Teachers' Retirement System of the State of Kentucky

The 82nd Annual Comprehensive Financial Report

A Component Unit of the Commonwealth of Kentucky
Fiscal Years Ended June 30, 2022 and 2021

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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Introductory Section

Chair's Letter

Teachers' Retirement System of the State of Kentucky

TRS KENTUCKY

December 19, 2022

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, 2022 and 2021, the 82nd 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 2022 fiscal year with 74,785 active members, 58,438 retirees and annual annuity and health insurance benefits of $2.4 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 19, 2022

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

Dear Governor Beshear:

It is my pleasure to submit the 82nd 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, 2022 and 2021. 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 fifth consecutive year of full pension funding for TRS of the actuarially determined employer contribution (ADEC) – with a sixth year already approved for next year. The importance of the consistent full funding of the retirement plan for Kentucky's teachers cannot be overstated — as evidenced by the year-over-year improvement in the funded ratios, as determined by the independent actuary, of the pension and health insurance funds. The Retirement Annuity Trust funded ratio reached 58.8% from 57.2% a year earlier, and the fifth gain in the last six years. The Health Insurance Trust reached 63.7% from 60% a year before and continuing the gains seen every year since the 2010 Shared Responsibility law (2010 RS HB 540) with the exception of last year when an experience study was implemented. Both funds, in the opinion of the actuary, are on track to be funded fully.

As of June 30, 2022, TRS's total funds were $25.3 billion, an improvement from $15.2 billion a decade ago. The year-over-year fiduciary net position declined with the downturn in public markets.

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 the 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 $2.4 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, 2022 and 2021. 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 $2.4 billion paid in total benefits, which is a record, the average annuity is $40,051 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 work on several major initiatives concerning funding, investments, benefit administration and cost containment. Before discussing those efforts individually, generally, TRS operations resumed pre-pandemic normalcy during the year while maintaining efficiencies in operations achieved during the COVID-19 global pandemic.

Operations

In June, TRS resumed offering in-person counseling to members by appointment. With the return of in-person counseling, TRS continued to offer members and retirees the convenience of video and phone counseling, which proved extremely popular during the pandemic and continues to be a popular alternative to the drive to TRS's Frankfort offices. TRS operations have occurred seamlessly and safely thanks in large part to the efforts of the information technology team. Public meetings are conducted in person and by live video teleconferencing, which is broadcast on the TRS Kentucky YouTube channel.

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 8,500 participants, most of whom are enrolled in the Medicare Eligible Health Plan (MEHP).

Personalized medicine helps retirees avoid taking ineffective medications that even could be fatal, while potentially saving the retiree and TRS on medical costs. To do this, personalized medicine uses DNA testing to help a patient's doctor make more effective treatment decisions for better health outcomes. 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 cost for members like TRS while providing personal service to customers.

TRS is proud to report the continued success of and scholarly notice of the Personalized Medicine program. Initial results included:

- DNA testing findings led to a recommended medication change for 28% of participants.
- A 14% reduction in medical spending for those involved.
- Medical costs for a control group not in the program increased 3.2%.
- 87% of medication change recommendations being accepted by the prescriber, a 22% reduction in hospitalizations and a 27% reduction in slip-and-fall accidents.

Requests to chronicle this successful program continue at numerous conferences. In March, a peer-reviewed article in the Journal of Personalized Medicine found:

- A savings of $218 per member per month over what otherwise would have been spent, which equates to $7,000 per participating member over the first 32 months. This is a return on investment of 1,422%.
- Among participants, inpatient visits decreased by 14.9%, Emergency Department visits decreased by 6.8% and outpatient visits decreased by 1.9%.

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 just over a decade, the health insurance fund has achieved a 63.7% 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.

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 90% in the final months of the fiscal year, up from 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

While year-over-year investment returns declined as a result of public market downturns, 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 2022, TRS investment returns resulted in net assets of $22.9 billion, compared to the average plan's $18 billion. This outperformance has generated $4.9 billion to the benefit of Kentucky's teachers and all taxpayers.

For the most recent year, the retirement annuity declined 10.91% while the health trust declined 9.43%, both gross of fees.

As of June 30, TRS achieved top fifth performance for the decade with an 8.83% return in the annuity trust (as ranked by Aon covering public plans with assets over $1 billion). The Health Insurance Trust saw a 7.53% gain as well 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, 2022, was characterized by volatile stock and bond markets as monetary conditions tightened. The Federal Reserve increased short-term interest rates aggressively and began to reduce its balance sheet by selling assets. The higher rates and tighter monetary conditions pressured most asset classes over the second half of the fiscal year.

Just as was mentioned a year ago when TRS saw record investment returns, a one-year period is not determinative for a long-term investor like TRS. However, the performance for longer periods follows TRS's historical record of top-tier performance. Moreover, during the last 30 years, TRS retirement annuity investment returns of 7.75% has 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 five and 10 years for both trusts. 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.

With the market declines, TRS's investment portfolio experienced a decrease in fair value during the fiscal year to $24.55 billion from $28.06 billion. The decrease was the result of market conditions and was mitigated by the additional funding provided in the state budget for TRS. At the same time, employer and employee contributions added to the portfolio.

The gross investment loss for all funds was $2.89 billion. The net depreciation in fair value of investments was $3.34 billion compared to an appreciation of $6.28 billion the prior year.

Legislation

During the 2022 regular session, TRS monitored a number of pieces of legislation that directly and indirectly impacted TRS, including Senate Resolution 245 confirming the gubernatorial reappointment of a trustee. Most importantly, the budget approved exceeds full funding of actuarially required contributions for TRS.

The Executive Branch Budget (2022 RS House Bill 1), which is for the 2022-24 biennium, provides TRS full retirement annuity funding. This consists of about $1.5 billion in total for the biennium, including the full $1.3 billion requested in additional funding to address the unfunded retirement annuity liability. The budget represents the fifth and sixth years of full funding for the retirement annuity, with two years of nearly full funding immediately preceding the current streak. This era of additional required funding being provided reversed a roughly decade-long period where the funding was not provided.

Beyond the required contribution, the budget also provided $479 million in fiscal 2022 to pay debt from previously awarded benefits for sick leave and ad hoc cost-of-living adjustments (COLAs).

Another matter of legislative attention was TRS's retired return-to-work programs amid a teacher shortage exacerbated by the pandemic.

As background, return-to-work programs in recent years have existed to help schools meet staffing needs while remaining actuarially sound and in compliance with federal tax law.

Regarding the most recent retired return-to-work legislation, TRS communicated with employers and retirees about what changed, and what didn't, as a result of the 2021 extraordinary session and two bills on the topic from the 2022 regular session, including HB 1.

While the first two bills dealt only with already retired teachers, HB 1's temporary changes include active teachers who retire before June 30, 2024 – thus possibly providing an incentive for members to retire and return to work in the same job for the same employer after one month and before the normal one-year gap. Such an incentive would have an accompanying actuarial impact on liabilities and required contributions. Any actuarial cost from this change will be included beginning in the fiscal 2023 valuation based on retirement and reemployment patterns seen.

Benefits Administration

The year included the implementation of the TRS 4, which was created by House Bill 258 (2021 RS). This hybrid retirement plan is for members beginning 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.

In addition to going through every function of Pathway to make changes to existing programming or create new programming where needed for TRS 4, other implementation efforts included the creation of plan documents, informational fliers and forms to provide for these members from Day 1. This included developing and filing an administrative regulation to provide disability benefits as directed by HB 258.

As mentioned in reference to legislation, TRS made considerable efforts to communicate with employers and retirees about temporary changes in retired return-to-work programs.

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 administration 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 of 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, financing previously awarded benefits, the biennial budget request; and annual valuations and five-year experience study from the actuary.

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, 2022 and 2021.

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 fiscal years ended June 30, 2021 and 2020. 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 34 consecutive years (fiscal 1988-2021). 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 2022. 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 refinement of a system for the monthly reconciliation of reciprocal health insurance costs between TRS and other state plans. The reconciliation system is part of comprehensive efforts by TRS to ensure that reciprocal benefits are administered according to law.

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 4,600 followers and posts that often reach more than 1,000 users — led this past year by more than 41,200 users who saw a post on record investment returns from the prior fiscal year and more than 37,400 that saw a post to dispel misinformation about TRS investment holdings. Facebook posts during the fiscal year were viewed nearly 167,500 times with 2,850 likes.

TRS Kentucky YouTube traffic for videos, on a variety of member benefits and retiree insurance issues, reached nearly 8,150 views, with more than a third of those views split between how-to explanations of the retirement process and registering for Pathway.

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 400,000 emails were delivered representing a rate of 94.5% and with almost 40% opened. Of the 400,000, only 150 resulted in someone unsubscribing and only 29 were marked spam.

Finally, the 20 TRS counselors met with members in response to 2,826 meeting requests, and 16,806 retirement estimates were provided.

General Administration
TRS continued for the fourth 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 13% to 1,601 from 1,411 last 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 in early 2022 for the two 2022 trustee elections.

Funding Progress
Retirement Annuity Trust
Teachers saw the continued benefits of increased funding by the state. The current fiscal year marks the start 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.

As previously mentioned, the Executive Branch Budget (2022 RS HB 1) for the 2022-24 biennium provides TRS full retirement annuity funding. This consists of about $1.5 billion in total for the biennium and includes the full $1.3 billion requested in additional required funding to address the unfunded retirement annuity liability.

Also as previously noted, the budget also provided $479 million in fiscal 2022 to pay debt from previously awarded benefits for sick leave and ad hoc COLAs.

Financial and actuarial reports show, thanks to funding and investment returns, that the fiduciary net position of all TRS funds has improved $15.2 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 $805 million (fiscal 2025).

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 $24.09 billion and actuarial liabilities of $40.97 billion. The funded ratio of actuarial assets to liabilities is now 58.8% from 57.2% a year earlier, and the fifth gain in the last six years.

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 2022 valuation, the actuary recommends a cumulative increase in employer contributions of 18.92% of pay for fiscal 2025 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 12 years, the Health Insurance Trust has reached 63.7% 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, 2022, indicated that the trust has an unfunded liability of $1.37 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.

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 pension 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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Chair, Retired Teacher Trustee
Bowling Green

John Boardman
Vice Chair, Appointed Trustee
Lexington

William Alverson
Lay Trustee
Paris

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Executive Secretary

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

Eric Wampler, JD
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Finance & Administration

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Chief Investment Officer

Actuary
Cavanaugh Macdonald Consulting
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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 113-116, 118, 119, 122, 128-130 and 132 for a list of investment fees and external asset managers.

Organizational Chart

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Brenda McGown, Chair
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Allison Ball
Frank Collecchia
Jason E. Glass, Ed.D.
Hollis Gritton
Ben Littlepage, Ed.D.
Laura Schneider
Josh Underwood
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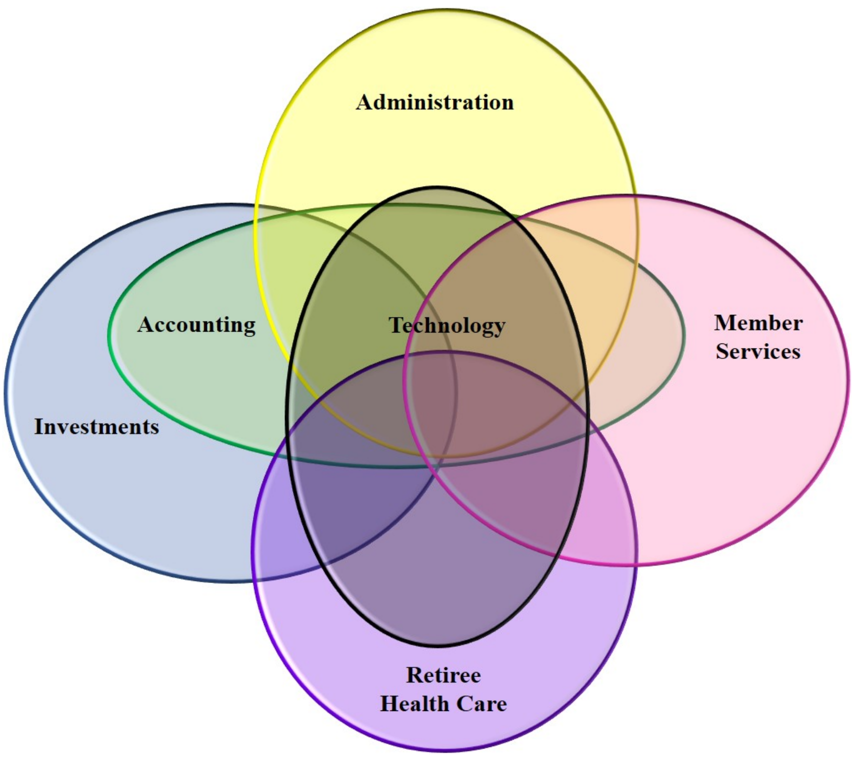
Internal Auditor



Administration

Executive Secretary
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

Investments
Tom Siderewicz, CFA

Accounting
Mark E. Whelan, CPA

Retiree Health Care
Jane C. Gilbert, CPA

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, 2021

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 34 consecutive years (fiscal years ended 1988-2021).

PPCC Public Pension Standards Award

PPCC

Public Pension Coordinating Council

Public Pension Standards Award For Funding and Administration 2022

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 2022 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

Independent Auditor's Report

CPAs / ADVISORS

blue

Blue & Co., LLC / 250 West Main Street, Suite 2900 / Lexington, KY 40507
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, 2022 and 2021, 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, 2022 and 2021, 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 audit. 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 23 through 26, and the defined benefit pension plan and other postemployment benefit plan supplemental schedules on pages 77 through 89, 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 89 through 91) 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 14, 2022, 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 14, 2022

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

This discussion and analysis of the financial performance of Teachers' Retirement System of the State of Kentucky (TRS or system) provides an overview of the Retirement Annuity Trust, the Health Insurance Trust and the Life Insurance Trust for the fiscal years ended June 30, 2022, and 2021. It should be read in conjunction with the respective financial statements, which begin on page 27. 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 27-30). The Notes to the Financial Statements are an essential part of the basic financial statements. They provide important background and detailed information about TRS, the plan and the basic financial statements themselves.

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

Teachers' Retirement System as a Whole

In the fiscal year ended June 30, 2022, the system's combined fiduciary net position decreased by $3 billion — from $28.3 billion in 2021 to $25.3 billion in 2022. In 2020, the combined net position totaled $22.4 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		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Assets									
Cash and investments	$ 22,846.5	$ 25,879.0	$ 20,680.9	$2,229.8	$ 2,288.2	$1,587.6	$ 88.3	$ 107.2	$ 87.0
Receivables	122.8	157.8	113.8	57.8	54.7	61.1	0.3	0.4	0.5
Capital assets	9.3	10.3	12.1						
Total assets	22,978.6	26,047.1	20,806.8	2,287.6	2,342.9	1,648.7	88.6	107.6	87.5
Liabilities	(78.6)	(111.3)	(89.8)	(18.5)	(42.4)	(32.0)	(0.2)	(0.1)	(0.1)
Net position	$ 22,900.0	$ 25,935.8	$ 20,717.0	$2,269.1	$ 2,300.5	$1,616.7	$ 88.4	$ 107.4	$ 87.4

Trust Totals* **

(In millions)

	2022	2021	2020
Assets			
Cash and investments	$ 25,164.6	$ 28,274.2	$ 22,355.5
Receivables	181.1	212.9	175.4
Capital Assets	9.3	10.3	12.1
Total assets	25,354.8	28,497.5	22,543.0
Liabilities	(97.3)	(153.8)	(122.0)
Net position	$ 25,257.5	$ 28,343.7	$ 22,421.0

*Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund. Other Funds had a combined fiduciary net position of $1.1 million for 2022, $1.4 million for 2021 and $1.1 million for 2020.
**Amounts above may not agree to the financial statements due to rounding.

The fiduciary net position of the Retirement Annuity Trust decreased by 11.7% ($22.9 billion compared to $25.94 billion in 2021). The fiduciary net position in 2020 was $20.72 billion. The decrease was primarily due to unfavorable market conditions. Net investment income was approximately a negative $2.73 billion in 2022 versus a positive $6.02 billion in 2021. This compares to a positive $1.09 billion in 2020.

The fiduciary net position of the Health Insurance Trust remained relatively unchanged ($2.27 billion compared to $2.3 billion in 2021) 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 2020 when fiduciary net position was $1.62 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		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Additions									
Member contributions	$ 357.0	$ 327.8	$ 324.7	$ 145.7	$ 128.1	$ 133.6	$	$	$
Employer contributions	1,679.6	1,147.0	1,134.3	151.7	184.9	184.6	2.8	2.1	1.8
Net investment increase (decrease)	(2,727.8)	6,017.2	1,094.0	(219.5)	503.2	32.5	(15.6)	24.1	5.2
Total additions	(691.2)	7,492.0	2,553.0	77.9	816.2	350.7	(12.8)	26.2	7.0
Deductions									
Benefit payments	2,305.9	2,235.2	2,167.2				6.2	6.1	5.4
Refunds	26.7	25.4	28.5						
Administrative expense	12.0	12.6	12.2	2.1	1.7	2.0			
Insurance expenses				107.2	130.7	146.0			
Total deductions	2,344.6	2,273.2	2,207.9	109.3	132.4	148.0	6.2	6.1	5.4
Net increase (decrease)	$(3,035.8)	$5,218.8	$ 345.1	$ (31.4)	$ 683.8	$ 202.7	$ (19.0)	$ 20.1	$ 1.6

Trust Totals* **

(In millions)

	2022	2021	2020
Additions			
Member contributions	$ 502.7	$ 456.0	$ 458.3
Employer contributions	1,834.1	1,334.0	1,320.7
Net investment increase (decrease)	(2,962.9)	6,544.5	1,131.7
Total additions	(626.1)	8,334.5	2,910.7
Deductions			
Benefit payments	2,312.1	2,241.4	2,172.6
Refunds	26.7	25.4	28.5
Administrative expense	14.1	14.4	14.2
Insurance expenses	107.2	130.7	146.0
Total deductions	2,460.1	2,411.8	2,361.3
Net increase (decrease)	$(3,086.2)	$ 5,922.7	$ 549.4

*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 2022, employer contributions totaled $1.68 billion, a net increase of $532.6 million from the prior fiscal year. The increase was due to employer contributions paid by the state being more than the prior year. In 2021, employer contributions increased $12.7 million compared to 2020 primarily due to amounts received from the state.

The Retirement Annuity Trust experienced net investment loss of $2.73 billion in 2022 and net investment income of $6.02 billion for 2021. For 2020, net investment income totaled $1.09 billion. The decrease in net investment income are due to unfavorable market conditions. Increases in deductions of $71.4 million in 2022 and $65.3 million in 2021 can be attributed to increases in the number of benefit recipients. Members and beneficiaries on the retiree payroll as of June 30, 2022, remained level compared to a prior year increase of 1,852.

Other Postemployment Benefit (OPEB) Activities

During 2022, the Health Insurance Trust member contributions increased $17.6 million from 2021, after decreasing $5.5 million from 2020, due to an increase in member's salaries paid from federal assistance received by the local school district employers. Also, during 2022, employer contributions decreased $33.2 million from 2021 and remained level from 2020 due to less funding received from the state.

In 2022, the Health Insurance Trust experienced net investment loss of $219.5 million compared to the previous year gain of $503.2 million net investment income. For 2020, net investment income totaled $32.5 million. The decrease in net investment income is due to unfavorable market conditions.

The Life Insurance Trust experienced net investment loss of $15.6 million in 2022, net investment income of $24.1 million in 2021 and $5.2 million in 2020. Life insurance benefits paid for 2022, 2021 and 2020 were $6.2 million, $6.1 million and $5.4 million respectively.

Funding

For the 2020-2022 biennium, the state budgeted $1.13 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 56.4% as of June 30, 2022, compared to 2021's 65.6%. The separately issued actuary's valuation shows progress of the trust's funded status over the amortization period set by the board funding policy. The additional funding provided in the budget resulted in 100% of the actuarially determined employer contribution (ADEC) being made for 2022 and 2021. 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. Although the Health Insurance Trust continues to have a large net OPEB liability, current obligations are being met by current funding. The Shared Responsibility solution enacted in 2010 continues to prefund retiree health benefits. The Schedule of Employer Contributions presented in the Required Supplementary Information provides the ADEC of the health and life insurance trusts.

Historical Trends

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

TRS's independent consulting actuaries are members of the American Academy of Actuaries and experienced in performing valuations for public retirement systems. As mandated by state law, the valuations of the retirement annuity and health insurance trusts are prepared in accordance with principles of practice prescribed by the Actuarial Standards Board consistent with accepted actuarial procedures. Actuarial assumptions used in the valuations are internally consistent and reasonable based on the actual experience of the trusts. An actuarial audit was completed in 2015, which confirmed the accuracy of actuarial procedures and the reasonableness of assumptions. A five-year experience study was completed in 2021, which also confirmed the reasonableness of assumptions based upon the actual experience of the trusts. The actuarial assumptions may be reasonably relied upon as reflected in the results.

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

Basic 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
Equities	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 31.

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

Statement of Fiduciary Net Position
As of June 30, 2021

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Assets					
Cash	$ 150,522,508	$ 68,774,604	$ 274,743	$ 253,916	$ 219,825,771
Prepaid expenses	32,939				32,939
Receivables					
Contributions	49,630,590	10,344,680	47,267		60,022,537
Due from other trusts	3,848,215				3,848,215
State of Kentucky			81,540		81,540
Investment income	45,254,996	3,441,069	263,725	2,645	48,962,435
Investment sales receivable	58,963,007	2,949,484	13,985		61,926,476
Other receivables	85,219	37,947,151			38,032,370
Total receivables	157,782,027	54,682,384	406,517	2,645	212,873,573
Investments at fair value					
Short-term investments	1,065,314,674	157,506,899	9,405,976	349,252	1,232,576,801
Fixed income	3,627,641,860	155,171,801	20,043,254	279,516	3,803,136,431
Equities	16,068,066,132	1,274,610,864	68,281,332	482,531	17,411,440,859
Alternative investments	1,758,133,237	170,660,050	1,420,801		1,930,214,088
Real estate	1,405,889,580	111,459,521	5,181,114		1,522,530,215
Additional categories	1,803,453,179	349,991,171	2,549,353		2,155,993,703
Total investments	25,728,498,662	2,219,400,306	106,881,830	1,111,299	28,055,892,097
Capital assets	26,723,964				26,723,964
Accumulated depreciation	(16,468,039)				(16,468,039)
Net capital assets	10,255,925				10,255,925
Total assets	26,047,092,061	2,342,857,294	107,563,090	1,367,860	28,498,880,305
Liabilities					
Accrued expenses and other liabilities	2,674,134	7,472,716	52,157		10,199,007
Due to other trusts		3,775,245	70,478	2,492	3,848,215
State of Kentucky	12,649,201	22,741,764			35,390,965
Investment purchases payable	95,989,520	8,363,153	13,539		104,366,212
Total liabilities	111,312,855	42,352,878	136,174	2,492	153,804,399
Net position restricted for pension and other postemployment benefits	$ 25,935,779,206	$ 2,300,504,416	$ 107,426,916	$ 1,365,368	$ 28,345,075,906

The Combining Statement of 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	$ 1,570,117,663	$ 31,349,388	$ 2,194,049	$	$ 1,603,661,100
Other employers	109,467,006	120,415,757	560,814	2,281	230,445,858
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.

Statement of Changes in Fiduciary Net Position
For the Year Ended June 30, 2021

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
Additions					
Contributions					
State of Kentucky	$ 1,060,257,414	$ 78,216,742	$ 1,852,447	$	$ 1,140,326,603
Other employers	86,720,255	106,670,323	285,928	365,866	194,042,372
Members	327,833,177	128,117,484			455,950,661
Total contributions	1,474,810,846	313,004,549	2,138,375	365,866	1,790,319,636
Investment income (loss)					
Net appreciation (depreciation) in fair value of investments	5,763,623,980	496,454,659	23,335,722	97,882	6,283,512,243
Interest	92,226,068	3,798,719	485,596	9,547	96,519,930
Dividends	208,073,365	9,586,461	583,808	6,489	218,250,123
Rental income, net	21,821,971				21,821,971
Securities lending, gross earnings	2,374,679		54,130	677	2,429,486
Gross investment income (loss)	6,088,120,063	509,839,839	24,459,256	114,595	6,622,533,753
Less: investment expense	(71,312,772)	(6,639,090)	(382,006)		(78,333,868)
Less: securities lending expense	377,020		(2,102)	13	374,931
Net investment income (loss)	6,017,184,311	503,200,749	24,075,148	114,608	6,544,574,816
Total additions	7,491,995,157	816,205,298	26,213,523	480,474	8,334,894,452
Deductions					
Benefits	2,235,240,616		6,120,000	166,555	2,241,527,171
Refunds of contributions	25,373,818				25,373,818
Insurance expenses		130,648,134			130,648,134
Administrative expense	12,601,841	1,728,008	34,498	939	14,365,286
Total deductions	2,273,216,275	132,376,142	6,154,498	167,494	2,411,914,409
Net increase (decrease)	5,218,778,882	683,829,156	20,059,025	312,980	5,922,980,043
Net position restricted for pension and other postemployment benefits					
Beginning of year	20,717,000,324	1,616,675,260	87,367,891	1,052,388	22,422,095,863
End of year	$25,935,779,206	$2,300,504,416	$ 107,426,916	$ 1,365,368	$ 28,345,075,906

The Combining Statement of Changes in Fiduciary Net Position — Other Funds is presented on page 33.
The accompanying notes are an integral part of these financial statements.

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
Equities			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

Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2021

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	$	$ 253,916	$	$ 253,916
Receivables				
Investment income	7		2,638	2,645
Investments at fair value				
Short-term investments	306,484		42,768	349,252
Fixed income			279,516	279,516
Equities			482,531	482,531
Total investments	306,484		804,815	1,111,299
Total assets	306,491	253,916	807,453	1,367,860
Liabilities				
Due to other trusts	50	2,219	223	2,492
Total liabilities	50	2,219	223	2,492
Net position restricted for pension and other postemployment benefits	$ 306,441	$ 251,697	$ 807,230	$ 1,365,368

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
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	19	954	120	1,093
Total deductions	2,956	144,680	18,120	165,756
Net increase (decrease)	(2,392)	(144,497)	(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	$ 304,049	$ 107,200	$ 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, 2021

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Additions				
Contributions				
Other employers	$	$ 365,866	$	$ 365,866
Investment income (loss)				
Net appreciation in fair value of investments			97,882	97,882
Interest	104	427	9,016	9,547
Dividends			6,489	6,489
Securities lending, gross			677	677
Gross investment income (loss)	104	427	114,064	114,595
Less: securities lending expense			13	13
Net investment income (loss)	104	427	114,077	114,608
Total additions	104	366,293	114,077	480,474
Deductions				
Benefits	4,061	144,494	18,000	166,555
Administrative expense	22	817	100	939
Total deductions	4,083	145,311	18,100	167,494
Net increase (decrease)	(3,979)	220,982	95,977	312,980
Net position restricted for pension and other postemployment benefits				
Beginning of year	310,420	30,715	711,253	1,052,388
End of year	$ 306,441	$ 251,697	$ 807,230	$ 1,365,368

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, 2022, 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.

	2022	2021
Active contributing members:		
Vested	49,588	48,817
Non-vested	25,197	20,439
Inactive members, vested	10,690	10,538
Retirees and beneficiaries currently receiving benefits	58,438	57,465
Total members, retirees and beneficiaries	143,913	137,259

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

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

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

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

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

For Members On or After July 1, 2008, and Before Jan. 1, 2022: 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: 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. Members who began participating on or after Jan. 1, 2022, 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 members who entered on or after Jan 1, 2022, 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, 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 Internal Revenue Code sec. 115 (IRC 115) trust cash account totaled $182.3 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.

At June 30, 2021, the retirement annuity cash account totaled $80.1 million, the control cash account totaled $70.1 million and the capital project cash account totaled $274,003 for a total of $150.5 million as carrying value of cash in the retirement trust. The health insurance's IRC 115 trust cash account totaled $54 million, the health insurance 401(h) cash account totaled $14.8 million for a total of $68.8 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled $274,743. The Supplemental Benefit Fund cash account contained $253,916. Therefore, the carrying value of cash was $219.8 million, and the bank balance was $237.2 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2021.

Capital Assets

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

Investments

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

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

Compensated Absences

Expenses for accumulated vacation days and compensatory time earned by TRS's employees are recorded when earned. Upon termination or retirement, employees of TRS are paid for accumulated vacation time limited to 60 days and accumulated compensatory time limited to 240 hours. As of June 30, 2022 and 2021, accrued compensated absences were included in accrued expenses and other liabilities on the statements of fiduciary net position amounting to $2 million and $1.5 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, 2022, other receivables in the retirement trust were $53,073 and $85,219 in 2021.

In the Health Insurance Trust, other receivables consist primarily of Medicare subsidies and formulary rebates accrued, but not received. The June 30, 2022, other receivables in the health trust were $37.3 million and $37.9 million in 2021.

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.

Reclassifications
Certain amounts in the 2021 financial statements have been reclassified to conform to the 2022 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 members who began participating on or after Jan. 1, 2022, 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, 2022 and 2021 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]
2022	$ 40,598,288	$ 22,899,952	$ 17,698,336	56.4	$ 3,876,491	456.6
2021	39,541,567	25,935,779	13,605,788	65.6	3,638,905	373.9

Summary of Actuarial Assumptions
A summary of the actuarial assumptions as of the latest actuarial valuation follows.

