneficiaries participating in a health care plan.*
*** Includes spouses, beneficiaries and surviving spouses.*

Table 6

Schedule of Retirees, Beneficiaries and Survivors Added To and Removed From Rolls *
Life Insurance Trust

(Dollars in thousands except Average Life Insurance Benefit)

Year Ended June 30	Number Added	Life Insurance Benefit	Number Removed	Life Insurance Benefit	Number at Year End	Life Insurance Benefit	Increase in Life Insurance Benefit	Average Life Insurance Benefit
2014	1,964	$ 9,820	954	$ 4,770	44,855	$ 224,275	2.30 %	$ 5,000
2015	2,270	11,350	1,641	8,205	45,484	227,420	1.40	5,000
2016	2,394	11,970	807	4,035	47,071	235,355	3.49	5,000
2017	2,175	10,875	1,021	5,105	48,225	241,125	2.45	5,000
2018	2,605	13,025	1,408	7,040	49,422	247,110	2.48	5,000
2019	2,226	11,130	210	1,050	51,438	257,190	4.08	5,000
2020	2,003	10,015	1,179	5,895	52,262	261,310	1.60	5,000
2021	1,886	9,430	2,417	12,085	51,731	258,655	(1.02)	5,000
2022	2,213	11,065	1,731	8,655	52,213	261,065	0.93	5,000
2023	2,600	13,000	1,434	7,170	53,379	266,895	2.23	5,000

** Beginning with the June 30, 2021 valuation date, the counts in the exhibit above reflect all adjustments, which resulted in a larger number removed from rolls. Prior to June 30, 2021, the exhibit reflected the initial member counts.*

Sensitivity Analysis — Health Insurance Trust

The June 30, 2023, valuation results of the Health Insurance Trust are projections based on the actuarial assumptions. Actual experience will differ from these assumptions, either increasing or decreasing cost. The charts on the following pages provide a simple analysis on how the costs are sensitive to changes to the assumed discount rate, the assumed inflation rate, the assumed rate of payroll growth, and the assumed rates of health care inflation (trend). The charts show the actuarial accrued liability, the unfunded liability, the funded ratio and the employer contribution rate under the following scenarios:

- The discount rate assumption sensitivity analysis shows the valuation results with the baseline discount rate assumption, 7.1%, together with a decrease in the discount rate to 6.1% and an increase in the discount rate to 8.1%. Under this scenario, the underlying inflation rate assumption is held constant at 2.5% and the payroll growth assumption is held constant at 2.75%.
- The inflation assumption sensitivity analysis shows the valuation results with the baseline underlying inflation rate assumption, 2.5%, together with decreases in the inflation rate to 2.25% and 2%. Under this scenario, the decrease in the underlying inflation rate assumption leads to corresponding decreases in the discount rate, the payroll growth assumption, and the assumed rates of salary increase for active members, and the ultimate health care trend.
- The wage inflation assumption sensitivity analysis shows the valuation results with the baseline underlying payroll growth assumption, 2.75%, together with decreases in the wage inflation assumption to 1.25% and 0%. Under this scenario, all other assumptions, including the individual member salary scale, are held constant so that the only impact is in the amortization of the unfunded liability, leading to higher employer contribution rates.
- The health care inflation (trend) assumption sensitivity analysis shows the valuation results with the baseline trend assumption along with a 1% increase in all assumed trend rates and a 1% decrease in all assumed trend rates.

Assumed Discount Rate Sensitivity Analysis
(Dollars in thousands)

	Decrease Discount Rate	Valuation Results	Increase Discount Rate
Actuarial accrued liability	$ 4,479,067	$ 3,909,612	$ 3,445,981
Actuarial value of assets	2,788,970	2,788,970	2,788,970
Unfunded liability	$ 1,690,097	$ 1,120,642	$ 657,011
Funded ratio	62.27 %	71.34 %	80.93 %
Contributions			
Normal cost	2.71 %	2.04 %	1.55 %
Accrued liability	3.07 %	2.17 %	1.36 %
Total	5.78 %	4.21 %	2.91 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.59)%	(2.59)%	(2.59)%
Statutorily required prefunding*	(3.5)%	(5.07)%	(6.37)%
Discount rate	6.10 %	7.10 %	8.10 %
Payroll growth	2.75 %	2.75 %	2.75 %
Inflation rate	2.50 %	2.50 %	2.50 %
Ultimate health care trend	4.50 %	4.50 %	4.50 %

** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

Inflation Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 3,909,612	$ 3,976,854	$ 4,051,759
Actuarial value of assets	2,788,970	2,788,970	2,788,970
Unfunded liability	$ 1,120,642	$ 1,187,884	$ 1,262,789
Funded ratio	71.34 %	70.13 %	68.83 %
Contributions			
Normal cost	2.04 %	2.08 %	2.12 %
Accrued liability	2.17 %	2.31 %	2.45 %
Total	4.21 %	4.39 %	4.57 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.59)%	(2.59)%	(2.59)%
Statutorily required prefunding*	(5.07)%	(4.89)%	(4.71)%
Discount rate	7.10 %	6.85 %	6.60 %
Payroll growth	2.75 %	2.50 %	2.25 %
Inflation rate	2.50 %	2.25 %	2.00 %
Ultimate health care trend	4.50 %	4.25 %	4.00 %

** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

Wage Inflation Assumption Sensitivity Analysis

(Dollars in thousands)

	Valuation Results	Decrease Payroll Growth 1.25%	No Payroll Growth
Actuarial accrued liability	$ 3,909,612	$ 3,909,612	$ 3,909,612
Actuarial value of assets	2,788,970	2,788,970	2,788,970
Unfunded liability	$ 1,120,642	$ 1,120,642	$ 1,120,642
Funded ratio	71.34 %	71.34 %	71.34 %
Contributions			
Normal cost	2.04 %	2.04 %	2.04 %
Accrued liability	2.17 %	2.40 %	2.61 %
Total	4.21 %	4.44 %	4.65 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.59)%	(2.59)%	(2.59)%
Statutorily required prefunding*	(5.07)%	(4.84)%	(4.63)%
Discount rate	7.10 %	7.10 %	7.10 %
Payroll growth	2.75 %	1.25 %	0.00 %
Inflation rate	2.50 %	2.50 %	2.50 %
Ultimate health care trend	4.50 %	4.50 %	4.50 %

** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

Health Care Trend Assumption Sensitivity Analysis
(Dollars in thousands)

