Teachers' Retirement System
of the State of Kentucky

TEACHERS'
Retirement System
TRS
KENTUCKY

The 81st Annual
Comprehensive Financial Report

A Component Unit of the Commonwealth of Kentucky

Fiscal Years Ended June 30, 2021 and 2020

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

December 20, 2021

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, 2021 and 2020, the 81st 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 2021 fiscal year with 69,256 active members, 57,465 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 benefits 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 to administer the affairs of the Teachers' Retirement System in the most competent and efficient manner possible.

Sincerely,

Alison Wright

Alison Wright
Chair
Board of Trustees

Letter of Transmittal

Teachers' Retirement System of the State of Kentucky

December 20, 2021

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

Dear Governor Beshear:

It is my pleasure to submit the 81st 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, 2021 and 2020. 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 fourth consecutive year of full pension funding for TRS of the actuarially determined employer contribution (ADEC). The importance of the consistent full funding of the retirement plan for Kentucky's teachers cannot be overstated — as evidenced by the record $28.3 billion net assets at the close of the fiscal year, which is an improvement of $5.9 billion over the prior year and a $10.7 billion improvement in fiduciary net position since 2016. All of this was done against the backdrop of the global COVID-19 coronavirus pandemic with all benefits and services provided safely and without interruption while nearly all employees worked remotely most of the year.

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 88% of retirees who live here and receive 91% of the annuity benefits paid by TRS. TRS paid $2.4 billion in total benefits (retirement, medical, 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, 2021 and 2020. 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 $39,400 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 a blended component unit 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 independent annual audit that resulted in no findings.

The year also included the completion of the five-year actuarial experience study, the most significant piece of the which implementing new mortality tables tailored specifically to teachers.

During the year, TRS continued work on several major initiatives concerning funding, investments, benefit administration and cost containment. Before discussing those efforts individually, it should be noted how all were accomplished amid the ongoing global pandemic.

Coronavirus Response

Since the outbreak of the coronavirus pandemic, coordinated efforts have kept members and retirees safer through communications done virtually and in other ways that alleviate any need for a visit to the TRS office, which has been closed to visitors as a safety precaution almost entirely since March 2020. Every service provided before the pandemic continues to be provided now, albeit not in person. At present, the lobby is open for members and retirees to deliver or receive documents. Most staff work remotely with full access to email and the ability to answer office phones using their computers.

Many members have expressed appreciation for the ease of webinars and remote counseling via phone call or video that allows them to avoid a drive to Frankfort.

The continued precautions are needed to ensure the uninterrupted continuity of TRS's primary mission of delivering about $200 million on time each month to retirees with only about 100 full-time employees. Staff work closely together, and in-person counseling occurs in close proximity with visitors from every part of the state. Counselors, in addition to their appointments with members, typically are involved in the business functions that get benefits out the door each month.

Replicating office discussions through secure videoconferencing, I meet daily with directors to review efforts on behalf of the retirement system. These measures have kept morale high among staff members.

With the pandemic and under the authority of state law, meetings of the board and its committees were conducted by live video teleconference and broadcast to the public by YouTube 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 Medicare Eligible Health Plan that improves the wellness of retirees. The program now has more than 8,000 participants.

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.

With initial results:

- DNA testing results led to a recommended medication change for 28% of participants.
- Medical spending for participants was reduced 14%.
- Medical costs for a control group not in the program increased 3.2%.
- Prescribers accepted 87% of medication change recommendations, hospitalizations were reduced 22% and slip and fall accidents were reduced 27%.

As the program has gained more experience, a review of medical claims data showed a savings of $219 per member per month over what otherwise would have been spent, which equates to $7,000 per member for 32 months. This is a return on investment of about 15 to one. TRS staff members continue to be in demand for presentations at conferences and in other forums to chronicle the success of this program.

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 TRS Health Insurance Trust. In just over a decade, the health insurance fund has achieved a 60% 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 made 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 89% of the time at the end 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.

Investing
The fiscal year was the best in the 81-year history of TRS with record gains in both the retirement annuity and health insurance trusts — 29.94% for the Retirement Annuity Trust and 31.53% for the Health Insurance Trust. The above-average performance of TRS's investing since the start of the Great Recession has meant an additional $5.4 billion over that term through the end of the most recent fiscal year for Kentucky teachers' pensions compared to the average pension plan.

As of June 30, 2021, TRS achieved top 4% for the decade, top 3% for the last five years, top 7% for three years and top quartile for the fiscal year (as ranked by Aon covering public plans with assets over $1 billion).

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. 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.

For the year ended June 30, 2021, the fair value of TRS's investments increased substantially, benefiting from market gains throughout the year that followed a snap-back from the pandemic-related crash near the end of the prior fiscal year. The Retirement Annuity Trust increased 29.94% gross and 29.59% net, while the Health Insurance Trust increased 31.53% gross and 31.13% net. This combined performance pushed total plan assets for all trusts to a record of $28.3 billion.

The fiscal year was characterized by the strong growth in global equity markets after a prior year marked by pandemic-related fluctuations. Interest rates rose sharply from depressed levels as bond markets reacted to a rebound in economic growth driven by heavy fiscal stimulus and the reopening of the economy.

Although a one-year period is not determinative for a long-term investor like TRS, the performance for the most recent year and longer periods follows TRS's historical record of top-tier performance. Moreover, during the last 30 years, TRS retirement annuity investment returns of 8.59% have bettered both the prior long-term assumed rate of return of 7.5% and the current 7.1% assumed rate. Net returns, as well, exceeded assumed rates for the annuity and health insurance trusts over the standard measuring periods — one, three, five and 10 years for both trusts and 20 years for the retirement annuity (since the Health Insurance Trust was established in 2010). This record validates policy changes by the board and implemented by the Investment Committee over the last several years. TRS's commitment to best practices, stringent risk controls and emphasis on fundamentals in investing helps ensure long-term retirement security for Kentucky's teachers.

TRS's investment portfolio experienced an increase in fair value during the fiscal year, increasing to $28.06 billion from $22.15 billion. The increase in value of the portfolio was the result of market conditions and additional funding provided in the state budget for TRS. Interest income, dividends and employer and employee contributions also added significantly to the portfolio.

Investment income for all funds totaled $6.62 billion. The net appreciation in fair value of investments was $6.28 billion compared to $746.5 million at June 30, 2020.

Legislation
TRS experienced one of its most active years with several pieces of retirement legislation, in addition to the budget, enacted by the General Assembly both in regular and extraordinary sessions.

House Bill 258 (RS 2021): This creates a hybrid retirement plan, now called TRS 4, for members beginning Jan. 1, 2022. With the direction of the board and its Benefits and Funding Committee, I coordinated timely responses to constituent groups, legislators, legislative staff and others regarding these changes. 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.

With HB 258 becoming law and TRS 4 set to register members less than nine months later, major staff efforts began in the year to implement TRS 4. These touched nearly all facets of operations and included numerous communications with constituency groups and members.

House Bill 113 (2021 RS): This is the first housekeeping bill in many years. Among the changes, the law reduces the number of times probate court would be needed to obtain a TRS benefit by making the spouse the default beneficiary in more instances.

Senate Bill 1 (2021 SS): Hearing pandemic staffing concerns of educators, I worked with the education community, legislators and legislative staff in advance of and during a special session on legislation that sought to address concerns while avoiding changes that would violate tax law or be actuarially unsound. Afterward, TRS staff reviewed the law and communicated its temporary return-to-work changes to members and employers.

Benefits Administration
TRS administered the implementation of a March 2021 regulation about the anti-spiking law governing annuities.

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, private equity accounting, the biennial budget request; and annual valuations and five-year experience study from the actuary. I also testified to the Interim Joint Committee on State Government.

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, 2021 and 2020.

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, 2020 and 2019. 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 comprehensive annual 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 33 consecutive years (fiscal 1988-2020). 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 2021. 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 widely are acknowledged 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 16 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 refining a system for reconciling reciprocal health insurance costs between other state plans. Additionally, TRS worked 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, both because of improved capabilities and the pandemic, 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 received more than 3,600 likes, and posts often reach more than 1,000 users — led this past year by nearly than 17,800 users who saw a post that sought to dispel misinformation about health care benefits. Facebook posts during the fiscal year were viewed nearly 69,000 times with 855 likes.

TRS Kentucky YouTube views for videos, on a variety of member benefits and retiree insurance issues, exceeded 5,800 for the year, with more than a quarter 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 622 people in live broadcasts with 812 views of recordings. This is in addition to speaking to hundreds interested in TRS at meetings of constituency groups. In particular, staff produced another video for the Kentucky Retired Teachers Association (KRTA) fall conferences that featured several TRS directors. A trustee and I also took part in in a KRTA-produced video about the actuarial experience study being a normal occurrence.

Use of mass email continued to communicate about a host of operations. A Beat the Blues campaign sent weekly emails to more than 27,000 retirees with information from providers on how to stay active during the pandemic.

And, as has taken place since TRS’s beginnings, the 19 TRS counselors met with about 1,300 members, and 21,905 retirement estimates were provided.

General Administration
TRS continued for the third 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 27% to 1,411 from 1,113 last year and 308 the first year.

Also, TRS implemented voting through Pathway in December for the Member Nominating Committee that met in early 2021 for the two 2021 trustee elections.

Funding Progress

Retirement Annuity Trust

Teachers saw the continued benefits of increased funding by the state. The end of the current fiscal year will mark the second 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.

The current fiscal 2022 Executive Branch Budget (2021 RS HB 192) provided TRS full retirement annuity funding, consisting of about $682.3 million in total and including the full $579.2 million requested in additional funding to address the unfunded liability.

Financial and actuarial reports show, thanks to funding and investment returns, that the fiduciary net position of all TRS funds has improved $10.7 billion since June 30, 2016.

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 $646.5 million (fiscal 2024). The following schedule details the growth of the additional contributions payable by the state:

Fiscal Year	Cumulative Increase as a % of Payroll	Cumulative Increase in Annual Retirement Appropriations Payable by the State
2009	1.88%	$60,499,800
2010	2.46	82,331,200
2011	3.59	121,457,000
2012	5.81	208,649,000
2013	7.27	260,980,000
2014	8.02	299,420,000
2015	10.42	386,400,000
2016	12.97	487,400,000
2017	13.8	520,372,000
2018	13.49	512,883,000
2019	14.61	553,597,000
2020	14.1	538,253,000
2021	14.27	551,092,000
2022	14.82	579,208,000
2023	15.78	629,415,000
2024	16.18	646,456,000

Source: Annual Valuation of the Retirement Annuity Trust

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 and in the fiscal 2021 and 2022 budgets.

The valuation for the Retirement Annuity Trust for the period ending June 30, 2021, reflects TRS's actuarial asset value of $22.6 billion and actuarial liabilities of $39.6 billion. The funded ratio of actuarial assets to liabilities is now 57.2%. Thanks to additional funding and top investment performance, the retirement annuity remains on track to achieve full funding, even with a 1.2 percentage point decline in the funded ratio that resulted from implementation of the experience study findings.
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 2021 valuation, the actuary recommends a cumulative increase in employer contributions of 16.18% of pay for fiscal 2024 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 11 years, the Health Insurance Trust has reached 60% 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, 2021, indicated that the trust has an unfunded liability of $1.4 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 2021 fiscal year budget included an appropriation that continued the record of full funding for retiree medical since Shared Responsibility was implemented in 2010. The full amount requested from the General Fund was not provided in the fiscal 2022 budget.

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 69 state, territorial, local and university pension systems with combined assets in excess of $2 trillion, serving more than 18 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

Board of Trustees

Administrative Staff and Professional Consultants

Gary L. Harbin, CPA
Executive Secretary

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

Eric Wampler, JD
Deputy Executive Secretary
Finance & Administration

Tom Siderewicz, CFA
Chief Investment Officer

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Kennesaw, GA 30144

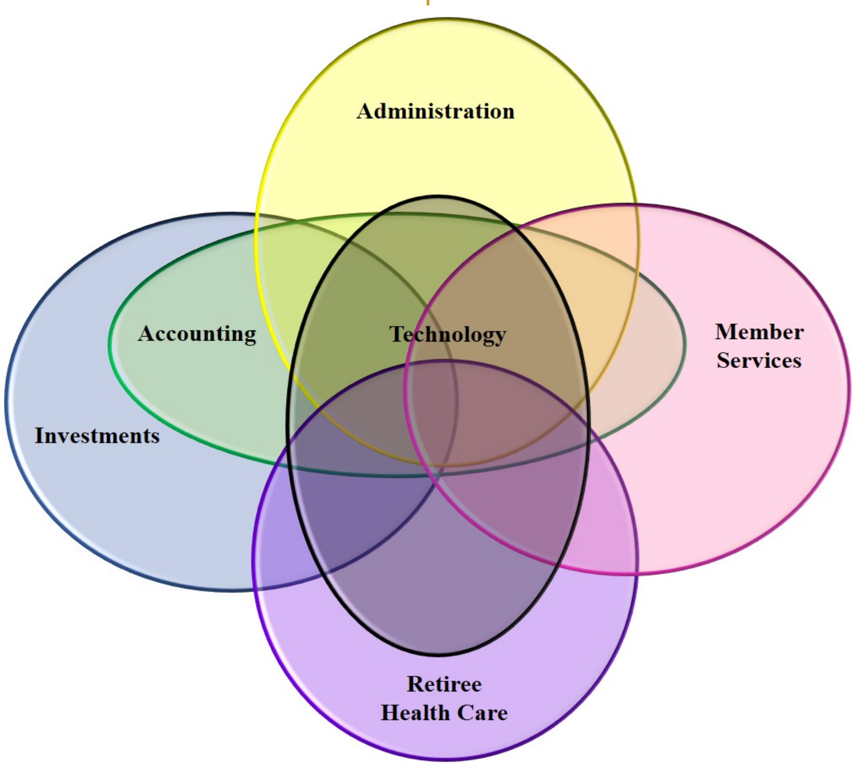
Auditor
Blue & Co. LLC
250 West Main Street, Suite 2900
Lexington, KY 40507

See the Schedules of Contracted Investment Management Expenses, Transaction Commissions and Professional Service Providers on pages 109-113, 115, 116 and 123-126 for a list of investment fees and external asset managers.

Organizational Chart

Board of Trustees

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
Nathan Van Sickel

Investments
Tom Siderewicz, CFA

Accounting
Mark E. Whelan, CPA

Retiree Health Care
Jane C. Gilbert, CPA

Technology
Jon Cordray

Member Services
Becky Niece

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 Comprehensive Annual Financial Report For the Fiscal Year Ended

June 30, 2020

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 33 consecutive years (fiscal years ended 1988-2020).

PPCC Public Pension Standards Award

PPCC

Public Pension Coordinating Council

Public Pension Standards Award
For Funding and Administration
2021

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
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 2021 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 widely are acknowledged 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

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main 859.253.1100 fax 859.253.1384 email blue@blueandco.com

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

We have audited the accompanying financial statements of the Teachers' Retirement System of the State of Kentucky (TRS), a component unit of the Commonwealth of Kentucky, as of and for the years ended June 30, 2021 and 2020, and the related notes to the financial statements, which collectively comprise TRS's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

Our responsibility is to express opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Teachers' Retirement System of the State of Kentucky as of June 30, 2021 and 2020, and the changes in fiduciary net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Report on Required Supplementary Information

Accounting principles generally accepted in the United States of America require that management's discussion and analysis on pages 22 through 25, and the defined benefit pension plan and other postemployment benefit plan supplemental schedules on pages 75 through 85, 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 85 through 87) are presented for purposes of additional analysis and are not a required part of the basic financial statements. The Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are fairly stated, in all material respects, in relation to the 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 16, 2021, on our consideration of the TRS's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with Government Auditing Standards in considering the TRS's internal control over financial reporting and compliance.

Blue & Co., LLC

Lexington, Kentucky
November 16, 2021

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, 2021, and 2020. It should be read in conjunction with the respective financial statements, which begin on page 26. TRS is the fiduciary of funds held in trust for its members.

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

Information about the activities of the retirement annuity, health insurance and life insurance trusts and the 403(b) Tax-Sheltered Trust as a whole is provided in the Statement of Fiduciary Net Position and Statement of Changes in Fiduciary Net Position (on pages 26-29). The Notes to the Financial Statements are an essential part of the basic financial statements. They provide important background and detailed information about TRS, the plan and the basic financial statements themselves.

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

Teachers' Retirement System as a Whole
In the fiscal year ended June 30, 2021, the system's combined fiduciary net position increased by $5.9 billion — from $22.4 billion in 2020 to $28.3 billion in 2021. In 2019, the combined net position totaled $21.9 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		
	2021	2020	2019	2021	2020	2019	2021	2020	2019
Assets									
Cash and investments	$ 25,879.0	$ 20,680.9	$ 20,295.0	$2,288.2	$ 1,587.6	$1,371.2	$ 107.2	$ 87.0	$ 85.4
Receivables	157.8	113.8	104.3	54.7	61.1	54.7	0.4	0.5	0.5
Capital assets	10.3	12.1	14.1						
Total assets	26,047.1	20,806.8	20,413.4	2,342.9	1,648.7	1,425.9	107.6	87.5	85.9
Liabilities	(111.3)	(89.8)	(41.6)	(42.4)	(32.0)	(11.9)	(0.2)	(0.1)	
Net position	$ 25,935.8	$ 20,717.0	$ 20,371.8	$2,300.5	$ 1,616.7	$1,414.0	$ 107.4	$ 87.4	$ 85.9

Trust Totals* **

(In millions)

	2021	2020	2019
Assets			
Cash and investments	$ 28,274.4	$ 22,355.5	$ 21,751.6
Receivables	212.9	175.4	159.5
Capital Assets	10.3	12.1	14.1
Total assets	28,497.5	22,543.0	21,925.2
Liabilities	(153.8)	(122.0)	(53.5)
Net position	$ 28,343.7	$ 22,421.0	$ 21,871.7

*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 $1.4 million for 2021, $1.1 million for 2020 and $1.2 million for 2019.
**Amounts above may not agree to the financial statements due to rounding.

The fiduciary net position of the Retirement Annuity Trust increased by 25.2% ($25.9 billion compared to $20.7 billion in 2020). The fiduciary net position in 2019 was $20.4 billion. The increases primarily are due to additional employer contributions from the state and improvements in market conditions. Net investment income was approximately $6.0 billion in 2021 and $1.1 billion in 2020. This compares to $1.1 billion in 2019.