Valuation date	June 30, 2021
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	3.37%
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 September 20, 2021. 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%. 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	37.4	4.2
Small cap U.S. equity	2.6	4.7
Developed international equity	16.5	5.3
Emerging markets equity	5.5	5.4
Fixed income	15.0	(0.1)
High yield bonds	2.0	1.7
Other additional categories	5.0	2.2
Real estate	7.0	4.0
Private equity	7.0	6.9
Cash	2.0	(0.3)
Total	100	

Discount Rate

For 2022 and 2021, 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 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

The following table presents TRS's net pension liability for 2021. TRS's 2021 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.

2021

(In thousands)	1% Decrease (6.1%)	Current Discount (7.1%)	1% Increase (8.1%)
Net pension liability	$ 18,389,990	$ 13,605,788	$ 9,631,759

June 30, 2021, is the actuarial valuation date upon which the total pension liability (TPL) is based for 2022. An expected TPL is determined as of June 30, 2022, 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, 2022, is the experience gain or loss for the year. These procedures are shown in the following table.

TPL Roll Forward 2022

(Dollars in thousands)

	Expected (1)	Actual (2)
(a) Interest Rate	7.1%	7.1%
(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

June 30, 2020, is the actuarial valuation date upon which the TPL is based for 2021. An expected TPL is determined as of June 30, 2021, 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 2021
(Dollars in thousands)

	Expected (1)	Actual Before Assumption Change (2)	Actual After Assumption Changes (3)
(a) Interest Rate	7.50%	7.50%	7.10%
(b) TPL as of June 30, 2020	$ 35,552,041	$ 35,582,250	$ 35,834,421
(c) Entry Age Normal Cost for the Year July 1, 2020 - June 30, 2021	563,188	563,188	612,069
(d) Actual Benefit Payments (including refunds) For the year July 1, 2020 - June 30, 2021	2,260,615	2,260,615	2,260,615
(e) TPL as of June 30, 2021 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	36,436,244	36,468,719	39,541,567
(f) Experience (Gain)/Loss = (e2) - (e1)		32,475	
(g) Assumption Change (Gain)/Loss = (e3) - (e2)			3,072,848

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, 2022, was $642.6 million. TRS's total cash balance held at J.P. Morgan Chase on June 30, 2021, was $237.2 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, 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.

As of June 30, 2021, TRS's cash balance of $237.2 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of $300 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, 2022, and 2021.

Schedules of Investments

Retirement Annuity Trust

	Fair Value June 30, 2022	Fair Value June 30, 2021
Short-term investments		
Cash and cash equivalents	$ 1,018,544,170	$ 1,065,663,926
Subtotal	1,018,544,170	1,065,663,926
Fixed Income		
U.S. government	1,149,592,337	1,432,074,083
Agency bonds	73,829,978	83,582,255
Mortgage-backed securities	133,311,012	142,314,510
Asset-backed securities	30,303,278	52,495,131
Commercial mortgage-backed securities	31,473,511	24,828,229
Collateralized mortgage obligations	24,673,583	29,963,781
Municipal bonds	312,626,893	313,070,347
Corporate bonds	1,488,986,426	1,549,593,040
Subtotal	3,244,797,018	$ 3,627,921,376
Equity		
International	4,227,631,298	5,826,115,153
U.S.	8,039,872,060	10,242,433,510
Subtotal	12,267,503,358	16,068,548,663
Real estate	1,693,627,935	1,405,889,580
Alternative investments		
Private equity	1,808,795,204	1,549,761,484
Timberland	483,469,603	208,371,753
Subtotal	2,292,264,807	1,758,133,237
Additional categories		
Opportunistic credit	813,467,573	666,169,453
Corporate bonds	751,414,788	785,923,582
Corporate loans	345,230,326	351,360,144
Subtotal	1,910,112,687	1,803,453,179
Total*	$ 22,426,849,975	$ 25,729,609,961

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

Health Insurance Trust

	Fair Value June 30, 2022	Fair Value June 30, 2021
Short-term investments		
Cash and cash equivalents	$ 67,213,821	$ 157,506,899
Subtotal	67,213,821	157,506,899
Fixed income		
U.S. government	37,651,068	41,897,387
Agency bonds	969,520	999,010
Mortgage-backed securities	5,087,374	3,896,465
Collateralized mortgage obligations	885,759	1,032,455
Municipal bonds	9,718,049	10,444,319
Corporate bonds	89,972,254	96,902,165
Subtotal	144,284,024	155,171,801
Equity		
Global	1,003,875,627	1,104,324,500
International	2,888,554	12,176,350
U.S.	88,497,979	158,110,014
Subtotal	1,095,262,160	1,274,610,864
Real estate equity	150,214,503	111,459,521
Private equity	204,919,107	170,660,050
Additional categories		
Opportunistic credit	129,749,917	104,033,282
Corporate bonds	173,323,332	173,674,041
Corporate loans	62,534,249	64,699,560
U.S. equity	6,334,819	7,584,288
Subtotal	371,942,317	349,991,171
Total	$ 2,033,835,932	$ 2,219,400,306

Life Insurance Trust

	Fair Value June 30, 2022	Fair Value June 30, 2021
Short-term investments		
Cash and cash equivalents	$ 8,345,378	$ 9,405,976
Subtotal	8,345,378	9,405,976
Fixed income		
U.S. government	7,590,127	8,228,565
Mortgage-backed securities	286,793	399,987
Municipal bonds	2,478,748	2,919,720
Corporate bonds	7,516,401	8,494,982
Subtotal	17,872,069	20,043,254
Equities		
International	17,248,072	25,316,564
U.S.	30,815,516	42,964,768
Subtotal	48,063,588	68,281,332
Real estate equity	7,489,602	5,181,114
Private equity	3,283,908	1,420,801
Additional categories		
Corporate bonds		5,586
Opportunistic credit	2,130,839	1,724,422
U.S equity	680,854	819,345
Subtotal	2,811,693	2,549,353
Total	$ 87,866,238	$ 106,881,830

Custodial Credit Risk

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

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

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

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

As of June 30, 2022, cash collateral reinvestment securities acquired through securities lending for the Retirement Annuity Trust by TRS's custodian amounted to $1.29 billion in relation to the $1.25 billion 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 $29 million in relation to the $28 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, 2022, and 2021, the Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust had the following investment fair value and weighted average maturities.

Retirement Annuity Trust

	2022			2021		
Investment Type	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**
U.S. government	$1,149,592,337	$	11.18	$1,432,074,083	$	11.34
Agency bonds	73,829,978		4.33	83,582,255		5.10
Mortgage-backed securities	133,311,012		15.00	142,314,510		16.49
Asset-backed securities	30,303,278		14.86	52,495,131		13.94
Commercial mortgage-backed securities	31,473,511		19.71	24,828,229		16.72
Collateralized mortgage obligations	24,673,583		8.56	29,963,781		10.64
Municipal bonds	312,626,893		11.16	313,070,347		12.16
Corporate bonds	1,488,986,426	751,414,788	9.40	1,549,593,040	785,923,582	9.16
Corporate loans		345,230,326	4.39		351,360,144	4.59
Total	$3,244,797,018	$1,096,645,114	9.79	$3,627,921,376	$1,137,283,726	9.92

Health Insurance Trust

	2022			2021		
Investment Type	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**
U.S. government	$ 37,651,068	$	7.36	$ 41,897,387	$	8.50
Agency bonds	969,520		1.17	999,010		2.16
Mortgaged-backed securities	5,087,374		11.01	3,896,465		17.60
Collateralized mortgage obligations	885,759		7.32	1,032,455		8.30
Municipal Bonds	9,718,049		8.41	10,444,319		9.52
Corporate bonds	89,972,254	173,323,332	6.49	96,902,165	173,674,041	7.34
Corporate loans		62,534,249	4.84		64,699,560	4.84
Total	$ 144,284,024	$ 235,857,581	6.40	$ 155,171,801	$ 238,373,601	7.20

Life Insurance Trust

Investment Type	2022 Fixed Income	2022 Additional Categories	2022 Average Maturity (years)	2021 Fixed Income	2021 Additional Categories	2021 Average Maturity (years)
U.S. government	$ 7,590,127	$	12.41	$ 8,228,565	$	12.14
Mortgage-backed securities	286,793		12.38	399,987		13.06
Municipal bonds	2,478,748		7.70	2,919,720		8.69
Corporate bonds	7,516,401		11.12	8,494,982	5,586	13.17
Total	$ 17,872,069	$	12.09	$ 20,043,254	$ 5,586	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 $1.09 billion and a weighted average maturity of 15 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 $133.3 million in mortgage-backed securities as of June 30, 2022, compared to $142.3 million as of June 30, 2021. The Health Insurance Trust held $5.1 million in mortgage-backed securities as of June 30, 2022, compared to $3.9 million as of June 30, 2021. The Life Insurance Trust held $286,793 in mortgage-backed securities as of June 30, 2022, compared to $399,987 as of June 30, 2021.

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 $24.7 million in collateralized mortgage obligations as of June 30, 2022, compared to $30 million as of June 30, 2021. The Health Insurance Trust held $885,759 in collateralized mortgage obligations as of June 30, 2022, compared to $1 million as of June 30, 2021.

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 $30.3 million in asset-backed securities as of June 30, 2022, compared to $52.5 million as of June 30, 2021.

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 $31.5 million in commercial mortgage-backed securities investments as of June 30, 2022, compared to $24.8 million as of June 30, 2021.

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, 2022, and 2021.

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

2021 Retirement Annuity Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	$ 1,432,074,083	$	$ 1,432,074,083	30.05
AAA	165,541,606	4,922,652	170,464,258	3.58
AA	418,443,880	4,923,371	423,367,251	8.88
A	640,112,602	3,021,777	643,134,379	13.50
BBB	737,028,573	29,001,678	766,030,251	16.08
BB	22,446,979	479,978,498	502,425,477	10.54
B		474,670,995	474,670,995	9.96
CCC		81,539,230	81,539,230	1.71
CC		1,059,296	1,059,296	0.02
C	1,400,395		1,400,395	0.03
D		1,437,717	1,437,717	0.03
Not rated	210,873,258	56,728,512	267,601,770	5.62
Total	$ 3,627,921,376	$ 1,137,283,726	$ 4,765,205,102	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

2021 Health Insurance Trust

Rating	Fixed Income	Additional Categories	Total	Percent
U.S. government	$ 41,897,387	$	$ 41,897,387	10.64
AAA	7,528,579	1,667,427	9,196,006	2.34
AA	25,883,816	471,419	26,355,235	6.69
A	46,891,792	847,932	47,739,724	12.13
BBB	28,041,307	7,326,631	35,367,938	8.99
BB		94,431,806	94,431,806	24.00
B		99,848,169	99,848,169	25.37
CCC		18,687,738	18,687,738	4.75
CC		268,726	268,726	0.07
C				
D				
Not rated	4,928,920	14,823,753	19,752,673	5.02
Total	$ 155,171,801	$ 238,373,601	$ 393,545,402	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

2021 Life Insurance Trust

Rating		Fixed Income		Additional Categories		Total	Percent
U.S. government	$	8,228,565	$		$	8,228,565	41.04
AAA		726,660				726,660	3.63
AA		3,619,559				3,619,559	18.05
A		1,992,979				1,992,979	9.94
BBB		5,075,751				5,075,751	25.32
BB				5,586		5,586	0.03
B		399,740				399,740	1.99
Total	$	20,043,254	$	5,586	$	20,048,840	100.00

Total fair value of the Retirement Annuity Trust's fixed income portfolio was $4.34 billion on June 30, 2022. The Health Insurance Trust's fixed income portfolio was valued at $380.1 million on June 30, 2022. Total fair value of the Life Insurance Trust's fixed income portfolio was $17.9 million on June 30, 2022. 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 $1.02 billion in short-term investments through the Dreyfus Institutional Cash Advantage Fund. The Health Insurance Trust held $67.2 million in the Dreyfus Institutional Cash Advantage Fund. The Life Insurance Trust held $8.3 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, 2022, TRS's exposure to foreign currency risk consisted of $4.76 billion in the Retirement Annuity Trust, $491.9 million in the Health Insurance Trust and $17.3 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 $736.1 million associated with foreign interests in American depository receipt investments. These American depository receipts are securities that are issued by a U.S. bank in place of the foreign stock shares held in trust by that bank, thereby facilitating the trading of foreign shares in U.S. markets. The cross-listed equities, in the amount of $382.2 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 equities is that not more than 30% of the assets at fair value shall be invested in the stocks of companies domiciled outside of the United States. Any amounts so invested shall be included in the 65% limitation for total stocks under 102 KAR 1:175 Section 2(e).

The following tables represent 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, 2022, and 2021.

Retirement Annuity Trust

	2022	2021
Commingled	$ 3,029,556,395	$ 3,959,389,179
Alternatives	277,842,260	237,151,587
American depository receipts	736,085,804	877,158,495
Cross-listed equities	382,244,110	581,929,795
Bonds	120,029,427	112,041,399
Additional categories (Fixed income)	118,089,954	121,162,648
Additional categories (Opportunistic)	98,744,254	130,256,713
Total	$ 4,762,592,204	$ 6,019,089,816

Health Insurance Trust

	2022	2021
Commingled	$ 397,664,494	$ 452,374,055
Alternatives	42,575,065	38,373,465
Cross-listed equities	2,888,554	12,176,350
Bonds	1,456,940	510,630
American depository receipts	1,368,805	2,958,806
Additional categories (Fixed income)	32,021,960	32,204,639
Additional categories (Opportunistic)	13,890,157	17,869,926
Total	$ 491,865,975	$ 556,467,871

Life Insurance Trust

	2022	2021
Commingled	$ 16,579,034	$ 23,045,234
Alternatives	420,996	154,705
Cross-listed equities	253,063	1,066,549
American depository receipts	39,893	86,179
Total	$ 17,292,986	$ 24,352,667

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	2022	2021	Currency	2022	2021
Argentine peso	$ 107,236	$ 135,630	Korean won	$ 101,697,578	$ 133,330,423
Australian dollar	130,644,553	90,242,923	Kuwaiti dinar	1,247,065	1,089,608
Bahamian dollar		226,500	Liberian dollar	4,361,250	4,786,542
Bermudian dollar	30,071,729	65,877,460	Malaysian ringgit	6,240,256	10,530,737
Brazilian real	133,674,447	124,047,275	Mexican peso	41,749,510	31,191,640
British pound sterling	482,751,292	524,954,167	Netherlands Antillean guilder	9,915,826	3,414,443
Bulgarian lev		627,985	New Zealand dollar	4,089,333	6,095,626
Canadian dollar	243,576,565	372,086,892	Norwegian krone	103,696,810	88,040,195
Cayman Islands dollar	43,357,760	40,100,852	Pakistani rupee		107,261
Chilean peso	17,286,332	845,748	Panamanian balboa	4,149,702	3,618,396
Chinese yuan	273,001,885	155,883,245	Peruvian nuevo sol	168,028	
Colombian peso	26,376,783	28,676,575	Philippine peso	2,737,447	2,901,614
Czech koruna	445,307	216,741	Polish zloty	1,560,230	25,943,943
Danish krone	103,164,522	130,612,264	Qatari riyal	1,569,598	1,320,500
Egyptian pound	134,404	189,824	Russian ruble	337	98,073,638
Euro	1,627,884,474	2,152,101,294	Saudi riyal	6,196,328	5,502,685
Gibraltar pound	710,219	331,912	Singapore dollar	43,773,717	40,415,964
Guernsey pound	17,345,142	16,261,072	South African rand	87,030,766	67,360,762
Hong Kong dollar	166,944,875	477,602,775	Sri Lankan rupee		168,000
Hungarian forint	266,544	429,405	Swedish krona	73,633,424	136,054,319
Indian rupee	86,528,883	98,023,927	Swiss franc	198,861,473	205,466,234
Indonesian rupiah	9,169,449	5,420,893	Taiwan new dollar	67,236,355	109,396,565
Israeli new shekel	6,815,504	9,870,314	Thai baht	8,822,794	5,046,193
Jamaican dollar	126,527	147,899	Turkish lira	920,768	1,095,009
Japanese yen	558,763,004	692,175,103	United Arab Emirates dirham	1,793,558	1,218,257
Jersey pound	18,955,841	47,737,520	Various	13,036,774	2,095,067
			Total	$ 4,762,592,204	$ 6,019,089,816

Health Insurance Trust

Currency	2022	2021	Currency	2022	2021
Argentine peso	$ 66,469	$ 53,460	Kuwaiti dinar	$ 1,007,828	761,645
Australian dollar	21,728,364	22,713,899	Liberian dollar	963,599	1,009,923
Bahamian dollar		226,500	Malaysian ringgit	1,927,885	2,001,823
Bermudian dollar	1,013,392	1,207,224	Mexican peso	3,543,837	3,320,609
Brazilian real	5,856,948	7,626,138	New Zealand dollar	843,955	1,073,659
British pound sterling	42,889,159	46,691,266	Norwegian krone	2,510,126	2,556,418
Canadian dollar	43,053,573	51,821,353	Pakistani rupee		82,832
Cayman Islands dollar	5,184,756	6,030,893	Panamanian balboa	823,842	720,339
Chilean peso	404,462	592,211	Peruvian nuevo sol	168,028	
Chinese yuan	11,371,846	9,722,150	Philippine peso	956,299	914,577
Colombian peso	389,755	319,725	Polish zloty	949,724	1,088,514
Czech koruna	171,744	181,675	Qatari riyal	1,222,823	936,551
Danish krone	6,786,186	7,061,749	Russian ruble	247	2,867,628
Egyptian pound	94,248	135,766	Saudi riyal	4,839,532	3,972,966
Euro	138,146,438	154,989,883	Singapore dollar	3,818,762	3,440,860
Gibraltar pound	168,334	67,344	South African rand	4,118,137	4,932,674
Hong Kong dollar	34,606,661	41,495,034	Sri Lankan rupee		168,000
Hungarian forint	188,949	346,097	Swedish krona	9,280,891	12,346,367
Indian rupee	16,666,383	15,612,093	Swiss franc	24,219,205	26,382,768
Indonesian rupiah	2,252,921	1,596,201	Taiwan new dollar	17,939,329	20,949,873
Israeli new shekel	2,173,098	1,763,998	Thai baht	2,529,664	2,559,866
Japanese yen	59,632,917	69,680,690	Turkish lira	793,503	853,192
Jersey pound	1,289,699	3,092,907	United Arab Emirates dirham	1,415,910	895,045
Korean won	13,852,831	19,603,486	Various	3,716	
			Total	$ 491,865,975	$ 556,467,871

Life Insurance Fund

Currency	2022	2021	Currency	2022	2021
Australian dollar	$ 797,952	$ 1,056,277	Kuwaiti dinar	$ 35,391	$ 34,216
Brazilian real	294,528	330,626	Malaysian ringgit	70,931	86,765
British pound sterling	1,546,974	1,969,439	Mexican peso	116,695	120,367
Canadian dollar	1,349,000	2,220,547	New Zealand dollar	30,442	43,382
Cayman Islands dollar	13,414	73,211	Norwegian krone	101,649	143,844
Chilean peso	14,049	26,558	Pakistani rupee		3,368
Chinese yuan	619,122	253,299	Philippine peso	31,366	39,514
Colombian peso	15,223	14,027	Polish zloty	28,027	48,092
Czech koruna	7,249	6,806	Qatari riyal	44,545	41,466
Danish krone	375,452	528,076	Russian ruble	10	125,247
Egyptian pound	3,814	5,961	Saudi riyal	175,849	172,794
Euro	4,099,101	5,834,780	Singapore dollar	152,371	151,660
Hong Kong dollar	1,353,409	2,550,124	South African rand	149,844	212,963
Hungarian forint	7,564	13,484	Swedish krona	412,996	666,951
Indian rupee	616,777	695,669	Swiss franc	846,621	1,130,043
Indonesian rupiah	81,358	69,267	Taiwan new dollar	718,802	948,730
Israeli new shekel	72,390	76,494	Thai baht	92,602	111,831
Japanese yen	2,352,561	3,383,908	Turkish lira	16,070	20,962
Jersey pound	78,743	251,322	United Arab Emirates dirham	50,900	38,255
Korean won	519,195	852,342			
			Total	$ 17,292,986	$ 24,352,667

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 equities and domestic equities. Commingled funds are valued at the net asset value held at the end of the period based upon the fair value of the underlying investments.

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

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

Private 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 — 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 Net Asset Value (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

Schedule of Investments at Net Asset Value (NAV) — 2022

	June 30, 2022	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European loan	$ 92,340,000	$	Daily	30 days
Commingled international equity	1,590,053,281		Daily	1-30 days
Commingled domestic equity	342,732,216		Daily	1-30 days
Private equity				
Open-ended*	441,730,035	87,667,046	Quarterly, annually	90 days
Closed-ended	1,367,065,169	1,218,309,199	N/A	N/A
Private real estate				
Open-ended	942,585,092	100,000,000	Quarterly	45-90 days
Closed-ended	348,922,772	554,548,963	N/A	N/A
Private opportunistic credit				
Open-ended	603,419,252	360,000,000	Semiannually	75 days
Closed-ended	210,048,321	75,412,097	N/A	N/A
Total investments at NAV	$ 5,938,896,138			

*Regarding the open-ended private equity, a few restrictions remain that would prevent redemption at this time. In the open-ended private real estate category, $100 million will remain locked up until April 2023.

Retirement Annuity Trust
Schedule of Investments at Fair Value Level — 2021

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and cash equivalents	$ 1,065,663,926	$	$	$ 1,065,663,926
Fixed income				
Asset-backed securities		52,495,131		52,495,131
Agency bonds		83,582,255		83,582,255
Commercial mortgage-backed securities		24,828,229		24,828,229
Collateralized mortgage obligations		29,963,781		29,963,781
Corporate bonds		1,549,593,040		1,549,593,040
Mortgage-backed securities		141,698,876	615,634	142,314,510
Municipal bonds		313,070,347		313,070,347
U.S. government	1,427,833,920	4,240,163		1,432,074,083
Subtotal	1,427,833,920	2,199,471,822	615,634	3,627,921,376
Equity				
International	1,446,614,691	2,421,167,032		3,867,781,723
U.S.	9,810,964,685			9,810,964,685
Subtotal	11,257,579,376	2,421,167,032		13,678,746,408
Real estate			402,420,072	402,420,072
Timberland			205,100,783	205,100,783
Additional categories				
Corporate bonds	1,621,858	783,993,063	308,661	785,923,582
Corporate loans			250,690,144	250,690,144
Subtotal	1,621,858	783,993,063	250,998,805	1,036,613,726
Total investments at fair value level	$ 13,752,699,080	$ 5,404,631,917	$ 859,135,294	$ 20,016,466,291
At NAV				
Commingled European loan funds				$ 100,670,000
Commingled international equity funds				1,958,333,430
Commingled domestic equity funds				431,468,825
Private equity funds				1,549,761,484
Private real estate funds				1,003,469,508
Private timber funds				3,270,970
Private opportunistic credit funds				666,169,453
Total investments measured at NAV				5,713,143,670
Total investments at fair value				$ 25,729,609,961

Health Insurance Trust

Schedule of Investments at Fair Value Level — 2022

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	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 opportunistic credit funds				129,749,917
Private real estate funds				150,214,503
Total investments measured at NAV				484,883,527
Total investments at fair value				$ 2,033,835,932

Schedule of Investments at NAV — 2022

	June 30, 2022	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private real estate				
Open-ended	$ 74,491,211	$ 10,000,000	Quarterly	45-90 days
Closed-ended	75,723,292	92,011,244	N/A	N/A
Private equity				
Closed-ended	204,919,107	184,942,200	N/A	N/A
Private opportunistic credit				
Open-ended	106,871,681		Semiannually	75 days
Closed-ended	22,878,236	10,521,502	N/A	N/A
Total investments at NAV	$ 484,883,527			

*Regarding the open-ended real estate, a few restrictions remain that would prevent redemption at this time. One fund has $10 million that will remain locked up until April 2023.

Health Insurance Trust
Schedule of Investments at Fair Value Level — 2021

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	$ 157,506,899	$	$	$ 157,506,899
Fixed income				
Agency bonds		999,010		999,010
Collateralized mortgage obligations		1,032,455		1,032,455
Corporate bonds		96,902,165		96,902,165
Mortgage-backed securities		3,896,465		3,896,465
Municipal bonds		10,444,319		10,444,319
U.S. government	41,897,387			41,897,387
Subtotal	41,897,387	113,274,414		155,171,801
Equity				
Global		1,104,324,500		1,104,324,500
International	12,176,350			12,176,350
U.S.	158,110,014			158,110,014
Subtotal	170,286,364	1,104,324,500		1,274,610,864
Additional categories				
Corporate bonds	212,113	173,461,928		173,674,041
Corporate loans			64,699,560	64,699,560
U.S. equity	7,584,288			7,584,288
Subtotal	7,796,401	173,461,928	64,699,560	245,957,889
Total investments at fair value level	$ 377,487,051	$ 1,391,060,842	$ 64,699,560	$ 1,833,247,453
At NAV				
Private equity funds				$ 170,660,050
Private real estate funds				111,459,521
Private opportunistic credit funds				104,033,282
Total investments measured at NAV				386,152,853
Total investments at fair value				$ 2,219,400,306

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				
Corporate bonds				—
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

Schedule of Investments at NAV — 2022

	June 30, 2022	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private equity				
Closed-ended	$ 3,283,908	$ 10,247,585	N/A	N/A
Private real estate				
Closed-ended	1,351,382	461,759	N/A	N/A
Open-ended	6,138,220	$ 500,000	Quarterly	45 days
Private opportunistic credit				
Open-ended	2,130,839	252,000	Semiannually	75 days
Total investments at NAV	$ 12,904,349			

*Regarding the open-ended real estate, a few restrictions remain that would prevent redemption at this time. One fund has $500,000 that will remain locked up until April 2023.

Life Insurance Trust
Schedule of Investments at Fair Value Level — 2021

	Level 1	Level 2	Level 3	Fair Value
Cash and cash equivalents	$ 9,405,976	$	$	$ 9,405,976
Fixed income				
Corporate bonds		8,494,982		8,494,982
Mortgage-backed securities		399,987		399,987
Municipal bonds		2,919,720		2,919,720
U.S. government	8,228,565			8,228,565
Subtotal	8,228,565	11,814,689		20,043,254
Equity				
International	1,066,549	24,250,015		25,316,564
U.S.	42,964,768			42,964,768
Subtotal	44,031,317	24,250,015		68,281,332
Additional Categories				
Corporate bonds		5,586		5,586
U.S. equity	819,345			819,345
Subtotal	819,345	5,586		824,931
Total investments at fair value level	$ 62,485,203	$ 36,070,290	$	$ 98,555,493
At NAV				
Private equity funds				$ 1,420,801
Private real estate funds				5,181,114
Private opportunistic credit funds				1,724,422
Total investments measured at NAV				8,326,337
Total investments at fair value				$ 106,881,830

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, 2022, 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, 2022, and 2021.

Securities Lending Net Earnings

	Retirement Annuity*		Life Insurance	
	2022	**2021**	**2022**	**2021**
Gross earnings (interest and fees)	$4,029,726	$2,375,356	$90,539	$54,130
Gross borrower rebates	2,094,160	1,556,370	9,485	20,186
Bank fees	(1,836,957)	(1,179,337)	(30,000)	(22,287)
Net earnings	$4,286,929	$2,752,389	$70,024	$52,029

*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, 2022, 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, 2022, and 2021.

Retirement Annuity Trust

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
Equities	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

2021

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	$ 321,661,902	$ 105,751,464	$ 221,730,420	$ 327,481,884
Equities	2,042,042,378	1,490,267,850	604,329,344	$ 2,094,597,194
Total	$ 2,363,704,280	$ 1,596,019,314	$ 826,059,764	$ 2,422,079,078

Life Insurance Trust

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
Equities	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

2021

Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	$ 2,752,590		$ 2,804,795	$ 2,804,795
Equities	32,939,807	14,017,229	19,810,303	$ 33,827,532
Total	$ 35,692,397	$ 14,017,229	$ 22,615,098	$ 36,632,327

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

	2022	2021
Retirement Annuity Trust	(10.91)%	29.57 %
Health Insurance Trust	(9.70)%	31.10 %
Life Insurance Trust	(14.96)%	28.16 %

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 2022, 2021 and 2020 were $1.2 million, $1 million and $980,508, 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). Prior to July 1, 2022, contributions were based on a percentage of creditable compensation. The approved rate for the fiscal year 2021 was 84.43%. Effective July 1, 2021, TRS is required to contribute 10.10% plus a monthly amount determined by the KERS actuary for its own portion of the total unfunded liability over a set period regardless of covered payroll. TRS's total contributions to KERS were $916,821 and $992,544 for fiscal years 2022 and 2021. TRS contributed 100% of the required contributions for each year.

Note 7
Description of Other Funds

403(b) Tax-Sheltered Annuity Plan

Plan Description
TRS has, in prior years, administered a salary deferral program as permitted by section 403(b) of the Internal Revenue Code. Under this program members were able to voluntarily defer a portion of their compensation within the limits established by the applicable laws and regulations. However, TRS's Board of Trustees determined that the cost of providing the necessary services to assure continuing compliance with these laws and regulations was not economically feasible due to the limited participation in the program by TRS's members. The board decided, therefore, to discontinue offering the program as of April 30, 1997. Members who were not receiving annuities from their account as of April 30, 1997, were able to transfer their respective accounts directly into other tax-sheltered plans on a tax-free basis. As of June 30, 2022, the four members who are receiving annuities will continue to receive distributions according to the terms of their respective elections.