	Decrease Trend Rates 1%	Valuation Results	Increase Trend Rates 1%
Actuarial accrued liability	$ 3,400,209	$ 3,909,612	$ 4,549,344
Actuarial value of assets	2,788,970	2,788,970	2,788,970
Unfunded liability	$ 611,239	$ 1,120,642	$ 1,760,374
Funded ratio	82.02 %	71.34 %	61.30 %
Contributions			
Normal cost	1.61 %	2.04 %	2.63 %
Accrued liability	1.19 %	2.17 %	3.42 %
Total	2.80 %	4.21 %	6.05 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.59)%	(2.59)%	(2.59)%
Statutorily required prefunding*	(6.48)%	(5.07)%	(3.23)%
Discount rate	7.10 %	7.10 %	7.10 %
Payroll growth	2.75 %	2.75 %	2.75 %
Inflation rate	2.50 %	2.50 %	2.50 %
Ultimate health care trend	3.50 %	4.50 %	5.50 %

** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

The 2024 monthly TRS MEHP rate of $207 includes $196 in EGWP prescription drug costs. The EGWP prescription drug costs are based on projected total drug costs minus projected reimbursements from CMS and drug manufacturers for Medicare Part D rebates, subsidies, and reinsurance. If these reimbursements were not to continue at the current rate. TRS MEHP costs could increase to as much as $552. In this case, the statutory contribution rates will be less than the actuarially determined contribution rates, the unfunded actuarial accrued liability will not be paid off in the scheduled 17 year timeframe and the health insurance fund will not reach 100% funded.

Health Insurance Trust MEHP Cost Sensitivity Analysis
(Dollars in thousands)

	Valuation Results (MA Rate = $207)	Alternative Results (MA Rate = $552)
Actuarial accrued liability	$ 3,909,612	$ 7,576,054
Actuarial value of assets	2,788,970	2,788,970
Unfunded liability	$ 1,120,642	$ 4,787,084
Funded ratio	71.34 %	61.30 %
Contributions		
Normal cost	2.04 %	3.28 %
Accrued liability	2.17 %	9.29 %
Total	4.21 %	12.57 %
Member	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%
State	(2.59)%	(2.59)%
Statutorily required prefunding*	(5.07)%	3.29 %
Discount rate	7.10 %	7.10 %
Payroll growth	2.75 %	2.75 %
Inflation rate	2.50 %	2.50 %
Ultimate health care trend	4.50 %	4.50 %

** This represents funding by active members, local school districts, universities and other employers toward the unfunded liability of the health trust. See KRS 161.540(1)(c)(3) & 161.550(5).*

Sensitivity Analysis — Life Insurance Trust

The June 30, 2023, valuation results of the Life Insurance Trust are projections based on the actuarial assumptions. Actual experience will differ from these assumptions, either increasing or decreasing cost. The charts on the following pages provide a simple analysis on how the costs are sensitive to changes to the assumed discount rate, the assumed inflation rate, and the assumed rate of payroll growth. The charts show the actuarial accrued liability, the unfunded liability, the funded ratio and the employer contribution rate under the following scenarios. Please note we maintain a minimum total employer contribution rate of 0.08% for all scenarios except the 1% increase in the discount rate scenario:

- The discount rate assumption sensitivity analysis shows the valuation results with the baseline discount rate assumption, and 7.1% together with a decrease in the discount rate to 6.1% and an increase in the discount rate to 8.1%. Under this scenario, the underlying inflation rate assumption is held constant at 2.5% and the payroll growth assumption is held constant at 2.75%.
- The inflation assumption sensitivity analysis shows the valuation results with the baseline underlying inflation rate assumption, 2.5%, together with decreases in the inflation rate to 2.25% and 2%. Under this scenario, the decrease in the underlying inflation rate assumption leads to corresponding decreases in the discount rate, the payroll growth assumption, and the assumed rates of salary increase for active members.
- The wage inflation assumption sensitivity analysis shows the valuation results with the baseline underlying wage inflation assumption, 2.75%, together with decreases in the wage inflation assumption to 1.25% and 0%. Under this scenario, all other assumptions, including the individual member salary scale, are held constant so that the only impact is in the amortization of the unfunded liability, leading to higher employer contribution rates.

Assumed Discount Rate Sensitivity Analysis
(Dollars in thousands)

	Decrease Discount Rate	Valuation Results	Increase Discount Rate
Actuarial accrued liability	$ 139,906	$ 122,611	$ 108,622
Actuarial value of assets	99,027	99,027	99,027
Unfunded liability	$ 40,879	$ 23,584	$ 9,595
Funded ratio	70.78 %	80.77 %	91.17 %
Contributions			
Normal cost	0.03 %	0.03 %	0.02 %
Accrued liability	0.06 %	0.05 %	0.02 %
Total	0.09 %	0.08 %	0.04 %
Member	0%	0%	0%
Employer/state	0.09 %	0.08 %	0.04 %
Discount rate	6.10 %	7.10 %	8.10 %
Payroll growth	2.75 %	2.75 %	2.75 %
Inflation rate	2.50 %	2.50 %	2.50 %

Inflation Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 122,611	$ 126,744	$ 131,122
Actuarial value of assets	99,027	99,027	99,027
Unfunded liability	$ 23,584	$ 27,717	$ 32,095
Funded ratio	80.77 %	78.13 %	75.52 %
Contributions*			
Normal cost	0.03 %	0.03 %	0.03 %
Accrued liability	0.05 %	0.05 %	0.05 %
Total	0.08 %	0.08 %	0.08 %
Member	0%	0%	0%
Employer/state	0.08 %	0.08 %	0.08 %
Discount rate	7.10 %	6.85 %	6.60 %
Payroll growth	2.75 %	2.50 %	2.25 %
Inflation rate	2.50 %	2.25 %	2.00 %

** Recommended contributions actuarially determined, but not less than 0.08%.*

Wage Inflation Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Payroll Growth 1.25%	No Payroll Growth
Actuarial accrued liability	$ 122,611	$ 122,611	$ 122,611
Actuarial value of assets	99,027	99,027	99,027
Unfunded liability	$ 23,584	$ 23,584	$ 23,584
Funded ratio	80.77 %	80.77 %	80.77 %
Contributions			
Normal cost	0.03 %	0.03 %	0.03 %
Accrued liability	0.05 %	0.05 %	0.05 %
Total	0.08 %	0.08 %	0.08 %
Member	0 %	0 %	0 %
Employer/state	0.08 %	0.08 %	0.08 %
Discount rate	7.10 %	7.10 %	7.10 %
Payroll growth	2.75 %	1.25 %	0.00 %
Inflation rate	2.50 %	2.50 %	2.50 %

** Recommended contributions actuarially determined, but not less than 0.08%.*

30-Year Baseline Projection
Health Insurance Trust

The results of actuarial valuations are a snapshot of the financial position on the valuation date, based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (30 years in this case) by “creating” future new hires and performing valuations using the projected membership. The following items are assumed for the projected results.

- Active Employee Growth Rate — 0%
- Valuation Discount Rate — 7.1%
- Investment Rate of Return — 7.1% each year
- Actuarial Value of Assets — Five year smoothing, no corridor
- Amortization Method — Level percent of payroll, closed
- Amortization Period — 17-year period as of valuation date
- Future Contributions — Based on the contribution rates defined in statue

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.