The fiduciary net position of the Health Insurance Trust increased by 42.3% ($2.3 billion compared to $1.6 billion in 2020) primarily due to investment income and contributions from members and employers due to Shared Responsibility legislation passed in 2010. This compares to 2019 when fiduciary net position was $1.4 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		
	2021	2020	2019	2021	2020	2019	2021	2020	2019
Additions									
Member contributions	$ 327.8	$ 324.7	$ 321.2	$ 128.1	$ 133.6	$ 131.7	$	$	$
Employer contributions	1,147.0	1,134.3	1,123.0	184.9	184.6	183.1	2.1	1.8	1.4
Net investment increase (decrease)	6,017.2	1,094.0	1,085.2	503.2	32.5	74.4	24.1	5.2	5.1
Total additions	7,492.0	2,553.0	2,529.4	816.2	350.7	389.2	26.2	7.0	6.5
Deductions									
Benefit payments	2,235.2	2,167.2	2,094.3				6.1	5.4	5.2
Refunds	25.4	28.5	32.4						
Administrative expense	12.6	12.2	12.4	1.7	2.0	1.8			
Insurance expenses				130.7	146.0	163.7			
Total deductions	2,273.2	2,207.9	2,139.1	132.4	148.0	165.5	6.1	5.4	5.2
Net increase (decrease)	$5,218.8	$ 345.1	$ 390.3	$ 683.8	$ 202.7	$ 223.7	$ 20.1	$ 1.6	$ 1.3

Trust Totals* **

(In millions)

	2021	2020	2019
Additions			
Member contributions	$ 456.0	$ 458.3	$ 452.9
Employer contributions	1,334.0	1,320.7	1,307.5
Net investment increase (decrease)	6,544.5	1,131.7	1,164.7
Total additions	8,334.5	2,910.7	2,925.1
Deductions			
Benefit payments	2,241.4	2,172.6	2,099.5
Refunds	25.4	28.5	32.4
Administrative expense	14.4	14.2	14.2
Insurance expenses	130.7	146.0	163.7
Total deductions	2,411.8	2,361.3	2,309.8
Net increase (decrease)	$ 5,922.7	$ 549.4	$ 615.3

*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 2021, employer contributions totaled $1.15 billion, a net increase of $13 million from the prior fiscal year. The increase was due to employer contributions paid by the state being more than the prior year. In 2020, employer contributions increased $11 million compared to 2019 primarily due to amounts received from the state.

The Retirement Annuity Trust experienced net investment income of $6.02 billion in 2021 and $1.09 billion for 2020. For 2019, net investment income totaled $1.09 billion. The increases in net investment income are due to favorable market conditions. Increases in deductions of $65.3 million in 2021 and $69 million in 2020 can be attributed to increases in the number of benefit recipients. Members and beneficiaries on the retiree payroll as of June 30, 2021, increased by 836 compared to a prior year increase of 1,016.

Other Postemployment Benefit (OPEB) Activities

During 2021, the Health Insurance Trust member contributions decreased $5.5 million from 2020 after increasing $2 million from 2019. Also, during 2021, employer contributions increased $261,591 from 2020 and increased $1 million from 2019. The employer and state contributions increased primarily due to the Shared Responsibility law.

In 2021, the Health Insurance Trust experienced net investment income of $503.2 million compared to the previous year of $32.5 million. For 2019, net investment income totaled $74.4 million. The increases in net investment income are due to favorable market conditions.

The Life Insurance Trust experienced net investment income of $24.1 million in 2021, $5.2 million in 2020 and $5.1 million in 2019. Life insurance benefits paid for 2021, 2020 and 2019 were $6.1 million, $5.3 million and $5.2 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 65.6% as of June 30, 2021, compared to 2020's 58.3%. 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 2021 and 2020. 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, 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 Fiduciary Net Position
As of June 30, 2020

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

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, 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	5,759,598,151	499,516,141	23,273,275	97,882	6,282,485,449
Interest	96,251,897	737,237	548,043	9,547	97,546,724
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 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, 2020

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

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.

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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

Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2020

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

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.

Combining Statement of Changes in Fiduciary Net Position — Other Funds
For the Year Ended June 30, 2020

	403(b) Tax-Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Additions				
Contributions				
Other employers	$	$	$	$
Investment income (loss)				
Net appreciation in fair value of investments			60,956	60,956
Interest	3,964	1,738	9,633	15,335
Dividends			6,758	6,758
Securities lending, gross			943	943
Gross investment income (loss)	3,964	1,738	78,290	83,992
Less: securities lending expense			(504)	(504)
Net investment income (loss)	3,964	1,738	77,786	83,488
Total additions	3,964	1,738	77,786	83,488
Deductions				
Benefits	4,061	207,513	18,000	229,574
Administrative expense	26	1,404	124	1,554
Total deductions	4,087	208,917	18,124	231,128
Net increase (decrease)	(123)	(207,179)	59,662	(147,640)
Net position restricted for pension and other postemployment benefits				
Beginning of year	310,543	237,894	651,591	1,200,028
End of year	$ 310,420	$ 30,715	$ 711,253	$ 1,052,388

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, 2021, 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.

	2021	2020
Active contributing members:		
Vested	48,817	49,045
Non-vested	20,439	24,106
Inactive members, vested	10,538	9,139
Retirees and beneficiaries currently receiving benefits	57,465	56,629
Total members, retirees and beneficiaries	137,259	138,919

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

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

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

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

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

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

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

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

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

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

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

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

Note 2
Summary of Significant Accounting Policies

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

Cash
TRS has seven cash accounts. At June 30, 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 $151 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 $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 $220 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.

At June 30, 2020, the retirement annuity cash account totaled $60.4 million, the control cash account totaled $84.4 million and the capital project cash account totaled $274,003 for a total of $145 million as carrying value of cash in the retirement trust. The health insurance's IRC 115 trust cash account totaled $43.1 million, the health insurance 401(h) cash account totaled $15.8 million and the medical claims cash account totaled $116,793 for a total of $59 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled a negative $52,642 due to timing. The Supplemental Benefit Fund cash account contained $32,119. Therefore, the carrying value of cash was $204.1 million, and the bank balance was $234.2 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2020.

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, 2021 and 2020, accrued compensated absences were included in accrued expenses and other liabilities on the statements of fiduciary net position amounting to $1.5 million and $1.4 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, 2021, other receivables in the retirement trust were $85,217 and $110,557 in 2020.

In the Health Insurance Trust, other receivables consist primarily of Medicare subsidies and formulary rebates accrued, but not received. The June 30, 2021, other receivables in the health trust were $37.9 million and $31.4 million in 2020.

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.

Note 3
Contributions and Funds of the Plan

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

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

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

Funds of the Plan
Teacher Savings Fund: KRS 161.420(2) establishes the Teacher Savings Fund consisting of contributions paid by university and non-university members. The fund also includes interest authorized by the Board of Trustees from the Guarantee Fund (described below). The accumulated contributions of members that are returned upon withdrawal or paid to the estate or designated beneficiary in the event of death are paid from this fund. Upon retirement, the member's contributions and the matching state contributions are transferred from this fund to the Allowance Reserve Fund, the fund (also described below) from which retirement benefits are paid.

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

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

Guarantee Fund: KRS 161.420(6) establishes the Guarantee Fund to collect income from investments, state matching contributions of members withdrawn from the system, and state matching contributions for cost-of-living adjustments (COLAs).

In addition, it receives money for which disposition is not otherwise provided. This fund provides interest to the other funds, benefits in excess of both members' and state matching contributions, monies for administrative expenses of TRS and deficiencies not covered by the other funds.

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

Note 4
Net Pension Liability of Employers

The net pension liability (i.e., the system's liability determined in accordance with GASB Statement No. 67 less the fiduciary net position) as of June 30, 2021 and 2020 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]
2021	$ 39,541,567	$ 25,935,779	$ 13,605,788	65.6	$ 3,638,905	373.9
2020	35,552,041	20,717,000	14,835,041	58.3	3,569,262	415.6

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

Valuation date	June 30, 2020
Actuarial cost method	Entry age
Investment rate of return	7.10%, net of pension plan investment expense, including inflation.
Projected salary increases	3.0 - 7.5%, including inflation
Inflation rate	2.5%
Post-Retirement adjustment	1.5%
Municipal bond index rate	2.13%
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 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 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 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

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

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

2020

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

June 30, 2020, is the actuarial valuation date upon which the total pension liability (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, refunds for the plan year and applies the expected investment rate of return for the year. In addition, 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.

TPL Roll Forward 2021

(Dollars in thousands)

	Expected (1)	**Actual Before Assumption Changes (2)**	**Actual After Assumption Changes (3)**
(a) Interest Rate	7.5%	7.5%	7.1%
(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

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

In addition, we have determined an expected TPL as of June 30, 2020, based on the TPL roll forward in the June 30, 2019, GASB Statement No. 67 report. The difference between this amount and the roll-forward of the actual TPL using last year's assumptions is reflected as an experience gain or loss for the year. These procedures are shown in the following table.

TPL Roll Forward 2020
(Dollars in thousands)

	Expected	Actual Before Assumption Change
(a) Interest Rate	7.50%	7.50%
(b) TPL as of June 30, 2019	$ 34,666,795	$ 34,676,713
(c) Entry Age Normal Cost for the Year July 1, 2019 - June 30, 2020	552,625	552,625
(d) Actual Benefit Payments (including refunds) For the year July 1, 2019 - June 30, 2020	2,195,711	2,195,711
(e) TPL as of June 30, 2020 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	35,541,380	35,552,041
(f) Difference between Expected and Actual Experience (Gain)/Loss		10,661

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, 2021, was $237.2 million. TRS's total cash balance held at J.P. Morgan Chase on June 30, 2020, was $234.2 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, 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.

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

Investments

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

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

The following tables represent the fair values of TRS's investments for June 30, 2021, and 2020.

Schedules of Investments

Retirement Annuity Trust

	Fair Value June 30, 2021	Fair Value June 30, 2020
Short-term investments		
Cash and cash equivalents	$ 1,065,663,926	$ 758,019,291
Subtotal	1,065,663,926	758,019,291
Fixed Income		
U.S. government	1,432,074,083	889,924,118
Agency bonds	83,582,255	55,122,909
Mortgage-backed securities	142,314,510	132,326,674
Asset-backed securities	52,495,131	51,470,861
Commercial mortgage-backed securities	24,828,229	32,705,450
Collateralized mortgage obligations	29,963,781	34,109,190
Municipal bonds	313,070,347	303,262,635
Corporate bonds	1,549,593,040	1,443,496,021
Subtotal	3,627,921,376	$ 2,942,417,858
Equities		
International	5,826,115,153	4,827,288,559
U.S.	10,242,433,510	7,766,822,743
Subtotal	16,068,548,663	12,594,111,302
Real estate	1,405,889,580	1,227,834,915
Alternative investments		
Private equity	1,549,761,484	1,209,514,168
Timberland	208,371,753	255,553,556
Subtotal	1,758,133,237	1,465,067,724
Additional categories		
Opportunistic credit	666,169,453	539,632,620
Corporate bonds	785,923,582	629,837,577
Corporate loans	351,360,144	303,538,415
U.S. equity	0	76,329,205
Subtotal	1,803,453,179	1,549,337,817
Total*	$ 25,729,609,961	$ 20,536,788,907

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

Health Insurance Trust

	Fair Value June 30, 2021	Fair Value June 30, 2020
Short-term investments		
Cash and cash equivalents	$ 157,506,899	$ 26,908,534
Subtotal	157,506,899	26,908,534
Fixed income		
U.S. government	41,897,387	28,776,155
Agency bonds	999,010	1,006,590
Mortgage-backed securities	3,896,465	1,437,464
Collateralized mortgage obligations	1,032,455	1,074,579
Municipal bonds	10,444,319	5,986,249
Corporate bonds	96,902,165	90,465,904
Subtotal	155,171,801	128,746,941
Equities		
Global	1,104,324,500	812,169,939
International	12,176,350	6,990,116
U.S.	158,110,014	94,850,518
Subtotal	1,274,610,864	914,010,573
Real estate equity	111,459,521	82,393,040
Private equity	170,660,050	113,773,956
Additional categories		
Opportunistic credit	104,033,282	85,150,167
Corporate bonds	173,674,041	133,717,678
Corporate loans	64,699,560	36,903,439
U.S. equity	7,584,288	7,027,166
Subtotal	349,991,171	262,798,450
Total	$ 2,219,400,306	$ 1,528,631,494

Life Insurance Trust

	Fair Value June 30, 2021	Fair Value June 30, 2020
Short-term investments		
Cash and cash equivalents	$ 9,405,976	$ 12,219,575
Subtotal	9,405,976	12,219,575
Fixed income		
U.S. government	8,228,565	3,596,065
Mortgage-backed securities	399,987	491,359
Municipal bonds	2,919,720	2,889,990
Corporate bonds	8,494,982	7,166,110
Subtotal	20,043,254	14,143,524
Equities		
International	25,316,564	18,189,635
U.S.	42,964,768	37,670,678
Subtotal	68,281,332	55,860,313
Real estate equity	5,181,114	2,399,699
Private equity	1,420,801	361,320
Additional categories		
Corporate bonds	5,586	42,116
Opportunistic credit	1,724,422	1,235,718
U.S equity	819,345	756,924
Subtotal	2,549,353	2,034,758
Total	$ 106,881,830	$ 87,019,189

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, 2021, cash collateral reinvestment securities acquired through securities lending for the Retirement Annuity Trust by TRS's custodian amounted to $2.42 billion in relation to the $2.36 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 $36.6 million in relation to the $35.7 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, 2021, and 2020, the Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust had the following investment fair values and weighted average maturities.

Retirement Annuity Trust

	2021			2020		
Investment Type	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**
U.S. government	$1,432,074,083	$	11.34	$ 889,924,118	$	11.04
Agency bonds	83,582,255		5.10	55,122,909		6.41
Mortgage-backed securities	142,314,510		16.49	132,326,674		18.99
Asset-backed securities	52,495,131		13.94	51,470,861		11.28
Commercial mortgage-backed securities	24,828,229		16.72	32,705,450		17.92
Collateralized mortgage obligations	29,963,781		10.64	34,109,190		13.52
Municipal bonds	313,070,347		12.16	303,262,635		12.14
Corporate bonds	1,549,593,040	785,923,582	9.16	1,443,496,021	629,837,577	9.16
Corporate loans		351,360,144	4.59		303,538,415	4.42
Total	$3,627,921,376	$1,137,283,726	9.92	$2,942,417,858	$933,375,992	9.89

Health Insurance Trust

	2021			2020		
Investment Type	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**	**Fixed Income**	**Additional Categories**	**Average Maturity (years)**
U.S. government	$ 41,897,387	$	8.50	$ 28,776,155	$	9.36
Agency bonds	999,010		2.16	1,006,590		3.20
Mortgaged-backed securities	3,896,465		17.60	1,437,464		28.61
Collateralized mortgage obligations	1,032,455		8.30	1,074,579		9.29
Municipal Bonds	10,444,319		9.52	5,986,249		6.77
Corporate bonds	96,902,165	173,674,041	7.34	90,465,904	133,717,678	6.47
Corporate loans		64,699,560	4.84		36,903,439	4.67
Total	$ 155,171,801	$ 238,373,601	7.20	$ 128,746,941	$ 170,621,117	6.65

Life Insurance Trust

Investment Type	2021 Fixed Income	2021 Additional Categories	2021 Average Maturity (years)	2020 Fixed Income	2020 Additional Categories	2020 Average Maturity (years)
U.S. government	$ 8,228,565	$	12.14	$ 3,596,065	$	1.68
Mortgage-backed securities	399,987		13.06	491,359		13.40
Municipal bonds	2,919,720		8.69	2,889,990		9.68
Corporate bonds	8,494,982	5,586	13.17	7,166,110	42,116	14.5
Total	$ 20,043,254	$ 5,586	12.09	$ 14,143,524	$ 42,116	10.23

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 $1.23 billion and a weighted average maturity of 30 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 $142.3 million in mortgage-backed securities as of June 30, 2021, compared to $132.3 million as of June 30, 2020. The Health Insurance Trust held $3.9 million in mortgage-backed securities as of June 30, 2021, compared to $1.4 million as of June 30, 2020. The Life Insurance Trust held $399,987 in mortgage-backed securities as of June 30, 2021, compared to $491,359 as of June 30, 2020.

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 $30.0 million in collateralized mortgage obligations as of June 30, 2021, compared to $34.1 million as of June 30, 2020. The Health Insurance Trust held $1 million in collateralized mortgage obligations as of June 30, 2021, compared to $1.1 million as of June 30, 2020.

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 $52.5 million in asset-backed securities as of June 30, 2021, compared to $51.5 million as of June 30, 2020.

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 $24.8 million in commercial mortgage-backed securities investments as of June 30, 2021, compared to $32.7 million as of June 30, 2020.

Credit Risk

Credit risk is the risk that an issuer or counterparty to an investment will not fulfill its obligations. The following schedules list TRS's fixed income investment fair values (net of cash equivalents) according to credit ratings as of June 30, 2021, and 2020.

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

2020 Retirement Annuity Trust

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

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

2020 Health Insurance Trust

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

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

2020 Life Insurance Trust

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

Total fair value of the Retirement Annuity Trust's fixed income portfolio was $4.77 billion on June 30, 2021. The Health Insurance Trust's fixed income portfolio was valued at $393.5 million on June 30, 2021. Total fair value of the Life Insurance Trust's fixed income portfolio was $20 million on June 30, 2021. 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 $1.07 billion in short-term investments through the Dreyfus Institutional Cash Advantage Fund. The Health Insurance Trust held $157.5 million in the Dreyfus Institutional Cash Advantage Fund. The Life Insurance Trust held $9.4 million in the Dreyfus Institutional Cash Advantage Fund. The credit risk associated with this fund is minimal as the securities held are required to maintain the highest possible short-term credit ratings by Moody's and S&P. In addition, investments in U.S. government and agency securities also are highly rated securities since they are backed by the U.S. government. Notation is made that the ratings of securities are subject to change.

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

Concentration of Credit Risk

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

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will affect adversely the fair value of an investment or a deposit. As of June 30, 2021, TRS's exposure to foreign currency risk consisted of $6.02 billion in the Retirement Annuity Trust, $556.5 million in the Health Insurance Trust and $24.4 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 $877.2 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 $581.9 million, represent securities domiciled in foreign countries, but are listed and traded on U.S. exchanges. Other foreign securities and investments consist of debt securities and alternative investment opportunities. Foreign holdings not readily identifiable to a specific country are listed in the various category, which includes investment receivables, payables and new issues.