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

Method Used to Value Investments
The short-term investments are reported at cost, which approximates fair value.

Supplemental Benefit Fund

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

Junita Losey Scholarship Fund

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

Note 8
Other Postemployment Benefits (OPEB) — Health Insurance Trust

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

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

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

Contributions are made on behalf of TRS retired members toward payment of health insurance premiums. The amount of the member's contribution is based on a table approved by the TRS board. Retired members pay premiums in excess of the monthly contribution. The amount of insurance premiums paid by retirees for fiscal years 2022 and 2021 were \$60.7 million and \$59.5 million, respectively. The Commonwealth of Kentucky bears risk for excess claims expenses that exceed the premium equivalents charged for the KEHP.

At June 30, 2022, TRS insurance covered 41,177 retirees and 6,661 dependents, and at June 30, 2021, TRS insurance covered 41,175 retirees and 6,728 dependents. The medical plan has 202 participating employers with 74,785 and 69,256 active members contributing at June 30, 2022, and 2021, 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.

	2022	2021
MEHP group expenditures	$ 206,386,429	$ 204,114,382
KEHP group expenditures	106,170,919	106,822,555
Subtotal	312,557,348	310,936,937
Less: amounts paid by retirees	(60,680,394)	(59,507,609)
Less: formulary rebates	(54,158,379)	(51,730,213)
Less: Medicare subsidies and other recovery income	(90,517,136)	(69,050,981)
Net insurance expenditures	$ 107,201,439	$ 130,648,134

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, 2022, and 2021 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]
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

*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, 2021
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	3.37%
Discount rate	7.1%
Single equivalent interest rate	7.1%, net of OPEB plan investment expense, including price inflation
Health care cost trends	
KEHP group	7% for fiscal year 2022 decreasing to an ultimate rate of 4.5% by fiscal year 2032
MEHP group	5.125% for fiscal year 2022* decreasing to an ultimate rate of 4.5% by fiscal year 2025
Medicare Part B premiums	6.97% for fiscal year 2022 with an ultimate rate of 4.5% by 2034

*Based on known expected increase in Medicare-eligible costs in the year following the valuation date, an increase rate of 20% was used for 2021.

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, 2021, 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, 2021, valuation of the health trust were based on a review of recent plan experience done concurrently with the June 30, 2021, valuation. The health care cost trend rate assumption was updated for the June 30, 2021, 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
Global equity	58	5.1
Fixed income	9	(0.1)
Real estate	6.5	4.0
Private equity	8.5	6.9
Additional categories: high yield	8	1.7
Other additional categories	9	2.2
Cash	1	(0.3)
Total	100	

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, 2021. In addition to the actuarial methods and assumptions of the June 30, 2021, 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 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	

Schedule of Net OPEB Liability and Health Care Cost Trend Rates 2021

(In thousands)

		Health Care Cost Trend Rates		
		1% Decrease	**Current**	**1% Increase**
	1% Increase (8.1%)	$	$ 1,648,531	$
Discount Rate	**Current (7.1%)**	1,558,870	2,145,707	2,876,058
	1% Decrease (6.1%)		2,747,046	

The TOL of the Health Insurance Trust for 2022 is based upon an actuarial valuation performed as of the valuation date, June 30, 2021. 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 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	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.

The TOL of the Health Insurance Trust for 2021 is based upon an actuarial valuation performed as of the June 30, 2020, valuation date. An expected, TOL was determined as of June 30, 2021, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2020, 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, 2021, is shown in the following table.

TOL Roll-Forward 2021

(In thousands)

		Expected	Actual
(a)	TOL as of June 30, 2020*	$ 4,140,425	$ 3,686,043
(b)	Actual benefit payments and refunds for July 1, 2020-June 30, 2021	(130,648)	(130,648)
(c)	Interest on TOL = [(a) x (0.08)] + [(b) x (0.04]	326,008	289,658
(d)	Service cost for July 1, 2020-June 30, 2021	84,727	84,727
(e)	Changes of benefit terms		
(f)	Changes of assumptions (updated health care trend)	516,431	516,431
(g)	TOL rolled forward to June 30, 2021 = (a) + (b) + (c) + (d) + (e) + (f)	4,936,943	4,446,211
(h)	Difference between expected and actual experience (gain) loss		$ (490,732)

*The TOL used in the roll-forward as of June 30, 2020, 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 members who entered on or after Jan 1, 2022, 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, 2022, and 2021 follows.

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

Fiscal Year Ending June 30	Total OPEB Liability (TOL) A	Plan Fiduciary Net Position B	Employers Net OPEB Liability (NOL) (A-B)	Plan Fiduciary Net Position (FNP) as a % of Total OPEB Liability (B/A)	Covered Payroll C	Net OPEB Liability as a % of Covered Payroll [(A-B)/C]
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

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

Valuation date	June 30, 2021
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	2.13%
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, 2021, 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	4.4
International equity	23	5.6
Fixed income	18	(0.1)
Real estate	6	4.0
Private equity	5	6.9
Additional Categories	6	2.1
Cash	2	(0.3)
Total	100	

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, 2021. In addition to the actuarial methods and assumptions of the June 30, 2021, 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 2022
(In thousands)

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

Schedule of Net OPEB Liability 2021
(In thousands)

1% Decrease (6.1%)	Current Discount Rate (7.1%)	1% Increase (8.1%)
$30,217	$13,078	$(800)

The TOL of the Life Insurance Trust for 2022 is based upon an actuarial valuation performed as of the valuation date, June 30, 2021. 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 Life Insurance 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*	$ 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.

The TOL of the Life Insurance Trust for 2021 is based upon an actuarial valuation performed as of the June 30, 2020, valuation date. An expected TOL is determined as of June 30, 2021, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2020, 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, 2021, is shown in the following table.

TOL Roll-Forward 2021
(In thousand

		Expected	Actual
(a)	TOL as of June 30, 2020*	$ 122,080	$ 122,194
(b)	Actual benefit payments and refunds for July 1, 2020-June 30, 2021	(6,120)	(6,120)
(c)	Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375]	8,926	8,934
(d)	Service cost for July 1, 2020-June 30, 2021	1,289	1,289
(e)	Changes of benefits terms		
(f)	Changes of assumptions	(5,792)	(5,792)
(g)	TOL rolled forward to June 30, 2021 = (a)+(b)+(c)+(d)+(e)+(f)	$ 120,383	$ 120,505
(h)	Difference between expected and actual experience (gain) loss		$ 122

*The TOL used in the roll-forward as of June 30, 2020, 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)

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	$ 621,689	$ 563,188	$ 552,625	$ 542,970	$ 1,104,102
Interest	2,724,644	2,581,630	2,517,671	2,448,387	2,063,109
Difference between expected and actual experience	42,986	32,475	10,661	93,650	(222,473)
Changes of assumptions	—	3,072,848	—	—	(14,167,315)
Benefit payments	(2,305,853)	(2,235,241)	(2,167,239)	(2,094,364)	(2,004,617)
Refunds of contributions	(26,745)	(25,374)	(28,472)	(32,403)	(31,073)
Net change in total pension liability	1,056,721	3,989,526	885,246	958,240	(13,258,267)
Total pension liability — beginning	39,541,567	35,552,041	34,666,795	33,708,555	46,966,822
Total pension liability — ending (a)	40,598,288	39,541,567	35,552,041	34,666,795	33,708,555
Plan net position					
Contributions - state	1,570,118	1,060,257	1,048,193	1,051,452	969,698
Contributions - other employers	109,467	86,720	86,088	71,583	78,973
Contributions - members	356,967	327,833	324,664	321,172	319,127
Net investment income	(2,727,776)	6,017,186	1,094,023	1,085,189	1,953,214
Benefit payments	(2,305,853)	(2,235,241)	(2,167,239)	(2,094,364)	(2,004,617)
Administrative expense	(12,005)	(12,602)	(12,167)	(12,352)	(11,388)
Refunds of contributions	(26,745)	(25,374)	(28,472)	(32,403)	(31,073)
Net change in plan net position	(3,035,827)	5,218,779	345,090	390,277	1,273,934
Plan net position - beginning	25,935,779	20,717,000	20,371,910	19,981,633	18,707,699
Plan net position - ending (b)	22,899,952	25,935,779	20,717,000	20,371,910	19,981,633
Net pension liability - ending (a)-(b)	$ 17,698,336	$ 13,605,788	$ 14,835,041	$ 14,294,885	$ 13,726,922

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

Schedule of Changes in Net Pension Liability

(In thousands)

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

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

Net Pension Liability

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

Changes of Benefit Terms. A new 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)

	2022	2021	2020	2019	2018
Total pension liability	$40,598,288	$39,541,567	$35,552,041	$34,666,795	$33,708,555
Plan net position	22,899,952	25,935,779	20,717,000	20,371,910	19,981,633
Net pension liability	17,698,336	13,605,788	14,835,041	14,294,885	13,726,922
Ratio of plan net position to total pension liability	56.41 %	65.59 %	58.27 %	58.76 %	59.28 %
Covered payroll	$3,876,491	$3,638,905	$3,569,262	$3,497,216	$3,455,660
Net pension liability as a percentage of covered payroll	456.56 %	373.90 %	415.61 %	408.75 %	397.23 %

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

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

Schedule of Employer Contributions
(Dollars in thousands)

Fiscal Year Ended June 30	Covered Payroll	Actual Employer Contributions	Actuarially Determined Employer Contributions	Annual Contribution Excess (Deficiency)	Actual Contributions as a % of Covered Payroll
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
2013	3,310,710	568,233	802,985	(234,752)	17.16

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	25.4 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.

2022	2021	2020	2019	2018	2017	2016	2015	2014
(10.91)%	29.57%	5.47%	5.6%	11%	15.00%	(1.32)%	4.96%	17.95%

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

Health Insurance Trust

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

	2022	2021	2020
Total OPEB liability			
Service cost	$ 109,082	$ 84,727	$ 82,572
Interest	311,875	326,008	341,430
Changes of benefit terms			
Difference between expected and actual experience	(68,928)	(490,732)	(585,090)
Changes of assumptions	60,667	516,431	106,575
Benefit payments	(107,201)	(130,648)	(145,869)
Net change in OPEB liability	305,495	305,786	(200,382)
Total OPEB liability - beginning	4,446,211	4,140,425	4,340,807
Total OPEB liability - ending (a)	4,751,706	4,446,211	4,140,425
Plan net position			
Contributions - state	31,349	78,217	77,191
Contributions - other employers	120,416	106,670	107,434
Contributions - active members	145,682	128,117	133,471
Net investment income	(219,500)	503,201	32,475
Benefit payments	(107,201)	(130,648)	(145,869)
Administrative expense	(2,074)	(1,728)	(2,047)
Other			
Net change in plan net position	(31,328)	683,829	202,655
Plan net position - beginning	2,300,504	1,616,675	1,414,020
Plan net position - ending (b)	2,269,176	2,300,504	1,616,675
Net OPEB liability - ending (a) - (b)	$ 2,482,530	$ 2,145,707	$ 2,523,750

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 the Net OPEB Liability
(In thousands)

	2019	2018	2017
Total OPEB liability			
Service cost	$ 93,792	$ 95,382	$ 95,625
Interest	366,254	355,491	333,990
Changes of benefit terms			8,926
Difference between expected and actual experience	(661,228)	(210,450)	
Changes of assumptions	45,659	56,483	
Benefit payments	(163,666)	(161,082)	(178,500)
Net change in OPEB liability	(319,189)	135,824	260,041
Total OPEB liability - beginning	4,659,996	4,524,172	4,264,131
Total OPEB liability - ending (a)	4,340,807	4,659,996	4,524,172
Plan net position			
Contributions - state	76,382	80,959	75,497
Contributions - other employers	106,764	106,143	104,879
Contributions - active members	131,677	130,778	128,819
Net investment income	74,385	76,841	95,453
Benefit payments	(163,666)	(161,082)	(178,500)
Administrative expense	(1,803)	(1,748)	(1,539)
Other			
Net change in plan net position	223,739	231,891	224,609
Plan net position - beginning	1,190,281	958,390	733,781
Plan net position - ending (b)	1,414,020	1,190,281	958,390
Net OPEB liability - ending (a) - (b)	$ 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)

- A new 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
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	25.5	3,455,660	100.4
2017	4,524,172	958,390	3,565,782	21.2	3,415,432	104.4

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

Schedule of Employer Contributions
GASB 74 (Dollars in thousands)

	2022	2021	2020	2019	2018
Statutorily required contributions					
Employer	$ 120,416	$ 106,670	$ 107,434	$ 106,764	$ 106,143
State					
Pre-65 health insurance premiums	56,312	55,061	54,034	53,707	58,535
SEEK 0.75%	23,507	23,156	23,157	22,675	22,424
Total state	79,819	78,217	77,191	76,382	80,959
Total	$ 200,235	$ 184,887	$ 184,625	$ 183,146	$ 187,102
Actual contributions					
Employer	$ 120,416	$ 106,670	$ 107,434	$ 106,764	$ 106,143
State	31,349	78,217	77,191	76,382	80,959
Total	151,765	184,887	184,625	183,146	187,102
Contribution deficiency (excess)	$ 48,470	$ —	$ —	$ —	$ —
Percent of statutorily required contributed	75.8	100.0	100.0	100.0	100.0
Covered payroll	$ 3,876,491	$ 3,638,905	$ 3,569,262	$ 3,497,216	$ 3,455,660
Actual contributions as a percentage of covered payroll	3.92	5.08	5.17	5.24	5.41

	2017	2016	2015	2014	2013
Shared responsibility contributions					
Employer	$ 104,879	$ 104,271	$ 77,656	$ 52,247	$ 36,990
State					
Pre-65 health insurance premiums	53,454	52,542	46,233	84,600	106,500
SEEK 0.75%	22,043	21,825	21,375	20,841	23,086
Total state	75,497	74,367	67,608	105,441	129,586
Total	$ 180,376	$ 178,638	$ 145,264	$ 157,688	$ 166,576
Actual contributions					
Employer	$ 104,879	$ 104,271	$ 77,656	$ 52,247	$ 36,990
State	75,497	74,367	67,608	105,441	129,586
Total	180,376	178,638	145,264	157,688	166,576
Contribution deficiency (excess)	$ —	$ —	$ —	$ —	$ —
Percent of shared responsibility contributed	100.0	100.0	100.0	100.0	100.0
Covered payroll	$ 3,415,432	$ 3,390,539	$ 3,455,008	$ 3,317,422	$ 3,310,710
Actual contributions as a percentage of covered payroll	5.28	5.27	4.20	4.75	5.03

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.

2022	2021	2020	2019	2018	2017	2016	2015	2014
(9.7)%	31.1%	2.30%	6.11%	8.44%	14.4%	(2.20)%	1.38%	15.38%

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

Life Insurance Trust

Schedule of Changes in the Net OPEB Liability

(In thousands)

	2022	2021	2020
Total OPEB liability			
Service cost	$ 943	$ 1,289	$ 1,299
Interest	8,337	8,926	8,563
Changes of benefit terms			
Difference between expected and actual experience	(4,123)	122	705
Changes of assumptions			
Benefit payments	(6,178)	(6,120)	(5,317)
Net change in OPEB liability	(1,021)	(1,575)	5,250
Total OPEB liability - beginning	120,505	122,080	116,830
Total OPEB liability - ending (a)	119,484	120,505	122,080
Plan Net Position			
Contributions - state	2,194	1,852	1,543
Contributions - other employers	561	286	253
Net investment income	(15,582)	24,075	5,167
Benefit payments	(6,178)	(6,120)	(5,317)
Administrative expense	(41)	(34)	(36)
Net change in plan net position	(19,046)	20,059	1,610
Plan net position - beginning	107,427	87,368	85,758
Plan net position - ending (b)	88,381	107,427	87,368
Net OPEB liability - ending (a) - (b)	$ 31,103	$ 13,078	$ 34,712

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 the Net OPEB Liability

(In thousands)

	2019	2018	2017
Total OPEB liability			
Service cost	$ 1,271	$ 1,068	$ 1,067
Interest	8,256	8,026	7,761
Changes of benefit terms			
Difference between expected and actual experience	(204)	(717)	
Changes of assumptions			
Benefit payments	(5,153)	(5,453)	(5,151)
Net change in OPEB liability	4,170	2,924	3,677
Total OPEB liability - beginning	112,660	109,736	106,059
Total OPEB liability - ending (a)	116,830	112,660	109,736
Plan Net Position			
Contributions - state	$ 1,209	$ 897	882
Contributions - other employers	212	161	168
Net investment income	5,058	1,111	915
Benefit payments	(5,153)	(5,453)	(5,151)
Administrative expense	(30)	(31)	(28)
Net change in plan net position	1,296	(3,315)	(3,214)
Plan net position - beginning	84,462	87,777	90,991
Plan net position - ending (b)	85,758	84,462	87,777
Net OPEB liability - ending (a) - (b)	$ 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)

- A new 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
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
2022	$ 2,649	$ 2,755	$ (106)	$ 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
2013	1,740	1,680	60	3,310,710	0.05

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

The actuarially determined contribution rates in the schedule of employer contributions are calculated as of June 30, 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	25 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.

2022	2021	2020	2019
(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, 2022 and 2021

	2022	2021
Salaries	$ 7,871,232	$ 7,541,161
Other personnel costs	691,560	676,745
Professional services and contracts	621,380	579,040
Utilities	88,939	83,408
Rentals	16,899	14,921
Maintenance	99,552	48,014
Postage and related services	337,894	472,159
Printing	112,322	160,532
Insurance	195,498	192,530
Miscellaneous services	233,914	166,614
Telecommunications	25,430	22,821
Computer services	77,775	80,280
Supplies	24,421	28,762
Depreciation	2,181,001	2,001,370
Travel	8,418	1,421
Dues and subscriptions	116,794	107,273
Miscellaneous commodities	46,256	10,237
Office systems and equipment	890,111	2,039,399
Compensated absences	482,018	138,599
Total	$ 14,121,414	$ 14,365,286

See accompanying independent auditor's report.

Schedule of Professional Services and Contracts
For the Year Ended June 30, 2022 and 2021

	Nature of Service	2022	2021
Cavanaugh Macdonald Consulting	Actuarial	$ 282,964	$ 286,275
Blue & Co.	Auditing	102,184	87,560
Crowe	Auditing		31,186
Ice Miller	Attorney	79,808	32,400
Reinhart Boerner VanDeuren	Attorney		563
Stoll Keenon and Ogden	Attorney	8,240	9,050
Williams & Jensen	Attorney	26,250	29,850
Wyatt, Tarrant & Combs	Attorney	19,365	
Other	Attorney	569	156
MulloyBorland	Communications	102,000	102,000
Total		$ 621,380	$ 579,040

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.

Schedule of Contracted Investment Management Expenses
Year Ended June 30, 2021

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity managers	$ 23,625,665	$ 766,258	$ 39,593	$ 24,431,516
Fixed income managers	606,150			606,150
Real estate	12,011,558	1,453,479	33,155	13,498,192
Additional categories	8,970,813	1,548,543	8,584	10,527,940
Alternative investments	21,487,372	2,359,198	31,377	23,877,947
Custodian	657,867	174,753	56,300	888,920
Consultant	493,950			493,950
Legal and research	61,311			61,311
Other (administrative and operational)	3,398,086	336,859	212,997	3,947,942
Total	$ 71,312,772	$ 6,639,090	$ 382,006	$ 78,333,868

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

Independent Auditor's Report on Internal Control and Compliance

CPAs / ADVISORS

blue

Blue & Co., LLC / 250 West Main Street, Suite 2900 / Lexington, KY 40507
main 859.253.1100 fax 859.253.1384 email blue@blueandco.com

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

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, 2022, 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 14, 2022.

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 14, 2022

Investment Section

TRS

KENTUCKY

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

William Alverson
Member

John Boardman, III
Member

Frank Collecchia
Member

Josh Underwood
Member

Alison Wright
Member

Bevis Longstreth
Investment Advisor to TRS
Kentucky Investment Committee

George Philip
Investment Advisor 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

AON

October 1, 2022

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

The Teachers' Retirement System of the State of Kentucky (TRS) investment program produced a total return decline of 10.7% for the 12-month period ended June 30, 2022, and lagged the return of the Policy Benchmark by 1.6 percentage points. On an absolute basis, the public equity and fixed income portfolios detracted from results due to the volatility in equity markets and a sharp increase in bond yields over the past 12 months. The relative performance was mainly driven by the U.S. and international equity managers' returns relative to their given benchmarks. It was a difficult fiscal year for active management as approximately 75% of U.S. equity portfolios failed to outperform the broad U.S. stock market. Despite the short-term underperformance, the investment program has outperformed its Policy Benchmark and ranked in the top quartile, relative to public pensions with assets greater than $1 billion, over the trailing 10-year period (17th percentile ranking).

Over the past fiscal year, the equity markets performed poorly due to inflation levels not seen in decades, sharpy rising interest rates and uncertainty stemming from lingering supply-chain issues and the Russia-Ukraine war. Within the global equity market, growth stocks significantly underperformed value stocks as technology and consumer discretionary stocks struggled amidst elevated inflation and rising interest rates. The TRS U.S. equity portfolio declined 16.1% for the fiscal year and underperformed its benchmark by 5.1% due to the weak performance from growth-oriented strategies such as Baillie Gifford U.S. Equity Growth and Wellington Mid Cap. The international equity component declined 26.2% over the fiscal year, underperforming its benchmark by 7.2%.

In the bond market, the 10-year U.S. Treasury yield ended the fiscal year at 2.98%, 153 basis points higher than the beginning of the fiscal year. Due to elevated inflation, the U.S. Federal Reserve increased its benchmark interest rate by 150 basis points in the first six months of the 2022 calendar year. The rise in interest rates resulted in a 10.2% decline for the fixed income portfolio, which outperformed the Bloomberg U.S. Government/Credit Index by approximately 70 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, provided a buffer to the losses incurred in equities and tradition bonds and produced a decline of 1.7% for the fiscal year as credit spreads widened.

Returns in the real estate market were strong during the fiscal year providing a valuable diversification benefit to stocks and bonds. TRS's real estate allocation returned 26.9% in the fiscal year and outperformed its benchmark by 5 percentage points. Over the past 10 years, TRS has diversified its alternatives portfolio across different private equity and infrastructure strategies, resulting in a welcomed fiscal year return of 24.9% 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

Brad Patt

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.
- 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 highly dependent on the unique characteristics of a particular plan. Factors such as liability requirements, the level of funding and statutory investment restrictions are important considerations within the context of the asset allocation decision making process. Consequently, asset allocations may differ markedly 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, 2022, and June 30, 2021, as well as the target and strategic range for each asset class for fiscal year 2022.

Retirement Annuity Trust

	June 30, 2022*	Percent	June 30, 2021**	Percent
Cash equivalents***	$ 418,588,882	1.9	624,171,103	2.4
Fixed income	3,697,099,774	16.4	3,934,716,084	15.3
Domestic equity	8,408,434,038	37.5	10,738,569,041	41.7
International equity	3,965,562,156	17.7	5,427,172,214	21.1
Real estate	1,693,627,935	7.6	1,405,889,580	5.5
Private equity	1,808,795,204	8.1	1,549,761,485	6.0
Timberland	483,469,603	2.1	208,371,753	0.8
Additional categories	1,950,569,832	8.7	1,840,153,888	7.2
Totals	$ 22,426,147,424	100	$ 25,728,805,148	100

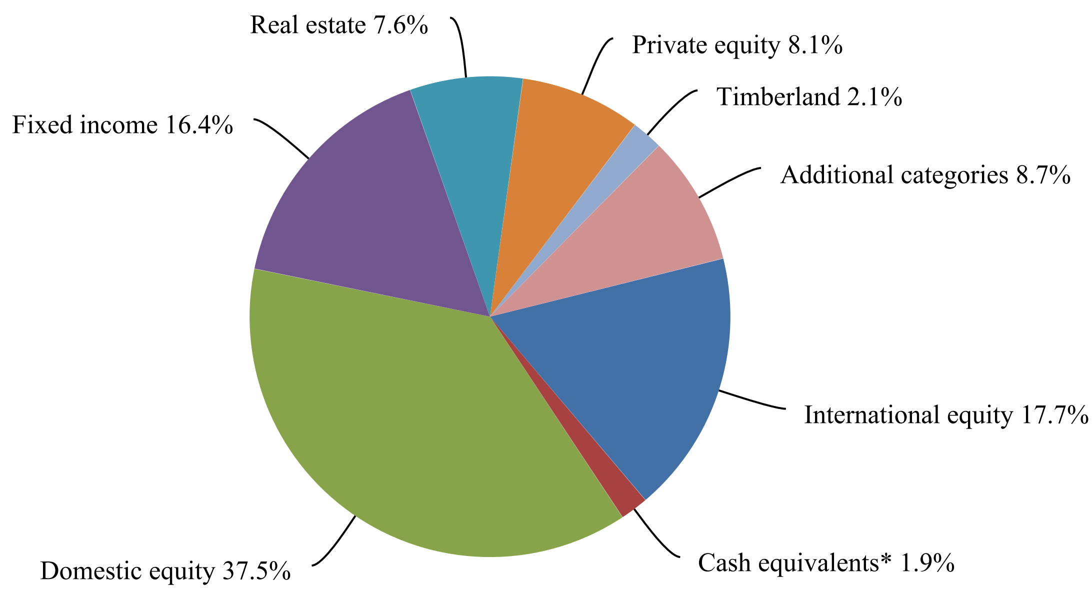
*Includes Tax Shelter Annuity value of $303,859
**Includes Tax Shelter Annuity value of $306,484
***Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Life Insurance Trust

	June 30, 2022	Percent	June 30, 2021	Percent
Cash equivalents*	1,740,624	2.0	2,914,977	2.7
Fixed income	21,754,900	24.8	25,974,525	24.3
Domestic equity	33,692,712	38.4	44,544,211	41.7
International equity	16,995,009	19.3	24,250,015	22.7
Real estate	7,489,602	8.5	5,181,114	4.9
Alternative investments	3,283,908	3.7	1,420,801	1.3
Additional categories	2,909,483	3.3	2,596,187	2.4
Totals	87,866,238	100	$ 106,881,830	100

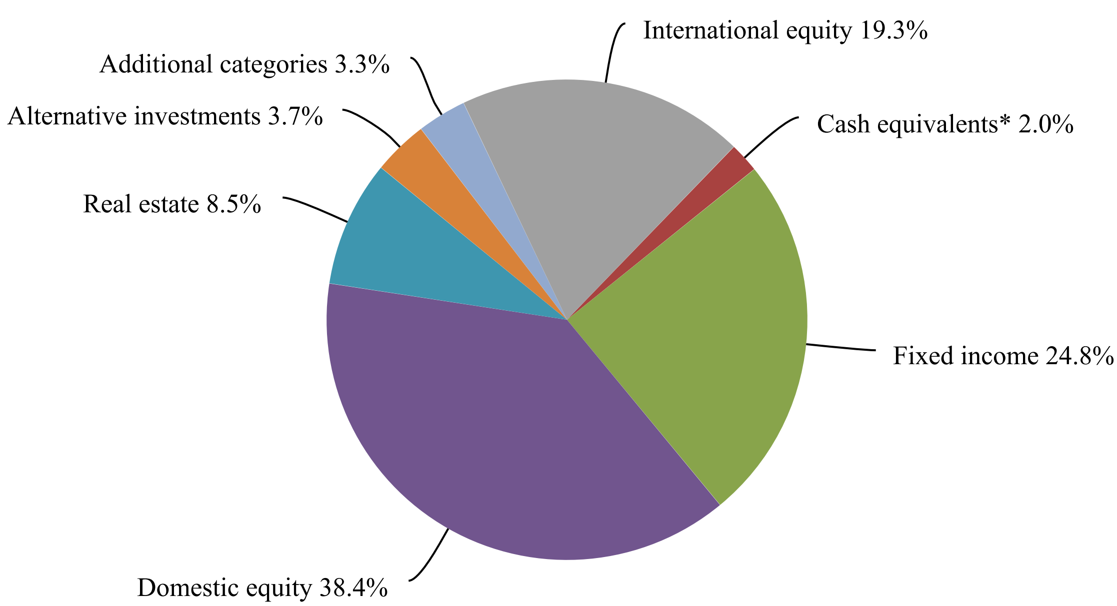
*Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Retirement Annuity Trust
Distribution of Investments — Fair Value as of June 30, 2022



*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, 2022



*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
Strategic Weightings by Asset Class

	Regulatory Limits (Fair Value)	Strategic Range (FV)	Target (FV)	June 30, 2022 (FV)*
Cash equivalents**		1-5%	2%	1.9%
Fixed income		8-22	15	16.4
Government/agency/other	Unlimited			9.6
Corporate	35%			6.8
Equity	65%	53-65	62	55.2
Domestic large cap		30-40	35	32.5
Domestic mid cap		1-5	3	3.0
Domestic small cap		1-3	2	2.0
International***	30%	16-27	22	17.7
Real estate	10%	4-10	7	7.6
Alternative investments*	10%	4-10	7	10.2
Additional categories	15%	4-15	7	8.7
Total			100%	100%

*Includes private equity and timberland.
**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.
***As of June 30, 2022, 23.7% of total international equity was invested in emerging markets.