Projections assume all actuarial assumptions are met and do not include any adjustment for adverse experience due to COVID-19 (either impacting claims or demographics), changes in the ACA, larger than expected increases to Medicare Advantage premiums, or lower than expected investment return or payroll growth.

Health Insurance Trust

(Dollars in thousands)

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Total Employer Contribution
2023	2024	$ 3,946,280	$ 192,629	$ 4,138,909	$ 1,120,642	7,130.0 %	$ 384,061
2024	2025	4,016,777	190,323	4,207,100	905,782	78.0	396,075
2025	2026	4,087,557	190,344	4,277,901	647,093	85.0	409,446
2026	2027	4,161,150	191,801	4,352,951	432,224	90.5	424,437
2027	2028	4,234,674	194,163	4,428,837	106,375	97.8	439,621
2028	2029	4,310,544	197,126	4,507,670		100.0	94,215
2029	2030	4,385,843	200,390	4,586,233		100.0	96,582
2030	2031	4,463,815	203,951	4,667,766		100.0	99,140
2031	2032	4,545,631	207,733	4,753,364		100.0	101,886
2032	2033	4,630,939	211,694	4,842,633		100.0	104,814
2033	2034	4,717,507	216,249	4,933,756		100.0	107,873
2034	2035	4,808,626	220,675	5,029,301		100.0	111,091
2035	2036	4,904,564	225,273	5,129,837		100.0	114,493
2036	2037	5,006,963	230,714	5,237,677		100.0	118,089
2037	2038	5,115,374	236,410	5,351,784		100.0	121,901
2038	2039	5,229,683	242,793	5,472,476		100.0	125,936
2039	2040	5,350,324	249,626	5,599,950		100.0	130,197
2040	2041	5,477,769	257,078	5,734,847		100.0	134,685
2041	2042	5,612,359	265,096	5,877,455		100.0	139,395
2042	2043	5,752,623	273,521	6,026,144		100.0	144,315

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Total Employer Contribution
2043	2044	5,900,619	282,496	6,183,115		100.0	149,506
2044	2045	6,055,287	292,300	6,347,587		100.0	154,949
2045	2046	6,216,417	302,567	6,518,984		100.0	160,660
2046	2047	6,383,235	313,366	6,696,601		100.0	166,594
2047	2048	6,558,980	324,541	6,883,521		100.0	172,816
2048	2049	6,741,741	336,214	7,077,955		100.0	179,359
2049	2050	6,931,017	347,790	7,278,807		100.0	186,191
2050	2051	7,134,628	359,777	7,494,405		100.0	193,635
2051	2052	7,349,499	371,516	7,721,015		100.0	201,788
2052	2053	7,571,991	383,174	7,955,165		100.0	210,530

30-Year Sensitivity Projection
Health Insurance Trust

The results of actuarial valuations are a snapshot of the financial position on the valuation date, based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (30 years in this case) by "creating" future new hires and performing valuations using the projected membership. The following items are assumed for the projected results.

- Active Employee Growth Rate — 0%
- Valuation Discount Rate — 7.1%
- Investment Rate of Return — 7.1% each year
- Actuarial Value of Assets — Five year smoothing, no corridor
- Amortization Method — Level percent of payroll, closed
- Amortization Period — 17-year period as of valuation date
- Future Contributions — Based on the contribution rates defined in statue
- Medicare Advantage Rate — $552

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.

Projections assume all actuarial assumptions are met and do not include any adjustment for adverse experience due to COVID-19 (either impacting claims or demographics), changes in the ACA, larger than expected increases to Medicare Advantage premiums, or lower than expected investment return or payroll growth. The 2024 monthly TRS MEHP rate of $207 includes $196 EGWP prescription drug costs. The EGWP prescription drug costs are based on projected total drug costs minus projected reimbursements from CMS and drug manufacturers for Medicare Part D rebates, TRS MEHP costs could increase to as much as $552. In this case, the statutory contribution rates will be less than the actuarially determined contribution rates, the unfunded actuarial accrued liability will not be paid off in the scheduled 17 year timeframe and the health insurance fund will not reach 100% funded.

Health Insurance Trust

(Dollars in thousands)

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Total Contribution Including Member Contributions
2023	2024	$ 3,946,280	$ 192,629	$ 4,138,909	$ 4,787,084	36.8 %	$ 384,061
2024	2025	4,016,777	190,323	4,207,100	4,886,398	38.7	396,075
2025	2026	4,087,557	190,344	4,277,901	4,967,270	40.6	409,446
2026	2027	4,161,150	191,801	4,352,951	5,118,068	41.6	424,437
2027	2028	4,234,674	194,163	4,428,837	5,186,021	43.5	439,621
2028	2029	4,310,544	197,126	4,507,670	5,263,555	45.1	455,522
2029	2030	4,385,843	200,390	4,586,233	5,335,123	46.7	472,086
2030	2031	4,463,815	203,951	4,667,766	5,399,894	48.3	489,829
2031	2032	4,545,631	207,733	4,753,364	5,456,574	49.8	507,532
2032	2033	4,630,939	211,694	4,842,633	5505041	51.3	524,930
2033	2034	4,717,507	216,249	4,933,756	5545425	52.8	542,514
2034	2035	4,808,626	220,675	5,029,301	5577303	54.4	557,397
2035	2036	4,904,564	225,273	5,129,837	5603236	55.9	568,381
2036	2037	5,006,963	230,714	5,237,677	5627256	57.3	580,158
2037	2038	5,115,374	236,410	5,351,784	5648845	58.7	592,627
2038	2039	5,229,683	242,793	5,472,476	5667581	60.1	605,812
2039	2040	5,350,324	249,626	5,599,950	5682995	61.5	619,743
2040	2041	5,477,769	257,078	5,734,847	5694576	62.8	634,488
2041	2042	5,612,359	265,096	5,877,455	5701707	54.0	650,078
2042	2043	5,752,623	273,521	6,026,144	5703695	65.5	666,335
2043	2044	5,900,619	282,496	6,183,115	5699977	66.8	683,506
2044	2045	6,055,287	292,300	6,347,587	5689780	68.0	701,493
2045	2046	6,216,417	302,567	6,518,984	5672363	69.3	720,243
2046	2047	6,383,235	313,366	6,696,601	5647012	70.6	739,672
2047	2048	6,558,980	324,541	6,883,521	5613011	71.9	760,135
2048	2049	6,741,741	336,214	7,077,955	5569313	73.2	781,429
2049	2050	6,931,017	347,790	7,278,807	5515059	74.4	803,444
2050	2051	7,134,628	359,777	7,494,405	5449410	75.7	827,122
2051	2052	7,349,499	371,516	7,721,015	5370872	77.0	848,910
2052	2053	7,571,991	383,174	7,955,165	5281613	78.2	861,068

30-Year Baseline Projection
Life Insurance Trust

The results of actuarial valuations are a snapshot of the financial position on the valuation date, based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (30 years in this case) by creating future new hires and performing valuations using the projected membership. The following items are assumed for the projected results.