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

The following tables represent the fair values of investments that are subject to foreign currency as a result of cash contributions to each portfolio manager as of June 30, 2021, and 2020.

Retirement Annuity Trust

	2021	2020
Commingled	$ 3,959,389,179	$ 3,259,745,164
Alternatives	237,151,587	178,887,706
American depository receipts	877,158,495	649,981,377
Cross-listed equities	581,929,795	492,364,508
Bonds	112,041,399	115,368,890
Additional categories (Fixed income)	121,162,648	110,569,345
Additional categories (Opportunistic)	130,256,713	130,135,491
Total	$ 6,019,089,816	$ 4,937,052,481

Health Insurance Trust

	2021	2020
Commingled	$ 452,374,055	$ 336,422,661
Alternatives	38,373,465	20,596,707
Cross-listed equities	12,176,350	6,990,116
Bonds	510,630	3,627,815
American depository receipts	2,958,806	1,475,129
Additional categories (Fixed income)	32,204,639	23,698,777
Additional categories (Opportunistic)	17,869,926	18,135,565
Total	$ 556,467,871	$ 410,946,770

Life Insurance Trust

	2021	2020
Commingled	$ 23,045,234	$ 16,648,593
Alternatives	154,705	96,721
Cross-listed equities	1,066,549	601,171
Bonds		399,172
American depository receipts	86,179	42,796
Total	$ 24,352,667	$ 17,788,453

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

Retirement Annuity Trust

Currency	2021	2020	Currency	2021	2020
Argentine peso	$ 135,630	$ 121,419	Korean won	$ 133,330,423	$ 90,879,746
Australian dollar	90,242,923	35,035,566	Kuwaiti dinar	1,089,608	
Bahamian dollar	226,500		Liberian dollar	4,786,542	1,836,325
Bermudian dollar	65,877,460	52,303,392	Malaysian ringgit	10,530,737	10,479,531
Brazilian real	124,047,275	43,685,570	Mexican peso	31,191,640	50,390,490
British pound sterling	524,954,167	452,525,848	Netherlands Antillean guilder	3,414,443	2,624,323
Bulgarian lev	627,985	510,576	New Zealand dollar	6,095,626	7,105,662
Canadian dollar	372,086,892	256,065,296	Norwegian krone	88,040,195	67,826,204
Cayman Islands dollar	40,100,852	62,289,034	Pakistani rupee	107,261	107,059
Chilean peso	845,748	1,143,256	Panamanian balboa	3,618,396	10,439,010
Chinese yuan	155,883,245	140,592,547	Paraguayan guarani		208,000
Colombian peso	28,676,575	22,050,495	Philippine peso	2,901,614	2,855,804
Czech koruna	216,741	154,331	Polish zloty	25,943,943	2,678,300
Danish krone	130,612,264	104,981,588	Qatari riyal	1,320,500	1,257,329
Egyptian pound	189,824	214,190	Russian ruble	98,073,638	63,358,118
Euro	2,152,101,294	1,784,062,092	Saudi riyal	5,502,685	3,987,683
Gibraltar pound	331,912		Singapore dollar	40,415,964	28,911,655
Guernsey pound	16,261,072	13,819,760	South African rand	67,360,762	49,963,451
Hong Kong dollar	477,602,775	368,976,311	Sri Lankan rupee	168,000	
Hungarian forint	429,405	330,079	Swedish krona	136,054,319	109,672,167
Indian rupee	98,023,927	71,420,435	Swiss franc	205,466,234	179,783,588
Indonesian rupiah	5,420,893	6,583,031	Taiwan new dollar	109,396,565	51,992,426
Israeli new shekel	9,870,314	11,059,642	Thai baht	5,046,193	5,194,521
Jamaican dollar	147,899	144,000	Turkish lira	1,095,009	3,238,704
Japanese yen	692,175,103	685,643,021	United Arab Emirates dirham	1,218,257	822,635
Jersey pound	47,737,520	72,493,175	Various	2,095,067	5,235,096
			Total	$ 6,019,089,816	$ 4,937,052,481

Health Insurance Trust

Currency	2021	2020	Currency	2021	2020
Argentine peso	$ 53,460	$ 49,467	Kuwaiti dinar	$ 761,645	$
Australian dollar	22,713,899	17,403,533	Liberian dollar	1,009,923	204,202
Bahamian dollar	226,500		Malaysian ringgit	2,001,823	1,835,196
Bermudian dollar	1,207,224	688,936	Mexican peso	3,320,609	1,688,836
Brazilian real	7,626,138	5,353,913	Netherlands Antillean guilder		34,740
British pound sterling	46,691,266	36,356,282	New Zealand dollar	1,073,659	1,030,590
Canadian dollar	51,821,353	37,276,671	Norwegian krone	2,556,418	1,695,396
Cayman Islands dollar	6,030,893	5,406,292	Pakistani rupee	82,832	71,730
Chilean peso	592,211	580,281	Panamanian balboa	720,339	328,755
Chinese yuan	9,722,150	5,403,454	Philippine peso	914,577	819,463
Colombian peso	319,725	237,254	Polish zloty	1,088,514	797,091
Czech koruna	181,675	96,577	Qatari riyal	936,551	887,366
Danish krone	7,061,749	5,143,794	Russian ruble	2,867,628	2,170,602
Egyptian pound	135,766	138,146	Saudi riyal	3,972,966	2,554,671
Euro	154,989,883	117,233,062	Singapore dollar	3,440,860	2,863,258
Gibraltar pound	67,344		South African rand	4,932,674	3,525,326
Hong Kong dollar	41,495,034	28,600,875	Sri Lankan rupee	168,000	
Hungarian forint	346,097	232,812	Swedish krona	12,346,367	8,057,831
Indian rupee	15,612,093	8,075,541	Swiss franc	26,382,768	22,176,350
Indonesian rupiah	1,596,201	1,436,185	Taiwan new dollar	20,949,873	13,004,742
Israeli new shekel	1,763,998	1,132,541	Thai baht	2,559,866	2,291,629
Jamaican dollar		144,000	Turkish lira	853,192	524,497
Japanese yen	69,680,690	60,286,397	United Arab Emirates dirham	895,045	560,308
Jersey pound	3,092,907	775,703			
Korean won	19,603,486	11,772,475	Total	$ 556,467,871	$ 410,946,770

Life Insurance Fund

Currency	2021	2020	Currency	2021	2020
Australian dollar	$ 1,056,277	$ 743,270	Kuwaiti dinar	$ 34,216	$
Brazilian real	330,626	242,444	Malaysian ringgit	86,765	86,313
British pound sterling	1,969,439	1,993,870	Mexican peso	120,367	79,790
Canadian dollar	2,220,547	1,592,200	New Zealand dollar	43,382	43,618
Cayman Islands dollar	73,211	42,796	Norwegian krone	143,844	83,570
Chilean peso	26,558	27,712	Pakistani rupee	3,368	3,159
Chinese yuan	253,299	185,097	Philippine peso	39,514	36,541
Colombian peso	14,027	9,775	Polish zloty	48,092	35,310
Czech koruna	6,806	4,554	Qatari riyal	41,466	37,100
Danish krone	528,076	302,707	Russian ruble	125,247	101,369
Egyptian pound	5,961	6,320	Saudi riyal	172,794	117,666
Euro	5,834,780	3,913,839	Singapore dollar	151,660	137,420
Hong Kong dollar	2,550,124	1,531,046	South African rand	212,963	166,674
Hungarian forint	13,484	9,740	Swedish krona	666,951	416,873
Indian rupee	695,669	380,144	Swiss franc	1,130,043	990,590
Indonesian rupiah	69,267	68,337	Taiwan new dollar	948,730	601,247
Israeli new shekel	76,494	52,679	Thai baht	111,831	107,620
Japanese yen	3,383,908	2,970,885	Turkish lira	20,962	22,755
Jersey pound	251,322	67,721	United Arab Emirates dirham	38,255	24,274
Korean won	852,342	551,428			
			Total	$ 24,352,667	$ 17,788,453

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 Values

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

Cash and Cash Equivalents: Cash equivalents are short-term, highly liquid investments that readily are convertible to known amounts of cash and so near to their maturity that they present insignificant risk of changes in value because of changes in interest rates. This category is comprised of short-term investments via the Dreyfus Institutional Cash Advantage Fund and cash. Cash equivalents can be valued with inputs from quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date and, therefore, are classified as Level 1 assets.

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

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

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

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

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

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

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

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

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

Retirement Annuity Trust

Schedule of Investments at Fair Value Level — 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
Equities				
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 Net Asset Value (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

Schedule of Investments at Net Asset Value (NAV) — 2021

	June 30, 2021	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European loan	$ 100,670,000	$	Daily	30 days
Commingled international equities	1,958,333,430		Daily	1-30 days
Commingled domestic equities	431,468,825		Daily	1-30 days
Private equity				
Open-ended*	375,799,738	114,176,739	Quarterly, annually	90 days
Closed-ended	1,173,961,745	953,055,103	N/A	N/A
Private real estate				
Open-ended	622,821,679	100,000,000	Quarterly	45-90 days
Closed-ended	380,647,829	272,909,087	N/A	N/A
Private timber	3,270,970		Biennially	90 days
Private opportunistic credit				
Open-ended	430,843,845	64,000,000	Semiannually	75 days
Closed-ended	235,325,609	75,469,384	N/A	N/A
Total investments at NAV	$ 5,713,143,670			

*Regarding the open-ended private equity, a few restrictions remain that would prevent redemption at this time. One fund has $12.5 million in lock-up until August 2023. Another fund in open-ended private equity has $75 million in lock-up until June 2022. Further, in the open-ended private real estate category, $100 million will be locked-up until April 2023.

Schedule of Investments at Fair Value Level — 2020

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

Health Insurance Trust

Schedule of Investments at Fair Value Level — 2021

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	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
Equities				
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

Schedule of Investments at NAV — 2021

	June 30, 2021	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private real estate				
Open-ended	$ 55,419,070	$ 10,000,000	Quarterly	45-90 days
Closed-ended	56,040,451	44,821,200	N/A	N/A
Private equity				
Closed-ended	170,660,050	147,845,248	N/A	N/A
Private opportunistic credit				
Open-ended	78,696,172		Semiannually	75 days
Closed-ended	25,337,110	10,527,230	N/A	N/A
Total investments at NAV	$ 386,152,853			

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

Schedule of Investments at Fair Value Level — 2020

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

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
Equities				
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

Schedule of Investments at NAV — 2021

	June 30, 2021	Unfunded Commitments	Redemption Frequency	Redemption Notice
Private equity				
Closed-ended	$ 1,420,801	$ 5,267,905	N/A	N/A
Private real estate				
Closed-ended	696,672	826,747	N/A	N/A
Open-ended	4,484,442	$ 500,000	Quarterly	45 days
Private opportunistic credit				
Open-ended	1,724,422	462,000	Semiannually	75 days
Total investments at NAV	$ 8,326,337			

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

Schedule of Investments at Fair Value Level — 2020

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

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, 2021, 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, 2021, and 2020.

Securities Lending Net Earnings

	Retirement Annuity*		Life Insurance	
	2021	2020	2021	2020
Gross earnings (interest and fees)	$2,375,356	$7,140,361	$54,130	$129,906
Gross borrower rebates	1,556,370	(3,956,163)	20,186	(75,661)
Bank fees	(1,179,337)	(955,029)	(22,287)	(16,271)
Net earnings	$2,752,389	$2,229,169	$52,029	$37,974

*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, 2021, the average days to maturity for loans in the Retirement Annuity Trust was one day, and the weighted average investment maturity of cash collateral investments was one day. The trust had no credit risk exposure to borrowers because the amounts owed to borrowers exceeded the amounts the borrowers owed the trust, and no losses resulted during the period.

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

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

The following table presents the fair values of the underlying securities and the value of the collateral pledged at June 30, 2021, and 2020.

Retirement Annuity Trust

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

2020

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

Life Insurance Trust

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	19,810,302	33,827,532
Total	$ 35,692,397	$ 14,017,229	$ 22,615,097	$ 36,632,327

2020

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

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

	2021	2020
Retirement Annuity Trust	29.57 %	5.47 %
Health Insurance Trust	31.10 %	2.30 %
Life Insurance Trust	28.16 %	6.49 %

Note 6
Retirement Plans for TRS Employees

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

The annual required contributions for TRS employee members in TRS for the fiscal years 2021, 2020 and 2019 were $1.04 million, $980,508 and $943,837, 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 System 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). The approved rate for the fiscal years 2021, 2020 and 2019 were 84.43%, 83.43% and 83.43%, and TRS's annual required contributions to KERS were $1 million, $1 million and $1.1 million, respectively. TRS contributed 100% of the required contributions for each year.

Note 7
Description of Other Funds

403(B) Tax-Sheltered Annuity Plan

Plan Description
TRS has, in prior years, administered a salary deferral program as permitted by section 403(b) of the Internal Revenue Code. Under this program members were able to voluntarily defer a portion of their compensation within the limits established by the applicable laws and regulations. However, TRS's Board of Trustees determined that the cost of providing the necessary services to assure continuing compliance with these laws and regulations was not economically feasible due to the limited participation in the program by TRS's members. The board decided, therefore, to discontinue offering the program as of April 30, 1997. Members who were not receiving annuities from their account as of April 30, 1997, were able to transfer their respective accounts directly into other tax-sheltered plans on a tax-free basis. As of June 30, 2021, 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 2021 and 2020 were $59.5 million and $59.2 million, respectively. The Commonwealth of Kentucky bears risk for excess claims expenses that exceed the premium equivalents charged for the KEHP.

At June 30, 2021, TRS insurance covered 41,175 retirees and 6,728 dependents, and, at June 30, 2020, TRS insurance covered 41,154 retirees and 6,883 dependents. The medical plan has 202 participating employers with 69,256 and 73,151 active members contributing at June 30, 2021, and 2020, 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.

	2021	2020
MEHP group expenditures	$ 204,114,382	$ 195,911,904
KEHP group expenditures	106,822,555	109,708,027
Subtotal	310,936,937	305,619,931
Less: amounts paid by retirees	(59,507,609)	(59,220,474)
Less: formulary rebates	(51,730,213)	(41,943,062)
Less: Medicare subsidies and other recovery income	(69,050,981)	(58,469,643)
Net insurance expenditures	$ 130,648,134	$ 145,986,752

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, 2021, and 2020 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]
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

*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, 2020
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	2.13%
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 2021 decreasing to an ultimate rate of 4.5% by fiscal year 2031
MEHP group	5% for fiscal year 2022* decreasing to an ultimate rate of 4.5% by fiscal year 2024
Medicare Part B premiums	4.4% for fiscal year 2021 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, 2020, 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, 2020, valuation of the health trust were based on a review of recent plan experience done concurrently with the June 30, 2020, valuation. The health care cost trend rate assumption was updated for the June 30, 2020, 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, 2020. In addition to the actuarial methods and assumptions of the June 30, 2020, 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 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 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	

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

(In thousands)

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

The TOL of the Health Insurance Trust for 2021 is based upon an actuarial valuation performed as of the valuation date, June 30, 2020. 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 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	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.

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

TOL Roll-Forward 2020

(In thousands)

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

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

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

Plan Description

TRS administers the Life Insurance Trust as provided by KRS 161.655 to provide life insurance benefits to retired and active members. This benefit is financed by actuarially determined contributions from the 202 participating employers. The benefit is $5,000 for members who are retired for service or disability and $2,000 for active contributing members.

Net OPEB Liability of Employers

The net OPEB liability (NOL) (i.e., the system's liability determined in accordance with GASB Statement No. 74 less the fiduciary net position) for the life insurance fund as of June 30, 2021, and 2020 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]
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

Actuarial Assumptions

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

Valuation date	June 30, 2020
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, 2020, 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, 2020. In addition to the actuarial methods and assumptions of the June 30, 2020, 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 actuarially determined contribution (ADC) in accordance with the Life Insurance Trust's funding policy (Schedule E) determined by a valuation performed on a date two years prior to the beginning of the fiscal year in which the ADC applies.
- As administrative expenses were assumed to be paid in all years by the employer as they come due, they were not considered.
- Active employees do not contribute to the plan.
- Cash flows occur midyear.

Based on these assumptions, the Life Insurance Trust's fiduciary net position (FNP) was not projected to be depleted.

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

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

Schedule of Net OPEB Liability 2021
(In thousands)

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

Schedule of Net OPEB Liability 2020
(In thousands)

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

The TOL of the Life Insurance Trust for 2021 is based upon an actuarial valuation performed as of the valuation date, June 30, 2020. 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 Life Insurance 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*	$ 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.

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

TOL Roll-Forward 2020
(In thousand

		Expected	Actual
(a)	TOL as of June 30, 2019*	$ 116,830	$ 117,485
(b)	Actual benefit payments and refunds for July 1, 2018-June 30, 2019	(5,317)	(5,317)
(c)	Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375]	8,563	8,613
(d)	Service cost for July 1, 2018-June 30, 2019	1,299	1,299
(e)	Changes of benefits terms		
(f)	Changes of assumptions		
(g)	TOL rolled forward to June 30, 2019 = (a)+(b)+(c)+(d)+(e)+(f)	$ 121,375	$ 122,080
(h)	Difference between expected and actual experience (gain) loss		$ 705

*The TOL used in the roll-forward as of June 30, 2019, 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)

	2021	2020	2019	2018
Total pension liability				
Service cost	$ 563,188	$ 552,625	$ 542,970	$ 1,104,102
Interest	2,581,630	2,517,671	2,448,387	2,063,109
Difference between expected and actual experience	32,475	10,661	93,650	(222,473)
Changes of assumptions	3,072,848			(14,167,315)
Benefit payments	(2,235,241)	(2,167,239)	(2,094,364)	(2,004,617)
Refunds of contributions	(25,374)	(28,472)	(32,403)	(31,073)
Net change in total pension liability	3,989,526	885,246	958,240	(13,258,267)
Total pension liability - beginning	35,552,041	34,666,795	33,708,555	46,966,822
Total pension liability - ending (a)	39,541,567	35,552,041	34,666,795	33,708,555
Plan net position				
Contributions - state	1,060,257	1,048,193	1,051,452	969,698
Contributions - other employers	86,720	86,088	71,583	78,973
Contributions - members	327,833	324,664	321,172	319,127
Net investment income	6,017,186	1,094,023	1,085,189	1,953,214
Benefit payments	(2,235,241)	(2,167,239)	(2,094,364)	(2,004,617)
Administrative expense	(12,602)	(12,167)	(12,352)	(11,388)
Refunds of contributions	(25,374)	(28,472)	(32,403)	(31,073)
Net change in plan net position	5,218,779	345,090	390,277	1,273,934
Plan net position - beginning	20,717,000	20,371,910	19,981,633	18,707,699
Plan net position - ending (b)	25,935,779	20,717,000	20,371,910	19,981,633
Net pension liability - ending (a)-(b)	$ 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. None.