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 that declined 10.68%, trailing the policy benchmark return of a 9.18% decline. Domestic equity fell 16.12% versus a drop of 11.02% for the Standard & Poor's 1500 Index, while international equity declined 26.28% versus a 19.01% drop for the MSCI All Country World ex-U.S. Index. Fixed income investments fell 10.23% versus a 10.85% 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 2022 was $85.2 million, consisting by asset class of $40.4 million in private equity, $35 million in private real estate and $9.8 million in private credit.

The table below details historical performance for the Retirement Annuity Trust and its component asset classes for the period ended June 30, 2022. TRS began separate reporting of its Life Insurance Trust effective Feb. 1, 2018. Previously, it was reported as part of the Retirement Annuity Trust's gross and net performance. Gross and net of fee performance reports for the Life Insurance Trust will be constructed for future ACFRs when the trust has enough history to warrant such schedules.

Retirement Annuity Trust
Schedule of Investment Results — Gross

	1-Year	3-Year*	5-Year*	10-Year*	20-Year*
Total Plan	**-10.68**	**7.09**	**7.58**	**8.83**	**7.15**
Policy benchmark**	-9.18	6.79	7.42	8.55	
Equity	**-19.52**	**7.37**	**7.96**	**10.52**	**7.76**
Domestic equity	**-16.12**	**9.73**	**10.05**	**12.48**	**8.90**
S&P 1500 Index	-11.02	10.29	10.92	12.79	9.05
All cap equity	**-13.64**	**12.92**	11.47		
Russell 3000 Index	-13.87	9.77	10.6		
Large cap equity	**-15.65**	**10.22**	**10.46**	**12.62**	
S&P 500 Index	-10.62	10.60	11.31	12.96	
Mid cap equity	**-20.63**	**4.60**	**7.09**	**11.43**	
S&P 400 Index	-14.64	6.87	7.00	10.90	
Small cap equity	**-19.04**	**6.51**	**6.58**	**11.19**	
S&P 600 Index	-16.81	7.30	7.20	11.26	
International equity	**-26.28**	**2.64**	**3.97**	**6.33**	
MSCI AC World ex U.S. Index	-19.01	1.81	2.98	5.31	
Fixed income	**-10.23**	**-0.32**	**1.49**	**2.19**	**4.30**
Bloomberg Barclay's U.S. Government/Credit Index	-10.85	-0.77	1.05	1.67	3.71
Total real estate	**26.93**	**12.30**	**11.65**	**11.14**	**10.01**
In-house real estate equity	**4.04**	**3.59**	**6.71**	**7.46**	**8.22**
CPI plus 2%	11.17	7.07	5.96	4.65	4.51
Core real estate	**31.14**	**13.39**	**11.35**	**11.64**	
NCREIF ODCE Index (VW)	29.51	12.66	10.54	11.16	
Non-core real estate	**44.80**	**19.63**	**16.67**	**17.46**	
NCREIF Property Index	21.45	10.22	8.86	9.67	
Alternative investments					
Private equity	**26.68**	**20.73**	**18.93**	**14.90**	
Mature private equity	**26.80**	**19.20**	**17.16**	**12.77**	
S&P 500 Index plus 3%	-7.93	13.92	14.65	16.35	
Private equity < 5 Years	**30.51**	**24.22**	**21.72**		
Timberland	**9.88**	**2.69**	**1.10**	**3.45**	
NCREIF Timberland Index	12.01	5.03	4.32	5.73	
Additional categories	**-1.70**	**3.60**	**4.52**	**5.63**	
BofA Merrill Lynch U.S. High Yield Master II Index	-12.69	-0.05	1.95	4.40	
Cash (unallocated)	**0.35**	**0.56**	**1.08**	**0.64**	**1.37**
90-day Treasury Bill	0.17	0.63	1.11	0.63	1.20
Total 30-year trust return*	**7.75**				

*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.

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

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

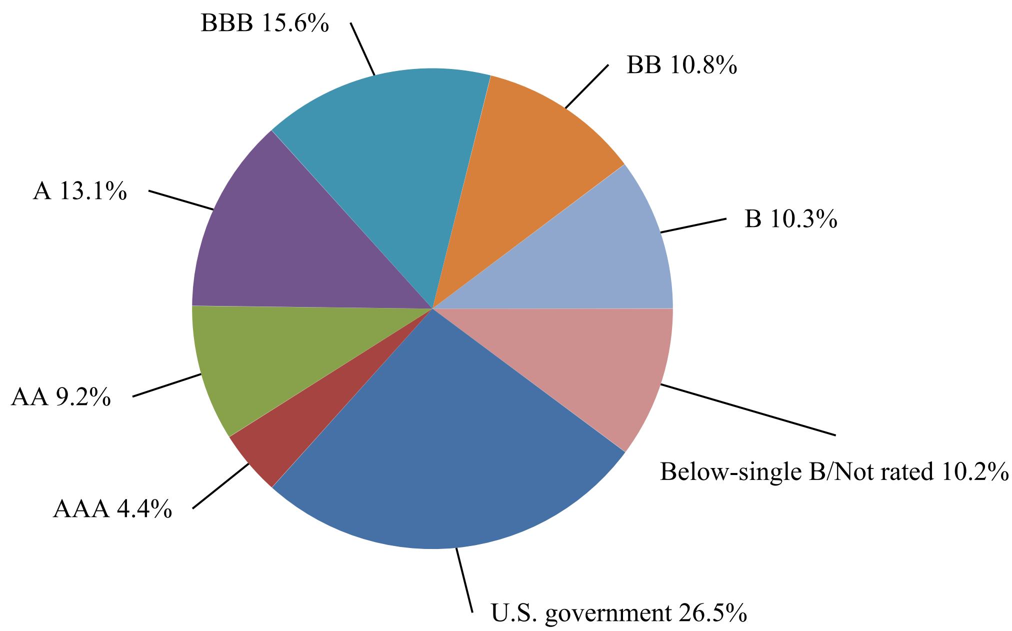
2022	-14.96%
2021	28.16
2020	6.32
2019	6.49

Fixed Income Investments
As of June 30, 2022, the Retirement Annuity Trust had about $3.7 billion in fixed income, which is 16.4% of total assets. The fund's fixed income investments as of June 30, 2022, maintained the average investment grade rating required by administrative regulation.

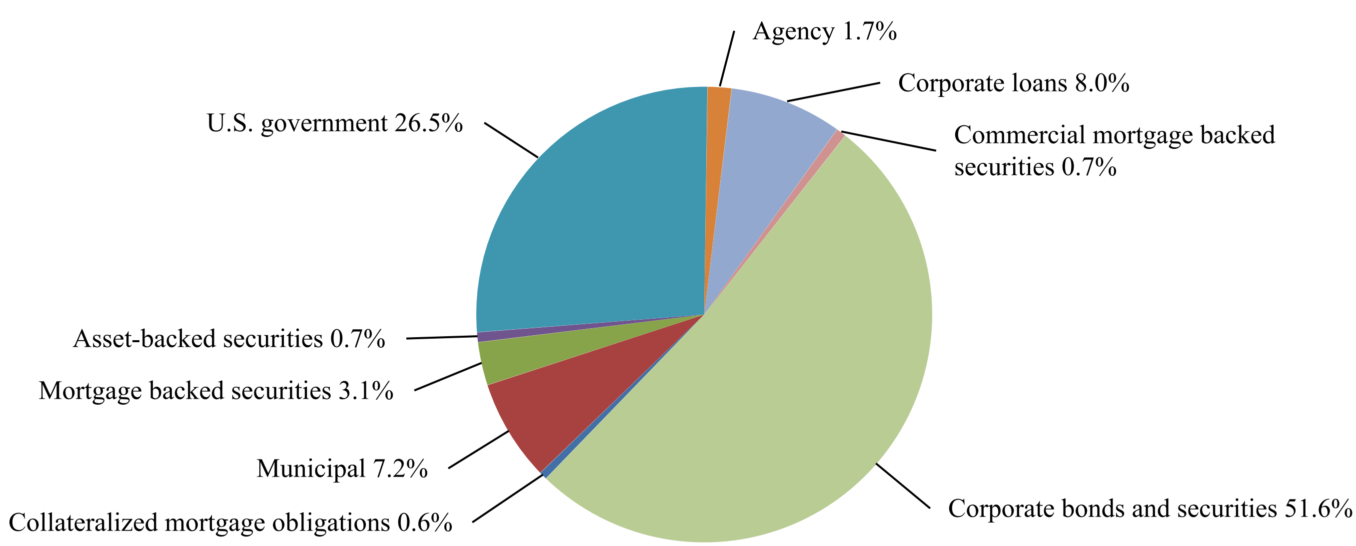
In addition, the trust had $1.95 billion, which is 8.7% of total assets, in other debt-related investments under a regulatory provision that allows for up to 15% of assets in additional categories approved by the board. Investments under this authorization included four high-yield bond portfolios and 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 10.23% for the year ended June 30, 2022. This compared favorably to the trust's fixed income benchmark, the Bloomberg Barclays U.S. Government/Credit Index, which fell 10.85%. The outperformance was driven by TRS's overweighting in corporate bonds, which provided a higher coupon than government bonds of similar duration.

Inflation continued to rise during fiscal 2022. The Consumer Price Index increased to 9.1% from 5.4% year over year. The Federal Open Market Committee (FOMC) responded raising the federal funds rate 1.5% in the final months of the fiscal year. As the year closed, higher rates, decreased market liquidity and slowing growth prompted fears of recession. Besides the United States, rates have increased across the globe, including in the United Kingdom, Mexico, Australia, Brazil and the European Union. With the FOMC's hawkish stance and interest rate increases, the U.S. Treasurys experienced extreme volatility as the 10-year Treasury yield increased to 3.01% from 1.46% and the two-year Treasury yield increased to 2.95% from 0.25%.

Risk spreads widened significantly in all sectors during the last half of the fiscal year. Spreads of investment-grade corporates, as measured by the Moody's BAA yield minus the 30-year U.S. Treasury yield, widened by 0.69% to 2.08% during the last two quarters of the year. Spreads have swung like a pendulum in the last two-and-half years from pre-COVID levels of 1.51% in December 2019 to 3.71% briefly during the height of the pandemic, back to 1.25% as stimulus packages took hold and, finally, to 2.15% as the close of fiscal 2022 approached. Bond issuance declined as risk spreads widened out, with issuances the first six months of 2022 down 5% compared to the first six months of 2021. In mortgages, fixed-rate pass-through mortgages underperformed commercial mortgage-backed securities (CMBS). This market has improved despite lingering uncertainty in some areas of CMBS from pandemic-related economic impacts on retail and office spaces. Asset-backed securities declined but performed better than other areas because of the shorter duration.

Rising prices added sluggishness to the economy as gross domestic product (GDP) growth was slightly negative over the last two quarters of the fiscal year. Leading economic indicators began to soften in the fourth quarter and the important new orders component of the Institute for Supply Management (ISM) Manufacturing Report on Business survey indicated slowing of business activity. The previously frenzied housing market has cooled as fixed rates for 30-year mortgages rose over the course of the year to 5.83% from 3.13%, reducing affordability and slowing the market generally. Real estate transactions slowed despite home prices continuing to rise as measured by the S&P Shiller national home price index. Home prices increased 18% year over year despite the pace of monthly and yearly change slowing. U.S. employment remained strong for the year, with the unemployment rate falling to 3.6% from 5.9%.

Oil prices increased, closing the year at $105 barrel after starting at $73.50 a barrel and being as high as more than $130 a barrel. The Bloomberg Commodity Index − which includes energy; grains; industrial and precious metals; softs; and livestock − rose 23.8%.

Equity Investments
As of June 30, 2022, the Retirement Annuity Trust's public equity investments had a fair value of $12.4 billion, representing 55.2% of total assets. The trust's U.S. equity portfolio declined 16.12% for the fiscal year, underperforming its policy benchmark by 5.1 percentage points.

The annuity trust divides its public equity into two broad categories: domestic and international. The domestic portfolio had a fair value of $8.4 billion at the fiscal year's end, representing 37.5% of total assets. The benchmark for the domestic portfolio is the Standard & Poor's (S&P) 1500. The S&P 1500 is made up 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 portfolios 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 at year end was $3.97 billion, representing 17.7% of total assets. The annuity trust's international equity portfolio fell 26.28%, a 7.27 percentage point underperformance of its policy benchmark, the MSCI All Country World ex-U.S. Index that represents the markets of 22 developed countries and 27 emerging market countries. Six external asset managers manage the trust's international equities, one of which is a passively managed international index fund.

Equity Investments Overview
In the first quarter of the fiscal year, the economic recovery slowed compared to the previous two quarters because of a surge in infections of the COVID-19 delta variant. The infections surge resulted in a return to cautionary practices, which maintained the trend of consumers purchasing goods rather than services and experiences. This demand for goods further strained supply chains. Investor sentiment weakened amid concerns over higher inflation resulting from these supply chain disruptions and increased monetary stimulus. As a result, U.S. equity markets moderated in the first quarter, and the S&P 500 finished relatively flat while smaller cap stocks turned negative. Treasury yields rose slightly, also amid inflation concerns. The Federal Reserve acknowledged that these inflationary drivers were more persistent than previously thought − with at least half of the Federal Open Market Committee (FOMC) projecting an initial rate hike as soon as calendar year 2022 where previously most FOMC members did not

foresee a hike until 2024. The unemployment rate declined to 4.8% from 5.9% in the previous quarter. The relative strength of the dollar lifted U.S. assets compared to non-U.S. markets, with the S&P 500 returning 0.6% for the quarter, although returns were negative outside of the large-cap space, with the Russell 2000 down 4.4%. Internationally, the MSCI EAFE Index was down 0.4%, while emerging markets were down 8.1% in the quarter. The Bloomberg commodity index saw the largest gain of any asset class and increased 6.6%, largely driven by gains in energy.

During the second quarter, the Consumer Price Index (CPI), a measure of inflation in the U.S., reached 7% year-over-year, the largest increase in inflation since 1982. The spike largely is attributable to the implementation of accommodative monetary policy through a combination of low interest rates and trillions of dollars in fiscal stimulus. New COVID-19 variants extended the impacts of the pandemic and continued the shift of consumer spending toward goods away from services. Temporarily shuttered factories in Asia and domestic labor shortages further contributed to inflation. The FOMC initially allowed the inflation rate to exceed its target, attempting to quicken a labor market recovery. The rise in inflation and the decrease in unemployment rate to 3.9% led the FOMC to reassess its expansionary monetary position. At the December Fed meeting, members anticipated three interest rate increases in 2022. The FOMC also announced its reduction in the purchases of Treasurys and agency mortgage-backed securities. Overall, broad U.S. indices finished the quarter at record levels with the S&P 500 Index returning 11% and the Russell 2000 Index up 2.1%. The strong returns largely resulted from a positive revision in earnings growth compared to the previous year. Internationally, the MSCI EAFE Index returned 2.7% while the MSCI EM Index fell 1.3%. Weakness overseas resulted from the relative strength of dollar assets combined with China's new regulations. Developed international markets were hurt less by the Omicron variant than emerging markets, and growth stocks outperformed value and large-cap stocks outperformed small-cap stocks. The U.S. Dollar Total Weighted Index appreciated.

In the third quarter, inflation accelerated as the United States entered one of the tightest labor markets in recent history. The unemployment rate finished the quarter at 3.6%, and average monthly non-farm payroll growth exceeded 561,000. Quit rates and job vacancies remained near all-time highs, and the labor force participation rate climbed to 62.4% by the quarter's end. Labor market dynamics led to persistent wage growth and higher inflation. The Federal Reserve Bank of Atlanta's (Atlanta Fed) wage growth tracker indicated year-over-year wage gains of 6% in March, up from levels closer to 3% over a year ago. CPI finished March at an annual rate of 8.5%, the highest level since 1981, while core inflation increased to 6.5%. The Atlanta Fed's GDPNow, an unofficial real-time estimation of gross domestic product (GDP) based on available data, lowered its Q3 growth forecast to 1%, largely due to significant inventory builds during the second half of 2021. Purchasing Managers' Indexes (PMI) indicated U.S. economic expansion lower than the prior 12 months. The ISM Manufacturing PMI finished the quarter at 57.1, while the Services PMI ended at 58.3, both well above 50 and firmly in expansionary territory. The S&P 500 Index fell 4.6%, its seventh negative quarter in the last 10 years. Internationally, inflation and global central banks drove market performance. The Russian-Ukrainian war and inflation-sensitive assets, like commodities, moving higher pushed central banks into increasingly hawkish territory. Volatility increased as both global equities and fixed income declined. Global equities finished the quarter down 5.4% as measured by the MSCI All Country World Index, and core bond prices fell 5.9%, the worst quarter for the Bloomberg U.S. Aggregate Bond Index since 1980. By contrast, commodities produced outsized gains in the quarter with the Bloomberg Commodity Index returning 25.5%. The U.S. Dollar Total Weighted Index appreciated.

During the fourth quarter, CPI increased to 9.1%, and core CPI (excluding food and energy) accelerated at a more modest 5.9%. The unemployment rate finished the fiscal year at 3.6%, and non-farm payroll growth averaged just under 375,000 per month. The United States had roughly two job openings for every unemployed individual according to the latest Job Openings and Labor Turnover Survey (JOLTS). The average annual wage growth accelerated at 6.7% based on a three-month moving average according to Atlanta Fed's wage tracker. The inflation dynamics and persistent labor market strength pushed the Fed to tighten monetary policy. The FOMC raised the federal funds rate by 0.75% at its June meeting. The Atlanta Fed's GDPNow indicated a modest contraction of growth in the quarter based in part on declining residential investment. Manufacturing and services PMIs were 53 and 55.3 at end of June, respectively. The S&P 500 declined 16.1% during the quarter, and core bonds fell 4.7%. Commodities declined 5.7% in the quarter. The inflationary environment worsened in the quarter, and, as a result, global central banks moved aggressively to tighten monetary policy. The European Central Bank announced a plan to end its asset purchase program and began raising interest rates at its July meeting, while the Bank of England moved similarly with a fifth straight 0.25% rate hike in June. Organization for Economic Cooperation and Development (OECD) reduced its full-year global GDP growth projection from 4.5% at the beginning of 2022 to 3% in June. Supply chain disruptions tied to the war in Ukraine and China's zero-COVID policy kept inflation elevated and eroded the consumers' purchasing power. Tightening financial conditions, falling growth and persistent inflationary pressure proved disastrous for investor portfolios. Equity and fixed income markets declined significantly during the quarter while credit spreads widened amid a difficult period for nearly all asset classes. Emerging market equities fell 11.4% in the quarter, modestly outperforming its developed market counterparts. China was the only emerging market to generate a positive return. The U.S. dollar was bid up 4.9% during the quarter on a trade-weighted basis as cross-currency flows favored the higher path of interest rates in the United States.

In summary, U.S. equity markets struggled amid a resurgence of COVID-19 infections and primarily its delta variant. This drove consumer behavior toward the purchase of physical goods instead of services and experiences. Consequently, supply chain strain increased and investor concern spiked over higher inflation rates and additional monetary stimulus. Inflation, rooted in the supply chain issues juxtaposed against increasing demand, increased to highs not seen in decades. Internationally, emerging markets and developed markets performed similarly with emerging markets slightly outpacing developed markets. Both performed worse than the U.S. market. The year ended at a point of uncertainty as investors continue to assess ranges of possible outcomes for the world's economies.

Real Estate

The Retirement Annuity Trust's real estate investments had a fair value of $1.69 billion as of June 30, 2022, representing 7.6% 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 the volatility of the overall portfolio. TRS's real estate portfolio outperformed last year's results in a year-over-year comparison with mixed returns versus its benchmarks for the fiscal year in each of its respective categories. The In-House Real Estate Equity Fund returned 4.04%, trailing its benchmark, the Consumer Price Index plus 2%, that returned 11.17%. Core funds, however, returned 31.14% to best the NCREIF ODCE's 29.51%. TRS's non-core funds return of 44.8% also beat the NCREIF Property Index's (NPI) 21.45%. TRS's combined real estate investments yielded 26.93% for the fiscal year, up from 6.74% the previous year.

The trust's real estate exposure is provided through 20 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. While 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 16 real estate limited partnerships: Carlyle Realty Partners VI, Carlyle Realty Partners VII, Carlyle Realty Partners VIII, Blackstone Real Estate Partners VII, Blackstone Real Estate Partners VIII, Blackstone Real Estate Partners IX, 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, Landmark Real Estate Partners VII and Landmark Real Estate Partners VIII.

Real Estate Overview

The commercial real estate market overall exceeded expectations in the first half of fiscal 2022. The multifamily and industrial markets outperformed historical trends while improving foot traffic heightened demand for segments of the retail sector. The office market experienced a weaker recovery. Overall, the economic backdrop supported a broad recovery for property fundamentals, but the disparities between sectors and geographies persisted.

Fiscal 2022 was a historic year for the U.S. industrial market with record-high rents amid extremely tight space conditions. Demand outpaced supply by a wide margin, almost 50%, with 502 million square feet absorbed. As a result, the vacancy rate fell to a record low 4.2%. The fiscal year's first half also saw record industrial sales alongside record price growth. Pricing surged 29.2%, the strongest across all property types. In line with industrial property prices hitting record highs, cap rates compressed to record lows.

After a pandemic-weakened fiscal 2021, unprecedented demand for U.S. multifamily properties in fiscal 2022 led to a historic improvement in fundamentals as evidenced by record demand of 705,000 units —more than double the pre-pandemic average of 327,000. Vacancy rates fell to a record-low of 4.6%, and the multifamily market experienced annual rent growth of 11.3% — a two-decade high. Across urban and suburban regions, asking rents recovered to, or surpassed, pre-pandemic levels in nearly every major market. The multifamily sector also reached record sales activity with annual volume of $335 billion, 74% higher than the previous record, sent cap rates to all-time lows while prices surged 23.6%.

Market fundamentals of the office market improved modestly as the spread of COVID-19 variants in the first half of the fiscal year slowed the recovery of the market. With improved demand, asking rents reported a slight uptick after falling for five consecutive quarters after the onset of the pandemic. The vacancy rate plateaued at 12.1% but remains above pre-pandemic levels. Office deal volume improved, up 50% from a year earlier but still well short of pre-pandemic levels. Suburban office buildings drew a greater percentage of investment than in the past and posted a 14.2% gain price versus the 3.3% pace of growth in commercial business district offices.

The retail sector exceeded expectations in the first half of fiscal 2022, as many retailers reported strong sales. A resurgence in tenant demand in the latter half of the year drove retail rents up 3.1% year-over-year, the strongest growth in more than a decade, while the vacancy rate fell to 4.6%, on par with pre-pandemic levels. Retail investment activity also rebounded with annual volume reaching $77 billion, the fourth highest on record. Pricing for the retail property sector posted a 21.5% gain after falling 2.7% in 2021, but shopping center sales still struggle to return to normal because of e-commerce and shifting consumer preferences.

Despite the economic headwinds, favorable property fundamentals continued through the second half of fiscal 2022 for most commercial real estate sectors. The multifamily and industrial markets continued to benefit from positive, structural demand dynamics while a persistent housing shortage sustained the need for multifamily housing., Global supply chain disruptions added emphasis on warehouse, distribution and manufacturing spaces. Meanwhile, the retail sector saw demand strengthen as elevated consumer spending relative to pre-pandemic levels encouraged many retailers to resume expansion plans. However, the office market continued to experience weak demand.

The U.S. industrial sector continued to see strong growth with demand outpacing supply for the seventh quarter in a row by year end. Leasing activity remained high, 60% above pre-pandemic levels with no sign of slowing. A diverse range of third-party logistics firms, retailers and manufacturers helped power leasing even as Amazon slowed its expansion. Rent growth of 11.6% further indicated the space market had yet to tilt in tenants' favor. The U.S. multifamily sector continued to perform well although the tight market conditions that characterized 2021 began to ease in the second half following the pandemic-related spikes in demand. Vacancies remain limited at just 5%, well below the 6.3% pre-pandemic five-year average. Occupancy gains were limited by the lack of availability.

The office sector performance was characterized by unevenness. Office demand continued to be positive in fiscal 2022, after turning positive the year before. Yet the office market only has regained 18% of the occupancy losses that followed the pandemic. In contrast, office-using employment, which has been historically highly correlated with office demand, increased 3.2% in the fiscal year. The dichotomy is no surprise as many firms remain committed to flexibility and hybrid workplace schedules that keeps utilization well below pre-pandemic levels.

With a slight improvement in leasing activity, office rent growth was a modest 1.2% year-over-year. The vacancy rate remains elevated at 12.2%, and new supply continues to add to the existing space overhang.

Retail real estate performed strongly in the second half of fiscal 2022. Foot traffic at retail destinations returned to levels seen just prior to the pandemic. Net absorption reached well above pre-pandemic averages and significantly outpaced new supply for the fifth consecutive quarter. Rent growth accelerated 4.6% in the fourth quarter, the fastest pace in more than a decade.

The retail sector recovery has been aided by a limited amount of construction activity with the 46 million square feet of new retail space representing the lowest amount in two decades. The combination of solid demand and limited new supply has kept vacancy rates on a downward trajectory. The overall vacancy rate continued to move lower to 4.4% in the second half, the lowest rate recorded since 2018.

Despite financial market challenges, investment sales activity remained strong through the second half. U.S. property transactions reached $169 billion in the fourth quarter, up 17% year-over-year, but the pace of transactions slowed over the quarter. With persistent inflation and interest rates increasing the cost of capital, some capital-chasing real estate has been diverted, and demand has eased slightly as the market began an expected pattern of normalization. Capital markets prices climbed 18.5% from a year ago supported by gains in the industrial and multifamily sectors.

Consistent with the property market fundamentals and pricing activity, strong overall investment performance was driven by the strength of the industrial and multifamily sectors. U.S. real estate posted a rolling annual return of 21.45%.

Alternative Investments
As of June 30, 2022, the Retirement Annuity Trust's alternative investments portfolio, which consisted of private equity and timberland, had a market value of $2.29 billion. The percentage of the trust's portfolio in alternative investments was 10.2%.

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 first half of the fiscal year, proved to be strong for private equity. U.S. private equity deals eclipsed $1 trillion in value and set several records. All this activity came despite numerous headwinds, including COVID-19 variants, inflation and a higher regulatory burden. Some of the higher volume resulted from deals being pushed back from 2020 because of COVID-19-related uncertainty. Along with new deals, the market also saw a wave of exits and strong distributions to limited partners.

The second half of the fiscal year was a bit weaker as interest rates rose and financing became more expensive. An uptick in take-private deals was seen as private equity firms looked to deploy large amounts of dry powder and falling public valuations make take-private assets less expensive. The private equity market continued to see a strong appetite for technology assets, with those assets accounting for about 27% of all deal activity in the quarter that ended June 30.

Private equity sponsors continued to strengthen existing portfolio companies, particularly those in industries − such as hospitality, retail and travel − that had been hardest hit by the pandemic.

Timberland
As of June 30, 2022, the Retirement Annuity Trust owned about 226,000 acres of timberland outright and is a member of a joint venture that has an interest in about 30,000 acres of timberland 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 equities 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 year ended June 30, 2022, proved positive for timber returns with the NCREIF Timberland Index returning 12.01%. Appreciation accounted for 8.38% of the return, while income was 3.41%.

The U.S. housing market and lumber prices were frequent headlines in the past year as new home construction did not keep up with the demand and underbuilt inventory in the U.S. supply chain further tightened supplies. Consequently, homebuilders were slower to complete homes due to material sourcing. Given the shortage of homes and these supply-side constraints, lumber demand is expected to remain at historical highs into the future. Rising mortgage rates recently have somewhat dampened demand for new housing, a welcome market dynamic for many areas as housing prices have far outpaced wage growth making affordability an issue for some homebuyers.

The past year also was positive for timberland owners as the market saw a higher level of interest in timberland for alternative uses. With timberland seen as a vital resource and key natural climate solution, the sector saw an increased interest in the market for carbon, solar and natural climate solutions from investors and public entities – a trend that should remain positive for timberland owners well into the future. Lastly, a renewed interest in timberland from traditional and non-traditional buyers is pushing the market for quality timberland properties.