- Active Employee Growth Rate — 0%
- Valuation Discount Rate — 7.1%
- Investment Rate of Return — 7.1% each year
- Actuarial Value of Assets — Five-year smoothing, no corridor
- Amortization Method — Level percent of payroll, closed
- Amortization Period — 21-year period as of valuation date
- Future Contributions — Based on expected actuarially determined contributions (not less than 0.08%)

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.

Life Insurance Trust

(Dollars in thousands)

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Actuarially Determined Contribution
2023	2026	$ 3,946,280	$ 192,629	$ 4,138,909	$ 23,584	80.8 %	$ 3,422
2024	2027	4,016,777	190,323	4,207,100	24,113	80.8	3,482
2025	2028	4,087,557	190,344	4,277,901	24,416	81.0	3,543
2026	2029	4,161,150	191,801	4,352,951	28,246	78.5	3,502
2027	2030	4,234,674	194,163	4,428,837	27,443	79.5	3,582
2028	2031	4,310,544	197,126	4,507,670	27,120	80.2	3,704
2029	2032	4,385,843	200,390	4,586,233	26,870	80.7	3,846
2030	2033	4,463,815	203,951	4,667,766	26,576	81.3	3,995
2031	2034	4,545,631	207,733	4,753,364	26,185	81.9	4,145
2032	2035	4,630,939	211,694	4,842,633	25,666	82.5	4,300

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Actuarially Determined Contribution
2033	2036	4,717,507	216,249	4,933,756	25,001	83.2	4,463
2034	2037	4,808,626	220,675	5,029,301	24,178	84.0	4,635
2035	2038	4,904,564	225,273	5,129,837	23,178	84.9	4,815
2036	2039	5,006,963	230,714	5,237,677	21,979	85.8	5,003
2037	2040	5,115,374	236,410	5,351,784	20,556	86.9	5,202
2038	2041	5,229,683	242,793	5,472,476	18,881	88.1	5,415
2039	2042	5,350,324	249,626	5,599,950	16,926	89.5	5,650
2040	2043	5,477,769	257,078	5,734,847	14,657	91.0	5,918
2041	2044	5,612,359	265,096	5,877,455	12,036	92.7	6,248
2042	2045	5,752,623	273,521	6,026,144	9,013	94.6	6,722
2043	2046	5,900,619	282,496	6,183,115	5,526	96.7	7,725
2044	2047	6,055,287	292,300	6,347,587	1,474	99.1	3,474
2045	2048	6,216,417	302,567	6,518,984		100.0	1,938
2046	2049	6,383,235	313,366	6,696,601		100.0	1,955
2047	2050	6,558,980	324,541	6,883,521		100.0	1,969
2048	2051	6,741,741	336,214	7,077,955		100.0	1,984
2049	2052	6,931,017	347,790	7,278,807		100.0	1,999
2050	2053	7,134,628	359,777	7,494,405		100.0	2,008
2051	2054	7,349,499	371,516	7,721,015		100.0	2,011
2052	2055	7,571,991	383,174	7,955,165		100.0	2,012

Statistical Section

This section of the Teachers' Retirement System of the State of Kentucky's Annual Comprehensive Financial Report presents detailed information as a context for understanding the information in the financial statements, note disclosures and required supplementary information regarding TRS's overall financial health. Schedules and information are derived from TRS's internal sources.

Contents

Retirement Annuity Trust

Past 10 Fiscal Years

Additions by Source

Year	Employer Contributions	Member Contributions	Net Investment Income (Loss)	Total Additions to Plan Net Position
2023	$ 1,144,448,806	$ 366,774,504	$ 2,266,085,160	$ 3,777,308,470
2022	1,679,584,669	356,966,620	(2,727,775,055)	(691,223,766)
2021	1,146,977,669	327,833,177	6,017,184,311	7,491,995,157
2020	1,134,281,095	324,664,055	1,094,023,378	2,552,968,528
2019	1,123,034,823	321,172,166	1,085,189,349	2,529,396,338
2018	1,048,671,201	319,127,087	1,953,214,031	3,321,012,319
2017	1,060,719,993	313,625,434	2,475,752,798	3,850,098,225
2016	565,454,590	313,044,226	(245,214,860)	633,283,956
2015	559,579,290	308,159,763	862,178,759	1,729,917,812
2014	563,326,249	304,981,620	2,803,247,956	3,671,555,825

Deductions by Type

Year	Service Retirees	Disability Retirees	Survivors	Total Benefits	Refunds — Separation*	Refunds — Death*	Administrative Expense	Total Deductions to Plan Net Position
2023	$2,281,150,748	$ 89,272,686	$ 20,902,766	$2,391,326,201	$ 24,861,526	$ 2,048,255	$ 14,470,733	$ 2,432,706,715
2022	2,196,122,634	88,683,021	21,047,117	2,305,852,772	23,810,213	2,934,990	12,005,095	2,344,603,070
2021	2,126,870,064	88,451,354	19,919,198	2,235,240,616	22,244,967	3,128,851	12,601,841	2,273,216,275
2020	2,059,900,271	87,666,903	19,672,067	2,167,239,241	26,822,159	1,650,058	12,166,651	2,207,878,109
2019	1,989,082,744	86,215,602	19,065,726	2,094,364,072	29,855,075	2,548,074	12,352,308	2,139,119,529
2018	1,901,237,575	84,500,330	18,879,429	2,004,617,334	29,618,564	1,453,857	11,388,493	2,047,078,248
2017	1,817,594,617	82,466,114	18,551,397	1,918,612,128	24,586,074	1,719,166	10,313,715	1,955,231,083
2016	1,735,374,416	79,808,432	18,015,782	1,833,198,630	25,320,322	2,427,420	8,636,438	1,869,582,810
2015	1,647,205,474	76,912,574	17,338,047	1,741,456,095	23,032,624		8,868,971	1,773,357,690
2014	1,563,634,993	73,501,441	17,239,266	1,654,375,700	25,461,843		7,955,972	1,687,793,515

** Prior to 2016, both refund types are shown under separation.*

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
2023	$ 3,777,308,470	$ 2,432,706,715	$ 1,344,601,755
2022	(691,223,766)	2,344,603,070	(3,035,826,836)
2021	7,491,995,157	2,273,216,275	5,218,778,882
2020	2,552,968,528	2,207,878,109	345,090,419
2019	2,529,396,338	2,139,119,529	390,276,809
2018	3,321,012,319	2,047,078,248	1,273,934,071
2017	3,850,098,225	1,955,231,083	1,894,867,142
2016	633,283,956	1,869,582,810	(1,236,298,854)
2015	1,729,917,812	1,773,357,690	(43,439,878)
2014	3,671,555,825	1,687,793,515	1,983,762,310