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)

	2021	2020	2019	2018
Total pension liability	$39,541,567	$35,552,041	$34,666,795	$33,708,555
Plan net position	25,935,779	20,717,000	20,371,910	19,981,633
Net pension liability	13,605,788	14,835,041	14,294,885	13,726,922
Ratio of plan net position to total pension liability	65.59 %	58.27 %	58.76 %	59.28 %
Covered payroll	$ 3,638,905	$ 3,569,262	$ 3,497,216	$ 3,455,660
Net pension liability as a percentage of covered payroll	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
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
2012	3,310,176	557,340	757,822	(200,482)	16.84

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	26.5 years
Asset valuation method	5-year smoothed fair value
Inflation	2.5%
Salary increase	3.0 to 7.5%, including inflation
Investment rate of return	7.1%, net of pension plan investment expense, including inflation

Schedule of Investment Returns

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

2021	2020	2019	2018	2017	2016	2015	2014
29.57%	5.47%	5.56%	10.5%	15%	(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)

	2021	2020	2019	2018	2017
Total OPEB liability					
Service cost	$ 84,727	$ 82,572	$ 93,792	$ 95,382	$ 95,625
Interest	326,008	341,430	366,254	355,491	333,990
Changes of benefit terms					8,926
Difference between expected and actual experience	(490,732)	(585,090)	(661,228)	(210,450)	
Changes of assumptions	516,431	106,575	45,659	56,483	
Benefit payments	(130,648)	(145,869)	(163,666)	(161,082)	(178,500)
Net change in OPEB liability	305,786	(200,382)	(319,189)	135,824	260,041
Total OPEB liability - beginning	4,140,425	4,340,807	4,659,996	4,524,172	4,264,131
Total OPEB liability - ending (a)	4,446,211	4,140,425	4,340,807	4,659,996	4,524,172
Plan net position					
Contributions - state	78,217	77,191	76,382	80,959	75,497
Contributions - other employers	106,670	107,434	106,764	106,143	104,879
Contributions - active members	128,117	133,471	131,677	130,778	128,819
Net investment income	503,201	32,475	74,385	76,841	95,453
Benefit payments	(130,648)	(145,869)	(163,666)	(161,082)	(178,500)
Administrative expense	(1,728)	(2,047)	(1,803)	(1,748)	(1,539)
Other					
Net change in plan net position	683,829	202,655	223,739	231,891	224,609
Plan net position - beginning	1,616,675	1,414,020	1,190,281	958,390	733,781
Plan net position - ending (b)	2,300,504	1,616,675	1,414,020	1,190,281	958,390
Net OPEB liability - ending (a) - (b)	$ 2,145,707	$ 2,523,750	$ 2,926,787	$ 3,469,715	$ 3,565,782

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

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

Changes of benefit terms. None

Changes of assumptions.

June 30, 2021(Valuation Date: June 30, 2020)

- In the 2020 experience study, rates of withdrawal, retirement, disability, mortality and salary increases were adjusted to reflect actual experience more closely. 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 8% to 7.1%. The price inflation assumption was lowered from 3% to 2.5%.
- The rates of member participation and spousal participation were adjusted to reflect actual experience more closely.

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
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)

	2021	2020	2019	2018	2017
Statutorily required contributions					
Employer	$ 106,670	$ 107,434	$ 106,764	$ 106,143	$ 104,879
State					
Pre-65 health insurance premiums	55,061	54,034	53,707	58,535	53,454
SEEK 0.75%	23,156	23,157	22,675	22,424	22,043
Allotment from pension					
Total state	78,217	77,191	76,382	80,959	75,497
Total	$ 184,887	$ 184,625	$ 183,146	$ 187,102	$ 180,376
Actual contributions					
Employer	$ 106,670	$ 107,434	$ 106,764	$ 106,143	$ 104,879
State	78,217	77,191	76,382	80,959	75,497
Total	184,887	184,625	183,146	187,102	180,376
Contribution deficiency (excess)	$ —	$ —	$ —	$ —	$ —
Percent of shared responsibility contributed	100	100	100	100	100
Covered payroll	$ 3,638,905	$ 3,569,262	$ 3,497,216	$ 3,455,660	$ 3,415,432
Actual contributions as a percentage of covered payroll	5.08	5.17	5.24	5.41	5.28

	2016	2015	2014	2013	2012
Shared responsibility contributions					
Employer	$ 104,271	$ 77,656	$ 52,247	$ 36,990	$ 19,612
State					
Pre-65 health insurance premiums	52,542	46,233	84,600	106,500	122,500
SEEK 0.75%	21,825	21,375	20,841	23,086	19,555
Allotment from pension					12,300
Total state	74,367	67,608	105,441	129,586	154,355
Total	$ 178,638	$ 145,264	$ 157,688	$ 166,576	$ 173,967
Actual contributions					
Employer	$ 104,271	$ 77,656	$ 52,247	$ 36,990	$ 19,612
State	74,367	67,608	105,441	129,586	154,355
Total	178,638	145,264	157,688	166,576	173,967
Contribution deficiency (excess)	$ —	$ —	$ —	$ —	$ —
Percent of shared responsibility contributed	100	100	100	100	100
Covered payroll	$ 3,390,539	$ 3,455,008	$ 3,317,422	$ 3,310,710	$ 3,310,176
Actual contributions as a percentage of covered payroll	5.27	4.20	4.75	5.03	5.26

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.

2021	2020	2019	2018	2017	2016	2015	2014
31.1%	2.3%	6.11%	8.44%	14.37%	(2.2)%	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)

	2021	2020	2019	2018	2017
Total OPEB liability					
Service cost	$ 1,289	$ 1,299	$ 1,271	$ 1,068	$ 1,067
Interest	8,926	8,563	8,256	8,026	7,761
Changes of benefit terms					
Difference between expected and actual experience	122	705	(204)	(717)	
Changes of assumptions	(5,792)				
Benefit payments	(6,120)	(5,317)	(5,153)	(5,453)	(5,151)
Net change in OPEB liability	(1,575)	5,250	4,170	2,924	3,677
Total OPEB liability - beginning	122,080	116,830	112,660	109,736	106,059
Total OPEB liability - ending (a)	120,505	122,080	116,830	112,660	109,736
Plan Net Position					
Contributions - state	1,852	1,543	1,209	$ 897	$ 882
Contributions - other employers	286	253	212	161	168
Net investment income	24,075	5,167	5,058	1,111	915
Benefit payments	(6,120)	(5,317)	(5,153)	(5,453)	(5,151)
Administrative expense	(34)	(36)	(30)	(31)	(28)
Net change in plan net position	20,059	1,610	1,296	(3,315)	(3,214)
Plan net position - beginning	87,368	85,758	84,462	87,777	90,991
Plan net position - ending (b)	107,427	87,368	85,758	84,462	87,777
Net OPEB liability - ending (a) - (b)	$ 13,078	$ 34,712	$ 31,072	$ 28,198	$ 21,959

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

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

Changes of benefit terms. None

Changes of assumptions.
June 30, 2021 (Valuation Date: June 30, 2020)

- In the 2020 experience study, rates of withdrawal, retirement, disability, mortality and rates of salary increases were adjusted to reflect actual experience more closely. 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%. The price inflation assumption was lowered from 3% to 2.5%.
- The rates of member participation and spousal participation were adjusted to reflect actual experience more closely.

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
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
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
2012	1,733	1,685	48	3,310,176	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	26 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.

2021	2020	2019
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, 2021 and 2020

	2021	2020
Salaries	$ 7,541,161	$ 7,348,155
Other personnel costs	676,745	699,974
Professional services and contracts	579,040	537,184
Utilities	83,408	99,046
Rentals	14,921	22,701
Maintenance	48,014	243,029
Postage and related services	472,159	387,799
Printing	160,532	118,356
Insurance	192,530	186,381
Miscellaneous services	166,614	143,650
Telecommunications	22,821	20,073
Computer services	80,280	101,283
Supplies	28,762	46,002
Depreciation	2,001,370	2,026,708
Travel	1,421	30,464
Dues and subscriptions	107,273	128,202
Miscellaneous commodities	10,237	15,842
Office systems and equipment	2,039,399	1,913,388
Compensated absences	138,599	183,186
Total	$ 14,365,286	$ 14,251,423

See accompanying independent auditor's report.

Schedule of Professional Services and Contracts
For the Year Ended June 30, 2021 and 2020

	Nature of Service	2021	2020
Cavanaugh Macdonald Consulting	Actuarial	$ 286,275	$ 194,108
Blue & Co.	Auditing	87,560	
Crowe	Auditing	31,186	
Auditor of Public Accounts	Auditing		164,767
Ice Miller	Attorney	32,400	20,895
Reinhart Boerner VanDeuren	Attorney	563	114
Stoll Keenon and Ogden	Attorney	9,050	12,157
Attorney General	Attorney	156	12,281
Williams & Jensen	Attorney	29,850	30,862
MulloyBorland	Communications	102,000	102,000
Total		$ 579,040	$ 537,184

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.

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

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity managers	$ 17,744,026	$ 497,652	$ 15,900	$ 18,257,578
Fixed income managers	514,525			514,525
Real estate	11,148,831	1,348,170	30,837	12,527,838
Additional categories	9,322,443	1,381,062	12,657	10,716,162
Alternative investments	21,058,757	2,036,849	11,740	23,107,346
Custodian	529,220	95,575	20,197	644,992
Consultant	497,377			497,377
Legal and research	73,818			73,818
Other (administrative and operational)	3,173,837	300,288	144,687	3,618,812
Total	$ 64,062,834	$ 5,659,596	$ 236,018	$ 69,958,448

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*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

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

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, 2021, 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 16, 2021.

Internal Control over Financial Reporting

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

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

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

Compliance and Other Matters

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

Purpose of this Report

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

Blue & Co., LLC

Lexington, Kentucky
November 16, 2021

Investment Section

Report on Investment Activity

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

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

Investment Committee

Hollis Gritton
Chair

Brenda McGown
Vice Chair

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

October 1, 2021

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

The Teachers' Retirement System of the State of Kentucky (TRS) investment program produced a total return of 30% for the 12-month period ended June 30, 2021, the highest fiscal year return ever achieved by TRS. Impressively, this return exceeded the return of the Policy Benchmark by 1.3 percentage points and ranked near the top of a universe of public pension funds with assets greater than $1 billion (22nd percentile ranking). On an absolute basis, the public and private equity portfolios contributed to results with returns above 38%, while the fixed income allocation was a drag on performance as this was the lowest returning asset class during the fiscal year. The relative performance was mainly driven by the U.S. and international equity managers' returns relative to their given benchmarks. In addition to the strong fiscal year performance, the investment program has ranked in the top decile, relative to public pensions with assets greater than $1 billion, over the trailing three-, five-, and 10-year periods (7th, 3rd and 4th, respectively).

Over the past fiscal year, the equity markets performed strongly due to supportive monetary and fiscal stimulus and optimism of an economic recovery. Due to the vaccination efforts in the United States outpacing those in other regions, U.S. stocks were the top performing region within the global equity market. The TRS U.S. equity portfolio advanced 47.7% for the fiscal year and significantly outperformed its benchmark by 5.6% due to the strong performance from Todd Large Cap and UBS Alpha Equity. The international equity component returned 38.9% over the fiscal year, outperforming its benchmark by 2.6%.

In the bond market, the 10-year U.S. Treasury yield ended the fiscal year at 1.45%, 79 basis points higher than the beginning of the fiscal year. The rise in interest rates resulted in a return of -0.1% for the fixed income portfolio, which outperformed the Bloomberg Barclays U.S. Government/Credit Index by approximately 30 basis points for the fiscal year. The additional categories asset class, which is generally comprised of alternative fixed income, private credit and below investment grade bonds, produced a positive absolute return of 16.3% for the fiscal year as credit spreads tightened.

Returns in the real estate market were positive during the fiscal year because of improving economic growth. TRS's real estate allocation returned 6.7% in the fiscal year but underperformed its benchmark by 0.8 percentage points. Over the past 10 years, TRS has diversified its alternatives portfolio across different private equity and infrastructure strategies, resulting in a fiscal year return of 31.2% 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 the retirement system in meeting its investment goals.

Respectfully,

Patrick J. Kelly

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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 7.5%.

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, 2021, and June 30, 2020, as well as the target and strategic range for each asset class for fiscal year 2021.

Retirement Annuity Trust

	June 30, 2021*	Percent	June 30, 2020**	Percent
Cash equivalents***	$ 624,171,103	2.4	$ 464,341,762	2.3
Fixed income	3,934,716,084	15.3	3,081,756,123	15.0
Domestic equities	10,738,569,041	41.7	8,170,741,415	39.8
International equities	5,427,172,214	21.1	4,546,983,468	22.1
Real estate	1,405,889,580	5.5	1,227,834,915	6.0
Private equity	1,549,761,485	6.0	1,209,514,167	5.9
Timberland	208,371,753	0.8	255,553,556	1.2
Additional categories	1,840,153,888	7.2	1,579,354,782	7.7
Totals	$ 25,728,805,148	100	$ 20,536,080,188	100

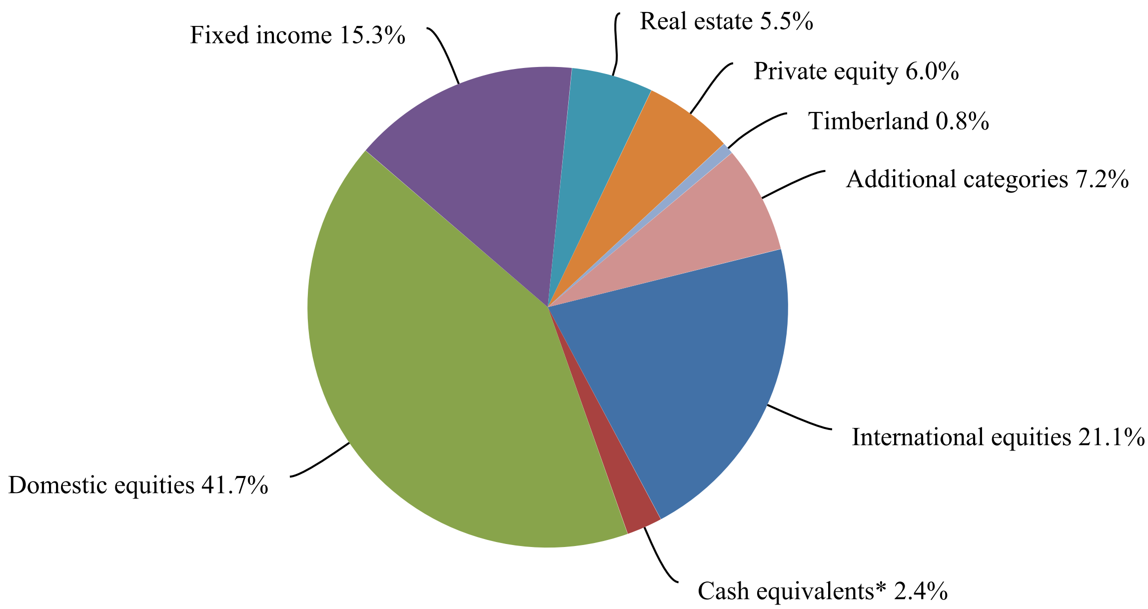
*Includes Tax Shelter Annuity value of $306,484
**Includes Tax Shelter Annuity value of $310,423
***Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Life Insurance Trust

	June 30, 2021	Percent	June 30, 2020	Percent
Cash equivalents*	2,914,977	2.7	10,757,865	12.4
Fixed income	25,974,525	24.3	15,175,494	17.4
Equities	68,794,226	64.4	56,010,942	64.3
Real estate	5,181,114	4.9	2,399,699	2.8
Alternative investments	1,420,801	1.3	361,320	0.4
Additional categories	2,596,187	2.4	2,313,869	2.7
Totals	106,881,830	100	$ 87,019,189	100

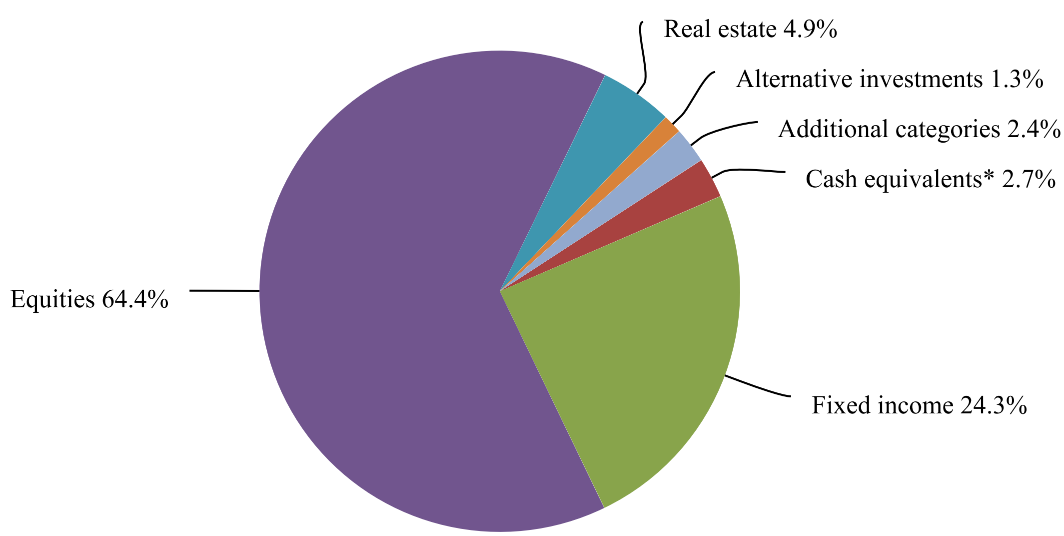
*Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Retirement Annuity Trust
Distribution of Investments — Fair Values as of June 30, 2021