Retirement Annuity Trust
Fair Value as of June 30, 2022

Internally managed	
Cash equivalents (unallocated)	$418,588,882
Fixed income	
Broad Market Bond	832,176,935
Intermediate Bond	545,932,925
Internal Bond	161,561,421
Long Term Bond	813,819,220
403(b) Tax-Sheltered Trust	303,859
Equity	
S&P 400 Stock Index	271,621,876
S&P 500 Stock Index	2,274,158,357
S&P 600 Stock Index	245,967,125
In-house Real Estate	402,120,072
In-house High Yield	186,282,727
Subtotal	$6,152,533,399
Externally managed	
Fixed income	
Galliard Capital Management Core Fixed	667,208,980
Fort Washington Core Fixed Income	676,096,434
Domestic equity	
Baillie Gifford US Equity Growth	252,024,704
Fort Washington Focused Equity	481,706,896
State Street US Premier Growth Equity	788,964,694
Todd Asset Intrinsic Value Opportunity	542,059,724
Todd Asset Large Cap Intrinsic Value	1,130,671,515
UBS Alpha Equity	342,732,216
UBS Value Oriented (Global)	775,255,747
Wellington Large Cap Equity	708,993,199
Wellington Mid Cap Equity	393,245,299
Wellington Small Cap Equity	201,032,684
International equity	
Baillie Gifford EAFE	1,012,364,022
Barings All Country World Ex US	642,602,519
BlackRock MSCI ACWI Ex US IMI Index	518,042,932
Todd Asset International Intrinsic Value	760,247,096
Todd Asset International Intrinsic	84,854,826
UBS All Country World Ex US Equity	947,450,762
Real estate	
Angelo Gordon Net Lease Realty III	44,810,113
Angelo Gordon Net Lease Realty IV	30,400,219
Blackstone Partners VII	12,689,367
Blackstone Partners VIII	42,400,253
Blackstone Partners IX	46,541,181
Carlyle Realty Partners VI	4,075,141
Carlyle Realty Partners VII	13,770,629
Carlyle Realty Partners VIII	28,786,274
Carlyle Property Investors	94,325,185
Landmark Real Estate Partners VII	10,482,668
Landmark Real Estate Partners VIII	22,816,368
Prudential PRISA	$ 490,290,301
Rockwood Capital Real Estate IX	9,079,228
Rockwood Capital Real Estate X	34,354,380
Rockwood Capital Real Estate XI	48,716,951
TA Realty Core Property	226,034,141
The Realty Associates X	35,178
The Realty Associates XI	55,819,275
The Realty Associates XII	76,081,012
Alternative investments	
Actis Global IV	34,366,270
Alinda Infrastructure II	10,926,387
Alpine Investors Co-Investment VIII	22,530,004
Alpine Investors Secondaries VII	15,294,857
Apax VIII	12,283,709
Apax IX	66,688,015
Apax X	28,963,366
Apax Digital	58,061,489
Audax Mezzanine III	1,241,529
Audax Mezzanine IV	8,865,491
Audax Mezzanine V	1,628,994
Audax Private Equity IV	108,647
Audax Private Equity V	20,330,235
Audax Private Equity VI-A	35,656,244
Baillie Gifford Private Companies II	17,899,342
CapitalSouth Partners III	1,014,579
Carlyle Asia Partners V	30,938,445
Carlyle Europe Partners IV	33,488,431
Carlyle Europe Partners V	31,524,066
Carlyle Renewable and Sustainable Energy	31,252,291
Fort Washington VIII	32,118,350
Fort Washington IX	43,015,079
Fort Washington IX-K	44,805,952
Fort Washington X	22,310,698
Fort Washington X-S	17,643,848
Fort Washington Opportunities IV	12,169,248
Fort Washington Opportunities IV-K	15,051,399
Gavea Investments V	9,540,416
Hellman & Friedman Capital VII	10,471,749
Hellman & Friedman Capital VIII	79,374,934
IFM Global Infrastructure	221,103,801
J.P. Morgan Global Maritime	45,964,249
J.P. Morgan Global Maritime II	204,524
J.P. Morgan Global Transport Income	77,500,956
KKR 2006	2,504,045
KKR European III	2,220,062
KKR European IV	34,014,403
KKR European V	45,631,281
KKR Americas XII	75,189,737
KKR Health II	738,824
Landmark Equity Partners XIV	2,752,847

Landmark Equity Partners XV	$ 11,543,999	Stepstone Pioneer Capital III	$ 9,057,448
Landmark Equity Partners XVI	29,749,429	**Additional categories**	
Lexington Capital Partners VII	4,920,901	Avenue Special Situations VI	11,234,572
Lexington Capital Partners VIII	25,437,104	Barings European Loan	92,340,000
Lexington Capital Partners IX	44,618,643	Columbia High Yield Bond	183,640,990
Molpus Lake Superior Timberlands	436,196,088	Fort Washington High Yield Bond	271,336,649
Molpus Seven States	47,273,515	Highbridge Specialty Loan III	886,617
NGP Natural Resources X	6,467,590	Lord Abbett High Yield Core	90,857,463
NGP Natural Resources XI	41,145,161	Marathon European Credit Opportunities II	7,891,947
NGP Natural Resources XII	40,254,113	Marathon European Credit Opportunities III	70,245,401
Oaktree European Principal III	15,844,269	Marathon TRS Credit	603,419,252
Oaktree European Principal IV	43,270,839	Oaktree European Capital Solutions	20,001,196
Oaktree European Principal V	40,910,464	Oaktree European Dislocation	605,710
Oaktree Mezzanine III	302,323	Oaktree Opportunities IX	37,536,829
Oaktree Mezzanine IV	4,962,316	Oaktree Opportunities X	17,148,965
Oaktree Mezzanine V	17,488,241	Oaktree Opportunities Xb	44,497,084
Public Pension Capital	143,125,278	Shenkman Capital Management	312,644,429
Riverstone/Carlyle Energy and Power IV	259,099	**Subtotal**	$ 16,273,614,025
Riverstone Energy and Power V	9,767,493		
Riverstone Energy and Power VI	40,413,415	**Total***	$ 22,426,147,424
Silver Lake Alpine II	21,868,287		

*Includes 403(b) Tax Sheltered Trust of $303,859

Life Insurance Trust
Fair Value as of June 30, 2022

Internally managed

Cash equivalents (unallocated)	$	1,740,624
Fixed income		
Broad Market Bond		21,754,900
Equity		
S & P 400 Stock Index		5,059,630
S & P 500 Stock Index		22,293,290
S & P 600 Stock Index		1,109,006
Additional categories		
In-House High Yield Bond		778,644
Subtotal	$	52,736,094

Externally managed

Domestic equity		
Baillie Gifford US Equity Growth	$	3,671,636
Fort Washington Focused Equity		1,559,150
International equity		
Baillie Gifford EAFE		2,292,086
BlackRock All Country World ex US IMI		14,702,923
Real estate		
Angelo Gordon Net Lease Realty IV		304,002
Carlyle Property Investors		1,617,536
Rockwood Capital Real Estate Partners XI		286,570
TA Realty Core Property		4,520,683
The Realty Associates XII		760,810
Alternative investments		
AlpInvest Co-Investment VIII		225,300
AlpInvest Secondaries VII		152,948
Apax X		289,636
Audax Mezzanine V		16,290
Baillie Gifford Private Companies II		85,643
Carlyle Renewable and Sustainable		312,523
Fort Washington PE Opportunities IV		188,964
Fort Washington PE Opportunities IV-K		199,093
Fort Washington X		318,728
Fort Washington X-S		252,056
Lexington Capital Partners IX		446,220
Oaktree European Principal V		420,996
Oaktree Mezzanine V		174,882
Silver Lake Alpine II		200,630
Additional categories		
Marathon TRS Credit		2,130,839
Subtotal	$	35,130,144
Total	$	87,866,238

Retirement Annuity Trust
Investment Summary — Fair Value*
as of June 30, 2022

	Fair Value June 30, 2021	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2022	Percent
Cash equivalents	$ 1,065,314,674	$ 4,732,097,006		$ 4,779,215,136	$ 1,018,196,544	4.5
Fixed income	3,627,641,860	1,613,407,607	(497,571,900)	1,498,917,345	3,244,560,222	14.5
Real estate	1,405,889,580	137,997,706	325,614,682	175,874,033	1,693,627,935	7.6
Alternative investments	1,758,133,237	1,241,503,622	416,786,146	1,124,158,198	2,292,264,807	10.2
Equities	16,068,066,132	3,058,464,778	(3,240,496,032)	3,618,953,508	12,267,081,370	54.7
Additional categories	1,803,453,179	811,190,426	(91,703,449)	612,827,469	1,910,112,687	8.5
Total	$ 25,728,498,662	$ 11,594,661,145	$(3,087,370,553)	$ 11,809,945,689	$ 22,425,843,565	100.0

Life Insurance Trust
Investment Summary — Fair Value
as of June 30, 2022

	Fair Value June 30, 2021	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2022	Percent
Cash equivalents	$ 9,405,976	$ 9,740,827	$	$ 10,801,425	$ 8,345,378	9.5
Fixed income	20,043,254	1,876,867	(2,970,122)	1,077,931	17,872,068	20.4
Equities	68,281,332	2,128,672	(16,001,962)	6,344,453	48,063,589	54.7
Real estate	5,181,114	518,478	1,921,527	131,517	7,489,602	8.5
Alternative investments	1,420,801	1,955,258	511,626	603,777	3,283,908	3.7
Additional categories	2,549,353	309,463	45,526	92,649	2,811,693	3.2
Total	$ 106,881,830	$ 16,529,565	$ (16,493,405)	$ 19,051,752	$ 87,866,238	100.0

Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2022
(Dollars in thousands)

Investment counselor fees	Assets Under Management	Expense
Equity manager(s)	$ 9,582,249	$ 21,571
Fixed income manager(s)	1,343,305	653
Real estate	1,291,508	13,579
Additional categories	1,764,287	7,262
Alternative investments	2,292,265	15,755
Subtotal	$ 16,273,614	$ 58,820
Administrative expenses		5,152
Total		$ 63,972
Basis Points*		28.5

*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 $22.43 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, 2022
(Dollars in thousands)

Investment counselor fees	Assets Under Management	Expense
Equity manager(s)	$ 22,226	$ 40
Real estate	7,489	67
Alternative investments	3,284	58
Additional categories	2,131	2
Subtotal	$ 35,130	$ 167
Administrative expenses**		335
Total		$ 502

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Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2022

Investment counselor fees	
Fixed income	
Galliard Capital Core Fixed Income	339,347
Fort Washington Core Fixed Income	314,172
Total fixed income	653,519
Domestic equity	
Baillie Gifford US Equity Growth	966,083
Fort Washington Focused Equity	1,948,412
State Street US Premier Growth Equity	800,000
Todd Asset Management	999,158
UBS Global Asset Management	2,314,723
Wellington Management Company	4,362,255
Total domestic equity	11,390,631
International equity	
Baillie Gifford EAFE	5,018,638
Barings All Country World ex US	3,038,453
BlackRock MSCI ACWI Ex US IMI Index	303,039
Todd Asset Management	500,842
UBS All Country World ex US Equity	1,320,000
Total international equity	10,180,972
Real estate	
Angelo Gordon Net Lease Realty III	1,042,154
Angelo Gordon Net Lease Realty IV	542,060
Blackstone Partners VII	190,760
Blackstone Partners VIII	455,105
Blackstone Partners IX	750,000
Carlyle Realty Partners VI	53,680
Carlyle Realty Partners VII	223,542
Carlyle Realty Partners VIII	571,482
Carlyle Property Investors	839,345
Landmark Real Estate Partners VII	132,503
Landmark Real Estate Partners VIII	457,106
Prudential PRISA	3,305,785
Rockwood Capital Real Estate IX	518,557
Rockwood Capital Real Estate X	655,000
Rockwood Capital Real Estate XI	693,075
TA Realty Core Property	1,559,606
The Realty Associates X	10,172
The Realty Associates XI	693,046
The Realty Associates XII	886,040
Total real estate	13,579,018

Alternative investments	
Actis Global IV	694,021
Alinda Infrastructure II	79,671
Alpine Investors Co-Investment VIII	624,125
AlpInvest Secondaries VII	439,668
Apax VIII	152,571
Apax IX	497,056
Apax X	603,429
Apax Digital	541,619
Audax Mezzanine III	33,829
Audax Mezzanine IV	131,781
Audax Private Equity IV	—
Audax Private Equity V	—
Audax Private Equity VI	—
Baillie Gifford Private Companies II	53,804
CapitalSouth Partners III	—
Carlyle Asia Partners V	700,780
Carlyle Europe Partners IV	293,912
Carlyle Europe Partners V	662,256
Carlyle Global Financial Services Partners II	(3,991,614)
Carlyle Global Financial Services Partners III	(2,494,653)
Carlyle Renewable and Sustainable Energy	1,275,334
Fort Washington VIII	122,677
Fort Washington IX	126,000
Fort Washington IX-K	126,000
Fort Washington X	124,338
Fort Washington X-S	124,336
Fort Washington Opportunities IV	461,541
Fort Washington Opportunities IV-K	541,809
Gavea Investments V	145,169
Hancock Bluegrass-Oregon	—
Hellman & Friedman Capital Partners VII	17,368
Hellman & Friedman Capital Partners VIII	287,893
IFM Global Infrastructure	2,053,229
J.P. Morgan Global Maritime	468,772
J.P. Morgan Global Maritime II	23,199
J.P. Morgan Global Transport Income	646,695
KKR 2006	40,828
KKR European III	29,637
KKR European IV	283,173
KKR European V	456,675

KKR Americas XII	253,111
KKR Health II	649,883
Landmark Equity Partners XIV	48,060
Landmark Equity Partners XV	292,890
Landmark Equity Partners XVI	500,000
Lexington Capital Partners VII	21,250
Lexington Capital Partners VIII	276,464
Lexington Capital Partners IX	386,657
Molpus Lake Superior Timberlands	787,696
Molpus Seven States	419,495
NGP Natural Resources X	157,652
NGP Natural Resources XI	478,505
NGP Natural Resources XII	728,482
Oaktree European Principal III	308,459
Oaktree European Principal IV	748,539
Oaktree European Principal V	592,161
Oaktree Mezzanine III	—
Oaktree Mezzanine IV	215,628
Oaktree Mezzanine V	106,170
Public Pension Capital	1,813,979
Riverstone/Carlyle Energy and Power IV	15,622
Riverstone Energy and Power V	142,635
Riverstone Energy and Power VI	354,932
Silver Lake Alpine II	3,748
Stepstone Pioneer Capital III	75,675
Total alternative investments	**15,754,621**
Additional categories	
Avenue Special Situations VI	—
Barings European Loan	445,698
Columbia High Yield Bond	764,365
Fort Washington High Yield Bond	616,767
Highbridge Specialty Loan III	—
Lord Abbett High Yield Core	332,930
Marathon European Credit Opportunities II	—
Marathon European Credit Opportunities III	1,057,031
Marathon TRS Credit	978,420
Oaktree European Capital Solutions	334,158
Oaktree European Dislocation	34,325
Oaktree Opportunities IX	450,458
Oaktree Opportunities X	256,319
Oaktree Opportunities Xb	783,280
Shenkman Capital Management	1,208,288
Total additional categories	**7,262,039**
Total investment counselor fees	**58,820,800**
Administrative expenses	
Custodian	
Bank of New York Mellon	705,535
Legal and research	
Ice Miller	102,691
Other	
Other administrative and operational	3,874,572
Consultant	
Aon Hewitt	388,850
Bevis Longstreth	50,000
George Philip	30,000
Total consultant	468,850
Total administrative expenses	**5,151,648**
Grand total	**63,972,448**

Life Insurance Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2022

Investment counselor fees	
Domestic equity	
Baillie Gifford US Equity Growth	$ 12,998
Fort Washington Focused Equity	6,317
Total domestic equity	19,315
International equity	
Baillie Gifford EAFE Alpha	12,441
BlackRock All Country World ex US IMI	7,698
Total international equity	20,139
Real estate	
Angelo Gordon Net Lease Realty IV	5,422
Carlyle Property Investors	15,770
Rockwood Capital Real Estate Partners XI	5,662
TA Realty Core Property	31,192
The Realty Associates XII	8,861
Total real estate	66,907
Alternative investments	
AlpInvest Co-Investment VIII	6,241
AlpInvest Secondaries VII	4,396
Apax X	6,033
Baillie Gifford Private Equity Companies II	258
Carlyle Renewable and Sustainable Energy	12,754
Fort Washington PE Opportunities IV	7,168
Fort Washington PE Opportunities IV-K	7,169
Fort Washington X	1,775
Fort Washington X-S	1,776
Lexington Capital Partners IX	3,868
Oaktree European Principal V	5,921
Oaktree Mezzanine V	1,062
Silver Lake Alpine II	41
Total alternative investments	58,462
Additional categories	
Marathon TRS Credit	1,901
Total investment counselor fees	**$166,724**

Administrative expenses		
Custodian		
Bank of New York Mellon	$	42,569
Other		
Other administrative and operational		292,778
Total administrative expenses	**$**	**335,347**
Grand total	**$**	**502,071**

Retirement Annuity Trust
Ten Largest Stock Holdings Ranked by Fair Value*
June 30, 2022

		Fair Value	Percent of Equities
1	Microsoft Corp.	$ 355,486,108	2.87
2	Apple	317,092,235	2.56
3	Amazon.com	203,065,023	1.64
4	United Health Group	154,144,472	1.24
5	Alphabet Class C	136,979,567	1.11
6	Alphabet Class A	128,497,375	1.04
7	Qualcomm	87,924,336	0.71
8	Visa	87,158,084	0.70
9	Abbvie	80,099,310	0.65
10	Tesla	71,269,385	0.58

*Includes only actively managed separate accounts. Detailed information concerning the fair value of all TRS investments is available on the TRS website.

Retirement Annuity Trust
Ten Largest Fixed Income Holdings Ranked by Fair Value*
June 30, 2022

		Maturity	Coupon	Par Value	Fair Value	Percent of Fixed Income
1	U.S. Treasury Note	Oct. 31, 2025	0.250	$123,350,000	$112,533,439	3.03
2	U.S. Treasury Note	Feb. 15, 2031	1.125	65,000,000	55,991,650	1.51
3	Federal Home Loan Mortgage Corp.	Sep. 8, 2023	0.250	53,000,000	51,384,560	1.38
4	U.S. Treasury Bond	Feb. 15, 2051	1.875	60,017,000	45,413,664	1.22
5	U.S. Treasury Bond	Aug. 15, 2050	1.375	56,500,000	37,535,210	1.01
6	U.S. Treasury Bond	Feb. 15, 2052	2.250	40,045,000	33,237,350	0.90
7	U.S. Treasury Bond	Aug. 15, 2023	6.250	31,900,000	33,097,526	0.89
8	U.S. Treasury Note	May 15, 2024	2.500	31,000,000	30,747,040	0.83
9	U.S. Treasury Bond	May 15, 2040	1.125	41,165,000	28,826,615	0.78
10	U.S. Treasury Bond	Aug. 15, 2029	6.125	22,000,000	26,379,320	0.71

*Detailed information concerning the fair value of all TRS investments is available on the TRS website.

Transaction Commissions for the Year Ended June 30, 2022

Companies	Shares Traded	Commissions	Commission Per Share	Percent of Total
Abel Noser	1,929,325	$ 19,293	$ 0.010	2.25
Allen & Co.	47,787	1,434	0.030	0.17
Bank of America	534,393	10,594	0.020	1.24
Barclays	963,192	14,826	0.015	1.73
Barclays Capital London	1,500	—	0.000	0.00
Blair, William & Co.	63,332	1,325	0.021	0.15
BMO Capital Markets	400,190	13,818	0.035	1.61
BTIG	528,822	17,689	0.033	2.06
Canaccord Genuity	107,373	2,844	0.026	0.33
Cantor Fitzgerald & Co.	102,999	2,850	0.028	0.33
CIBC Worldmarket	1,781	71	0.040	0.01
Citigroup Global	209,980	3,751	0.018	0.44
ConvergEx - Algos	13,487,347	70,166	0.005	8.18
ConvergEx - FS	3,014,472	15,072	0.005	1.76
ConvergEx - Transitions	4,502,150	22,511	0.005	2.62
ConvergEx ADR Conversions	13,747,154	2,343	0.000	0.27
Cornerstone	115,000	3,450	0.030	0.40
Cortview Capital	10,096	81	0.008	0.01
Cowen & Co.	890,427	11,352	0.013	1.32
Credit Suisse Securities	1,119,487	26,300	0.023	3.07
Cuttone & Co.	4,013	40	0.010	0.00
Deutsche Bank	33,848	—	0.000	0.00
Evercore Group	131,180	3,658	0.028	0.43
Global Liquidity Partners	2,392	18	0.008	0.00
Goldman Sachs	704,018	13,401	0.019	1.56
Guggenheim Capital Markets	3,209	125	0.039	0.01
Instinet	66,596	748	0.011	0.09
Investment Tech Grp Transition	23,677,341	177,581	0.008	20.71
Investment Technology Group	97,419	971	0.010	0.11
ISI Algos	1,119,100	11,191	0.010	1.30
ISI Group	754,400	22,632	0.030	2.64
J.J.B. Hilliard, W.L. Lyons	105,800	3,174	0.030	0.37
Janney Montgomery Scott	4,092	82	0.020	0.01
Jefferies & Co.	1,147,670	14,324	0.012	1.67
JMP Securities	66,966	1,372	0.020	0.16
Jones & Associates	51,773	1,931	0.037	0.23
JP Morgan & Chase	659,619	16,501	0.025	1.92
Keefe Bruyette & Woods	5,169	154	0.030	0.02
Keybanc Capital	67,519	1,971	0.029	0.23
Leerink Swann & Co.	15,811	367	0.023	0.04

Continued on next page

Companies	Shares Traded	Commissions	Commission Per Share	Percent of Total
Liquidnet	3,263,032	32,377	0.010	3.78
Liquidnet - Transition	1,423,836	7,124	0.005	0.83
Loop Capital Markets	25,819	516	0.020	0.06
Luminex Trading	2,158	11	0.005	0.00
Maxim Group	3,726	75	0.020	0.01
Merrill Lynch	952,238	28,264	0.030	3.30
Mischler Financial Group	13,028	245	0.019	0.03
Mizuho Securities USA	23,618	468	0.020	0.05
MKM Partners	13,255	483	0.036	0.06
Morgan Stanley	1,985,802	25,184	0.013	2.94
National Financial Services Corp	1,200	36	0.030	0.00
Needham	39,778	820	0.021	0.10
Oppenheimer & Co.	35,050	1,108	0.032	0.13
Pershing	27,851	388	0.014	0.05
Piper Jaffray	1,070,700	26,902	0.025	3.14
Piper Sandler & Co.	114,512	2,192	0.019	0.26
R W Baird	246,894	7,686	0.031	0.90
Raymond James & Assoc.	1,358,057	40,734	0.030	4.75
Raymond James Algos	68,070	681	0.010	0.08
RBC Capital Markets	4,760,185	27,969	0.006	3.26
RBC Transitions	1,806,957	9,036	0.005	1.05
Sanford C. Bernstein	324,124	3,278	0.010	0.38
Scotia Capital USA	117,578	877	0.007	0.10
Siebert Brandford Shank & Co.	9,830	79	0.008	0.01
Stephens	73,800	1,944	0.026	0.23
Stifel, Nicolaus & Co.	428,742	12,855	0.030	1.50
Stifel, Nicolaus & Co. Louisville	141,054	4,289	0.030	0.50
Stonex Group	807,805	8,078	0.010	0.94
Stuart Frankel	8,581	86	0.010	0.01
Suntrust Robinson	4,500	138	0.031	0.02
Tradebook	4,366,264	21,831	0.005	2.55
UBS Financial Services	820,454	15,019	0.018	1.75
Virtu Americas	6,447,370	64,316	0.010	7.50
Wachovia / First Clearing Corp.	60,230	1,911	0.032	0.22
Wedbush Morgan Securities	4,900	119	0.024	0.01
Wells Fargo Securities	15,373	461	0.030	0.05
Zacks & Co.	2,447	18	0.007	0.00
Totals*	101,363,560	$ 857,610	$ 0.008	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 2022, the Retirement Annuity Trust bought small capitalization IPOs that generated $178,690 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 regularly votes proxy statements associated with its equity ownership. The positions assumed by TRS are intended to represent the financial interests of the membership. The board has adopted a policy that directs the staff not to subjugate the financial concerns of TRS to social or political protests. At the same time, TRS expects the companies in which it acquires stock to be solid corporate citizens that abide by federal, state and local laws. The board has adopted the following position on corporate behavior.

The board's stated fiduciary duty is to obtain the highest return for the fund commensurate with acceptable levels of risk. This implies that non-financial considerations cannot take precedence to pure risk/return considerations in the evaluation of investment decisions. However, action taken by the fund as a share owner can be instrumental in encouraging action as a responsible corporate citizen by the companies in which the fund has invested.

The board expects the management of companies whose equity securities are held in the fund's portfolio to conduct themselves with propriety and with a view toward social considerations. A level of performance above minimum adherence to the law is generally expected. If any improper practices come into being, the board expects corporate management to move decisively to eliminate them and effect adequate controls to prevent recurrence.

On the other hand, the board does not intend to supplant the duties that are the responsibility of federal or state regulatory agencies, such as the Equal Employment Opportunity Commission, the Environmental Protection Agency, the Occupational Safety and Health Agency, the Nuclear Regulatory Commission, the Securities and Exchange Commission and others that are covered by U.S. and Kentucky laws.

Should satisfaction of the board's criteria by any company not be adequate, the board will consider what action to take, which may include, but not be limited to, correspondence with the company, meetings with company officials, sponsoring of shareholder resolutions or, as a last resort, liquidation of TRS's holdings in the company, if the sale is consistent with sound investment policy.

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 anually to members and annuitants living in Kentucky. Approximately $328.4 million of the Retirement Annuity Trust's investments directly impact the commonwealth. 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 companies which have an impact on the commonwealth's economy but receive earnings from global operations. Fiduciary duty requires that investments be made solely for the benefit of the retirement system's members and annuitants. Investments which benefit the commonwealth's economy are made only when fully consistent with this fiduciary duty.

Professional Service Providers

Investment consultant
Aon

Investment custodian
Bank of New York Mellon

Fixed income managers
Fort Washington Investment Advisors
Galliard Capital Management

Domestic equity managers
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
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

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. As near-term liquidity needs recede in importance, the focus increasingly has been 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

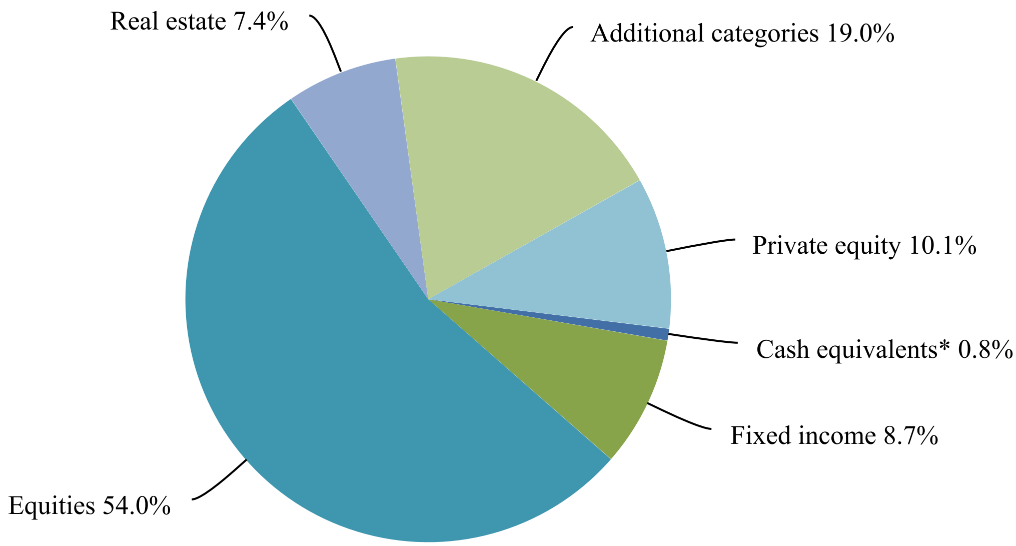
As of June 30, 2022, the Health Insurance Trust had $2.03 billion in assets. This included $176.3 million in investment-grade bonds. This trust also had $182.7 million in high-yield bonds, $1.1 billion in public equity investments, $204.9 million in private equity, $74.2 million in bank loans, $129.7 million in alternative credit funds and $150.2 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, 2022 and 2021.

	June 30, 2022	Percent	June 30, 2021	Percent
Cash equivalents*	$ 16,585,256	0.8	$ 109,572,850	4.9
Fixed income	176,287,536	8.7	192,012,876	8.7
Global equity	1,099,199,886	54.0	1,275,845,514	57.5
Real estate	150,214,503	7.4	111,459,521	5.0
Private equity	204,919,106	10.1	170,660,050	7.7
Additional categories	386,629,645	19.0	359,849,495	16.2
Totals	$ 2,033,835,932	100.0	$ 2,219,400,306	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, 2022



*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
Strategic Weightings by Asset Class

	Strategic Range (FV)	Target (FV)	June 30, 2022 (FV)*
Cash equivalents	0-5%	1%	0.8%
Fixed income	6-14	9	8.7
Equity	51-64	58	54.0
Real estate	4-12	6.5	7.4
Alternative investments*	5-12	8.5	10.1
Additional categories	14-25	17	19.0
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 2022, the Health Insurance Trust's portfolio declined 9.43% versus a policy index decline of 10.05%. The fund's public equity fell 20.01% versus a 16.49% decline for the MSCI All Country World IMI Index. A high-quality bond fund fell 8.11% versus a drop of 10.85% for the Barclays Government/Credit Index. Additional categories declined 3.96% versus a 12.69% drop 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 2022 was $ 12.6 million, consisting by asset class of $5.4 million in private equity, $5.6 million in private real estate and $1.6million in private credit.