Health Insurance Trust

Past 10 Fiscal Years

Additions by Source

Year	Employer Contributions	Member Contributions*	Recovery Income*	Net Investment Income (Loss)	Total Additions to Plan Net Position
2023	$ 208,815,818	$ 149,209,656	$	$ 243,052,241	$ 601,077,715
2022	151,765,145	145,681,855		(219,500,061)	77,946,939
2021	184,887,065	128,117,484		503,200,749	816,205,298
2020	184,625,474	133,588,771		32,474,949	350,689,194
2019	183,146,155	131,676,820		74,385,482	389,208,457
2018	187,102,413	130,777,471		76,840,512	394,720,396
2017	180,375,986	128,819,243		95,452,597	404,647,826
2016	178,638,370	128,068,781		(9,332,490)	297,374,661
2015	145,263,926	157,467,680	22,820,427	7,354,704	332,906,737
2014	157,688,414	135,190,891	4,879,981	67,741,063	365,500,349

** Amounts paid by retirees and recovery income is netted against insurance expenses beginning fiscal year 2016.*

Deductions by Type

	Insurance Benefit Expense				
Year	Under Age 65	Age 65 & Over	Total Insurance Benefits Expense	Administrative Expense	Total Deductions to Plan Net Position
2023	$ 110,701,357	$ 14,164,648	$ 124,866,005	$ 1,974,318	$ 126,840,323
2022	106,170,919	1,030,520	107,201,439	2,074,227	109,275,666
2021	106,822,555	23,825,579	130,648,134	1,728,008	132,376,142
2020	109,708,027	36,278,725	145,986,752	2,047,238	148,033,990
2019	114,509,069	49,156,948	163,666,017	1,803,192	165,469,209
2018	120,519,991	40,561,709	161,081,700	1,747,561	162,829,261
2017	124,079,802	54,420,744	178,500,546	1,538,574	180,039,120
2016	127,673,325	61,196,669	188,869,994	1,686,070	190,556,064
2015	131,396,480	108,998,102	240,394,582	1,545,235	241,939,817
2014	136,963,208	105,107,323	242,070,531	1,100,133	243,170,664

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
2023	$ 601,077,715	$ 126,840,323	$ 474,237,392
2022	77,946,939	109,275,666	(31,328,727)
2021	816,205,298	132,376,142	683,829,156
2020	350,689,194	148,033,990	202,655,204
2019	389,208,457	165,469,209	223,739,248
2018	394,720,396	162,829,261	231,891,135
2017	404,647,826	180,039,120	224,608,706
2016	297,374,661	190,556,064	106,818,597
2015	332,906,737	241,939,817	90,966,920
2014	365,500,349	243,170,664	122,329,685

Life Insurance Trust

Past 10 Fiscal Years

While TRS began separate reporting of its Life Insurance Trust effective Feb. 1, 2018, for investment purposes, life insurance funds always have been accounted for separately, which is the basis of the following schedules.

Additions by Source

Year	Employer Contributions	Net Investment Income (Loss)	Total Additions to Plan Net Position
2023	$ 3,223,560	$ 8,682,485	$ 11,906,045
2022	2,754,863	(15,582,277)	(12,827,414)
2021	2,138,375	24,075,148	26,213,523
2020	1,796,389	5,166,203	6,962,592
2019	1,421,227	5,058,188	6,479,415
2018	1,058,329	1,110,421	2,168,750
2017	1,049,683	915,497	1,965,180
2016	1,037,769	4,829,336	5,867,105
2015	1,019,519	1,990,324	3,009,843
2014	1,006,091	4,572,845	5,578,936

Deductions by Type

Year	Life Insurance	Administrative Expense	Total Deductions to Plan Net Position
2023	$ 6,219,000	$ 37,633	$ 6,256,633
2022	6,178,000	40,999	6,218,999
2021	6,120,000	34,498	6,154,498
2020	5,317,000	35,980	5,352,980
2019	5,153,000	30,392	5,183,392
2018	5,452,920	30,979	5,483,899
2017	5,151,013	27,690	5,178,703
2016	4,595,489	27,195	4,622,684
2015	4,061,000	25,306	4,086,306
2014	4,692,000	21,324	4,713,324

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
2023	$ 11,906,045	$ 6,256,633	$ 5,649,412
2022	(12,827,414)	6,218,999	(19,046,413)
2021	26,213,523	6,154,498	20,059,025
2020	6,962,592	5,352,980	1,609,612
2019	6,479,415	5,183,392	1,296,023
2018	2,168,750	5,483,899	(3,315,149)
2017	1,965,180	5,178,703	(3,213,523)
2016	5,867,105	4,622,684	1,244,421
2015	3,009,843	4,086,306	(1,076,463)
2014	5,578,936	4,713,324	865,612

Distribution of Active Contributing Members
as of June 30, 2023

By Age

Age	Male	Female
20-24	916	3,796
25-29	1,822	5,982
30-34	1,973	6,393
35-39	2,293	7,438
40-44	2,749	8,732
45-49	2,708	7,995
50-54	2,505	7,656
55-59	1,544	4,742
60-64	1,022	2,925
65 & over	1,083	2,856
Total	18,615	58,515

By Service

Years of	Male	Female
Less than 1	2,595	8,464
1-4	4,489	14,256
5-9	3,094	9,665
10-14	2,409	7,617
15-19	2,432	7,756
20-24	1,979	6,598
25-29	1,337	3,455
30-34	239	641
35 or more	41	63
Total	18,615	58,515

Principal Participating Employers
Current Year and Nine Years Ago

Employer	2023 Covered Employees	2023 Rank	2023 Percentage of System	2014 Covered Employees	2014 Rank	2014 Percentage of System
Jefferson County Schools	10,921	1	14.16 %	10,255	1	13.48 %
Fayette County Schools	5,207	2	6.75	4,580	2	6.02
Boone County Schools	2,122	3	2.75	1,872	3	2.46
Warren County Schools	1,719	4	2.23	1,262	7	1.66
Hardin County Schools	1,529	5	1.98	1,343	4	1.77
Kenton County Schools	1,280	6	1.66	1,327	5	1.74
Oldham County Schools	1,261	7	1.63	1,192	8	1.57
Bullitt County Schools	1,219	8	1.58	1,318	6	1.73
Madison County Schools	1,147	9	1.49	1,101	10	1.45
Daviess County Schools	1,137	10	1.47	1,103	9	1.45
Other Employers (see below)	49,588		64.29	50,716		66.67
Total (201 Employers)	77,130		100 %	76,069		100 %