*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 Values as of June 30, 2021



*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, 2021 (FV)*
Cash equivalents**		1-5%	2%	2.4%
Fixed income		8-22	15	15.3
Government/agency/other	Unlimited			9.2
Corporate	35%			6.1
Equity	65%	57-65	62	62.8
Domestic large cap		32-40	35	36.2
Domestic mid cap		1-5	3	3.3
Domestic small cap		1-3	2	2.2
International***	30%	18-25	22	21.1
Real estate	10%	4-10	7	5.5
Alternative investments*	10%	4-10	7	6.8
Additional categories	15%	4-15	7	7.2
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, 2021, 24.9% of total international equities were 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 values. For the fiscal year, the Retirement Annuity Trust portfolio generated a total return of 29.94%, ahead of the policy benchmark return of 28.65%. Domestic equities returned 47.70% versus 42.12% for the Standard & Poor's 1500 Index, while international equities returned 38.86% versus 36.29% for the MSCI All Country World ex-U.S. Index. Fixed income investments returned -0.13% versus -0.39% 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 2021 was $75.7 million, consisting by asset class of $65.7 million in private equity, $4.9 million in private real estate and $5.1 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, 2021. 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	**29.94**	**13.34**	**13.23**	**10.32**	**7.53**
Policy benchmark**	28.65	12.94	12.42	9.93	
Equities	**44.65**	**16.9**	**17.32**	**12.84**	**8.08**
Domestic equity	**47.70**	**18.81**	**18.45**	**14.79**	**9.01**
S&P 1500 Index	42.12	18.12	17.38	14.63	8.61
All cap equities	**51.58**	**21.26**			
Russell 3000 Index	44.16	18.73			
Large cap equities	**46.78**	**19.43**	**18.78**	**14.95**	
S&P 500 Index	40.79	18.67	17.65	14.84	
Mid cap equities	**47.68**	**14.99**	**16.50**	**13.71**	
S&P 400 Index	53.24	13.17	14.29	12.40	
Small cap equities	**60.06**	**12.99**	**15.88**	**13.65**	
S&P 600 Index	67.40	12.20	15.82	13.49	
International equity	**38.86**	**13.38**	**15.24**	**8.22**	
MSCI AC World ex U.S. Index	36.29	9.88	11.59	5.93	
Fixed income	**-0.13**	**6.21**	**3.72**	**4.25**	**5.34**
Bloomberg Barclay's U.S. Government/Credit Index	-0.39	5.95	3.31	3.71	4.73
Total real estate	**6.74**	**6.67**	**8.34**	**8.65**	**9.02**
In-house real estate equity	**3.89**	**4.87**	**7.7**	**7.89**	**8.33**
CPI plus 2%	7.43	4.62	4.49	3.92	4.13
Core real estate	**4.42**	**6.49**	**7.09**	**10.15**	
NCREIF ODCE Index (VW)	8.02	5.52	6.57	9.60	
Non-core real estate	**13.70**	**9.18**	**10.67**	**14.76**	
NCREIF Property Index	7.37	5.50	6.13	8.79	
Alternative investments					
Private equity	**38.66**	**15.87**	**15.98**	**13.28**	
Mature private equity	**37.09**	**13.66**	**13.19**		
S&P 500 Index plus 3%	45.02	22.23	21.17		
Private equity < 5 Years	**43.90**	**18.46**	**18.88**		
Timberland	**-5.57**	**0.53**	**0.37**	**2.74**	
NCREIF Timberland Index	3.10	2.12	2.65	4.66	
Additional categories	**16.35**	**6.76**	**6.92**	**6.14**	
BofA Merrill Lynch U.S. High Yield Master II Index	15.62	7.15	7.30	6.5	
Cash (unallocated)	**0.03**	**1.19**	**1.11**	**0.62**	**1.48**
90-day Treasury Bill	0.09	1.34	1.16	0.61	1.31
Total 30-year trust return*	**8.59**				

*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

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

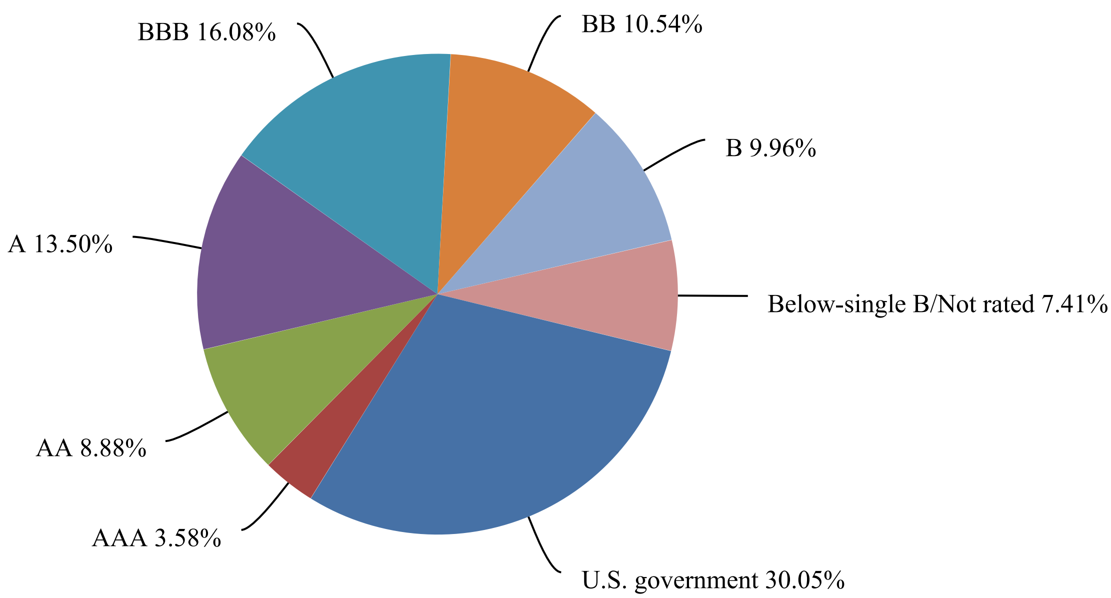
2021	28.16 %
2020	6.32
2019	6.49

Fixed Income Investments
As of June 30, 2021, the Retirement Annuity Trust had approximately $3.9 billion, which is 15.3% of total assets, in fixed income. The fund's fixed income investments as of June 30, 2021, maintained the average investment grade rating required by administrative regulation.

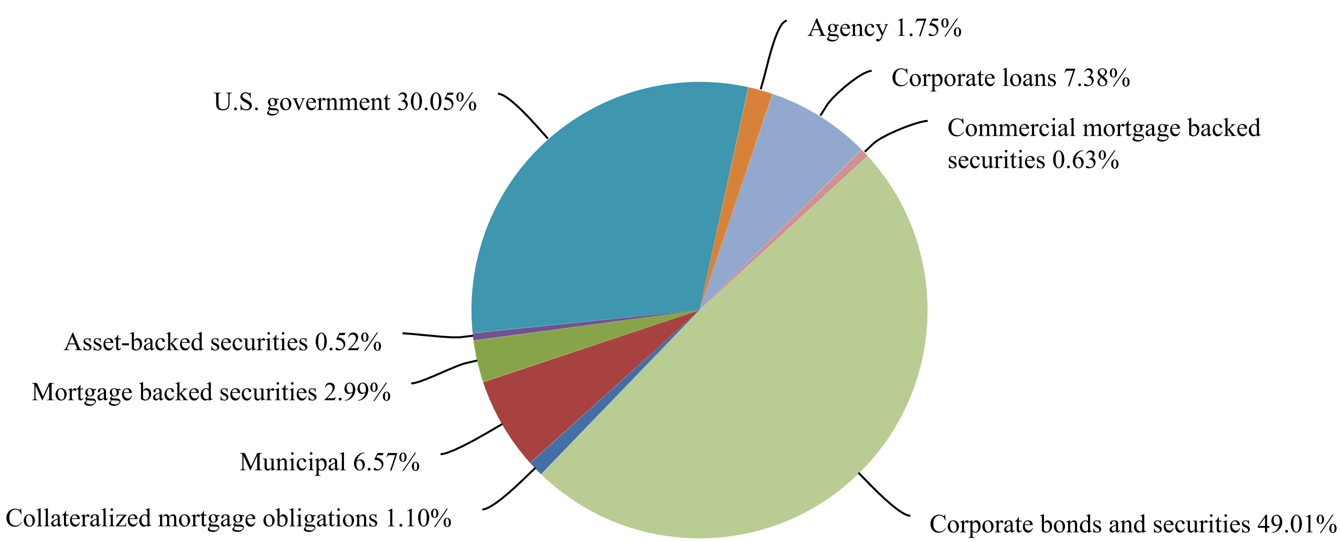
In addition, the trust had $1.84 billion, which is 7.2% of total assets, in other debt-related investments under a regulatory provision that allows for up to 15% of assets in additional categories approved by the board. Investments under this authorization included four high-yield bond portfolios and two syndicated bank loan portfolios. Several alternative credit portfolios also are under this additional categories provision, including a multiple strategy opportunistic credit portfolio and distressed-debt and specialty-lending funds.

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 returned 2.78% for the year ended June 30, 2021. This compared favorably to the trust's fixed income benchmark, the Bloomberg Barclays U.S. Government/Credit Index, which returned 2.42%. The outperformance was driven by TRS's overweighting in corporate bonds, which provided a higher coupon than government bonds of similar duration.

The June Federal Open Market Committee (FOMC) meeting brought no policy changes but delivered a surprise with projections for two rate hikes in 2023. The Fed also will start tapering its $14 billion bond purchases. FOMC began purchasing corporate bonds during fiscal 2020 through programs it established as part of its pandemic response to stabilize markets. The Treasury curve flattened as long-end yields declined and front-end yields moved higher. The curve flattening is due to inflation expectations, a smaller-than-expected infrastructure deal and the Fed tapering purchases. The front end of the curve rose with the two-year Treasury increasing by 0.09% while the five-year Treasury declined by 0.05%. The 10-year and 30-year fell 0.27% and 0.35%, respectively. The two-year finished the quarter at 0.25% while the 10-year closed at 1.47%. Overall, Treasury yields declined for intermediate and longer maturities, and the yield curve flattened.

Spreads tightened significantly in all sectors during the last quarter of the fiscal year. Investment-grade corporates tightened by 0.1%, to 0.83% over Treasury levels that haven't been seen since 2005, making back much of the widening from the first quarter. Industrials and utilities outperformed financials, while longer duration corporates had higher returns than shorter duration corporates. Despite the tightening of spreads, corporate bond issuance continued to shatter records with corporations looking to take advantage of the low yields and high investor demands. The amount of new issuance easily could top the record set in 2017. This is a sign that corporations have access to the capital markets to improve balance sheet liquidity and help build a bridge to the post-COVID environment. Companies in some of the hardest hit industries, such as airlines, lodging, casinos, retail and energy were able to access the debt market, helping provide cash to fund operations for the near-term. In mortgages, pass-through mortgages underperformed commercial mortgage-backed securities (CMBS). The CMBS market has improved despite uncertainty stemming from COVID impacts in areas such as retail and hotels and the unknown future of employees working from home. Asset-backed securities posted a small positive return.

The economy strongly rebounded in the year's last quarter as lower infection rates and greater vaccination rates led many people to start traveling, eating out and leaving the house for entertainment. Consumer spending increased, with retail sales soaring 11% in March.. The housing market continued to be hot with strong demand fueled by low inventory and mortgage rates and the lack of new home inventory, which stems from high material costs and a shortage of workers. Manufacturing remained strong; however, supply shortages are common in certain segments, which has the potential to hamper growth. The non-farm payroll data showed steady signs of a rebound with 264,000 jobs in April, 583,000 in May and 856,000 in June. Unemployment ended the quarter at 5.9% in June, well below the high of 14.7% from April 2020, but still well above the pre-COVID level last February of 3.5%. In May, core consumer price index (CPI) inflation rose from 3% to 3.8% the largest year-over-year increase since June 1992. The inflation increase did not result in higher interest rates as it did in the first quarter – because inflation expectations have stabilized after rising significantly since late last year and are currently about 2.3% based on the current 10-year Treasury. Oil rose $14 a barrel during the quarter and $25 a barrel on the year, an increase of more than 50%.

With U.S. Treasury rates and risk premiums on corporate bonds both still relatively near the low end of their historical ranges, investment-grade fixed income is an asset class with moderately unfavorable risk/reward characteristics and below average upside potential.

Equity Investments

As of June 30, 2021, the Retirement Annuity Trust's public equity investments had a fair value of $16.2 billion, representing 62.8% of total assets. The trust's U.S. equity portfolio returned 47.7% for the fiscal year and outperformed its policy benchmark by 5.58 percentage points. The annuity trust divides its public equity into two broad categories: domestic and international.

The domestic portfolio had a fair value of $10.74 billion as of June 30, 2021, representing 41.7% 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 as of June 30, 2021, was $5.43 billion, representing 21.1% of total assets. The Retirement Annuity Trust's international equity portfolio returned 38.86%, a 2.57 percentage point outperformance of its policy benchmark, the MSCI All Country World ex-U.S. Index that represents the markets of 22 developed countries and 27 emerging market countries. Six external asset managers manage the Retirement Annuity 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 market continued to rise, partly due to support from stimulus measures, accommodative monetary policy and the release of pent-up demand as some businesses reopened. While equity returns in the quarter's first two months were strong, they were weakest in September because of uncertainty on further fiscal stimulus, growing concerns over a stagnating recovery and uncertainty regarding the then-upcoming U.S. election. The Treasury yield curve remained depressed.

The Federal Open Market Committee (FOMC) introduced flexible average inflation targeting (FAIT), meaning the Fed will seek an inflation rate that averages 2% over time, as opposed to targeting a 2% inflation rate. Policymakers now will allow inflation to run temporarily above the 2% target to make up for any past shortfalls or vice versa. In response, the five-year breakeven inflation rate increased from 1.17% in the prior quarter to 1.49%. The unemployment rate declined from its April peak of 14.7% to 7.9% in September. The Federal Reserve Bank of Atlanta estimated first quarter gross domestic product (GDP) quarter over quarter growth to be 34.6%, compared to the prior quarter growth of -31.4%. The S&P 500 returned 8.9%. Internationally, the MSCI Europe, Australasia and Far East (EAFE) Index increased 4.8%, with growth stocks, small-caps and emerging markets outperforming value stocks, large-caps and developed markets, respectively. The MSCI Emerging Market (EM) Index returned 9.6% in the quarter. The U.S. Dollar Total Weighted Index depreciated slightly.

During the second quarter, promising results of COVID-19 vaccine trials from Pfizer/BioNTech and Moderna allowed market participants to pull forward expectations for normalized economic activity. The fiscal stimulus package included supplemental unemployment benefits of $300 per week and $600 stimulus checks for individuals. The eurozone passed its own 750 billion euro stimulus plan in December as part of a larger budget, backed by joint debt. Global economic activity remains well off its pre-pandemic peak, yet financial markets have rebounded from the sharp drawdown. The World Bank Global Economic Prospects report estimated that calendar year 2020 world gross domestic product shrank by 4.3% compared to the prior year. The pace of economic recovery remains uncertain going forward, though household balance sheets are strong. The anticipation of lockdowns easing in calendar year 2021 contributed to strong performance for the energy and financial sectors as well as small-cap stocks, with the Russell 2000 Index up 31.4% relative to the S&P 500 Index returning 12.1%. Overall, broad U.S. indices finished the volatile calendar year at record high levels. The MSCI EAFE Index returned 16% while the MSCI EM Index returned 19.7%. Developed international markets had strong quarterly returns, continuing a rebound with value stocks outperforming growth, while small stocks continued to beat their larger counterparts. Nearly all developed market countries saw double-digit positive returns for the quarter, led by several European countries and Australia. Cyclical sectors outperformed overall with energy leading the pack. A post-Brexit trade deal securing continued free trade of goods between the United Kingdom and the European Union calmed investor sentiment. Emerging markets outpaced developed, led by Latin America. The Asian-Pacific Regional Comprehensive Economic Partnership free trade agreement was signed as the largest free trade agreement covering over 30% of global GDP. The U.S. Dollar Total Weighted Index depreciated.

In the third quarter, COVID-19 cases and hospitalizations fell significantly from winter highs along with U.S. vaccination rates outpacing much of the developed world, as the economy moved toward reopening. The federal government enacted the $1.9 trillion American Rescue Plan. Interest rates on the 10-year Treasury bond rose from 0.93% to 1.74% during the quarter, while inflation expectations for five years beginning in five years (5Y/5Y) rose from 2.03% to 2.2%. The International Monetary Fund (IMF) revised its calendar year 2021 forecast for global GDP growth to 6% from 5.2%. The IMF increased calendar year 2021 U.S. growth expectations to 6.4% from its October estimate of 3.1%. The unemployment rate fell to 6% and non-farm payrolls increased by 916,000. The Institute for Supply Management's (ISM) Manufacturing and Services Purchase Managers Indexes (PMIs) came in at 64.7% and 63.7% respectively. The S&P 500 returned 6.2%, driven primarily by the resurgence of value stocks, outperforming both developed non-U.S. and emerging markets, partly due to a strong dollar. While small-cap stocks significantly outperformed their larger-cap counterparts, the Russell 2000 Value Index returned 21.2%, compared to 4.9% for the Russell 2000 Growth. The prospect of increased economic activity contributed to the strong performance in the energy and financial sectors. Internationally, the MSCI EAFE Index returned 3.5% while the MSCI EM Index returned 2.3%. Small-cap stocks outperformed large-cap stocks. In developed markets, energy and financials were the best performing sectors while consumer staples and utilities trailed the general market. The most developed countries had positive equity market returns. Emerging markets equity ended with positive returns but underperformed developed markets. Value stocks outperformed growth and small-cap outperformed large, but the spreads between these groups were not as significant as in developed markets. Materials and real estate were the best performers and technology stocks continued to hold up. The U.S. Dollar Total Weighted Index appreciated.