Schedule of Investment Results — Gross

	1-year	3-year*	5-year*	10-year*
Total Plan	**-9.43**	**6.95**	**7.26**	**7.53**
Policy benchmark**	-10.05	6.25	6.72	
Equity	**-20.01**	**6.04**	**6.86**	
All cap equity	**-44.45**	**2.94**	**5.06**	
S&P 500 Index	-10.62	10.60		
Russell 3000	-13.87	9.77	10.60	
Global equity	**-16.49**	**6.27**	**7.00**	**9.09**
MSCI AC World IMI (Net)	-16.52	5.98	6.70	8.71
Fixed income	**-8.11**	**0.37**	**1.64**	**1.52**
Barclays Government Credit	-10.85	-0.77	1.05	1.67
Total real estate	**42.12**	**19.02**	**15.61**	
Core real estate	**35.49**	**15.63**	**12.67**	
NCREIF ODCE (VW)	29.51	12.66	10.54	
Non-core real estate	**49.05**	**22.29**	**18.27**	
NCREIF Property Index	21.45	10.22	8.86	
Private equity	**30.88**	**22.69**	**19.73**	**18.13**
Mature private equity	**40.50**	**22.82**	**20.69**	**16.64**
S&P 500 plus 3%	-7.93	13.92	14.65	16.35
Private equity < 5 Years	**15.81**	**19.26**	**17.67**	
Additional categories	**-3.96**	**2.87**	**3.90**	**4.85**
B of A Merrill Lynch High Yield Master II	-12.69	-0.05	1.95	4.40
Cash (unallocated)	**1.23**	**0.86**	**1.29**	**0.75**
90-day Treasury Bill	0.17	0.63	1.11	0.63

*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

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, 2022

Internally managed			
Cash collections (unallocated)	$ 16,585,256	Carlyle Europe V	$ 6,109,316
Fixed income		Carlyle Renewable & Sustainable Energy	6,250,457
Internal Bond	176,287,536	Fort Washington PE Opportunities III	1,726,438
In-house High Yield	7,032,132	Fort Washington VII	2,510,995
Subtotal	$ 199,904,924	Fort Washington VIII	9,176,674
		Fort Washington IX	12,289,883
Externally managed		Fort Washington IX-K	12,801,700
Domestic equity		Fort Washington X	3,187,241
Baillie Gifford US Equity Growth	41,842,130	Fort Washington X-S	2,520,549
Fort Washington Focused Equity	53,482,129	Fort Washington IV	1,889,635
International equity		Fort Washington IV-K	1,990,926
BlackRock B	1,003,875,627	KKR European IV	6,802,885
Real estate		KKR European V	4,563,126
Angelo Gordon Net Lease Realty IV	6,080,043	KKR Americas XII	15,037,950
Blackstone Partners VIII	8,480,049	KKR Health II	105,548
Blackstone Partners IX	4,654,118	Landmark Equity Partners XV	1,924,001
Carlyle Realty Partners VII	2,754,127	Landmark Equity XVI	5,949,887
Carlyle Realty Partners VIII	5,520,288	Lexington Capital Partners IX	4,461,882
Carlyle Property Advisors	18,847,524	NGP Natural Resources XI	8,229,038
Landmark Real Estate Partners VII	2,096,535	NGP Natural Resources XII	8,050,826
Landmark Real Estate Partners VIII	4,273,290	Oaktree European Principal IV	8,654,170
Prudential PRISA	17,418,513	Oaktree European Principal V	4,091,047
Rockwood Capital Real Estate X	6,887,673	Oaktree Mezzanine V	1,748,824
Rockwood Capital Real Estate XI	8,597,109	Riverstone E & P VI	8,082,685
The Realty Associates XI	11,163,856	Silver Lake Alpine II	4,012,520
The Realty Associates XII	15,216,204	**Additional categories**	
TA Realty Core Property	38,225,175	Columbia High Yield	57,461,003
Alternative investments		Fort Washington High Yield Bond	61,003,149
Actis Global IV	3,436,327	Highbridge Principal Strategies III	88,662
Alpine Investor Co-Invest VIII	4,506,001	Lord Abbett High Yield Core	57,159,994
Alpine Investor Secondaries VII	3,058,972	Marathon European Credit Opportunities II	526,130
APAX IX	13,337,610	Marathon European Credit Opportunities III	9,366,053
APAX X	5,792,676	Marathon TRS Credit	106,871,681
Apax Digital	11,612,297	Oaktree European Capital Solutions	3,997,974
Audax Mezzanine V	162,899	Oaktree Opportunities Xb	8,899,417
Audax Private Equity V	6,776,745	Shenkman Capital Management	74,223,448
BG Private Companies II	1,712,856	**Subtotal**	$ 1,833,931,008
Carlyle Asia V	5,656,965		
Carlyle Europe Partners IV	6,697,556	**Total**	$ 2,033,835,932

Investment Summary — Fair Value as of June 30, 2022*

	Fair Value June 30, 2021	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2022	Percent
Cash equivalents	$ 157,506,899	$ 336,024,806	$	$ 426,317,884	$ 67,213,821	3.3
Fixed income	155,171,801	17,293,148	(19,372,713)	8,808,212	144,284,024	7.1
Real estate	111,459,521	22,088,896	44,242,072	27,575,986	150,214,503	7.4
Equity	1,274,610,864	118,808,461	(277,748,148)	20,409,017	1,095,262,160	53.8
Alternative investments	170,660,050	88,025,819	50,614,974	104,381,736	204,919,107	10.1
Additional categories	349,991,171	207,436,769	(29,867,371)	155,618,252	371,942,317	18.3
Total	$ 2,219,400,306	$ 789,677,899	$ (232,131,186)	$ 743,111,087	$ 2,033,835,932	100.0

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2022

(Dollars in thousands)

Investment counselor fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 1,099,200	$ 834	7.6
Fixed income manager(s)			
Real estate	150,215	1,737	115.6
Additional categories	386,630	1,380	35.7
Alternative investments	204,919	1,981	96.7
Subtotal	$ 1,840,964	$ 5,932	32.2
Administrative expenses**		568	2.8
Total		$ 6,500	32.0

*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 $2.03 billion in assets under management for the trust.

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2022

Investment counselor fees	
Domestic equity	
Baillie Gifford US Equity Growth	$ 160,684
Fort Washington Focused Equity	216,426
Total domestic equity	377,110
International equity	
BlackRock Fund B	457,180
Total international equity	457,180
Real estate	
Angelo Gordon Net Lease Realty IV	108,412
Blackstone Partners VIII	91,021
Blackstone IX	75,000
Carlyle Realty Partners VII	44,708
Carlyle Realty Partners VIII	114,296
Carlyle Property Advisors	186,393
Landmark Real Estate Partners VII	26,500
Landmark Real Estate Partners VIII	91,422
Prudential PRISA	117,420
Rockwood Capital Real Estate X	135,000
Rockwood Capital Real Estate XI	169,807
The Realty Associates XI	138,610
The Realty Associates XII	177,208
TA Realty Core Property	261,255
Total real estate	1,737,052
Alternative investments	
Actis Global IV	68,702
AlpInvest Secondaries VII	87,934
AlpInvest Co-Investment VIII	124,825
APAX IX	99,412
APAX X	120,686
Apax Digital	108,325
Audax Private Equity V	0
Baillie Gifford Private Companies II	5,149
Carlyle Asia V	140,156
Carlyle Europe Partners IV	58,782
Carlyle Europe V	128,345
Carlyle Global Financial Services Partners	(498,930)
Carlyle Renewable and Sustainable Energy	255,067
Fort Washington PE Opportunities III	10,466
Fort Washington PE Opportunities IV	71,668
Fort Washington PE Opportunities IV-K	71,668

Fort Washington VII	$ 19,931
Fort Washington VIII	35,051
Fort Washington IX	36,000
Fort Washington IX-K	36,000
Fort Washington X	17,763
Fort Washington X-S	17,762
KKR Americas XII	50,621
KKR IV	56,625
KKR European V	45,668
KKR Health II	92,839
Landmark Equity Partners XV	48,815
Landmark Equity Partners XVI	100,000
Lexington Capital Partners IX	38,663
NGP Natural Resources XI	95,700
NGP Natural Resources XII	145,697
Oaktree European Principal IV	149,709
Oaktree European Principal V	59,217
Oaktree Mezzanine V	10,618
Riverstone E & P VI	70,986
Silver Lake Alpine II	825
Total alternative investments	1,980,745
Additional categories	
Columbia High Yield Bond	227,276
Fort Washington High Yield Bond	128,228
Highbridge Specialty Loan III	—
Lord Abbett High Yield Core	209,822
Marathon European Credit Opportunities II	—
Marathon European Credit Opportunities III	140,938
Marathon TRS Credit	162,735
Oaktree European Capital Solutions	66,832
Oaktree Opportunities Xb	156,656
Shenkman Capital Management	287,211
Total additional categories	1,379,698
Total Investment Counselor Fees	**$ 5,931,785**
Administrative expenses	
Custodian	
Bank of New York Mellon	143,029
Other	
Other administrative and operational	425,142
Total administrative expenses	**$ 568,171**
Grand total	**$ 6,499,956**

Health Insurance Trust
Ten Largest Stock Holdings Ranked by Fair Value*
June 30, 2022

		Fair Value	Percent of Equities
1	Amazon.com	$ 4,301,505	4.51
2	Microsoft Corp.	3,334,424	3.50
3	Tesla	3,308,512	3.47
4	Apple	3,003,875	3.15
5	Moderna	2,896,855	3.04
6	Alphabet	2,775,874	2.91
7	Trade Desk	2,765,452	2.90
8	Berkshire Hathaway	2,197,538	2.30
9	Shopify	1,989,363	2.09
10	UnitedHealth Group	1,845,473	1.94

*Includes only actively managed separate accounts. Detailed information concerning the fair values of all TRS investments is available on the TRS website.

Health Insurance Trust
Ten Largest Fixed Income Holdings Ranked by Fair Value*
June 30, 2022

		Maturity	Coupon	Par Value	Fair Value	Percent of Fixed Income
1	U.S. Treasury Note	Feb. 15, 2031	1.125	15,000,000.00	$ 12,921,150.00	7.29
2	U.S. Treasury Note	Feb. 15, 2027	2.250	5,000,000.00	4,827,950.00	2.72
3	U.S. Treasury Note	Sep. 30, 2023	1.375	3,750,000.00	3,679,237.50	2.08
4	U.S. Treasury Bond	May 15, 2047	3.000	3,750,000.00	3,530,850.00	1.99
5	BMW U.S. Capital LLC 144A	April 1, 2031	2.550	3,000,000.00	2,602,950.00	1.47
6	Amazon.com Inc	May 12, 2031	2.100	3,000,000.00	2,577,120.00	1.45
7	New York City NY Transitional	Nov. 1, 2027	2.370	2,500,000.00	2,325,100.00	1.31
8	FNMA POOL #0BL7881	Sep. 1, 2033	1.385	2,581,300.00	2,090,026.98	1.18
9	McDonalds Corp.	June 10, 2024	3.250	2,000,000.00	1,999,600.00	1.13
10	U.S. Treasury Note	Oct. 31, 2022	1.875	2,000,000.00	1,998,300.00	1.13

*Detailed information concerning the fair values of all TRS investments is available on the TRS website.

Professional Service Providers

Investment Consultant
Aon

Investment Custodian
Bank of New York Mellon

Equity Managers
BlackRock Institutional Trust Co.
Fort Washington Investment Advisors

Additional Categories Managers
Columbia Threadneedle Investments
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

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Actuarial Section

Annual Valuation of the Retirement Annuity Trust

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 14, 2022

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 system. We are pleased to submit the results of the annual actuarial valuation prepared as of June 30, 2022. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The valuation reflects a new tier of benefits for members hired on or after January 1, 2022 (TRS 4).

During the 2021 valuation, a new set of economic and demographic assumptions were 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 2022 valuation, and each of the next three 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 (TRS1), 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, 2025 and June 30, 2024, required to support the total benefits of the system are as follows:

Group	Total Combined Contributions for FYE 2025	Total Combined Contributions for FYE 2024
University TRS 1, TRS 2 and TRS 3 members	37.34%	37.00%
Non-University TRS 1 and TRS 2 members	40.30%	39.96%
Non-University TRS 3 members	41.30%	40.96%

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 0.34% of payroll for the fiscal year ending June 30, 2025.

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,
- a net decrease of 0.95% of payroll due to the lump sum contribution of $479.2 million made by the state to pay off the liability for ad hoc increases and sick leave allowances granted after 1981,
- a decrease of 0.02% of payroll due to the increase in the amount required for life insurance benefits from 0.06% to 0.08% of payroll, and
- a decrease of 0.41% of payroll due to the overall experience of the System for the fiscal year ending June 30, 2022.

Board of Trustees
November 14, 2022
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	10.70%	4.00%
Non-University TRS 4 members	16.92%	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).

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 market values but less volatile market related values. A smoothing technique is applied to market values to determine the market-related values. The unfunded actuarial accrued liability amounts and funded ratios using the market 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, 2022
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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 2023 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

Section I — Summary of Principal Results

1. For convenience of reference, the principal results of the aggregate valuation (TRS1, TRS2, 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, 2022		June 30, 2021
Number of active members		74,785		69,256
Annual salaries	$	4,033,509	$	3,784,400
Number of annuitants and beneficiaries		58,438		57,465
Annual allowances	$	2,340,475	$	2,265,323
Assets				
Market value	$	22,899,952	$	25,935,779
Actuarial value		24,090,355		22,624,398
Actuarial accrued liability	$	40,970,441	$	39,581,704
Unfunded actuarial accrued liability (UAAL)	$	16,880,086	$	16,957,306
Funded ratio		58.8 %		57.2 %
Amortization period (years)		21.9	$	22.9

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, 2022, for TRS 4 members:

Group	University				Non-University			
Number of active members	54				3,086			
Annual salaries	$776,933				$9,616,595			
		Foundational		Supplemental		Foundational		Supplemental
Market value of assets	$	79,566	$	29,730	$	1,582,461	$	373,883
Actuarial accrued liability	$	18,120	$	5,288	$	337,922	$	66,428
Unfunded actuarial accrued liability	$	(61,446)	$	(24,442)	$	(1,244,539)	$	(307,455)
Funded ratio		439.1 %		562.2 %		468.3 %		562.8 %
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, 2022**		**June 30, 2021**	
For fiscal year ending	June 30, 2025		June 30, 2024	
	TRS 1 & TRS 2	TRS 3	TRS 1 & TRS 2	TRS 3
Retirement Annuity Trust:				
Normal*	12.230 %	12.230 %	12.280 %	12.280 %
Actuarial accrued liability	25.110	25.110	24.720	25.720
Total**	37.340 %	37.340 %	37.000 %	38.000 %
Member	7.625 %	7.625 %	7.625 %	7.625 %
State (ARC)	29.715	29.715	29.375	30.375
Total**	37.340 %	37.340 %	37.000 %	38.000 %
Life Insurance Trust:				
State	0.080 %	0.080 %	0.060 %	0.060 %
Health Insurance Trust:				
Member	2.775 %	2.775 %	2.775 %	2.775 %
State match	2.775	2.775	2.775	1.775
Total	5.550 %	5.550 %	5.550 %	4.550 %
Total contributions	42.970 %	42.970 %	42.610 %	42.610 %
Member fixed	10.400 %	10.400 %	10.400 %	10.400 %
State fixed	13.650	13.650	13.650	13.650
Required increase	18.920	18.920	16.180	16.180
State special	—	—	2.380	2.380
Total	42.970 %	42.970 %	42.610 %	42.610 %

**Includes a load for administrative expenses.*

*** Total contribution rates for fiscal year ending June 30, 2024 and June 30, 2025, shown above apply a 5-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, 2022**		**June 30, 2021**	
For fiscal year ending	June 30, 2025		June 30, 2024	
	TRS 1 & TRS 2	TRS 3	TRS 1 & TRS 2	TRS 3
Retirement Annuity Trust:				
Normal*	16.210 %	16.210 %	16.410 %	16.410 %
Actuarial accrued liability	24.090	25.090	23.550	24.550
Total**	40.300 %	41.300 %	39.960 %	40.960 %
Member	9.105 %	9.105 %	9.105 %	9.105 %
State (ARC)	31.195	32.195	30.855	31.855
Total**	40.300 %	41.300 %	39.96 %	40.960 %
Life Insurance Trust:				
State	0.080 %	0.080 %	0.060 %	0.060 %
Health Insurance Trust:				
Member	3.750 %	3.750 %	3.750 %	3.750 %
State match	3.750	3.750	3.750	2.750
Total	7.500 %	7.500 %	7.500 %	6.500 %
Total Contributions	47.880 %	48.880 %	47.520 %	47.520 %
Member fixed	12.855 %	12.855 %	12.855 %	12.855 %
State fixed	16.105	17.105	16.105	16.105
Required increase	18.920	18.920	16.180	16.180
State special	—	—	2.380	2.380
Total	47.880 %	48.880 %	47.520 %	47.520 %

**Includes a load for administrative expenses.*
*** Total contribution rates for fiscal year ending June 30, 2024 and June 30, 2025, shown above apply a 5-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 fiscal year ending	June 30, 2025		June 30, 2025	
	Foundational	Supplemental	Foundational	Supplemental
Retirement Annuity Trust:				
Normal*	7.470 %	2.210 %	9.490 %	2.190 %
Actuarial accrued liability	3.225	1.790	7.430	1.810
Total	10.695 %	4.000 %	16.920 %	4.000 %
Member	5.000 %	2.000 %	9.000 %	2.000 %
Employer	5.695	2.000	7.92	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 pension plan. 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, 2022, 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. Since the previous valuation, the System has been amended to reflect a new tier of benefits for members hired on or after January 1, 2022. These plan changes will first be recognized in the June 30, 2022 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 market 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, 2022, on the basis of which the valuation was prepared.

Group	Number	Annual Salaries *(In thousands)*
University hired before July 1, 2008	1,434	$ 101,598
University hired after July 1, 2008	1,493	85,937
University hired after Jan. 1, 2022	54	777
Total university active members	2,981	188,312
Non-university full time hired before July 1, 2008	29,322	2,120,507
Non-university full time hired after July 1, 2008	30,726	1,633,131
Non-university full time hired after Jan. 1, 2022	436	6,044
Non-university part time hired before July 1, 2008	1,036	10,164
Non-university part time hired after July 1, 2008	8,741	71,779
Non-university part time hired after Jan. 1, 2022	1,543	3,572
Total non-university active members	71,804	3,845,197
Grand total	74,785	$ 4,033,509

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, 2022

Group	Number	Annual Retirement Allowances[1] *(In thousands)*
Service retirements	50,977	$ 2,129,595
Disability retirements	2,784	88,664
Beneficiaries of deceased members	4,677	122,216
Total	58,438	$ 2,340,475

[1]Includes cost-of-living adjustments effective through July 1, 2022.

3. In addition, there are 10,690 terminated vested employees entitled to benefits in the future and 49,637 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, 2022, the market value of Retirement Annuity Trust assets for valuation purposes held by the system amounted to $22.9 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, 2022, on a market value basis was (10.9)%. 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 market related value of Retirement Annuity Trust assets used for valuation purposes as of June 30, 2022, was $24.09 billion. The estimated investment return for the plan year ending June 30, 2022, on an actuarial value of assets basis was 7.9%, 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, 2022.
3. Below is a history of actual investment rates of return for the Retirement Annuity Trust over the past five years:

Fiscal Year	Market Value Rate of Return	Actuarial Value Rate of Return
2022	(10.9)%	7.9%
2021	29.6%	12.9%
2020	5.5%	7.0%
2019	5.6%	7.1%
2018	10.5%	9.1%

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, 2022. 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 $20.4 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 $25.47 billion of which there are no 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 $527.6 million. The total prospective liabilities of the system amounts to $46.4 billion. Against these liabilities, the system has present assets for valuation purposes of $24.09 billion. When this amount is deducted from the total liabilities of $46.4 billion, there remains $22.31 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 12.23% of payroll for university other than TRS 4 and 9.68% of payroll for university TRS 4 members for both foundational and supplemental plans. The valuation indicates that employer normal contributions at the rate of 16.21% of payroll for non-university members other than TRS 4 and 11.68% 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 $5.43 billion. When this amount is subtracted from $22.31 billion, which is the present value of the total future contributions to be made by the employer, there remains $16.88 billion as the amount of future unfunded actuarial accrued liability contributions.
5. The unfunded actuarial accrued liability decreased by approximately $77.2 million for the plan year ending June 30, 2022, and the funded ratio increased from 57.2% to 58.8%. These results were mainly due to the additional employer contribution of $479.2 million made for the fiscal year ending June 30, 2022 to pay off the unfunded liability for ad hoc increases and sick leave allowances granted after 1981. 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. 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 24.09% 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 18.92% of payroll for the fiscal year ending June 30, 2025.
7. The state made an additional contribution of $479.2 million during the fiscal year ended June 30, 2022 to pay off the accrued liability for ad hoc increases and sick leave allowances granted after 1981. Therefore, there are no additional appropriations needed by the state.
8. The total actuarially determined employer contribution (ADEC) rate to the Retirement Annuity Trust is 29.715% for university members other than TRS 4. The total ADEC rate to the pension plan is 31.195% for non-university TRS 1 and TRS 2 members and 32.195% 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	18.920
Special appropriation	—
Contribution to Retirement Annuity Trust	29.715%
Total contribution to Retirement Annuity Trust	37.340%

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	18.920	18.920
Special appropriation	—	—
ADEC contribution to Retirement Annuity Trust	31.195%	32.195%
Total contribution to Retirement Annuity Trust	40.300%	41.300%

9. The valuation indicates that normal contributions at the rate of 12.23% of active university members' salaries and 16.21% 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 9.68% of active university members' salaries and 11.68% 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 25.11% for university members other than TRS 4, 24.09% for non-university TRS 1 and TRS 2 members, and 25.09% for non-university TRS 3 members. The actuarial accrued liability rate for TRS 4 members is 5.01% for university members and 9.24% 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*	12.23%	12.23%	16.21%	16.21%
Actuarial accrued liability	25.11	25.11	24.09	25.09
Total**	37.34%	37.34%	40.30%	41.30%

**Includes a load for administrative expenses.*

***Total contribution rates shown above apply a 5-year contribution direct rate smoothing methodology and are anticipated to increase each year until the full funding rates are achieved in not more than 5 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*	7.470%	2.210%	9.490%	2.190%
Actuarial accrued liability	3.225	1.790	7.430	1.810
Total	10.695%	4.000%	16.920%	4.000%

**Includes a load for administrative expenses.*

10. 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	$ 15,369,769	22	$ 1,087,449	
New incremental June 30, 2015	(351,610)	(326,576)	13	(33,180)	
New incremental June 30, 2016*	340,766	322,698	14	31,022	
New incremental June 30, 2017	(428,468)	(412,846)	15	(37,741)	
New incremental June 30, 2018	(192,240)	(187,655)	16	(16,383)	
New incremental June 30, 2019	53,306	52,516	17	4,395	
New incremental June 30, 2020	112,464	111,447	18	8,972	
New incremental June 30, 2021*	2,042,379	2,029,763	19	157,625	
New incremental June 30, 2022	(79,030)	(79,030)	20	(5,936)	
Total UAAL		$ 16,880,086		$ 1,196,223	**
UAAL as a percentage of payroll				29.66 %	
Blended amortization period (years)				21.9	

**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 on the next page provides a historical view of the special appropriations and required increase as a percentage of payroll.

Valuation Date	Fiscal 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	0.00	18.92	18.92	805,690,000

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 0.36% of payroll from FY24 to FY25. 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,
   - a net decrease of 0.95% of payroll due to the lump sum contribution of $479.2 million made by the state to pay off the liability for ad hoc increases and sick leave allowances granted after 1981, and
   - a decrease of 0.41% of payroll due to the overall experience of the system for the fiscal year ending June 30, 2022.
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 a decrease of $77.22 million in the unfunded actuarial accrued liability from $16.96 billion to $16.88 billion during the year ending June 30, 2022. The decrease in the unfunded actuarial accrued liability was primarily due to a lump sum contribution made by the state to pay off the liability for ad hoc increases and sick leave allowances granted after 1981. There was also a gain due to investment return on an actuarial value basis that was greater than expected (7.9% vs 7.1%) and a gain due to mortality (more deaths than expected). These gains were partially offset by a loss due to salary increases that were more than expected.

Analysis of Financial Experience
(In thousands)

Item	Amount of Increase/ (Decrease)
Interest (7.1%) added to previous unfunded accrued liability	$ 1,203,969
Expected actuarially accrued liability contribution	(1,007,960)
Gain due to excess contributions	(479,200)
Experience:	
Valuation asset growth	(178,612)
Pensioners' mortality	(15,604)
Turnover and retirements	5,897
New entrants	69,124
Salary increases	285,896
Amendments	0
Assumption changes	0
Data changes	39,270
Total	$ (77,220)

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, 2022

Group	Number
Retirees and beneficiaries currently receiving benefits	58,438
Terminated vested employees entitled to benefits but not yet receiving benefits	10,690
Inactive non-vested members	49,637
Active plan members	74,785
Total	193,550

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)
2013	$ 14,962,758	$ 28,817,232	$ 13,854,474	51.9 %	$ 3,480,066	398.1 %
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

* *Reflects change in assumptions and methods.*

3. The information presented above was determined as part of the actuarial valuation at June 30, 2022. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2022	Actuarial Assumptions:
Actuarial cost method	Entry age	Investment rate of return* 7.1%
Amortization method	Level percent of pay, closed	Projected salary increases** 3 - 7.5%
Remaining amortization period	21.9 years	
Asset valuation method	Five-year smoothed market	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
2013	$ 802,984,644	$ 568,233,446	71
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

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 equities which are considerably riskier - because they 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, 2022
(Dollars in thousands)

	Decrease Discount Rate	Valuation Results	Increase Discount Rate
Actuarial accrued liability	$ 45,965,283	$ 40,970,441	$ 36,819,951
Actuarial value of assets	24,090,355	24,090,355	24,090,355
Unfunded actuarial accrued liability	$ 21,874,928	$ 16,880,086	$ 12,729,596
Funded ratio	52.4%	58.8%	65.4%
Employer ADEC — university	45.135%	34.865%	25.945%
Employer ADEC — non-university*	47.615%	37.345%	28.425%
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, 2022
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 40,970,441	$ 41,986,727	$ 43,048,890
Actuarial value of assets	24,090,355	24,090,355	24,090,355
Unfunded actuarial accrued liability	$ 16,880,086	$ 17,896,372	$ 18,958,535
Funded ratio	58.8 %	57.4 %	56.0 %
Employer ADEC — university	34.865 %	37.305 %	39.865 %
Employer ADEC — non-university*	37.345 %	39.785 %	42.345 %
Discount rate	7.1 %	6.85 %	6.6 %
Wage inflation rate	2.75 %	2.50 %	2.25 %
Price inflation rate	2.5 %	2.25 %	2 %

** 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, 2022
(Dollars in thousands)

	Valuation Results	Decrease Wage Inflation to 1.25%	No Wage Inflation
Actuarial accrued liability	$ 40,970,441	$ 40,970,441	$ 40,970,441
Actuarial value of assets	24,090,355	24,090,355	24,090,355
Unfunded actuarial accrued liability	$ 16,880,086	$ 16,880,086	$ 16,880,086
Funded ratio	58.8%	58.8%	58.8%
Employer ADEC — university	34.865%	39.345%	43.415%
Employer ADEC — non-university*	37.345%	41.825%	45.895%
Discount rate	7.1%	7.1%	7.1%
Wage inflation rate	2.75%	1.25%	0%
Price inflation rate	2.50%	2.50%	2.50%

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

Schedule A

Valuation Balance Sheet
Showing the Present and Prospective Assets and Liabilities
As of June 30, 2022

(In thousands)

Actuarial Liabilities

(1)	Present value of prospective benefits payable on account of present active members			
	- Service retirement benefits	$ 19,332,819		
	- Disability retirement benefits	711,865		
	- Death and survivor benefits	117,441		
	- Refunds of member contributions	238,875		
	Total		$	20,401,000
(2)	Present value of prospective benefits payable on account of present retired and disabled members, and beneficiaries of deceased members			
	- Service retirement benefits	$ 23,458,959		
	- Disability retirement benefits	991,565		
	- Death and survivor benefits	1,024,057		
	Total		$	25,474,581
(3)	Present value of prospective benefits payable on account of inactive members and members entitled to deferred vested benefits		$	527,630
(4)	Total Actuarial Liabilities		$	46,403,211

Present and Prospective Assets

(5)	Actuarial value of assets		$	24,090,355
(6)	Present value of total future contributions = (4)-(5)	$ 22,312,856		
(7)	Present value of future member contributions and employer normal contributions		$	5,432,770
(8)	Prospective unfunded accrued liability contributions = (6)-(7)		$	16,880,086
(9)	Total Present and Prospective Assets		$	46,403,211

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

Valuation Date June 30	Aggregate Actuarial Accrued Liability for: (1) Active Member Contributions	(2) Retirants and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets: (1)	(2)	(3)
2013	$3,514.4	$17,716.4	$7,586.4	$14,962.8	100 %	65 %	0 %
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

Schedule B

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

(1)	Actuarial value of assets beginning of year		$ 22,624,398,184
(2)	Net position at market value at end of year		22,899,952,370
(3)	Net position at market value at beginning of year		25,935,779,206
(4)	Cash flow		
	a.	Contributions	2,036,551,289
	b.	Benefit payments	2,332,597,975
	c.	Administrative expense	12,005,095
	d.	Net: (4)a - (4)b - (4)c	(308,051,781)
(5)	Investment income		
	a.	Market total: (2) - (3) - (4)d	(2,727,775,055)
	b.	Assumed rate	7.1 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	1,830,504,485
	d.	Amount for phased-in recognition: (5)a - (5)c	(4,558,279,540)
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	(911,655,908)
	b.	First prior year	898,669,898
	c.	Second prior year	(81,156,976)
	d.	Third prior year	(77,474,783)
	e.	Fourth prior year	115,121,919
	f.	Total recognized investment gain	(56,495,850)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		$ 24,090,355,038
(8)	Difference between market & actuarial values: (2) - (7)		$ (1,190,402,668)
(9)	Net investment rate of return on actuarial value		7.9 %

Schedule C

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

	For the Year Ending June 30, 2022	For the Year Ending June 30, 2021
Receipts for the year		
Contributions		
Members	$ 356,966,620	$ 327,833,177
Employers	1,679,584,669	1,146,977,669
Total	2,036,551,289	1,474,810,846
Net investment income	(2,727,775,055)	6,017,184,311
Total	(691,223,766)	7,491,995,157
Disbursements for the year		
Benefit payments	2,305,852,772	2,235,240,616
Refunds to members	26,745,203	25,373,818
Miscellaneous, including expenses	12,005,095	12,601,841
Total	2,344,603,070	2,273,216,275
Excess of receipts over disbursements	(3,035,826,836)	5,218,778,882
Reconciliation of net position		
Net position as of the beginning of the year	25,935,779,206	20,717,000,324
Excess of receipts over disbursements	(3,035,826,836)	5,218,778,882
Net position as of the end of the year	$ 22,899,952,370	$ 25,935,779,206
Net investment rate of return on market value	(10.9)%	29.6 %

**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			Retirement	
			Service			Before 27 Years of Service	After 27 Years of Service**
			0 - 4	5 - 9	10+		
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		17.00%
50	0.122	0.28	14.25	4.50	1.10		25.00
55	0.187	0.40	15.00	6.00	1.25	5.25%	40.00
60	0.291	0.50	15.00	0.00	0.00	13.50	33.00
62	0.354	0.50	15.00	0.00	0.00	15.00	30.00
65	0.481	0.50	20.00	0.00	0.00	20.00	30.00
70	0.774	0.50	20.00	0.00	0.00	25.00	30.00
75	1.234	0.50	20.00	0.00	0.00	100.00	100.00

**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			Retirement	
			Service			Before 27 Years of Service	After 27 Years of Service**
			0 - 4	5 - 9	10+		
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 market 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 market 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.