Other Employers
(detailed from above chart)

Type	Number of Employers	Employees
Local School Districts	161	44,660
Higher Education	6	3,087
State Agencies	12	1,270
Educational Cooperatives	8	446
Other	5	125
Total	192	49,588

TRS Schedule of Participating Local School District Employers

Adair County
Allen County
Anchorage
Anderson County
Ashland
Augusta
Ballard County
Barbourville
Bardstown
Barren County
Bath County
Beechwood
Bell County
Bellevue
Berea
Boone County
Bourbon County
Bowling Green
Boyd County
Boyle County
Bracken County
Breathitt County
Breckinridge County
Bullitt County
Burgin
Butler County
Caldwell County
Calloway County
Campbell County
Campbellsville
Carlisle County
Carroll County
Carter County
Casey County
Caverna
Christian County
Clark County
Clay County
Clinton County
Cloverport
Corbin
Covington
Crittenden County
Cumberland County
Danville
Daviess County
Dawson Springs
Dayton
East Bernstadt
Edmonson County
Elliott County
Elizabethtown
Eminence
Erlanger-Elsmere
Estill County
Fairview
Fayette County
Fleming County
Floyd County
Fort Thomas
Frankfort
Franklin County
Fulton
Fulton County
Gallatin County
Garrard County
Glasgow
Grant County
Graves County
Grayson County
Green County
Greenup County
Hancock County
Hardin County
Harlan
Harlan County
Harrison County
Hart County
Hazard
Henderson County
Henry County
Hickman County
Hopkins County
Jackson
Jackson County
Jefferson County
Jenkins
Jessamine County
Johnson County
Kenton County
Knott County
Knox County
LaRue County
Laurel County
Lawrence County
Lee County
Leslie County
Letcher County
Lewis County
Lincoln County
Livingston County
Logan County
Ludlow
Lyon County
Madison County
Magoffin County
Marion County
Marshall County
Martin County
Mason County
Mayfield
McCracken County
McCreary County
McLean County
Meade County
Menifee County
Mercer County
Metcalfe County
Middlesboro
Monroe County
Montgomery County
Morgan County
Muhlenberg County
Murray
Nelson County
Newport
Nicholas County
Ohio County
Oldham County
Owen County
Owensboro
Owsley County
Paducah
Paintsville
Paris
Pendleton County
Perry County
Pike County
Pikeville
Pineville
Powell County
Pulaski County
Raceland
Robertson County
Rockcastle County
Rowan County
Russell
Russell County
Russellville
Science Hill
Scott County
Shelby County
Simpson County
Somerset
Southgate
Spencer County
Taylor County
Todd County
Trigg County
Trimble County
Union County
Walton-Verona
Warren County
Washington County
Wayne County
Webster County
Whitley County
Williamsburg
Williamstown
Wolfe County
Woodford County

TRS Schedule of Participating Higher Education and Agency Employers

Central Kentucky Special Education Cooperative
Department of Corrections
Eastern Kentucky University
Education and Workforce Development Cabinet
Green River Regional Education Cooperative
Kentucky Academic Association
Kentucky Community & Technical College System
Kentucky Education Association
Kentucky Educational Development Cooperative
Kentucky High School Athletic Association
Kentucky School Boards Association
Kentucky State University
Kentucky Valley Educational Cooperative
Morehead State University
Murray State University
Northern Kentucky Cooperative for Educational Services
Ohio Valley Educational Cooperative
Southeast South-Central Educational Cooperative
Teachers' Retirement System of the State of Kentucky
West Kentucky Education Cooperative
Western Kentucky University

Distribution of Retirement and Health Insurance Payments Statewide
For the Year Ended June 30, 2023

County	Payments	Recipients	County	Payments	Recipients
Adair	$ 10,745,555	256	Laurel	$ 33,164,887	798
Allen	9,290,239	214	Lawrence	6,966,979	181
Anderson	10,221,530	275	Lee	3,885,672	96
Ballard	5,495,259	139	Leslie	7,441,263	169
Barren	23,502,804	553	Letcher	13,887,176	360
Bath	6,488,699	177	Lewis	7,867,710	195
Bell	15,399,074	374	Lincoln	14,237,331	338
Boone	54,547,483	1,200	Livingston	4,263,187	102
Bourbon	9,352,690	230	Logan	13,566,701	321
Boyd	24,265,769	578	Lyon	4,941,539	116
Boyle	23,014,847	544	Madison	69,296,016	1,652
Bracken	4,888,265	118	Magoffin	9,497,132	222
Breathitt	10,360,650	259	Marion	9,653,303	234
Breckinridge	9,627,152	235	Marshall	18,035,014	425
Bullitt	25,639,254	558	Martin	6,001,809	152
Butler	5,127,709	119	Mason	10,140,262	257
Caldwell	8,272,562	204	McCracken	30,672,871	758
Calloway	32,558,712	791	McCreary	8,895,074	221
Campbell	37,280,013	824	McLean	5,149,177	125
Carlisle	2,236,817	62	Meade	10,059,337	222
Carroll	4,720,852	105	Menifee	2,964,984	83
Carter	17,126,747	432	Mercer	12,450,968	321
Casey	7,926,498	191	Metcalfe	4,496,239	110
Christian	23,739,497	595	Monroe	7,533,728	175
Clark	18,065,376	432	Montgomery	16,004,380	394
Clay	14,428,360	339	Morgan	7,851,475	193
Clinton	7,049,999	179	Muhlenberg	17,410,012	392
Crittenden	2,487,443	67	Nelson	22,367,043	530
Cumberland	3,970,732	91	Nicholas	2,757,470	72
Daviess	56,170,607	1,349	Ohio	10,084,898	256
Edmonson	5,109,190	128	Oldham	28,581,157	619
Elliott	2,615,441	69	Owen	4,915,529	121
Estill	7,895,145	188	Owsley	5,089,601	128
Fayette	153,055,067	3,609	Pendleton	6,724,290	155
Fleming	8,278,090	208	Perry	19,371,865	447
Floyd	23,643,925	585	Pike	34,210,012	832
Franklin	33,290,144	953	Powell	6,678,404	152
Fulton	3,186,873	83	Pulaski	36,536,714	896
Gallatin	2,113,347	53	Robertson	1,166,112	30
Garrard	10,810,009	254	Rockcastle	9,494,366	223
Grant	9,255,384	212	Rowan	24,922,773	599
Graves	18,798,778	435	Russell	11,554,878	271
Grayson	13,813,948	330	Scott	26,552,638	628
Green	6,686,469	163	Shelby	25,688,670	577
Greenup	18,366,796	427	Simpson	7,264,844	177
Hancock	3,249,475	76	Spencer	8,235,528	178
Hardin	50,181,655	1148	Taylor	15,653,569	384
Harlan	17,346,197	436	Todd	4,421,704	114
Harrison	9,326,816	232	Trigg	8,476,729	209
Hart	8,009,805	182	Trimble	3,012,659	68
Henderson	21,756,413	529	Union	4,969,179	136
Henry	8,960,101	218	Warren	86,677,540	2,072
Hickman	1,538,846	36	Washington	6,245,143	147
Hopkins	21,795,852	516	Wayne	11,451,936	277
Jackson	7,586,872	195	Webster	5,885,162	148
Jefferson	371,293,843	7,685	Whitley	33,024,812	807
Jessamine	22,943,578	552	Wolfe	5,488,991	143
Johnson	17,040,008	381	Woodford	17,914,305	420
Kenton	49,550,314	1,155			
Knott	10,774,031	261	**Total in Kentucky**	**$ 2,296,649,269**	**53,749**
Knox	13,751,258	343			
LaRue	8,871,661	189			