During the fourth quarter, reopening efforts and increased vaccine rollout along with accommodative monetary policy around the world led to optimism in the markets. Substantial upward earnings revisions helped the S&P 500 gain 8.5% in the quarter. Worldwide, the more contagious delta variant of the coronavirus grew to account for a large portion of new cases, which delayed reopening efforts in certain countries with lower vaccination rates. Despite these setbacks, the MSCI EAFE and MSCI EM indices still returned 5.2% and 5.1%, respectively, during the quarter, indicating market participants were looking past virus-related disruptions. Commodities and fixed income assets both performed well, with the former returning 13.3% in the quarter. Nonfarm payroll growth averaged 567,000 jobs per month during the quarter, and payrolls increased by 850,000 in June alone, because of states relaxing pandemic-related restrictions and jobs returning to the leisure and hospitality sectors. With employers hiring at higher rates. the quarter saw a record 9.3 million job openings, causing some states to end supplemental pandemic unemployment assistance to spur employment. The ISM Manufacturing and Services PMI ended June at 60.6 and 60.1, respectively, indicating sector expansion. The Atlanta Fed estimated annualized GDP growth of 7.9%. Despite growing job openings, unemployment remained high at 5.9%, above the long-run unemployment projected range of 3.8% to 4.3%. Consumer Price Index (CPI) came in high as supply constraints and heightened demand for goods led to a series of above consensus price level changes during the quarter. CPI came in at 5.4% year over year while CPI excluding food and energy increased to 4.5%, which was the highest reading since November 1991. While the FOMC views high year-over-year CPI as transitory, it did pull forward interest rate increase expectations to two hikes in 2023 from none until 2024. Large-cap and mid-cap growth stocks outperformed value, but value led growth in the small-cap space. The U.S. Dollar Total Weighted Index depreciated.

In summary, the U.S. equity markets continued to rise due to accommodative monetary policy along with optimism for economies reopening as the vaccine rollout progressed further and COVID-19 cases and hospitalizations dropped from winter highs. Inflation increased in the fourth quarter as the result of supply chain issues and demand increasing to levels not seen in decades. Internationally, emerging markets and developed markets performed similarly with emerging markets slightly outpacing developed markets. Both performed slightly better than the U.S. market. The year ended generally positive as investors continued to expect economic recovery and reopening of businesses.

Real Estate

The Retirement Annuity Trust's real estate investments had a fair value of $1.41 billion as of June 30, 2021, representing 5.5% 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 vs. its benchmarks for the fiscal year in each of its respective categories. The In-House Real Estate Equity Fund trailed its benchmark, the Consumer Price Index plus 2%, returning 3.89% vs. 7.43%. Core funds fell short of the NCREIF ODCE 4.42% vs. 8.02%. However, TRS's non-core funds bested the NCREIF Property Index 13.7% vs. 7.37%. TRS's combined real estate investments yielded 6.74% for the fiscal year, up from 4.54% for previous fiscal year.

The trust's real estate exposure is provided through 16 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 fund 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 Fund IX, Rockwood Capital Real Estate Fund X, Rockwood Capital Real Estate Fund XI, TA Realty Associates Fund X, TA Realty Associates Fund XI, TA Realty Associates Fund XII, AG Net Lease Realty Fund III, AG Net Lease Realty Fund IV, Landmark Real Estate Partners VII and Landmark Real Estate Partners VIII. Going forward, investment staff will continue to opportunistically add to the annuity trust fund's real estate investments.

Real Estate Overview

In the first half of the fiscal year, U.S. real estate investment markets began a slow and steady recovery from the impacts of the COVID-19 pandemic. U.S. commercial real estate investment activity had tumbled earlier in late fiscal 2020 but was showing signs of improvement as fiscal 2021 began. Overall U.S. commercial property prices grew year-over-year with gains driven by the industrial and multifamily sectors.

The industrial sector proved to be the most resilient of real estate sectors in the first half of FY 2021, supported by the growth of e-commerce and the expansion and transformation of supply chains and distribution networks. Leasing activity hit a record high, measuring more than 880 million square feet, outpacing the prior year by 2.5%.

While industrial market sales had slowed in response to the onset of the pandemic, activity was robust as FY 2021 began and transaction volume reached $98.8 billion for the year – slightly above 2018 totals. The industrial property sector outpaced the price growth of the other property sectors, climbing 8.8% year-over-year. The industrial sector overtook the office sector as the second most active real estate market in the fiscal year.

While the impact of the pandemic weakened the U.S. multifamily sector in the second half of fiscal 2020, the most recent year started strong. In the aggregate, demand reached over 325,000 units, in line with the past three years. While transaction volume in the multifamily market was down 28% for the year, the sector held its position as the most active real estate sector. Price growth for multifamily properties regained momentum and gained 8.3% on a year-over-year basis, second only to the industrial sector for price growth. Specifically, across multifamily subtypes, garden-style assets climbed year-over-year while deal activity for high-rise assets declined. High-rise assets located in coastal markets had an outsized impact from the pandemic-induced lockdowns.

Office and retail sectors lagged real estate investments in the fiscal year's first half. The future demand for office space was put into question as the pandemic spurred the adoption of working remotely across the country. The major drop in U.S. office absorption in fiscal 2020 and the start of fiscal 2021 was followed by a steeper drop in the second quarter of the most recent year – pushing the annual total past the demand losses seen following the Great Recession of the late 2000s. While the office sector deal volume was down early, activity picked up slightly through the fiscal year and ended down 37% year-over-year. With uncertainty about return-to-work trends, price growth slowed for the office sector, up only 1.5% from a year earlier and down from the 3.8% annual pace in fiscal 2019.

The retail sector was particularly vulnerable to the initial impact of the COVID-19 recession. Rent growth slowed and turned negative in the second quarter, registering a 0.7% decline over the year. This inflection marked the first time the retail sector recorded negative rent growth since 2012. Declines slowed in FY 2021, with a second quarter volume drop of 42% year-over-year compared with a 70% drop in 2020. Like other property types, the retail sector underperformed in the largest metro areas, with prices there falling 6.7% over the year. By contrast, prices for the non-major locales were down only 2.6% year-over-year. Similarly, some locations and subtypes outperformed while others suffered. One segment of the retail market that had positive news was grocery-anchored retail. While deal volume for such properties fell, price growth for grocery-anchored retail climbed 1.6% year-over-year.

As the U.S. economy moved from recovery to expansion in the second half of the fiscal year, demand increased across commercial real estate asset classes. U.S. commercial real estate sales rebounded in the second half of the year, returning to levels seen prior to the pandemic. Across all property sectors, prices climbed 9.8% year-over-year. However, the recovery in commercial real estate markets is proceeding unevenly across geographies and property types, led again by industrial and multifamily investments.

The U.S. industrial market ended the second half of the year with records. In fact, the market absorbed 108 million square feet in the fourth quarter — the most space ever absorbed in a quarter — and demand outpaced supply for the third consecutive quarter. Fourth-quarter leasing surpassed 300 million square feet for the first time, and, at 1.2 billion square feet for the trailing 12 months, leasing is up 50% compared to the annual average during the three years prior to the pandemic. The acceleration in leasing and absorption pushed the vacancy rate down to a near-historic low of 5.1%. Nearly three-quarters of the 40 largest U.S. markets reported year-over-year rent growth of more than 5%. Construction completions in the fourth quarter of the fiscal year slowed for the second consecutive quarter to 70 million square feet, the lowest level in two years, due to challenges in getting materials to complete facilities. Despite these delays, a record 418 million square feet of industrial space was under construction, of which 48% is preleased. With the strength of investor demand for industrial properties, prices continue to grow quickly, climbing 9.8% year-over-year and cap rates for warehouse assets fell 0.3%.

The U.S. multifamily sector showed remarkable strength, as well, through the fourth quarter with record numbers for demand and rent gains. Net absorption totaled over 400,000 units , exceeding the combined full-year totals for 2020 and 2019. Demand significantly outpaced new supply delivered for the final two quarters, and the multifamily vacancy rate fell to a two-decade low of 5.3%. The quarterly increase in multifamily rents was a record 5.4%. Year-over-year rent growth was 7.7% and positive in every major metropolitan area. Both suburban and downtown areas are recording strong gains across a wide range of markets. Notably, the resurgence in fundamentals in the markets most impacted by the pandemic, primarily coastal gateway markets, does not appear to be coming at the expense of demand in the suburban and Sun Belt markets that thrived during the downturn. The confluence of pre-pandemic drivers, such as a strong labor market and the lack of affordable for-sale homes, combined with the unbundling of households as the impact of pandemic restrictions wains are driving the sector's dramatic growth.

With demand and rent growth indicators surging, sales volume topped $52 billion in the fourth quarter, a record for the quarter and 40% ahead of pre-pandemic averages. Multifamily prices grew 12%, the strongest price growth among sectors. While pricing climbed during the pandemic, a shift was seen in what transacted. Deal volume for assets in the non-major metropolitan areas, mostly garden apartments, is above the trend set in the five years before the pandemic. Investment has gravitated toward fast-growth Sun Belt markets, and sales volumes in metropolitan areas like Dallas, Atlanta, and Phoenix are well above averages. Transaction activity in Los Angeles, Washington, D.C., the San Francisco Bay area and New York remains tepid.

The U.S. office market is showing signs of stabilization, but market fundamentals were mixed in the fourth quarter of the fiscal year as many tenants are still assessing their future space needs. Occupancy declined for the fifth consecutive quarter. Vacancy rates have risen from below 10% at the beginning of 2020 to 12.4%, approaching global financial crisis recession highs. But the rise in the vacancy rate was at half the pace of increase of the past year and rents stabilized after four quarters of decline. Sun Belt and secondary markets outperformed the nation's largest markets during the pandemic. Construction starts have slowed considerably since the pandemic hit, and inventory under construction has fallen to 144 million square feet, or less than 2% of total inventory.

Despite sizable headwinds, many segments of the retail real estate market showed signs of improvement and the sector recorded positive net absorption of 18.8 million square feet in the fourth quarter. This is the largest increase in demand since 2018. The retail market has regained 95% of the 29 million square feet of occupancy losses in 2020. Retail vacancy rates tightened slightly to 4.9% and rents ticked up 1.1% year-over-year as both construction starts and new deliveries fell to the lowest level in over 10 years.

Investment in the retail market is seeing signs of a rebound. Fourth-quarter deal volume of $13.7 billion was still 26% below the average from the five years before COVID-19, but the trend has been improving. After five quarters of flat-or-declining property prices, retail prices reversed and climbed 3.2% from a year ago. Shopping centers have borne the brunt of the uncertainty over future consumer patterns and cap rates for shopping centers edged up in the fourth quarter to 7.2%. By contrast, neighborhood and strip centers, often with outperforming essential retailers, fell 0.2% from a year earlier to 6%.

Alternative Assets

As of June 30, 2021, the Retirement Annuity Trust's alternative asset portfolio, which consisted of private equity investments and timberland, had a fair value of $1.758 billion. The percentage of the trust's portfolio invested in alternative assets was 6.8%.

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 by building out the portfolio 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 are routinely negative due to the J-curve (initial losses followed by significant gains) effect. Positive returns typically are realized only several years into a partnership's existence, during the harvesting period.

Private Equity Market Overview

After a slowdown in the early months of the pandemic, private equity dealmaking activity surged in the first half of fiscal 2021, ending the year with the highest aggregate dollar volume of deals since 2007.

At the same time the first half of the fiscal year saw private equity sponsors focus their efforts on strengthening existing portfolio companies, particularly those in industries, such as hospitality, retail, travel and energy, that have been hardest hit by the pandemic. During this period of acute uncertainty and volatility, private equity sponsors became ever more creative, flexible and nimble, providing an important source of liquidity to companies facing challenging circumstances.

The last first half of fiscal 2021 continued to see record-breaking levels of activity, fueled by rock-bottom interest rates and sky-high levels of unallocated capital. Globally, private equity generated $539 billion in deal value during the last half of fiscal 2021.

The strength in dealmaking showed up across the board, but the technology sector continued to dominate activity. One in every three buyout deals in the last half of the fiscal year involved a technology company, most notably in software. These numbers often leave out subsectors such as fintech, technology-enabled services, and healthcare information technology, which also drew heavy interest from private equity investors.

Timberland

As of June 30, 2021, the Retirement Annuity Trust owns about 110,000 acres of timberland outright and is a member of a joint venture that has a current an interest in about 30,000 acres of timberland located across four Southern states. Timberland is, by nature, a long-term investment as our anticipated time horizon in this asset category is generally 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 lower 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, 2021, was marked by several ups and downs for timber and timber product markets. The NCREIF Timberland Property Index returned 3.1% for the year. The income component of return made up the great majority of the annual return, with the appreciation component being flat.

Lumber demand and the resurgence of the housing market across the nation dominated headlines over fiscal 2021. Lumber prices hit all-time highs as mills across the United States were unable to meet demand from the new residential and home improvement sectors. Consequently, existing mills are seeking to expand production and numerous new mills have been announced as it is estimated that U.S. single-family housing is severely underbuilt and it will take years for this imbalance to be corrected.

While lumber prices are at record highs, uncut timber prices are flat-to-slightly up for the fiscal year. The problem lies with the supply of logs currently available. The Great Recession caused landowners to defer harvest in the anticipation of higher prices. This coupled with the slowdown in demand when housing pulled back due to the great financial crisis caused a large supply imbalance, especially in the South.

Timberland transactions picked up during the fiscal year with several properties trading at strong valuations. There has been an uptick in interest in timberland properties from investors and corporations looking to take advantage of the carbon sequestering potential and environmental, social and governance impact.

Retirement Annuity Trust
Fair Values as of June 30, 2021

Internally Managed	
Cash equivalents (unallocated)	624,171,103
Fixed income	
Broad Market Bond	829,065,713
Intermediate Bond	538,499,168
Internal Bond	183,947,216
Long Term Bond	826,786,132
403(b) Tax-Sheltered Trust	306,484
Equity	
S&P 400 Stock Index	346,194,664
S&P 500 Stock Index	2,786,642,331
S&P 600 Stock Index	303,086,111
In-house Real Estate	402,420,072
In-house High Yield	131,461,386
Subtotal	6,972,580,380
Externally Managed	
Fixed income	
Galliard Capital Management Core Fixed	771,627,467
Fort Washington Core Fixed Income	784,483,903
Domestic equity	
Baillie Gifford US Equity Growth	658,704,503
Fort Washington Focused Equity	556,689,905
State Street US Premier Growth Equity	1,057,112,114
Todd Asset Intrinsic Value Opportunity	620,186,773
Todd Asset Large Cap Intrinsic Value	1,331,058,821
UBS Alpha Equity	431,468,825
UBS Value Oriented (Global)	1,034,213,232
Wellington Large Cap Equity	824,482,454
Wellington Mid Cap Equity	526,890,080
Wellington Small Cap Equity	261,839,229
International equity	
Baillie Gifford EAFE	1,777,080,682
Barings All Country World Ex US	786,291,120
BlackRock MSCI ACWI Ex US IMI Index	644,086,350
Todd Asset International Intrinsic Value	941,870,792
Todd Asset International Intrinsic	105,800,960
UBS All Country World Ex US Equity	1,172,042,310
Real estate	
Angelo Gordon Net Lease Realty III	46,622,195
Angelo Gordon Net Lease Realty IV	13,828,638
Blackstone Partners VII	19,239,838
Blackstone Partners VIII	36,658,519
Blackstone Partners IX	25,296,965
Carlyle Realty Partners VI	3,649,558
Carlyle Realty Partners VII	16,790,032
Carlyle Realty Partners VIII	17,349,505
Carlyle Property Investors	68,928,753
Landmark Real Estate Partners VII	13,829,207
Landmark Real Estate Partners VIII	16,372,285
Prudential PRISA	$388,971,757
Rockwood Capital Real Estate IX	9,612,389
Rockwood Capital Real Estate X	37,194,242
Rockwood Capital Real Estate XI	33,322,112
TA Realty Core Property	164,921,169
The Realty Associates X	4,757,851
The Realty Associates XI	49,887,233
The Realty Associates XII	36,237,261
Alternative investments	
Actis Global IV	34,095,584
Alinda Infrastructure II	12,041,544
Alpine Investors Secondaries VII	4,203,266
Apax VIII	17,367,970
Apax IX	79,730,471
Apax X	11,421,482
Apax Digital	40,025,030
Audax Mezzanine III	2,687,480
Audax Mezzanine IV	13,160,214
Audax Private Equity IV	905,944
Audax Private Equity V	25,733,994
Audax Private Equity VI-A	20,931,293
CapitalSouth Partners III	973,494
Carlyle Asia Partners V	19,497,635
Carlyle Europe Partners IV	39,423,778
Carlyle Europe Partners V	15,683,922
Carlyle Global Financial Services II	15,829,594
Carlyle Global Financial Services III	50,215,676
Carlyle Renewable and Sustainable Energy	9,357,649
Fort Washington VIII	30,370,805
Fort Washington IX	31,669,706
Fort Washington IX-K	32,060,812
Fort Washington X	12,560,113
Fort Washington X-S	8,292,938
Fort Washington Opportunities IV	12,880,000
Fort Washington Opportunities IV-K	15,120,000
Gavea Investments V	4,707,130
Hancock Bluegrass - Oregon	3,270,970
Hellman & Friedman Capital VII	23,043,851
Hellman & Friedman Capital VIII	71,415,799
IFM Global Infrastructure	198,121,966
J.P. Morgan Global Maritime	28,202,787
J.P. Morgan Global Maritime II	5,869,126
J.P. Morgan Global Transport Income	75,403,578
KKR 2006	5,029,686
KKR European III	3,079,425
KKR European IV	47,110,360
KKR European V	33,223,625
KKR Americas XII	67,199,924
Landmark Equity Partners XIV	4,617,949
Landmark Equity Partners XV	14,155,637

Landmark Equity Partners XVI	$ 23,879,139	**Additional categories**	
Lexington Capital Partners VII	5,888,221	Avenue Special Situations VI	$ 13,368,844
Lexington Capital Partners VIII	25,183,200	Barings European Loan	100,670,000
Lexington Capital Partners IX	22,791,803	Columbia High Yield Bond	210,396,077
Molpus Lake Superior Timberlands	154,168,337	Fort Washington High Yield Bond	327,263,838
Molpus Seven States	50,932,446	Highbridge Specialty Loan III	1,948,528
NGP Natural Resources X	6,528,287	Lord Abbett High Yield Core	106,159,688
NGP Natural Resources XI	35,689,874	Marathon European Credit Opportunities II	15,228,335
NGP Natural Resources XII	27,899,021	Marathon European Credit Opportunities III	87,865,561
Oaktree European Principal III	17,371,375	Marathon TRS Credit	430,843,845
Oaktree European Principal IV	46,290,960	Oaktree European Capital Solutions	25,707,948
Oaktree European Principal V	15,470,507	Oaktree European Dislocation	1,454,869
Oaktree Mezzanine III	246,927	Oaktree Opportunities IX	33,012,915
Oaktree Mezzanine IV	18,289,865	Oaktree Opportunities X	20,376,954
Oaktree Mezzanine V	9,041,864	Oaktree Opportunities Xb	36,361,655
Public Pension Capital	102,274,194	Shenkman Capital Management	298,033,445
Riverstone/Carlyle Energy and Power IV	773,072	**Subtotal**	18,756,224,768
Riverstone Energy and Power V	9,021,763		
Riverstone Energy and Power VI	33,246,761	**Total***	$ 25,728,805,148
Stepstone Pioneer Capital III	12,453,414		

*Includes 403(b) Tax Sheltered Trust of $306,484.