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, 2022. 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, 2022

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 29	30 to 34	35 & Over	Number	Number
Under 25	2,818	2,029	6							4,853	102,977,337
25 to 29	943	4,769	1,996							7,708	326,849,945
30 to 34	633	2,004	4,246	1,436	5					8,324	417,040,756
35 to 39	613	1,446	2,176	4,167	1,511	4				9,917	557,755,235
40 to 44	622	1,343	1,482	1,983	4,465	1,298	6			11,199	692,913,011
45 to 49	387	910	1,014	1,313	1,997	3,953	960	3		10,537	706,613,173
50 to 54	578	837	725	1,011	1,433	2,115	2,655	374	2	9,730	648,449,305
55 to 59	783	857	462	536	820	1,003	826	325	37	5,649	325,178,567
60 to 64	597	945	306	282	397	418	343	112	57	3,457	159,118,198
65 to 69	501	658	248	122	117	154	135	49	33	2,017	65,610,308
70 & Over	373	551	206	69	57	43	43	24	28	1,394	31,003,343
Total Count	8,848	16,349	12,867	10,919	10,802	8,988	4,968	887	157	74,785	4,033,509,178

Average Age: 43.2

Average Service: 11.1

Table 2

Schedule of Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2013	74,831	$ 3,480,066,406	$ 46,506	1.51
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)

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	782	$ 8,670,509	$ 11,088
50 - 54	1,631	68,255,143	41,849
55 - 59	4,366	199,377,476	45,666
60 - 64	6,934	301,299,968	43,453
65 - 69	10,308	429,420,999	41,659
70 - 74	13,744	562,447,389	40,923
75 - 79	10,242	401,363,909	39,188
80 - 84	5,793	217,586,500	37,560
85 - 89	2,983	102,712,970	34,433
90 - 94	1,281	39,294,085	30,675
95 & Over	374	10,045,515	26,860
Total	58,438	$ 2,340,474,463	$ 40,051

Average Current Age: **71.0**

Average Age at Retirement for All Retirees and Beneficiaries: **56.2**

Table 4

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

Year Ended June 30	Add to Rolls: Number	Add to Rolls: Annual Allowances *(In millions)*	Removed from Rolls: Number	Removed from Rolls: Annual Allowances *(In millions)*	Rolls at End of Year: Number	Rolls at End of Year: Annual Allowances *(In millions)*	Increase In Annual Allowances	Average Annual Allowances
2013	2,303	$ 105.7	991	$ 22.2	47,406	$ 1,608.7	5.5%	$ 33,934
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

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 21.9-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
2025	3,995	186	4,181	16,880	58.8	1,316	511	805
2026	4,074	187	4,261	17,243	58.8	1,451	521	930
2027	4,153	189	4,342	17,634	58.8	1,595	533	1,062
2028	4,230	192	4,422	17,879	59.2	1,733	545	1,188
2029	4,308	196	4,504	18,895	57.8	1,863	558	1,305
2030	4,390	199	4,589	18,859	58.8	1,921	570	1,351
2031	4,474	203	4,677	18,670	60.0	1,974	583	1,391
2032	4,563	207	4,770	18,328	61.5	2,023	597	1,426
2033	4,655	210	4,865	17,899	63.1	2,071	610	1,461
2034	4,748	215	4,963	17,381	64.8	2,118	625	1,493
2035	4,847	219	5,066	16,775	66.6	2,167	640	1,527
2036	4,952	223	5,175	16,071	68.5	2,219	655	1,564
2037	5,062	228	5,290	15,263	70.5	2,272	671	1,601
2038	5,179	233	5,412	14,344	72.7	2,376	688	1,688
2039	5,301	238	5,539	13,302	75.1	2,389	705	1,684
2040	5,430	244	5,674	12,129	77.6	2,506	723	1,783
2041	5,567	251	5,818	10,762	80.4	2,594	742	1,852
2042	5,711	257	5,968	9,282	83.3	2,656	762	1,894
2043	5,860	265	6,125	7,573	86.6	2,705	782	1,923
2044	6,017	272	6,289	5,649	90.1	2,490	804	1,686
2045	6,180	281	6,461	3,522	93.9	2,535	826	1,709
2046	6,350	289	6,639	1,193	98.0	2,515	849	1,666
2047	6,527	299	6,826	—	100.0	—	873	—
2048	6,712	308	7,020	—	100.0	—	898	—
2049	6,903	318	7,221	—	100.0	—	924	—
2050	7,105	328	7,433	—	100.0	—	951	—
2051	7,323	338	7,661	—	100.0	—	978	—
2052	7,548	348	7,896	—	100.0	—	1,008	—
2053	7,780	357	8,137	—	100.0	—	1,039	—
2054	8,019	367	8,386	—	100.0	—	1,071	—

Annual Valuation of the Health and Life Insurance Trusts

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 14, 2022

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, 2022. 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 appropriate actuarial models. that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

The valuation indicates a total actuarially determined contribution of 4.62% as of percentage of active member payroll for the health trust payable for the fiscal year ending June 30, 2023 is required to support the benefits of the Kentucky Employees' Health Plan (KEHP) and the Medicare Eligible Health Plan (MEHP). Of this amount, 2.775% of payroll is estimated to be paid by University members and 3.75% of payroll is estimated to be paid by all other members, leaving 1.845% and 0.87% respectively, as the remaining actuarially determined contribution. 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. Due to the uncertainty regarding the long-term impact of COVID-19, the continuation of the projected high cost trend of prescription drugs and the uncertainty regarding the future changes to Medicare Part D, we have reset the first year of health care trend assumption at 6.75%, stepping down 0.25% per year to the ultimate rate of 4.5% in 2031, which is 2% plus price inflation.

We note that was we are preparing this report, the world is in the midst of a pandemic. We have considered available information, but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions other than healthcare trend. We will continue to monitor the situation and advise the board in the future of any adjustments that we believe would be appropriate.

We recommend that the life insurance plan maintain a total actuarially determined contribution of 0.08% of active member payroll payable for the fiscal years ending June 30, 2024 and June 30, 2025 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, 2022
Page 2

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 18-year period for the retiree medical plan and a 22-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 valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, 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 market values, but less volatile market-related values. A smoothing technique is applied to market values to determine the market-related values. The unfunded liability amounts and funded ratios using the market 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, 2022	June 30, 2021
Number of active members*	70,427	65,604
Annual salaries	$ 4,033,509	$ 3,784,400
Number of deferred vested members	7,665	7,658
Number of annuitants in medical plans	41,177	41,175
Number of spouses and beneficiaries in medical plans**	6,661	6,728
Total	47,838	47,903
Assets:		
Market value	$ 2,269,176	$ 2,300,504
Actuarial value	$ 2,401,147	$ 2,072,648
Unfunded actuarial accrued liability	$ 1,367,566	$ 1,384,029
Funded ratio based on actuarial value of assets	63.7%	60.0%
Amortization period (years)	18	19
Discount rate	7.1%	7.1%

**There were initially 74,785 active members. However, 4,358 of these members were also listed as a retiree and were ultimately valued in their retired status. For the June 30, 2021 valuation date, there were initially 69,256 active members. However, 3,652 of these members were also listed as a retiree and were ultimately valued in their retired status.*

*** 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.*

Health Insurance Trust Contribution Rates for University Members

Valuation Date	**June 30, 2022**			**June 30, 2021**		
Contribution For Fiscal Year Ending	June 30, 2023			June 30, 2022		
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022
Normal	2.00%	2.00%	2.00%	1.92%	1.92%	1.92%
Accrued liability	2.62	2.62	2.62	2.72	2.72	2.72
Total	4.62%	4.62%	4.62%	4.64%	4.64%	4.64%
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)*	1.57	1.57	1.57	1.58	1.58	1.58
Statutorily Required Prefunding**	(2.500)	(2.500)	(1.725)	(2.490)	(2.490)	(1.715)
Total	4.62%	4.62%	4.62%	4.64%	4.64%	4.64%

**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, 2022**			**June 30, 2021**		
Contribution For Fiscal Year Ending	June 30, 2023			June 30, 2022		
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022
Normal	2.00%	2.00%	2.00%	1.92%	1.92%	1.92%
Accrued liability	2.62	2.62	2.62	2.72	2.72	2.72
Total	4.62%	4.62%	4.62%	4.64%	4.64%	4.64%
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)*	2.32	2.32	2.32	2.33	2.33	2.33
Statutorily Required Prefunding**	(4.45)	(4.45)	(4.45)	(4.44)	(4.44)	(4.44)
Total	(4.62)%	4.62%	4.62%	4.64%	4.64%	4.64%

**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, 2022**			**June 30, 2021**		
Contribution For Fiscal Year Ending	June 30, 2023			June 30, 2022		
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022
Normal	2.00%	2.00%	2.00%	1.92%	1.92%	1.92%
Accrued liability	2.62	2.62	2.62	2.72	2.72	2.72
Total	4.62%	4.62%	4.62%	4.64%	4.64%	4.64%
Member	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%
Employer (ARC)	3.75	3.75	3.75	3.75	2.75	3.75
State (ARC)*	1.57	1.57	1.57	2.33	2.33	1.58
Statutorily Required Prefunding**	(4.45)	(4.45)	(4.45)	(5.19)	(4.19)	(4.44)
Total	4.62%	4.62%	4.62%	4.64%	4.64%	4.64%

**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 2024 and 2025 (from actual amounts of 0.023% and 0.024%) and holding the accrued liability contribution at 0.05%. The resulting contribution is equivalent to using an effective amortization period of 16 years.

Life Insurance Trust
(Dollars in thousands)

Valuation Date	June 30, 2022	June 30, 2021	June 30, 2020
Number of active members*	70,427	65,604	73,151
Annual salaries	$ 4,033,509	$ 3,784,400	$ 3,723,482
Number of vested former members	10,573	10,388	9,139
Number of retirees in life insurance plan	52,213	51,731	52,262
Assets:			
Market value	$ 88,381	$ 107,427	$ 87,368
Actuarial value	$ 96,926	$ 95,483	$ 92,229
Unfunded actuarial accrued liability**	$ 22,271	$ 21,173	$ 29,965
Funded ratio based on actuarial value of assets	81.3%	81.9%	75.5%
Amortization period (years)	22	23	24
Effective amortization period (years)	16	16	24
Discount rate	7.1%	7.1%	7.5%

Life Insurance Contribution Rates

Contribution for fiscal year ending	June 30, 2025	June 30, 2024	June 30, 2023
Normal	0.03%	0.03%	0.03%
Accrued liability	0.05	0.05	0.05
Total	0.08%	0.08%	0.08%

**There were initially 74,785 active members and 10,690 deferred vested members. However, 4,358 active members and 117 deferred vested members were also listed as a retiree and were ultimately valued in their retired status. There were initially 53,761 retired or disabled members. However, 1,548 were listed multiple times, reflecting different pension benefits earned under multiple roles as an employee. For the June 30, 2021 valuation date, there were initially 69,256 active members and 10,538 deferred vested members. However, 3,652 active members and 150 deferred vested members were also listed as a retiree and were ultimately valued in there retired status. There were initially 52,960 retired or disabled members. However, 1,229 were listed multiple times, reflecting different pension benefits earned under multiple roles as an employee.*

*** 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 4.62% 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, 2022, 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. Due to the uncertainty regarding the long-term impact of COVID-19, the continuation of the projected high-cost trend of prescription drugs and the uncertainty regarding the future changes to the Medicare Part D, we have reset the first-year health care trend assumption at 6.75%, stepping down 0.25% per year to the ultimate rate of 4.5% in 2031, which is 2% plus price inflation.
5. A new benefit tier was added for members joining the System on and after Jan. 1, 2022. A description of the benefit provisions applicable to these members can be found in Schedule E of this report.

6. The impact of the COVID-19 pandemic was considered in this valuation, however, no changes other than the healthcare trend adjustments 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.
7. 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.
8. 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 market 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, 2022, upon which the valuation was based. Detailed tabulations of the data are given in Schedule F.

Active Members as of June 30, 2022

(Dollars in thousands)

Group	Number*	Annual Salaries
University Full Time hired before July 1, 2008	1,434	$ 101,598
University Full Time hired after July 1, 2008	1,493	85,937
University Full Time hired on or after Jan. 1, 2022	54	777
Non-University Full Time hired before July 1, 2008	29,322	2,120,507
Non-University Full Time hired after July 1, 2008	30,726	1,633,131
Non-University Full Time hired on or after Jan. 1, 2022	436	6,044
Non-University Part Time hired before July 1, 2008	1,036	10,164
Non-University Part Time hired after July 1, 2008	8,741	71,779
Non-University Part Time hired on or after Jan. 1, 2022	1,543	3,572
Total	74,785	$ 4,033,509

**The active member counts above reflect the initial active membership. Approximately 4,358 of these active members were ultimately valued in their retired status.*

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, 2022

	Under Age 65	Age 65 and Over	Total
Number	9,076	32,101	41,177
Average Age	59.6	75.1	71.7

Spouses Receiving Health Benefits as of June 30, 2022

	Under Age 65	Age 65 and Over	Total
Number	1,459	5,202	6,661
Average Age	60.0	74.9	71.6

3. The retiree health plan valuation includes 7,665 deferred vested members eligible for health care at age 60 and the life insurance plan valuation includes 10,573 deferred vested members eligible for retiree life insurance at age 60. There were initially 10,690 deferred vested members eligible for retiree life insurance at age 60. However, approximately 117 of these were also listed as retirees and were valued in their retired status verses deferred vested status.

Section III — Assets

1. As of June 30, 2022, the market value of Health Insurance Trust assets held by the retiree medical plan amounted to $2.27 billion and the market value of Life Insurance Trust assets held by the life insurance plan amounted to $88.4 million. The estimated market investment return for the plan year was (9.7)% for the Health Insurance Trust and (14.96)% for the Life Insurance Trust.
2. The five-year market related value of health trust assets used for valuation purposes as of June 30, 2022 was $2.4 billion and the five-year market related value of Life Insurance Trust assets used for valuation purposes as of June 30, 2022 was $96.9 million. Schedule B shows the development of the actuarial value of assets as of June 30, 2022.
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 $1.94 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 $75 million. The liability on account of benefits payable to retirees and covered spouses amounts to $1.76 billion. The total actuarial accrued liability of the retiree medical plan amounts to $3.77 billion. Against these liabilities, the retiree medical plan has present assets for valuation purposes of $2.4 billion. When this amount is deducted from the actuarial accrued liability of $3.77 billion, there remains $1.37 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 $80.6 million, or 2% of payroll.
4. The valuation shows that the life insurance plan has an actuarial accrued liability of $16.42 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 $4.33 million. The liability on account of benefits payable to retirees amounts to $98.45 million. The total actuarial accrued liability of the life insurance plan amounts to $119.2 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 $96.9 million. When this amount is deducted from the actuarial accrued liability of $119.2 million, there remains $22.3 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 $965,924, 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, 2022, is shown below (dollars in thousands).

	Experience Gain/(Loss)* of the:	Health Insurance Trust	Life Insurance Trust
(1)	UAAL as of June 30, 2021	$ 1,384,029	$ 21,173
(2)	Normal cost from last valuation	72,690	880
(3)	Expected employer contributions	175,804	2,726
(4)	Interest accrual: [(1) + (2)] x .071 - (3) x .071/2 for MIF [(1) + (2)] x .071 - (3) x .071/2 for LIF	97,186	1,469
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	$ 1,378,101	$ 20,796
(6)	Change due to updated health care trend rates	181,271	—
(7)	Change due to claims experience	(57,424)	—
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 1,501,948	$ 20,796
(9)	Actual UAAL as of June 30, 2022	1,367,566	22,271
(10)	Total gain/(loss): (9) - (8)	(134,382)	1,475
	(a) Contribution and investment gain/(loss)	(110,303)	1,762
	(b) Experience gain/(loss) (10) - (10a)	(24,079)	(287)
(11)	Accrued liabilities as of June 30, 2021	$ 3,456,677	$ 116,656
(12)	Experience gain/(loss) as percent of actuarial accrued liabilities at start of year (10b) / (11)	(0.7%)	(0.25)%

**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**		
Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022
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 fiscal year ending June 30, 2022, 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 18-year period as a level percentage of payroll, the valuation indicates employer and state contributions of 1.845% of payroll for university employees and 0.87% of payroll for all other members.

3. The state is scheduled to contribute 0.08% of salary to the Life Insurance Trust for the fiscal year ending June 30, 2024. CMC recommends maintaining this rate for the fiscal year ending June 30, 2025 to support sufficiently the benefits of the life insurance plan.

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

Normal	2.00 %
Accrued liability	2.62 %
Total	4.62 %

	University Employees			**School District Employees (Non-Federal)**			**Other Employees**		
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired on or after Jan. 1, 2022
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*	1.570	1.570	1.570	2.320	2.320	2.320	1.570	1.570	1.570
Statutorily Required Prefunding**	(2.500)	(2.500)	(1.725)	(4.450)	(4.450)	(4.450)	(4.450)	(4.450)	(4.450)
Total	4.620 %	4.620 %	4.620 %	4.620 %	4.620 %	4.620 %	4.620 %	4.620 %	4.620 %

**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 Fiscal 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% 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 2.62% 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 $1.37 billion for the retiree medical plan and $22.3 million for the life insurance plan as of the valuation date. An accrued liability contribution rate of 2.62% 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 18-year period for the retiree medical plan and a 22-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 4.62% 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 18 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, 2022

Group	Number*
Retirees currently receiving health benefits	41,177
Spouses of retirees currently receiving health benefits	6,661
Terminated employees entitled to benefits but not yet receiving benefits	7,665
Active plan members	70,427
Total	125,930

Number of Active and Retired Members in Life Insurance Plan as of June 30, 2022

Group	Number*
Retirees	52,213
Terminated employees	10,573
Active plan members	70,427
Total	133,213

**There were initially 74,785 active members and 10,690 deferred vested members. However, 4,358 active members and 117 deferred vested members were also listed as a retiree and were ultimately valued in their retired status. There were initially 53,761 retired or disabled members in the Life Insurance Trust. However, 1,548 were listed multiple times, reflecting different pension benefits earned under multiple roles as an employee.*

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]
2013	$ 412,185	$ 3,521,073	$ 3,108,888	11.7 %	$ 3,480,066	89.3 %
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

**Reflects change in participation assumptions and plan design.*

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]
2013	$ 94,863	$ 94,325	$(538)	100.6 %	$ 3,480,066	(0.02) %
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

**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, 2022. Additional information as of the latest actuarial valuation follows.

Valuation Date	Actuarial Cost Method	Amortization Method	Remaining Amortization Period	Asset Valuation Method	Actuarial Assumptions: Investment Rate of Return*	Actuarial Assumptions: Investment Rate of Return*
June 30, 2022	Entry age	Level percent of pay, closed	18 years retiree medical plan 22 years life insurance plan	Five-year smoothed market	7.1%-retiree medical plan	7.1%-life insurance plan

Medical trend assumption**	6.75%
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

Fiscal 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

Schedule of Employer Contributions
Life Insurance Trust

Fiscal Year Ended June 30	Actuarially Determined Contribution (ADC)	Actual Employer Contribution	Percentage of ADC Contributed
	(A)	(B)	(B) / (A)
2013	$ 1,739,908	$ 1,680,495	96.6%
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

Schedule A

Results of the Valuation
June 30, 2022
(Dollars in thousands)

	Health Insurance Trust	Life Insurance Trust
Payroll	$ 4,033,509	$ 4,033,509
Actuarial Accrued Liability		
Present value of prospective benefits payable in respect of:		
(a) Present active members	$ 1,936,621	$ 16,417
(b) Present terminated vested members	75,002	4,326
(c) Present retired members and covered spouses	1,757,090	98,454
(d) Total actuarial accrued liability	$ 3,768,713	$ 119,197
Present Assets for Valuation Purposes	$ 2,401,147	$ 96,926
Unfunded Actuarial Accrued Liability	$ 1,367,566	$ 22,271

Contributions	Fiscal Year Ended June 30, 2023	Fiscal Year Ended June 30, 2025
Normal	2.00 %	0.03 %
Accrued liability	2.62	0.05
Total	4.62 %	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)
2013	n/a	$ 2,001.8	$ 1,519.3	$ 412.2	n/a	21%	0%
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

Life 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)
2013	n/a	$78.1	$16.2	$94.9	n/a	100%	104%
2014	n/a	81	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	95.5	n/a	95	0
2022	n/a	102.8	16.4	96.9	n/a	94	0

Schedule B

Development of the Actuarial Value of Assets
Health Insurance Trust
June 30, 2022

(1)	Actuarial value of assets beginning of year		$2,072,648,389
(2)	Market value of assets end of year		2,269,175,689
(3)	Market value of assets beginning of year		2,300,504,416
(4)	Cash flow		
	a.	Contributions	442,122,514
	b.	Benefit payments	251,876,953
	c.	Administrative expense	2,074,227
	d.	Net: (4)a - (4)b - (4)c	188,171,334
(5)	Investment Income		
	a.	Market total: (2) - (3) - (4)d	(219,500,061)
	b.	Assumed rate	7.1 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	170,015,896
	d.	Amount for phased-in recognition: (5)a - (5)c	(389,515,957)
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	(77,903,191)
	b.	First prior year	73,328,318
	c.	Second prior year	(17,490,773)
	d.	Third prior year	(5,362,227)
	e.	Fourth prior year	(2,260,477)
	f.	Total recognized investment gain	(29,688,350)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		2,401,147,269
(8)	Difference between market & actuarial values: (2) - (7)		$ (131,971,580)
(9)	Rate of return on actuarial value		6.48 %

Development of the Actuarial Value of Assets
Life Insurance Trust
June 30, 2022

(1)	Actuarial value of assets beginning of year		$ 95,483,312
(2)	Market value of assets end of year		88,380,503
(3)	Market value of assets beginning of year		107,426,916
(4)	Cash flow		
	a.	Contributions	2,754,863
	b.	Benefit payments	6,178,000
	c.	Administrative expense	40,999
	d.	Net: (4)a - (4)b - (4)c	(3,464,136)
(5)	Investment Income		
	a.	Market total: (2) - (3) - (4)d	(15,582,277)
	b.	Assumed rate	7.1 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	7,504,334
	d.	Amount for phased-in recognition: (5)a - (5)c	(23,086,611)
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	(4,617,322)
	b.	First prior year	3,534,632
	c.	Second prior year	(226,459)
	d.	Third prior year	(227,080)
	e.	Fourth prior year	(1,061,386)
	f.	Total recognized investment gain	(2,597,615)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		96,925,895
(8)	Difference between market & actuarial values: (2) - (7)		$ (8,545,392)
(9)	Rate of return on actuarial value		5.23 %

Schedule C

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

	For the Year Ended June 30, 2022	For the Year Ended June 30, 2021
Receipts for the Year		
Contributions		
Members statutory	$ 145,681,855	$ 128,117,484
Payment by retired members	60,680,394	59,507,609
Total members	206,362,249	187,625,093
State statutory contributions	23,507,666	23,155,586
Employer contributions	120,415,757	106,670,323
State contributions	7,841,722	55,061,156
Total employer	151,765,145	184,887,065
Total receipts	358,127,394	372,512,158
Recovery income	144,675,514	120,781,194
Net investment income	(219,500,061)	503,200,749
Total	283,302,847	996,494,101
Disbursements for the Year		
Administrative expense	2,074,227	1,728,008
Medical insurance expense	312,557,347	310,936,937
Total disbursements	314,631,574	312,664,945
Excess of Receipts Over Disbursements	(31,328,727)	683,829,156
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	2,300,504,416	1,616,675,260
Excess of receipts over disbursements	(31,328,727)	683,829,156
Asset balance as of the end of the year	$2,269,175,689	$ 2,300,504,416
Investment rate of return on market value	(9.70)%	31.10%

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

	For the Year Ended	
	June 30, 2022	June 30, 2021
Receipts for the Year		
Contributions		
Members	$	$
State	2,194,049	1,852,447
Employer	560,814	285,928
Total	2,754,863	2,138,375
Net investment income	(15,582,277)	24,075,148
Total	(12,827,414)	26,213,523
Disbursements for the Year		
Benefit payments	6,178,000	6,120,000
Miscellaneous, including expenses	40,999	34,498
Total	6,218,999	6,154,498
Excess of Receipts Over Disbursements	(19,046,413)	20,059,025
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	107,426,916	87,367,891
Excess of receipts over disbursements	(19,046,413)	20,059,025
Asset balance as of the end of the year	$ 88,380,503	$107,426,916
Investment rate of return on market value	(14.96)%	28.17 %

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, 2022

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**
2023	1.55%	6.75%
2024	6.23	6.50
2025	7.11	6.25
2026	7.88	6.00
2027	6.82	5.75
2028	6.01	5.50
2029	5.65	5.25
2030	5.74	5.00
2031	5.58	4.75
2032	4.87	4.50
2033	4.62	4.50
2034 and beyond	4.50	4.50

Age Related Morbidity — For retirees ages 65 and older, per capita health care costs are adjusted to reflect expected health care cost changes related to age. The increase to the net incurred health care claims is assumed to be as follows.

Participant Age	Annual Increase
65 – 69	3.0%
70 – 74	2.5
75 – 79	2.0
80 – 84	1.0
85 – 89	0.5
90 and over	0.0

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	$ 813.02	$ 833.64	$ 783.92
Parent Plus	1,117.34	1,177.30	1,078.16
Couple	1,608.24	1,792.42	1,650.78
Family	1,794.34	1,988.62	1,837.42
Family Cross-Reference	936.90	998.02	919.72

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	821.02	841.64	791.92
Spouse - Parent Plus	1,126.34	1,185.30	1,086.16

** 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	$ 610.90	$ 831.62	$ 1,120.24	$ 1,246.76	$ 701.34
	10-14.99	462.23	682.95	971.57	1,098.09	552.67
	15-19.99	313.57	534.29	822.91	949.43	404.01
	20 or More	164.90	385.62	674.24	800.76	255.34
Living Well PPO	5-9.99	599.60	774.54	1,072.00	1,123.32	678.88
	10-14.99	454.70	625.87	923.33	974.65	530.21
	15-19.99	309.80	477.21	774.67	825.99	381.55
	20 or More	164.90	328.54	626.00	677.32	232.88
Living Well Basic	5-9.99	607.91	861.98	1,220.70	1,351.08	739.56
	10-14.99	460.24	713.31	1,072.03	1,202.41	590.89
	15-19.99	312.57	564.65	923.37	1,053.75	442.23
	20 or More	164.90	415.98	774.70	905.08	293.56

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	$ 700.09	$ 920.81	$ 1,209.43	$ 1,335.95	$ 790.53
	10-14.99	610.90	831.62	1,120.24	1,246.76	701.34
	15-19.99	491.97	712.69	1,001.31	1,127.83	582.41
	20-24.99	373.04	593.76	882.38	1,008.90	463.48
	25-25.99	224.37	445.09	733.71	860.23	314.81
	26-26.99	194.64	415.36	703.98	830.50	285.08
	27 or More	164.90	385.62	674.24	800.76	255.34
Living Well PPO	5-9.99	686.54	863.73	1,161.19	1,212.51	768.07
	10-14.99	599.60	774.54	1,072.00	1,123.32	678.88
	15-19.99	483.68	655.61	953.07	1,004.39	559.95
	20-24.99	367.76	536.68	834.14	885.46	441.02
	25-25.99	222.86	388.01	685.47	736.79	292.35
	26-26.99	193.88	358.28	655.74	707.06	262.62
	27 or More	164.90	328.54	626.00	677.32	232.88
Living Well Basic	5-9.99	696.51	951.17	1,309.89	1,440.27	828.75
	10-14.99	607.91	861.98	1,220.70	1,351.08	739.56
	15-19.99	489.78	743.05	1,101.77	1,232.15	620.63
	20-24.99	371.64	624.12	982.84	1,113.22	501.70
	25-25.99	223.97	475.45	834.17	964.55	353.03
	26-26.99	194.44	445.72	804.44	934.82	323.30
	27 or More	164.90	415.98	774.70	905.08	293.56

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	**Entered TRS Before July 1, 2002**	**Entered TRS After June 30, 2002 & Before July 1, 2008**	**Entered TRS After June 30, 2008**
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

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
56%	41%	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 - 10	**10 - 15**	**15 - 27**	**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.