Distribution of Retirement and Health Insurance Payments Worldwide as of June 30, 2023

Number of Recipients in United States Outside Kentucky

214	Alabama	6	Montana
5	Alaska	10	Nebraska
97	Arizona	27	Nevada
41	Arkansas	6	New Hampshire
102	California	14	New Jersey
88	Colorado	22	New Mexico
13	Connecticut	50	New York
15	Delaware	360	North Carolina
6	District of Columbia	1	North Dakota
1,555	Florida	740	Ohio
319	Georgia	32	Oklahoma
11	Hawaii	36	Oregon
10	Idaho	81	Pennsylvania
124	Illinois	3	Rhode Island
945	Indiana	304	South Carolina
26	Iowa	11	South Dakota
36	Kansas	1,167	Tennessee
47	Louisiana	259	Texas
18	Maine	29	Utah
50	Maryland	3	Vermont
33	Massachusetts	196	Virginia
75	Michigan	40	Washington
27	Minnesota	106	West Virginia
69	Mississippi	45	Wisconsin
100	Missouri	11	Wyoming

Number of Recipients Outside United States

4	Military APO
2	Australia
1	Barbados
5	Canada
1	Czech Republic
1	Japan
1	Poland
3	Puerto Rico
3	Spain
1	Sweden

	Number of Recipients	Amount of Payments
Inside Kentucky	53,749	$ 2,296,649,269
Outside Kentucky	7,607	248,282,065
Total	61,356	$ 2,544,931,334

Growth in Annuitants as of June 30, 2023

Fiscal Year	Service Retirees	Disability Retirees	Beneficiaries of Retired Members	Beneficiaries of Deceased Members Eligible to Retire	Survivors	Disabled Adult Child
2023	52,086	2,788	3,452	622	390	364
2022	51,085	2,801	3,311	627	395	349
2021	50,267	2,840	3,175	634	359	352
2020	49,526	2,859	3,019	648	353	349
2019	48,727	2,842	2,886	644	344	343
2018	47,606	2,831	2,757	648	353	339
2017	46,356	2,806	2,675	655	349	333
2016	45,096	2,762	2,544	652	370	327
2015	43,634	2,691	2,442	653	349	328
2014	42,265	2,641	2,304	596	429	316

Schedule of Annuitants by Type of Benefit as of June 30, 2023

Monthly Benefit ($)	Number of Annuitants	Type of Benefit* 1	2	3	4	5	6
1 - 500	4,574	3,587	10	205	19	389	364
501 - 1,000	3,054	2,595	122	272	65	0	0
1,001 - 1,500	2,857	2,069	253	449	85	1	0
1,501 - 2,000	3,231	2,267	362	528	74	0	0
2,001 - 2,500	3,847	2,968	419	383	77	0	0
2,501 - 3,000	5,848	4,719	622	409	98	0	0
3,001 - 3,500	8,774	7,815	518	371	70	0	0
3,501 - 4,000	8,293	7,730	254	268	41	0	0
4,001 - 4,500	6,030	5,666	121	214	29	0	0
4,501 - 5,000	4,253	4,026	64	137	26	0	0
5,001 & over	8,941	8,644	43	216	38	0	0
Total	59,702	52,086	2,788	3,452	622	390	364

Type of Benefit
1 — Normal Retirement for Age & Service
2 — Disability Retirement
3 — Beneficiaries of Retired Members
4 — Beneficiaries of Deceased Member Eligible to Retire
5 — Survivor Payments
6 — Disabled Adult Child

Schedule of Annuitants by Option Selected as of June 30, 2023

Monthly Benefit ($)	Option Selected* 1	2	3	4	5	6	7	8
1 - 500	2,378	578	304	45	5	428	81	755
501 - 1,000	1,729	459	265	68	11	383	135	4
1,001 - 1,500	1,413	351	278	149	10	363	285	8
1,501 - 2,000	1,561	380	290	132	10	457	383	18
2,001 - 2,500	1,936	460	353	136	2	581	328	51
2,501 - 3,000	2,830	598	526	188	5	1,022	531	148
3,001 - 3,500	4,501	1,048	670	201	4	1,513	782	55
3,501 - 4,000	4,402	1,076	567	201	8	1,231	764	44
4,001 - 4,500	3,109	730	453	159	4	956	600	19
4,501 - 5,000	2,190	479	360	119	6	629	461	9
5,001 & OVER	4,636	986	798	327	21	1,247	922	4
Total	30,685	7,145	4,864	1,725	86	8,810	5,272	1,115

Option selected:
1 — Straight-life annuity with refundable balance
2 — Period certain benefit and life thereafter
3 — Joint-survivor annuity
4 — Joint-survivor annuity, one-half benefit to beneficiary
5 — Other payment - special option
6 — Joint-survivor annuity with pop-up option
7 — Joint-survivor annuity, one-half benefit to beneficiary with pop-up option
8 — Disability, survivors and disabled adult children - set by statute

Retirement Annuity Trust
Average Initial Benefit Payments for the Past 10 Years
By Years of Service Credit