Life Insurance Trust
Fair Values as of June 30, 2021

Internally Managed

Cash equivalents (unallocated)	$	2,914,977
Fixed income		
Broad Market Bond		25,974,525
Equity		
S & P 400 Stock Index		5,932,579
S & P 500 Stock Index		25,878,938
S & P 600 Stock Index		1,325,442
Additional categories		
In-House High Yield Bond		871,764
Subtotal	$	62,898,225

Externally Managed

Domestic equity	
Baillie Gifford US Equity Growth	$ 9,603,710
Fort Washington Focused Equity	1,803,544
International equity	
Baillie Gifford EAFE	4,023,476
BlackRock All Country World ex US IMI	20,226,539
Real estate	
Angelo Gordon Net Lease Realty IV	138,286
Carlyle Property Investors	1,186,018
Rockwood Capital Real Estate XI	196,012
TA Realty Core Property	3,298,424
TA Realty Associates XII	362,373
Alternative investments	
Alpine Investors Secondaries VII	42,052
Apax X	114,215
Carlyle Renewable and Sustainable	93,576
Fort Washington Opportunities IV	200,000
Fort Washington Opportunities IV-K	200,000
Fort Washington X	179,432
Fort Washington X-S	118,471
Lexington Capital Partners IX	227,931
Oaktree European Principal V	154,705
Oaktree Mezzanine V	90,419
Additional categories	
Marathon TRS Credit	1,724,422
Subtotal	$ 43,983,605
Total	$106,881,830

Retirement Annuity Trust
Investment Summary — Fair Values*
as of June 30, 2021

	Fair Value June 30, 2020	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2021	Percent
Cash equivalents	$ 757,664,315	$ 6,535,328,850		$ 6,227,678,491	$ 1,065,314,674	4.1
Fixed income	2,942,102,334	1,996,027,003	(93,195,988)	1,217,291,489	3,627,641,860	14.1
Real estate	1,227,834,915	245,642,147	48,564,074	116,151,556	1,405,889,580	5.5
Alternative	1,465,067,724	945,078,232	463,590,316	1,115,603,035	1,758,133,237	6.8
Equities	12,593,762,661	5,927,922,079	5,165,499,415	7,619,118,023	16,068,066,132	62.5
Additional categories	1,549,337,817	780,788,061	175,140,334	701,813,033	1,803,453,179	7.0
Total	$ 20,535,769,766	$ 16,430,786,372	$ 5,759,598,151	$ 16,997,655,627	$ 25,728,498,662	100.0

Life Insurance Trust
Investment Summary — Fair Values
as of June 30, 2021

	Fair Value June 30, 2020	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2021	Percent
Cash equivalents	$ 12,219,575	$ 36,523,301	$	$ 39,336,900	$ 9,405,976	8.8
Fixed income	14,143,524	8,751,413	(158,952)	2,692,731	20,043,254	18.8
Equities	55,860,313	8,336,140	22,687,238	18,602,359	68,281,332	63.9
Real estate	2,399,699	2,629,598	204,368	52,551	5,181,114	4.8
Alternative investments	361,320	1,056,325	242,893	239,737	1,420,801	1.3
Additional categories	2,034,758	307,104	297,728	90,237	2,549,353	2.4
Total	$ 87,019,189	$ 57,603,881	$ 23,273,275	$ 61,014,515	$ 106,881,830	100.0

Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2021

Investment Counselor Fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 12,729,818	$ 23,626	18.6
Fixed income manager(s)	1,556,111	606	3.9
Real estate	1,003,470	12,012	119.7
Additional categories	1,708,693	8,971	52.5
Alternative investments	1,758,133	21,487	122.2
Subtotal	$ 18,756,225	$ 66,702	35.6
Administrative Expenses**		4,611	1.8
Total		$ 71,313	27.7

(Dollars in thousands)

*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 $25.7 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, 2021

Investment Counselor Fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 35,657	$ 40	11.1
Real estate	5,181	33	64.0
Alternative investments	1,421	31	220.8
Additional categories	1,724	9	49.8
Subtotal	$ 43,983	$ 113	25.6
Administrative Expenses**		269	25.2
Total		$ 382	35.7

(Dollars in thousands)

*One basis point is one hundredth of 1% or the equivalent of 0.0001.
**Basis points for each type of administrative expense are calculated against the $87 million in assets under management for the trust.

Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2021

Investment counselor fees	
Fixed income	
Galliard Capital Core Fixed Income	$ 319,033
Fort Washington Core Fixed Income	287,117
Total fixed income	606,150
Domestic equity	
Baillie Gifford US Equity Growth	1,101,634
Fort Washington Focused Equity	1,714,319
State Street US Premier Growth Equity	800,000
Todd Asset Management	926,472
UBS Global Asset Management	3,295,561
Wellington Management Company	4,310,562
Total domestic equity	12,148,548
International equity	
Baillie Gifford EAFE	5,944,727
Barings All Country World ex US	3,117,602
BlackRock MSCI ACWI Ex US IMI Index	302,522
Todd Asset Management	537,411
UBS All Country World ex US Equity	1,574,855
Total international equity	11,477,117
Real estate	
Angelo Gordon Net Lease Realty III	1,187,474
Angelo Gordon Net Lease Realty IV	294,869
Blackstone Partners VII	249,754
Blackstone Partners VIII	529,300
Blackstone Partners IX	750,000
Carlyle Realty Partners VI	71,464
Carlyle Realty Partners VII	262,736
Carlyle Realty Partners VIII	649,104
Carlyle Property Investors	590,586
Landmark Real Estate Partners VII	161,326
Landmark Real Estate Partners VIII	500,000
Prudential PRISA	2,867,902
Rockwood Capital Real Estate IX	238,567
Rockwood Capital Real Estate X	655,000
Rockwood Capital Real Estate XI	897,515
TA Realty Core Property	423,257
The Realty Associates X	71,514
The Realty Associates XI	1,036,191
The Realty Associates XII	574,999
Total real estate	12,011,558
Alternative investments	
Actis Global IV	762,124
Alinda Infrastructure II	89,147
AlpInvest Secondaries VII	528,278
Apax VIII	203,479
Apax IX	506,591
Apax X	1,342,154
Apax Digital	745,091
Audax Mezzanine III	43,914
Audax Mezzanine IV	311,695
Audax Private Equity IV	—
Audax Private Equity V	79,194
Audax Private Equity VI	125,428
CapitalSouth Partners III	—
Carlyle Asia Partners V	725,000
Carlyle Europe Partners IV	361,640
Carlyle Europe Partners V	895,453
Carlyle Global Financial Services Partners II	169,706
Carlyle Global Financial Services Partners III	688,343
Fort Washington Private Equity Opportunities	68,425
Fort Washington Private Equity Opportunities	80,325
Fort Washington V	24,214
Fort Washington VI	62,200
Fort Washington VIII	126,000
Fort Washington IX	126,000
Fort Washington IX-K	126,000
Fort Washington X	92,838
Fort Washington X-S	92,835
Gavea Investments V	118,713
Hancock Bluegrass-Oregon	88,761
Hellman & Friedman Capital Partners VII	54,342
Hellman & Friedman Capital Partners VIII	325,968
IFM Global Infrastructure	1,783,839
J.P. Morgan Global Maritime	525,203
J.P. Morgan Global Maritime II	141,309
J.P. Morgan Global Transport Income	464,571
KKR 2006	(4,761)
KKR European III	34,668
KKR European IV	271,255
KKR European V	341,555
KKR Americas XII	420,588
Landmark Equity Partners XIV	50,304
Landmark Equity Partners XV	299,482
Landmark Equity Partners XVI	500,000
Lexington Capital Partners VII	55,498
Lexington Capital Partners VIII	232,628
Lexington Capital Partners IX	425,123
Molpus Lake Superior Timberlands	806,309
Molpus Seven States	445,605
NGP Natural Resources X	221,368
NGP Natural Resources XI	473,153
NGP Natural Resources XII	748,877
Oaktree European Principal III	325,317
Oaktree European Principal IV	783,655
Oaktree European Principal V	335,604
Oaktree Mezzanine III	5,269
Oaktree Mezzanine IV	283,156
Oaktree Mezzanine V	28,202
Public Pension Capital	1,657,309
Riverstone/Carlyle Energy and Power IV	29,435
Riverstone Energy and Power V	148,537
Riverstone Energy and Power VI	591,063
Stepstone Pioneer Capital III	99,393
Total alternative investments	21,487,372
Additional categories	
Avenue Special Situations VI	—
Barings European Loan	431,354

Columbia High Yield Bond	$ 747,404
Fort Washington High Yield Bond	645,283
Highbridge Specialty Loan III	—
Lord Abbett High Yield Core	366,333
Marathon European Credit Opportunities II	90,578
Marathon European Credit Opportunities III	1,117,437
Marathon TRS Credit	2,308,369
Oaktree European Capital Solutions	423,237
Oaktree European Dislocation	34,853
Oaktree Opportunities IX	541,762
Oaktree Opportunities X	331,753
Oaktree Opportunities Xb	788,789
Shenkman Capital Management	1,143,661
Total additional categories	8,970,813
Total investment counselor fees	$66,701,558

Administrative expenses	
Custodian	
The Bank of New York Mellon	$ 657,867
Legal and research	
Ice Miller	61,311
Other	
Other administrative and operational	3,398,086
Consultant	
Aon Hewitt	413,850
Bevis Longstreth	50,000
George Philip	30,100
Total consultant	493,950
Total administrative expenses	4,611,214
Grand total	$71,312,772

Life Insurance Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2021

Investment Counselor Fees

Domestic equity	
Baillie Gifford US Equity Growth	$ 16,057
Fort Washington Focused Equity	5,558
Total domestic equity	21,615
International equity	
Baillie Gifford EAFE Alpha	8,442
BlackRock All Country World ex US	9,536
Total international equity	17,978
Real estate	
Angelo Gordon Net Lease Realty IV	1,656
Carlyle Property Investors	12,003
Rockwood Capital Real Estate XI	5,282
TA Realty Core Property Fund	8,465
The Realty Associates XII	5,749
Total real estate	33,155
Alternative investments	
Alpine Investors Secondaries VII	$ 5,283
Apax X	13,422
Fort Washington Private Equity	1,063
Fort Washington Private Equity	1,063
Fort Washington X	1,327
Fort Washington X-S	1,328
Lexington Capital Partners IX	4,253
Oaktree European Principal V	3,357
Oaktree Mezzanine V	281
Total alternative investments	31,377
Additional categories	
Marathon TRS Credit	8,584
Total Investment Counselor Fees	$112,709

Administrative Expenses

Custodian	
The Bank of New York Mellon	$ 56,300
Other	
Other Administrative and Operational	212,997
Total Administrative Expenses	$ 269,297
Grand total	$ 382,006

Retirement Annuity Trust
Ten Largest Stock Holdings Ranked by Fair Value*
June 30, 2021

		Fair Value	Percent of Equities
1	Microsoft Corp.	$ 404,152,188	2.50
2	Apple	352,774,994	2.18
3	Amazon.com	343,462,134	2.12
4	Facebook	211,354,828	1.31
5	Alphabet Class C	164,690,287	1.02
6	Alphabet Class A	153,390,806	0.95
7	United Health Group	138,876,997	0.86
8	Qualcomm	105,529,793	0.65
9	Visa	99,733,817	0.62
10	JP Morgan Chase and Co.	94,208,867	0.58

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

Retirement Annuity Trust
Ten Largest Fixed Income Holdings Ranked by Fair Value*
June 30, 2021

		Maturity	Coupon	Par Value	Fair Value	Percent of Fixed Income
1	U.S. Treasury Note	Oct. 31, 2025	0.250	$ 92,515,000	$ 90,487,621	2.29
2	U.S. Treasury Bond	Feb. 15, 2051	1.875	77,605,000	74,137,027	1.87
3	U.S. Treasury Bond	Aug. 15, 2050	1.375	83,165,000	70,157,474	1.77
4	U.S. Treasury Bond	Feb. 15, 2041	1.875	68,690,000	67,316,200	1.70
5	U.S. Treasury Note	Feb. 15, 2031	1.125	65,000,000	63,161,719	1.60
6	Federal Home Loan Mortgage Corporation	Sep. 8, 2023	0.250	53,000,000	52,947,546	1.34
7	U.S. Treasury Note	Jan. 31, 2026	0.375	49,200,000	48,233,297	1.22
8	U.S. Treasury Bond	May 15, 2040	1.125	50,515,000	43,652,063	1.10
9	U.S. Treasury Note	May 31, 2026	0.750	40,960,000	40,745,600	1.03
10	U.S. Treasury Bond	Aug. 15, 2023	6.250	31,900,000	35,927,375	0.91

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

Transaction Commissions for the Year Ended June 30, 2021

Companies	Shares Traded	Commissions	Commission Per Share	Percent of Total
Abel Noser	2,641,376	$ 26,414	$ 0.010	2.25
Abel Noser - Transitions	501,562	3,762	0.008	0.32
Allen & Co	20,089	603	0.030	0.05
Bank of America	727,174	9,221	0.013	0.78
Barclays	1,268,942	18,451	0.015	1.57
Barclays Capital, London	1,672	13	0.008	0.00
Blair, William & Co	39,085	635	0.016	0.05
BMO Capital Markets	289,734	8,897	0.031	0.76
BTIG	493,486	15,727	0.032	1.34
Canaccord Genuity, Inc.	40,624	990	0.024	0.08
Cantor Fitzgerald & Co	42,912	984	0.023	0.08
CIBC Worldmarket	10,506	63	0.006	0.01
Citigroup Global	326,523	8,680	0.027	0.74
ConvergEx - Algos	15,134,047	77,920	0.005	6.63
ConvergEx - FS	4,059,522	20,298	0.005	1.73
ConvergEx - Transitions	5,305,060	26,546	0.005	2.26
ConvergEx ADR Conversions	14,996,510	268,037	0.018	22.82
Cornerstone	265,700	7,971	0.030	0.68
Cowen & Co	560,858	10,354	0.018	0.88
Credit Suisse Sec. LLC	1,135,435	27,725	0.024	2.36
Cronin $ Co Inc	617	12	0.020	0.00
Cuttone & Co Inc	2,400	24	0.010	0.00
Deutsche Bank	19,200	—	0.000	0.00
Evercore Group LLC	133,859	2,298	0.017	0.20
Fidelity Capital Markets	6,613	132	0.020	0.01
First Kentucky Securities Corp	62,300	1,869	0.030	0.16
Goldman Sachs	1,367,988	22,617	0.017	1.93
Guggenheim Capital Markets	2,172	44	0.020	0.00
Hilltop Securities	2,139	43	0.020	0.00
Imperial Capital	400	17	0.043	0.00
Instinet	56,006	509	0.009	0.04
Investment Tech Grp Transition	21,364,523	160,236	0.008	13.64
Investment Technology Grp	6,315,198	61,924	0.010	5.27
ISI Algos	1,602,840	16,028	0.010	1.36
ISI Group	604,758	18,143	0.030	1.54
J.J.B. Hilliard, W.L. Lyons	173,792	5,214	0.030	0.44
Janney Montgomery Scott Inc	20,915	447	0.021	0.04
Jefferies & Co.	1,049,774	10,892	0.010	0.93
JMP Securities	68,292	1,356	0.020	0.12
Jones & Associates	13,515	379	0.028	0.03
JP Morgan & Chase	424,115	8,294	0.020	0.71
Keefe Bruyette & Woods	94,097	2,738	0.029	0.23
Keybanc Capital	191,586	6,181	0.032	0.53
Knight Equity Markets	400	4	0.010	0.00
Liquidnet Inc	4,369,901	43,253	0.010	3.68
Liquidnet Inc - Transition	7,080,475	35,403	0.005	3.01
Luminex Trading	9,700	49	0.005	0.00
MacQuarie Securities Inc	3,218	129	0.040	0.01
Merrill Lynch	964,640	28,937	0.030	2.46
Mizuho Securities, USA	2,940	100	0.034	0.01

Continued on next page

Companies	Shares Traded	Commissions	Commission Per Share	Percent of Total
MKM Partners	10,870	$ 321	$ 0.030	0.03
Morgan Keegan	20,600	886	0.043	0.08
Morgan Stanley	1,110,679	15,204	0.014	1.29
National Bank of Canada	1,100	44	0.040	0.00
National Financial Services	20,692	684	0.033	0.06
Needham	57,582	1,101	0.019	0.09
Oppenheimer & Co, Inc	48,525	1,469	0.030	0.13
Pershing LLC	144,355	3,593	0.025	0.31
Piper Jaffray	905,194	25,374	0.028	2.16
Piper Sandler & Co	2,400	—	0.000	0.00
R W Baird	126,807	3,853	0.030	0.33
Raymond James & Assoc	1,250,874	37,166	0.030	3.16
Raymond James Algos	230,000	2,300	0.010	0.20
RBC Capital Markets	8,675,093	46,307	0.005	3.94
Sanford C Bernstein	245,277	2,724	0.011	0.23
Scotia Capital, USA	156,271	1,151	0.007	0.10
Stephens Inc.	32,581	764	0.023	0.07
Stifel, Nicolaus & Co	704,355	21,323	0.030	1.82
Stonex Group Inc	476,800	4,768	0.010	0.41
Suntrust Robinson	9,648	239	0.025	0.02
Susquehanna Brokerage	800	24	0.030	0.00
Telsey Advisory Group LLC	1,247	25	0.020	0.00
Tradebook	3,692,106	18,461	0.005	1.57
UBS Financial Services Inc	345,249	5,178	0.015	0.44
Virtu Americas LLC	1,774,285	17,339	0.010	1.48
Wall Street Access	1,557	9	0.006	0.00
Wedbush Morgan Securities	25,400	—	0.000	0.00
Wells Fargo Securities, LLC	111,678	3,721	0.033	0.32
Williams Capital Group	2,682	107	0.040	0.01
Wolfe Research Secruties	4,582	92	0.020	0.01
Totals*	114,058,479	$ 1,174,790	$ 0.010	100

* The acquisition of initial public offerings (IPOs) represented a portion of small-capitalization stock purchases. IPOs usually have a high commission rate; however, the security issuers and not the investors pay the commissions. In fiscal year 2021, the Retirement Annuity Trust bought small capitalization IPOs that generated $272,492 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 managements of the 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 which 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.