Affordable Care Act (ACA) — The impact of the Affordable Care Act (ACA) was addressed in this valuation. Review of the information currently available did not identify any specific provisions of the ACA that are anticipated to significantly 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. Continued monitoring of the ACA's impact on the plan's liability will be required.

COVID-19 — The impact of COVID-19 pandemic was considered in this valuations, however, no changes other than healthcare trend adjustments 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 market 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 market 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.

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*

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*

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	Formula	Shared Responsibility Contribution
July 1, 2010	$ 110.50	(1/3 x $110.50)	$ 37.00
January 1, 2011	115.40	(1/3 x 115.40)	39.00
July 1, 2011	115.40	(2/3 x 115.40)	77.00
January 1, 2012	99.90	(2/3 x 99.90)	66.00
July 1, 2012	99.90	99.90	99.90
January 1, 2013	104.90	104.90	104.90
January 1, 2014	104.90	104.90	104.90
January 1, 2015	104.90	104.90	104.90
January 1, 2016	121.80	121.80	121.80
January 1, 2017	134.00	134.00	134.00
January 1, 2018	134.00	134.00	134.00
January 1, 2019	135.50	135.50	135.50
January 1, 2020	144.60	144.60	144.60
January 1, 2021	148.50	148.50	148.50
January 1, 2022	170.10	170.10	170.10
January 1, 2023	164.90	164.90	164.90

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	Hired before July 1, 2002: Age 65 or Older and Covered Before Jan.1, 2005	Hired before July 1, 2002: Age 65 After or Covered After Dec.31, 2004	Entered TRS After June 30, 2002 and Before July 1, 2008	Entered TRS After June 30, 2008
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 $759.56. TRS will contribute this amount towards insurance costs, less the Shared Responsibility cost of $164.90. 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	LivingWell PPO	LivingWell Basic CDHP	Ages 65 and Older (MEHP)
Single	$813.02	$833.64	$783.92	$ 217.00
Parent Plus	1,117.34	1,177.30	1,078.16	n/a
Couple	1,608.24	1,792.42	1,650.78	n/a
Family	1,794.34	1,988.62	1,837.42	n/a
Family Cross-Reference	936.90	998.02	919.72	n/a

**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. For 2022, 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	$ 821.02	$ 841.64	$ 791.92	$ 217.00
Parent Plus	1,125.34	1,185.30	1,086.16	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*

Years of Service	Entered TRS Before July 1, 2002: Age 65 or Older & Covered Before Jan. 1, 2005	Entered TRS Before July 1, 2002: Age 65 After or Covered After Dec. 31, 2004	Entered TRS After June 30, 2002 and Before July 1, 2008	Entered TRS After June 30, 2008
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 January 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		
Hired Before July 1, 2008	Hired on or After July 1, 2008	Hired on or After Jan. 1, 2022	Hired Before July 1, 2008	Hired on or After July 1, 2008	Hired on or After Jan. 1, 2022	Hired Before July 1, 2008	Hired on or After July 1, 2008	Hired on or After Jan. 1, 2022
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, 2022
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 29	30 to 34	35 & Over	Number*	Payroll
Under 25	2,818	2,029	6							4,853	$ 102,977,337
25 to 29	943	4,769	1,996							7,708	326,849,945
30 to 34	633	2,004	4,246	1,436	5					8,324	417,040,756
35 to 39	613	1,446	2,176	4,167	1,511	4				9,917	557,755,235
40 to 44	622	1,343	1,482	1,983	4,465	1,298	6			11,199	692,913,011
45 to 49	387	910	1,014	1,313	1,997	3,953	960	3		10,537	706,613,173
50 to 54	578	837	725	1,011	1,433	2,115	2,655	374	2	9,730	648,449,305
55 to 59	783	857	462	536	820	1,003	826	325	37	5,649	325,178,567
60 to 64	597	945	306	282	397	418	343	112	57	3,457	159,118,198
65 to 69	501	658	248	122	117	154	135	49	33	2,017	65,610,308
70 & Over	373	551	206	69	57	43	43	24	28	1,394	31,003,343
Total Count	8,848	16,349	12,867	10,919	10,802	8,988	4,968	887	157	74,785	$4,033,509,178

**The active member counts above reflect the initial active membership. Approximately 4,358 of these active members were ultimately valued in their retired status.*

Average Age: 43.2 Average Service: 11.1

Table 2

Schedule of Total Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	Percentage Increase in Average Pay
2013	74,831	$3,480,066,406	$46,506	1.51%
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)

Table 3

Eligible Deferred Vested Members
Male and Female Demographic Breakdown
as of June 30, 2022
Health Insurance Trust

Attained Age	Number of Males	Number of Females	Total Number
Under 30	1	0	1
30-34	31	49	80
35-39	179	644	823
40-44	381	1082	1,463
45-49	337	1,083	1,420
50-54	335	1289	1,624
55-59	255	910	1,165
60 & Over	259	830	1,089
Total	1,778	5,887	7,665

Life Insurance Trust

Attained Age	Number of Males	Number of Females	Total Number*
Under 30	23	69	92
30-34	182	554	736
35-39	333	1,185	1,518
40-44	474	1,427	1,901
45-49	420	1,374	1,794
50-54	404	1,509	1,913
55-59	302	1,060	1,362
60 & Over	344	1,030	1,374
Total	2,482	8,208	10,690

**There were initially 74,785 active members and 10,690 deferred vested members. However, 4,358 active members and 117 deferred vested members were also listed as a retiree and were ultimately valued in their retired status. The counts in the exhibit above reflect the initial member counts without adjustment.*

Table 4
All Retirees and Spouses Receiving Health Care Benefits
as of June 30, 2022
Male and Female Demographic Breakdown

Attained Age	Number of Males	Number of Females	Total Number
Under 40	1	9	10
40-44	3	26	29
45-49	53	116	169
50-54	381	930	1,311
55-59	1073	2,376	3,449
60-64	1,733	4,077	5,810
65-69	2,602	6,395	8,997
70-74	3,739	8,127	11,866
75-79	2,876	5,333	8,209
80-84	1,540	2,902	4,442
85-89	792	1,501	2,293
90-94	254	721	975
95-99	48	193	241
100 and over	8	29	37
Total	15,103	32,735	47,838

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
2013	1,853	664	2,517	1,076	619	1,695	36,777	7,053	43,830
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

**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
2013	2,195	$10,975	952	$4,760	43,845	$219,225	2.92%	$5,000
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

** The life insurance benefit is payable upon the death of only members retired for service or disability. Numbers do not include life insurance benefits payable upon the death of an active contributing member. There were initially 53,761 retired or disabled members. However, 1,548 were listed multiple times, reflecting different pension benefits earned under multiple roles as an employee. 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, 2022, 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	$ 4,325,183	$ 3,768,713	$ 3,316,037
Actuarial value of assets	2,401,147	2,401,147	2,401,147
Unfunded liability	$ 1,924,036	$ 1,367,566	$ 914,890
Funded ratio	55.52 %	63.71 %	72.41 %
Contributions			
Normal cost	2.66 %	2 %	1.51 %
Accrued liability	3.43 %	2.62 %	1.87 %
Total	6.09 %	4.62 %	3.38 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.28)%	(2.28)%	(2.28)%
Statutorily required prefunding*	(2.88)%	(4.35)%	(5.59)%
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	$ 3,768,713	$ 3,840,519	$ 3,919,696
Actuarial value of assets	2,401,147	2,401,147	2,401,147
Unfunded liability	$ 1,367,566	$ 1,439,372	$ 1,518,549
Funded ratio	63.71 %	62.52 %	61.26 %
Contributions			
Normal cost	2.00 %	2.04 %	2.09 %
Accrued liability	2.62 %	2.76 %	2.91 %
Total	4.62 %	4.8 %	5.00 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.28)%	(2.28)%	(2.28)%
Statutorily required prefunding*	(4.35)%	(4.17)%	(3.97)%
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	$ 3,768,713	$ 3,768,713	$ 3,768,713
Actuarial value of assets	2,401,147	2,401,147	2,401,147
Unfunded liability	$ 1,367,566	$ 1,367,566	$ 1,367,566
Funded ratio	63.71 %	63.71 %	63.71 %
Contributions			
Normal cost	2.00 %	2.00 %	2.00 %
Accrued liability	2.62 %	2.91 %	3.17 %
Total	4.62 %	4.91 %	5.17 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.28)%	(2.28)%	(2.28)%
Statutorily required prefunding*	(4.35)%	(4.06)%	(3.80)%
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	$ 3,273,770	$ 3,768,713	$ 4,390,636
Actuarial value of assets	2,401,147	2,401,147	2,401,147
Unfunded liability	$ 872,623	$ 1,367,566	$ 1,989,489
Funded ratio	73.35 %	63.71 %	54.69 %
Contributions			
Normal cost	1.56 %	2.00 %	2.59 %
Accrued liability	1.67 %	2.62 %	3.81 %
Total	3.23 %	4.62 %	6.4 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.99)%	(2.99)%	(2.99)%
State	(2.28)%	(2.28)%	(2.28)%
Statutorily required prefunding*	(5.74)%	(4.35)%	(2.57)%
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).*

Sensitivity Analysis — Life Insurance Trust

The June 30, 2022, 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	$ 136,142	$ 119,197	$ 105,497
Actuarial value of assets	96,926	96,926	96,926
Unfunded liability	$ 39,216	$ 22,271	$ 8,571
Funded ratio	71.19 %	81.32 %	91.88 %
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	$ 119,197	$ 123,248	$ 127,540
Actuarial value of assets	96,926	96,926	96,926
Unfunded liability	$ 22,271	$ 26,322	$ 30,614
Funded ratio	81.32 %	78.64 %	76.00 %
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	$ 119,197	$ 119,197	$ 119,197
Actuarial value of assets	96,926	96,926	96,926
Unfunded liability	$ 22,271	$ 22,271	$ 22,271
Funded ratio	81.32 %	81.32 %	81.32 %
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 — 18-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
2022	2023	$ 3,845,198	$ 188,311	$ 4,033,509	$ 1,367,566	63.7 %	$ 212,915
2023	2024	3,919,054	185,788	4,104,842	1,214,864	69.4	222,051
2024	2025	3,995,265	186,070	4,181,335	1,033,645	75.2	231,755
2025	2026	4,073,746	187,338	4,261,084	809,519	81.5	241,872
2026	2027	4,152,528	189,472	4,342,000	631,139	86.2	253,026
2027	2028	4,229,811	192,316	4,422,127	344,370	92.8	264,716
2028	2029	4,308,036	195,537	4,503,573	24,554	99.5	277,111
2029	2030	4,389,593	198,989	4,588,582		100.0	95,147
2030	2031	4,474,429	202,790	4,677,219		100.0	97,766
2031	2032	4,563,338	206,509	4,769,847		100.0	100,580
2032	2033	4,655,488	210,368	4,865,856		100.0	103,575
2033	2034	4,748,282	214,683	4,962,965		100.0	106,684
2034	2035	4,847,256	218,739	5,065,995		100.0	109,975
2035	2036	4,951,697	222,845	5,174,542		100.0	113,466
2036	2037	5,062,407	227,690	5,290,097		100.0	117,159
2037	2038	5,178,745	232,647	5,411,392		100.0	121,075
2038	2039	5,301,073	238,258	5,539,331		100.0	125,217
2039	2040	5,429,989	244,175	5,674,164		100.0	129,570
2040	2041	5,566,858	250,553	5,817,411		100.0	134,159
2041	2042	5,710,607	257,472	5,968,079		100.0	138,991

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Total Employer Contribution
2042	2043	5,859,777	264,619	6,124,396		100.0	144,041
2043	2044	6,016,863	272,306	6,289,169		100.0	149,358
2044	2045	6,180,054	280,612	6,460,666		100.0	154,929
2045	2046	6,350,161	289,377	6,639,538		100.0	160,767
2046	2047	6,527,121	298,764	6,825,885		100.0	166,859
2047	2048	6,711,975	308,302	7,020,277		100.0	173,263
2048	2049	6,903,214	318,386	7,221,600		100.0	179,976
2049	2050	7,105,133	328,203	7,433,336		100.0	186,990
2050	2051	7,322,818	338,133	7,660,951		100.0	194,725
2051	2052	7,547,934	347,912	7,895,846		100.0	203,080

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 — 22-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
2022	2025	$ 3,845,198	$ 188,311	$ 4,033,509	$ 22,271	81.3 %	$ 3,345
2023	2026	3,919,054	185,788	4,104,842	23,639	80.6	3,409
2024	2027	3,995,265	186,070	4,181,335	24,876	80.1	3,474
2025	2028	4,073,746	187,338	4,261,084	25,883	79.8	3,188
2026	2029	4,152,528	189,472	4,342,000	30,415	76.7	3,677
2027	2030	4,229,811	192,316	4,422,127	30,315	77.3	3,817
2028	2031	4,308,036	195,537	4,503,573	30,557	77.6	4,000
2029	2032	4,389,593	198,989	4,588,582	30,363	78.1	4,162
2030	2033	4,474,429	202,790	4,677,219	30,066	78.7	4,331
2031	2034	4,563,338	206,509	4,769,847	29,614	79.4	4,499

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funded Ratio	Actuarially Determined Contribution
2032	2035	4,655,488	210,368	4,865,856	29,014	80.1	4,672
2033	2036	4,748,282	214,683	4,962,965	28,246	81.0	4,855
2034	2037	4,847,256	218,739	5,065,995	27,300	81.9	5,045
2035	2038	4,951,697	222,845	5,174,542	26,152	82.8	5,243
2036	2039	5,062,407	227,690	5,290,097	24,778	83.9	5,449
2037	2040	5,178,745	232,647	5,411,392	23,152	85.2	5,668
2038	2041	5,301,073	238,258	5,539,331	21,244	86.6	5,904
2039	2042	5,429,989	244,175	5,674,164	19,025	88.1	6,165
2040	2043	5,566,858	250,553	5,817,411	16,457	89.8	6,458
2041	2044	5,710,607	257,472	5,968,079	13,493	91.7	6,819
2042	2045	5,859,777	264,619	6,124,396	10,079	93.9	7,335
2043	2046	6,016,863	272,306	6,289,169	6,149	96.3	8,424
2044	2047	6,180,054	280,612	6,460,666	1,593	99.1	3,637
2045	2048	6,350,161	289,377	6,639,538		100.0	1,973
2046	2049	6,527,121	298,764	6,825,885		100.0	1,989
2047	2050	6,711,975	308,302	7,020,277		100.0	2,004
2048	2051	6,903,214	318,386	7,221,600		100.0	2,020
2049	2052	7,105,133	328,203	7,433,336		100.0	2,034
2050	2053	7,322,818	338,133	7,660,951		100.0	2,040
2051	2054	7,547,934	347,912	7,895,846		100.0	2,044

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
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
2013	568,233,446	304,738,728	2,039,874,263	2,912,846,437

Deductions by Type

Year	Service Retirees	Disability Retirees	Survivors	Total Benefits	Refunds*	Administrative Expense	Total Deductions to Plan Net Position
2022	$2,196,122,634	$ 88,683,021	$ 21,047,117	$2,305,852,772	$ 26,745,203	$ 12,005,095	$ 2,344,603,070
2021	2,126,870,064	88,451,354	19,919,198	2,235,240,616	25,373,818	12,601,841	2,273,216,275
2020	2,059,900,271	87,666,903	19,672,067	2,167,239,241	28,472,217	12,166,651	2,207,878,109
2019	1,989,082,744	86,215,602	19,065,726	2,094,364,072	32,403,149	12,352,308	2,139,119,529
2018	1,901,237,575	84,500,330	18,879,429	2,004,617,334	31,072,421	11,388,493	2,047,078,248
2017	1,817,594,617	82,466,114	18,551,397	1,918,612,128	26,305,240	10,313,715	1,955,231,083
2016	1,735,374,416	79,808,432	18,015,782	1,833,198,630	27,747,742	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
2013	1,484,132,938	69,808,291	16,781,695	1,570,722,924	22,059,094	8,377,003	1,601,159,021

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2013	2,912,846,437	1,601,159,021	1,311,687,416

*Refunds by type (e.g., death, separation) are not available.

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
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
2013	166,576,444	119,795,780	34,976	30,718,836	317,126,036

Amounts paid by retirees and recovery income is netted against insurance expenses beginning fiscal year 2016.

Deductions by Type

Year	Insurance Benefit Expense		Total Insurance Benefits Expense	Administrative Expense	Total Deductions to Plan Net Position
	Under Age 65	Age 65 & Over			
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
2013	142,170,438	98,761,180	240,931,618	1,275,206	242,206,824

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2013	317,126,036	242,206,824	74,919,212

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
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
2013	1,680,495	674,760	2,355,255

Deductions by Type

Year	Life Insurance	Administrative Expense	Total Deductions to Plan Net Position
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
2013	4,614,718	24,425	4,639,143

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2013	2,355,255	4,639,143	(2,283,888)

Distribution of Active Contributing Members
as of June 30, 2022

By Age

Age	Male	Female
20-24	1,026	3,894
25-29	1,759	6,010
30-34	1,979	6,410
35-39	2,370	7,608
40-44	2,710	8,537
45-49	2,679	7,936
50-54	2,430	7,592
55-59	1,542	4,540
60-64	928	2,770
65 & over	1,033	2,618
Total	18,456	57,915

By Service

Years of	Male	Female
Less than 1	2,595	8,364
1-4	4,288	13,430
5-9	3,004	9,720
10-14	2,537	7,853
15-19	2,449	7,890
20-24	2,034	6,553
25-29	1,276	3,396
30-34	230	652
35 or more	43	57
Total	18,456	57,915

Principal Participating Employers
Current Year and Nine Years Ago

Employer	2022 Covered Employees	2022 Rank	2022 Percentage of System	2013 Covered Employees	2013 Rank	2013 Percentage of System
Jefferson County Schools	10,799	1	14.14 %	10,215	1	13.44 %
Fayette County Schools	5,037	2	6.60	4,691	2	6.17
Boone County Schools	2,146	3	2.81	1,852	3	2.44
Warren County Schools	1,670	4	2.19	1,260	6	1.66
Hardin County Schools	1,454	5	1.90	1,357	4	1.79
Kenton County Schools	1,284	6	1.68	1,297	5	1.71
Oldham County Schools	1,266	7	1.66	1,203	8	1.58
Bullitt County Schools	1,238	8	1.62	1,238	7	1.63
Daviess County Schools	1,154	9	1.51	1,087	10	1.43
Madison County Schools	1,104	10	1.45	1,159	9	1.52
Other Employers (see below)	49,219		64.45	50,651		66.64
Total (202 Employers)	76,371		100 %	76,010		100 %

Other Employers
(detailed from above chart)

Type	Number of Employers	Employees
Local School Districts	161	44,339
Higher Education	6	3,067
State Agencies	12	1,293
Educational Cooperatives	8	403
Other	5	117
Total	192	49,219

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, 2022

County	Payments	Recipients	County	Payments	Recipients
Adair	$ 10,141,213	246	Laurel	$ 32,173,315	779
Allen	8,912,080	204	Lawrence	6,543,975	173
Anderson	9,630,453	270	Lee	3,666,497	90
Ballard	5,254,606	139	Leslie	6,972,859	166
Barren	22,059,054	526	Letcher	14,122,274	369
Bath	6,254,856	167	Lewis	7,817,981	198
Bell	15,206,482	387	Lincoln	13,527,342	325
Boone	51,469,271	1,152	Livingston	3,986,657	98
Bourbon	8,967,619	228	Logan	12,996,710	316
Boyd	23,836,648	578	Lyon	4,892,787	117
Boyle	22,483,729	531	Madison	67,046,280	1,610
Bracken	4,826,091	120	Magoffin	9,180,806	223
Breathitt	10,090,585	263	Marion	9,164,025	231
Breckinridge	9,341,800	229	Marshall	17,585,357	418
Bullitt	23,660,402	532	Martin	6,163,585	161
Butler	5,140,475	121	Mason	9,661,565	253
Caldwell	8,011,662	200	McCracken	30,619,331	764
Calloway	31,396,751	764	McCreary	8,979,265	227
Campbell	35,732,296	804	McLean	5,102,444	125
Carlisle	2,049,593	60	Meade	9,199,741	204
Carroll	4,524,281	104	Menifee	2,853,272	81
Carter	16,868,744	433	Mercer	11,720,094	309
Casey	7,524,224	191	Metcalfe	4,411,249	112
Christian	23,370,096	595	Monroe	7,181,277	174
Clark	17,301,467	415	Montgomery	15,219,440	384
Clay	13,688,371	329	Morgan	7,469,139	197
Clinton	6,750,556	176	Muhlenberg	16,693,930	385
Crittenden	2,573,201	69	Nelson	21,208,995	514
Cumberland	3,782,643	89	Nicholas	2,823,285	74
Daviess	54,477,658	1,319	Ohio	9,607,880	251
Edmonson	5,024,564	126	Oldham	27,370,885	608
Elliott	2,545,114	69	Owen	4,650,996	120
Estill	7,777,131	188	Owsley	4,841,749	121
Fayette	147,085,272	3,561	Pendleton	6,933,570	159
Fleming	7,907,447	201	Perry	18,621,205	440
Floyd	22,882,753	577	Pike	33,631,903	833
Franklin	33,058,121	961	Powell	6,397,465	148
Fulton	3,011,888	79	Pulaski	34,712,171	888
Gallatin	2,078,532	52	Robertson	1,091,419	28
Garrard	9,874,421	241	Rockcastle	9,057,223	213
Grant	9,170,359	213	Rowan	23,609,747	577
Graves	18,201,070	439	Russell	11,098,466	267
Grayson	13,512,835	322	Scott	24,616,466	581
Green	6,278,906	159	Shelby	24,772,573	561
Greenup	18,084,973	434	Simpson	6,949,925	174
Hancock	3,015,759	72	Spencer	7,492,993	168
Hardin	47,427,296	1111	Taylor	14,827,286	376
Harlan	16,882,747	424	Todd	4,378,072	111
Harrison	8,907,897	223	Trigg	8,257,322	207
Hart	7,635,942	175	Trimble	2,853,771	65
Henderson	20,761,263	509	Union	4,781,366	132
Henry	8,914,920	224	Warren	84,674,145	2,041
Hickman	1,506,904	35	Washington	5,963,788	145
Hopkins	21,365,493	511	Wayne	10,821,217	270
Jackson	7,174,952	186	Webster	5,732,419	144
Jefferson	363,727,871	7,660	Whitley	31,353,161	791
Jessamine	21,918,014	538	Wolfe	5,291,922	143
Johnson	16,591,788	388	Woodford	16,567,513	405
Kenton	46,929,739	1,113			
Knott	11,266,035	277	**Total in Kentucky**	**$ 2,217,278,635**	**52,874**
Knox	13,077,114	333			
LaRue	8,412,516	188			

Distribution of Retirement and Health Insurance Payments Worldwide as of June 30, 2022

Number of Recipients in United States Outside Kentucky

196	Alabama
6	Alaska
40	Arizona
100	Arkansas
96	California
85	Colorado
12	Connecticut
15	Delaware
6	District of Columbia
1,528	Florida
305	Georgia
12	Hawaii
14	Idaho
123	Illinois
889	Indiana
26	Iowa
39	Kansas
48	Louisiana
21	Maine
49	Maryland
28	Massachusetts
71	Michigan
23	Minnesota
70	Mississippi
103	Missouri
7	Montana
10	Nebraska
29	Nevada
6	New Hampshire
16	New Jersey
20	New Mexico
47	New York
338	North Carolina
2	North Dakota
729	Ohio
32	Oklahoma
33	Oregon
76	Pennsylvania
3	Rhode Island
287	South Carolina
8	South Dakota
1,160	Tennessee
260	Texas
32	Utah
3	Vermont
191	Virginia
41	Washington
103	West Virginia
42	Wisconsin
10	Wyoming

Number of Recipients Outside United States

4	Military APO
2	Australia
1	Barbados
1	Bosnia and Herzegovina
5	Canada
1	Czech Republic
1	Japan
1	Poland
1	Puerto Rico
3	Spain
1	Sweden

	Number of Recipients	Amount of Payments
Inside Kentucky	52,874	$ 2,217,278,635
Outside Kentucky	7,411	237,173,878
Total	60,285	$ 2,454,452,513

Growth in Annuitants as of June 30, 2022

Fiscal Year	Service Retirees	Disability Retirees	Beneficiaries of Retired Members	Beneficiaries of Deceased Members Eligible to Retire	Survivors	Disabled Adult Child
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
2013	41,255	2,582	2,207	601	432	303

Schedule of Annuitants by Type of Benefit as of June 30, 2022

Monthly Benefit ($)	Number of Annuitants	Type of Benefit*					
		1	2	3	4	5	6
1 - 500	4,477	3,508	11	198	17	394	349
501 - 1,000	2,992	2,516	120	287	69	0	0
1,001 - 1,500	2,886	2,063	267	465	90	1	0
1,501 - 2,000	3,262	2,323	379	487	73	0	0
2,001 - 2,500	3,974	3,086	432	376	80	0	0
2,501 - 3,000	6,150	4,995	648	411	96	0	0
3,001 - 3,500	8,953	8,021	507	354	71	0	0
3,501 - 4,000	7,962	7,453	230	237	42	0	0
4,001 - 4,500	5,668	5,337	109	191	31	0	0
4,501 - 5,000	4,124	3,925	57	121	21	0	0
5,001 & over	8,120	7,858	41	184	37	0	0
Total	58,568	51,085	2,801	3,311	627	395	349

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, 2022

Monthly Benefit ($)	Option Selected*							
	1	2	3	4	5	6	7	8
1 - 500	2,308	556	305	44	5	432	81	746
501 - 1,000	1,692	446	253	72	9	380	136	4
1,001 - 1,500	1,420	339	291	140	10	374	301	11
1,501 - 2,000	1,612	374	289	128	10	459	367	23
2,001 - 2,500	2,027	452	360	143	2	599	334	57
2,501 - 3,000	2,938	634	540	194	8	1,109	567	160
3,001 - 3,500	4,623	1,083	668	205	4	1,498	810	62
3,501 - 4,000	4,205	1,005	541	201	8	1,191	778	33
4,001 - 4,500	2,930	670	425	154	4	882	584	19
4,501 - 5,000	2,123	451	345	115	6	621	458	5
5,001 & OVER	4,189	882	728	306	21	1,135	854	5
Total	30,067	6,892	4,745	1,702	87	8,680	5,270	1,125

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, 2013								
Average monthly benefit	$ 161	$ 475	$ 1,186	$ 1,963	$ 2,781	$ 3,811	$ 5,162	**$ 3,149**
Final average salary	$ 3,362	$ 3,660	$ 4,498	$ 4,956	$ 5,518	$ 5,799	$ 6,632	**$ 5,476**
Number of retired members	44	234	156	154	294	685	447	**2,014**
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**
Average 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**
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**
Ten Years Ended June 30, 2022								
Average monthly benefit	**$ 143**	**$ 474**	**$ 1,241**	**$ 2,053**	**$ 2,902**	**$ 3,992**	**$ 5,302**	**$ 3,141**
Final average salary	**$ 3,342**	**$ 3,565**	**$ 4,657**	**$ 5,265**	**$ 5,748**	**$ 6,096**	**$ 6,850**	**$ 5,612**
Number of retired members	**679**	**2,306**	**1,538**	**1,888**	**3,157**	**7,659**	**3,426**	**20,653**

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 Nine 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

Retiree Sick Leave Payments
Summary for the Year Ended June 30, 2022

Total members retiring	2,284
Total members receiving sick leave payments	1,660
Total amount of sick leave payments at 12.855% contribution rate	$ 22,144,917
Average sick leave payment per retiree	$ 13,340
Total increase in final three or five year average salary base	$ 5,829,263
Average increase in final average salary	$ 3,512
Total service credit of 1,461 retirees	43,512
Average service credit of 1,461 retirees	26.21

Anticipated Payout of Additional Annuity

Actuarial cost of sick leave as salary credit	$ 48,668,994

Funding of Additional Payments

Member contributions ($22,144,917 x 9.105%)	$ 2,016,295
Employer contributions ($22,144,917 x 12.305%)	2,724,932
Total Contributions	$ 4,741,227
Anticipated additional payout	$ 48,668,994
Less: total member and state contributions	4,741,227
Total	$ 43,927,767