Retirement Effective Dates	0-4.99	5-9.99	10-14.99	15-19.99	20-24.99	25-29.99	≥ 30	Total
Year ending June 30, 2014								
Average monthly benefit	$ 192	$ 484	$ 1,270	$ 2,068	$ 2,797	$ 3,847	$ 5,362	**$ 3,126**
Final average salary	$ 4,148	$ 3,677	$ 4,751	$ 5,364	$ 5,600	$ 5,902	$ 6,860	**$ 5,589**
Number of retired members	56	211	161	145	258	678	344	**1,853**
Year ending June 30, 2015								
Average monthly benefit	$ 157	$ 472	$ 1,282	$ 2,038	$ 2,890	$ 3,898	$ 5,124	**$ 3,173**
Final average salary	$ 3,331	$ 3,577	$ 4,892	$ 5,266	$ 5,709	$ 5,948	$ 6,552	**$ 5,577**
Number of retired members	60	231	183	206	314	806	456	**2,256**
Year ending June 30, 2016								
Average monthly benefit	$ 177	$ 519	$ 1,316	$ 1,998	$ 2,934	$ 3,935	$ 5,389	**$ 3,195**
Final average salary	$ 3,642	$ 3,791	$ 4,847	$ 5,188	$ 5,777	$ 6,019	$ 6,858	**$ 5,664**
Number of retired members	61	254	194	217	356	807	448	**2,337**
Year ending June 30, 2017								
Average monthly benefit	$ 176	$ 473	$ 1,235	$ 2,039	$ 2,902	$ 3,935	$ 5,179	**$ 3,040**
Final average salary	$ 3,691	$ 3,506	$ 4,588	$ 5,208	$ 5,722	$ 6,024	$ 6,666	**$ 5,514**
Number of retired members	53	259	162	212	346	766	320	**2,118**
Year ending June 30, 2018								
Average monthly benefit	$ 152	$ 486	$ 1,254	$ 2,098	$ 2,990	$ 4,002	$ 5,412	**$ 3,175**
Final average salary	$ 3,760	$ 3,668	$ 4,702	$ 5,397	$ 5,883	$ 6,068	$ 6,980	**$ 5,677**
Number of retired members	64	255	147	193	356	844	330	**2,189**
Year ending June 30, 2019								
Average monthly benefit	$ 130	$ 460	$ 1,190	$ 2,073	$ 2,847	$ 4,027	$ 5,393	**$ 3,078**
Average final average salary	$ 3,041	$ 3,595	$ 4,523	$ 5,260	$ 5,738	$ 6,185	$ 7,049	**$ 5,607**
Number of retired members	79	239	153	197	330	779	295	**2,072**
Year ending June 30, 2020								
Average monthly benefit	$ 134	$ 433	$ 1,187	$ 2,060	$ 3,002	$ 4,157	$ 5,343	**$ 3,115**
Final average salary	$ 3,260	$ 3,276	$ 4,447	$ 5,369	$ 5,972	$ 6,379	$ 7,042	**$ 5,672**
Number of retired members	84	214	129	179	283	718	245	**1,852**
Year ending June 30, 2021								
Average monthly benefit	$ 105	$ 465	$ 1,313	$ 2,081	$ 2,943	$ 4,133	$ 5,445	**$ 3,143**
Final average salary	$ 2,900	$ 3,414	$ 4,821	$ 5,208	$ 5,836	$ 6,288	$ 7,120	**$ 5,649**
Number of retired members	83	219	131	179	284	760	249	**1,905**
Year ending June 30, 2022								
Average monthly benefit	$ 104	$ 462	$ 1,124	$ 2,102	$ 2,911	$ 4,147	$ 5,355	**$ 3,205**
Final average salary	$ 2,903	$ 3,407	$ 4,337	$ 5,407	$ 5,696	$ 6,314	$ 7,082	**$ 5,688**
Number of retired members	95	190	122	206	336	816	292	**2,057**
Year ending June 30, 2023								
Average monthly benefit	$ 129	$ 472	$ 1,204	$ 2,133	$ 3,035	$ 4,246	$ 5,445	**$ 3,350**
Final average salary	$ 3,057	$ 3,697	$ 4,723	$ 5,412	$ 5,892	$ 6,406	$ 7,005	**$ 5,840**
Number of retired members	76	216	133	191	323	916	318	**2,173**
Ten Years Ended June 30, 2023								
Average monthly benefit	**$ 141**	**$ 474**	**$ 1,243**	**$ 2,068**	**$ 2,927**	**$ 4,037**	**$ 5,335**	**$ 3,162**
Final average salary	**$ 3,310**	**$ 3,567**	**$ 4,679**	**$ 5,305**	**$ 5,784**	**$ 6,158**	**$ 6,894**	**$ 5,649**
Number of retired members	**711**	**2,288**	**1,515**	**1,925**	**3,186**	**7,890**	**3,297**	**20,812**

The annuity for most TRS retirees is in lieu of Social Security. Final average salary is a monthly equivalent of the average final average salary for the respective group.

Health Insurance Trust
Average Insurance Premium Supplements for the Last 10 Years
By Years of Service Credit

Retirement Effective Dates	0-9.99	10-14.99	15-19.99	≥ 20	Total
Year ending June 30, 2014					
Average monthly supplement	$ 52	$ 190	$ 335	$ 484	
Number of retired members	15	82	100	1,227	1,424
Year ending June 30, 2015					
Average monthly supplement	$ 78	$ 204	$ 369	$ 492	
Number of retired members	24	101	176	1,411	1,712
Year ending June 30, 2016					
Average monthly supplement	$ 87	$ 182	$ 323	$ 484	
Number of retired members	68	98	178	1,407	1,751
Year ending June 30, 2017					
Average monthly supplement	$ 75	$ 192	$ 333	$ 477	
Number of retired members	62	71	194	1,291	1,618
Year ending June 30, 2018					
Average monthly supplement	$ 85	$ 122	$ 299	$ 464	
Number of retired members	59	71	169	1,375	1,674
Year ending June 30, 2019					
Average monthly supplement	$ 75	$ 181	$ 305	$ 483	
Number of retired members	48	72	158	1,239	1,517
Year ending June 30, 2020					
Average monthly supplement	$ 64	$ 201	$ 295	$ 473	
Number of retired members	57	56	141	1,096	1,350
Year ending June 30, 2021					
Average monthly supplement	$ 80	$ 199	$ 300	$ 484	
Number of retired members	66	54	137	1,104	1,361
Year ending June 30, 2022					
Average monthly supplement	$ 74	$ 203	$ 284	$ 487	
Number of retired members	68	42	128	1,207	1,445
Year ending June 30, 2023					
Average monthly supplement	$ 78	$ 238	$ 297	$ 544	
Number of retired members	48	44	108	1,286	1,486

Sick Leave Payments Summary
for Members Completing Service By June 30, 2023

Total members retiring (including July 1, 2023, retirees.)	2,149
Total members receiving sick leave payments	1,521
Total amount of sick leave payments included in final average salary	$ 21,196,671
Average sick leave payment per retiree	$ 13,936
Total increase in final three or five year average salary base	$ 5,607,732
Average increase in final average salary	$ 3,687
Total service credit of 1,521 retirees	39,524
Average service credit of 1,521 retirees	25.99

Anticipated Payout of Additional Annuity

Actuarial cost of sick leave as salary credit	$ 47,089,327

Funding of Sick Leave Payment Used in Annuity

Member contributions ($21,196,671 x 9.105%)	$ 1,929,957
Employer contributions ($21,196,671 x 12.305%)	2,608,250
Total Contributions	$ 4,538,207
Anticipated additional payout	$ 47,089,327
Less: total member and state contributions	4,538,207
Total	$ 42,551,120