Security Lending

TRS operates its security 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 to members and annuitants living in Kentucky annually. Approximately $307 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
CapitalSouth Partners
The Carlyle Group
Chrysalis Ventures
Fort Washington Private Equity Investors
Gavea Investimentos
Hancock Natural Resources Group
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
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
Reinhert, 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 8% 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

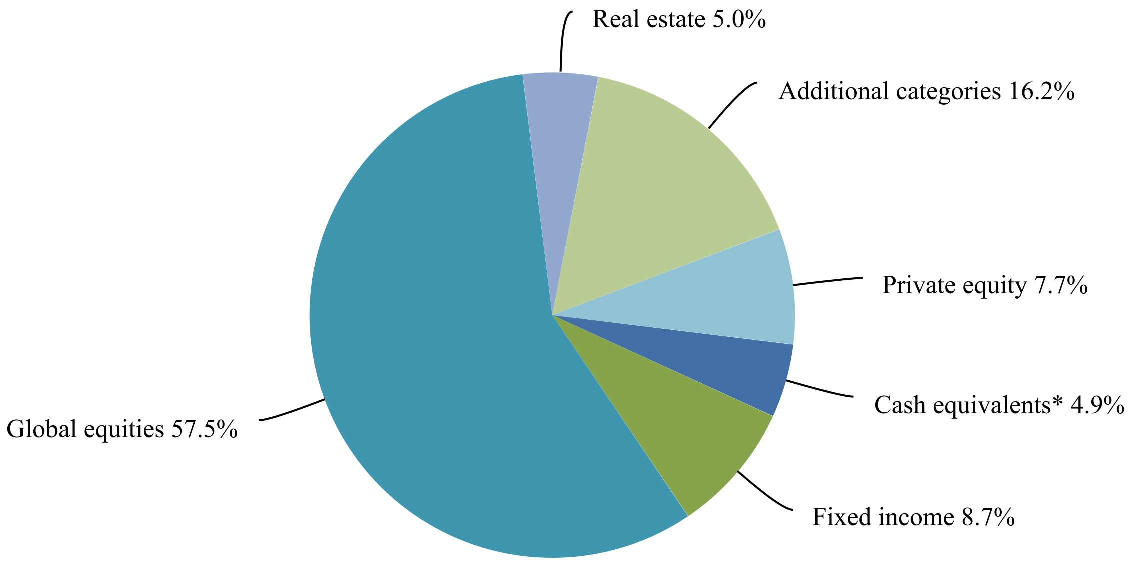
As of June 30, 2021, the Health Insurance Trust had $2.22 billion in assets. This included $192 million in investment-grade bonds. This trust also had $185.1 million in high-yield bonds, $1.27 billion in public equity investments, $170.6 million in private equity, $70.7 million in bank loans, $104 million in alternative credit funds and $111.4 million in real estate.

Asset allocation is adjusted annually by the Investment Committee to reflect changing liquidity needs and actuarial funding status. Due to the trust being cash flow positive, liquidity needs are declining as funding status has improved. The information below shows the health insurance fund's asset allocation by fair value as of June 30, 2021 and 2020.

	June 30, 2021	Percent	June 30, 2020	Percent
Cash equivalents*	$ 109,572,850	4.9	$ 16,448,674	1.1
Fixed income	192,012,876	8.7	131,887,681	8.6
Global equities	1,275,845,514	57.5	914,544,057	59.8
Real estate	111,459,521	5.0	82,393,040	5.4
Additional categories	359,849,495	16.2	269,584,086	17.6
Private equity	170,660,050	7.7	113,773,956	7.5
Totals	$ 2,219,400,306	100.0	$ 1,528,631,494	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 Values
As of June 30, 2021



*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.

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 values. For fiscal year 2021, the Health Insurance Trust's portfolio returned 31.53% versus a policy index of 29.96%. The fund's public equities returned 44.4% versus 40.94% for the MSCI All Country World IMI Index. A high-quality bond fund returned -0.32% versus -0.39% for the Barclays Government/Credit Index. This was the sixth year of managing the bond fund against this index. Previously, it was managed against 90-day Treasury bills. While working to extend duration, it's prudent to be selective in entry points given the low-interest rate environment. Additional categories returned 16.73% versus a 15.62% return for the benchmark, Bank of America Merrill Lynch High Yield Master II.

General partner profit sharing, known as carried interest, for the Health Insurance Trust for fiscal year 2021 was $10.2 million, consisting by asset class of $8.3 million in private equity, $917,600 in private real estate and $1.0 million in private credit.

Schedule of Investment Results — Gross

	1-year	3-year*	5-year*	10-year*
Total Plan	**31.53**	**12.92**	**12.48**	
Policy benchmark**	29.96	12.29	12.10	
Equities	**44.40**	**16.03**	**15.67**	
All cap equities	**67.63**	**27.30**		
S&P 500 Index	40.79	18.67		
Russell 3000	44.16	18.73	17.89	
Global equities	**41.49**	**14.61**	**14.92**	**10.32**
MSCI AC World IMI (Net)	40.94	14.24	14.55	9.90
Fixed income	**-0.32**	**5.91**	**3.32**	**2.45**
Barclays Government Credit	(0.39)	5.95	3.31	3.71
Total real estate	**11.88**	**9.40**	**10.06**	
Core real estate	**6.76**	**7.71**	7.61	
NCREIF ODCE (VW)	8.02	5.52	6.57	
Non-core real estate	**16.37**	**10.86**	**11.68**	
NCREIF Property Index	7.37	5.50	6.13	
Private equity	**42.60**	**16.22**	**17.85**	
Mature private equity	**37.07**	**17.05**	**15.78**	
S&P 500 plus 3%	45.02	22.23	21.17	
Private equity < 5 Years	**48.85**	**17.26**		
Additional categories:	**16.73**	**6.92**	**7.14**	**6.10**
B of A Merrill Lynch High Yield Master II	15.62	7.15	7.30	6.50
Cash (unallocated)	**0.04**	**1.28**	**1.15**	**0.64**
90-day Treasury Bill	0.09	1.34	1.16	0.61

*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

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 Values
as of June 30, 2021

Internally Managed	
Cash collections (unallocated)	$109,572,850
Fixed income	
Internal Bond	192,012,876
In-house High Yield	7,969,503
Subtotal	$309,555,229
Externally Managed	
Domestic equity	
Baillie Gifford US Equity Growth	109,647,161
Fort Washington Focused Equity	61,873,854
International equity	
Blackrock B	1,104,324,500
Real estate	
Angelo Gordon Net Lease Realty IV	2,765,728
Blackstone Partners VIII	7,331,698
Blackstone Partners IX	2,529,697
Carlyle Realty Partners VII	3,358,005
Carlyle Realty Partners VIII	3,469,902
Carlyle Property Advisors	13,785,749
Landmark Real Estate Partners VII	2,765,842
Landmark Real Estate Partners VIII	3,274,458
Prudential PRISA	13,742,269
Rockwood Capital Real Estate X	7,439,848
Rockwood Capital Real Estate XI	5,880,373
The Realty Associates XI	9,977,448
The Realty Associates XII	7,247,453
TA Realty Core Property	27,891,051
Alternative investments	
Actis Global IV	3,409,358
Alpine Investor Secondaries II	840,669
APAX IX	15,946,099
APAX X	2,284,297
Apax Digital	8,005,006
Audax Private Equity V	8,577,998
Carlyle Asia V	3,899,524
Carlyle Europe Partners IV	7,884,742
Carlyle Europe V	3,039,520
Carlyle Global Financial Services Partners III	$10,043,133
Carlyle Renewable & Sustainable Energy	1,871,530
Fort Washington PE Opportunities III	1,890,816
Fort Washington VII	2,427,112
Fort Washington VIII	8,677,375
Fort Washington IX	9,048,348
Fort Washington IX-K	9,160,231
Fort Washington X	1,794,300
Fort Washington X-S	1,184,705
Fort Washington IV	2,000,000
Fort Washington IV-K	2,000,000
KKR European IV	9,422,069
KKR European V	3,322,365
KKR Americas XII	13,439,983
Landmark Equity Partners XV	2,359,274
Landmark Equity XVI	4,775,829
Lexington Capital Partners IX	2,279,194
NGP Natural Resources XI	7,137,980
NGP Natural Resources XII	5,579,806
Oaktree European Principal IV	9,258,194
Oaktree European Principal V	1,547,051
Oaktree Mezzanine V	904,186
Riverstone E & P VI	6,649,356
Additional categories	
Columbia High Yield	55,918,935
Fort Washington High Yield Bond	55,123,672
Highbridge Principal Strategies III	194,853
Lord Abbett High Yield Core	66,056,353
Marathon European Credit Opportunities II	1,015,222
Marathon European Credit Opportunities III	11,715,408
Marathon TRS Credit	78,696,172
Oaktree European Capital Solutions	5,139,296
Oaktree Opportunities Xb	7,272,331
Shenkman Capital Management	70,747,749
Subtotal	$1,909,845,077
Total	$2,219,400,306

Investment Summary — Fair Values as of June 30, 2021*

	Fair Value June 30, 2020	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2021	Percent
Cash equivalents	$ 26,908,534	$ 620,106,910	$	$ 489,508,545	$ 157,506,899	7.1
Fixed income	128,746,941	49,254,118	(3,081,287)	19,747,971	155,171,801	7.0
Real estate	82,393,040	39,108,252	9,981,410	20,023,181	111,459,521	5.0
Equities	914,010,573	78,667,330	400,519,766	118,586,805	1,274,610,864	57.4
Alternative	113,773,956	50,175,182	58,106,140	51,395,228	170,660,050	7.7
Additional categories	262,798,450	195,617,251	33,990,112	142,414,642	349,991,171	15.8
Total	$ 1,528,631,494	$ 1,032,929,043	$ 499,516,141	$ 841,676,372	$ 2,219,400,306	100.0

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2021

Investment Counselor Fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 1,275,846	$ 766	6.0
Fixed income manager(s)			
Real estate	111,460	1,453	130.4
Additional categories	351,880	1,549	44.0
Alternative investments	170,660	2,359	138.2
Subtotal	$ 1,909,846	$ 6,127	32.1
Administrative Expenses**		512	2.3
Total		$ 6,639	29.9

(Dollars in thousands)

*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 $1.3 billion in assets under management for the trust.

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2021

Investment Counselor Fees

Domestic equity	
Baillie Gifford US Equity Growth	$ 183,492
Fort Washington Focused Equity	190,539
Total domestic equity	374,031
International equity	
BlackRock Fund B	392,228
Total international equity	392,228
Real estate	
Angelo Gordon Net Lease Realty IV	35,005
Blackstone Partners VIII	105,859
Blackstone IX	75,000
Carlyle Realty Partners VII	52,548
Carlyle Realty Partners VIII	129,822
Carlyle Property Advisors	121,880
Landmark Real Estate Partners VII	32,395
Landmark Real Estate Partners VIII	100,000
Prudential PRISA	109,021
Rockwood Capital Real Estate X	133,271
Rockwood Capital Real Estate XI	177,965
The Realty Associates XI	177,211
The Realty Associates XII	111,673
TA Realty Core Property	91,829
Total real estate	1,453,479
Alternative investments	
Actis Global IV	76,612
AlpInvest Secondaries VII	105,656
APAX IX	101,318
APAX X	268,431
Apax Digital	149,018
Audax Private Equity V	26,398
Carlyle Asia V	145,000
Carlyle Europe Partners IV	72,328
Carlyle Europe V	173,536
Carlyle Global Financial Services Partners	137,670
Fort Washington PE Opportunities III	12,618
Fort Washington PE Opportunities IV	10,625
Fort Washington PE Opportunities IV-K	10,625
Fort Washington VII	22,142
Fort Washington VIII	36,000
Fort Washington IX	36,000

Fort Washington IX-K	36,000
Fort Washington X	13,263
Fort Washington X-S	$ 13,262
KKR Americas XII	84,116
KKR IV	54,250
KKR European V	34,155
Landmark Equity Partners XV	49,914
Landmark Equity Partners XVI	100,000
Lexington Capital Partners IX	42,512
NGP Natural Resources XI	94,631
NGP Natural Resources XII	149,775
Oaktree European Principal IV	156,732
Oaktree European Principal V	33,560
Oaktree Mezzanine V	2,821
Riverstone E & P VI	110,230
Total alternative investments	2,359,198
Additional categories	
Columbia High Yield Bond	199,459
Fort Washington High Yield Bond	81,337
Highbridge Specialty Loan III	25,386
Lord Abbett High Yield Core	175,371
Marathon European Credit Opportunities II	6,039
Marathon European Credit Opportunities III	148,992
Marathon TRS Credit	446,866
Oaktree European Capital Solutions	84,648
Oaktree Opportunities Xb	157,757
Shenkman Capital Management	222,687
Total additional categories	1,548,542
Total Investment Counselor Fees	6,127,478
Administrative Expenses	
Custodian	
The Bank of New York Mellon	174,753
Other	
Other Administrative and Operational	336,859
Total Administrative Expenses	511,612
Grand Total	$ 6,639,090

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
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

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Actuarial Section

Annual Valuation of the Retirement Annuity Trust

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 15, 2021

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

Members of the Board:
Section 161.400 of the law governing the operation of the Teachers' Retirement System of the State of Kentucky provides that the actuary shall make an actuarial valuation of the system. We have submitted the results of the annual actuarial valuation prepared as of June 30, 2021. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The combined member and state contribution rates as a percentage of payroll for the fiscal year ending June 30, 2024 required to support the total benefits of the system are as follows:

Group	Combined Member and State Contribution Requirement
University members hired before July 1, 2008	37.00%
University members hired on or after July 1, 2008	38.00%
Non-University members hired before July 1, 2008	39.96%
Non-University members hired on or after July 1, 2008	40.96%

These rates represent an increase since the previous valuation in the total pension actuarially determined employer contribution rates (ADEC) of 0.19% of payroll for the fiscal year ending June 30, 2024.

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

- a decrease in the expected state special appropriation from 2.61% to 2.38%, or 0.23% of payroll
- a decrease in the amount required for life insurance benefits from 0.08% to 0.06% of payroll
- the additional required increase of 0.40%, from 15.78% to 16.18%

Since the previous valuation, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2020. In addition, the contribution requirements for the fiscal year ending June 30, 2024 use a direct rate smoothing methodology over a five-year period. These revised assumption changes and methods were adopted by the board on September 20, 2021 and are discussed in the Summary of Principal Results. The valuation also considers the effect of membership to the system enacted as of June 20, 2021.

The financing objective of the system is that contribution rates will remain relatively level over time as a percentage of payroll. 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.

Board of Trustees
November 13, 2020
Page 2

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.

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. We note that as 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 due to the pandemic. We will continue to monitor the situation and advise the board in the future of any adjustments that we believe would be appropriate.

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.

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 fiscal year 2022. **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 valuation and a comparison with the results of the previous valuation are summarized below (dollar amounts in thousands):

Valuation Date	June 30, 2021	June 30, 2020
Number of active members	69,256	73,151
Annual salaries	$ 3,784,400	$ 3,723,482
Number of annuitants and beneficiaries	57,465	56,629
Annual allowances	$ 2,265,323	$ 2,198,098
Assets		
Market value	$ 25,935,779	$ 20,717,000
Actuarial value	22,624,398	20,796,494
Actuarial accrued liability	$ 39,581,704	$ 35,582,250
Unfunded actuarial accrued liability (UAAL)	$ 16,957,306	$ 14,785,756
Funded ratio	57.2 %	58.4 %
Amortization period (years)	22.9	$ 24.4

Contribution Rates for University Members

Valuation Date	June 30, 2021		June 30, 2020	
For fiscal year ending	June 30, 2024		June 30, 2023	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Retirement Annuity Trust:				
Normal*	12.280 %	12.280 %	10.570 %	10.570 %
Actuarial accrued liability	24.720	25.720	26.240	27.240
Total**	37.000 %	38.000 %	36.810 %	37.810 %
Member	7.625 %	7.625 %	7.625 %	7.625 %
State (ARC)	29.375	30.375	29.185	30.185
Total**	37.000 %	38.000 %	36.810 %	37.810 %
Life Insurance Trust:				
State	0.060 %	0.060 %	0.080 %	0.080 %
Health Insurance Trust:				
Member	2.775 %	2.775 %	2.775 %	2.775 %
State match	2.775	1.775	2.775	1.775
Total	5.550 %	4.550 %	5.550 %	4.550 %
Total Contributions	42.610 %	42.610 %	42.440 %	42.440 %
Member statutory	10.400 %	10.400 %	10.400 %	10.400 %
State statutory	13.650	13.650	13.650	13.650
Required increase	16.180	16.180 %	15.780	15.780
State special	2.380	2.380 %	2.610	2.610
Total	42.610 %	42.610 %	42.440 %	42.440 %

**Includes a load for administrative expenses for the contribution rates for fiscal year ending June 30, 2024.*
*** Total contribution rates for fiscal year ending June 30, 2024 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. See Schedule H for anticipated contribution rate increases.*

Contribution Rates for Non-University Members

Valuation Date	**June 30, 2021**		**June 30, 2020**	
For fiscal year ending	June 30, 2024		June 30, 2023	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Retirement Annuity Trust:				
Normal*	16.410 %	16.410 %	14.820 %	14.820 %
Actuarial accrued liability	23.550	24.550	24.950	25.950
Total**	39.960 %	40.960 %	39.770 %	40.770 %
Member	9.105 %	9.105 %	9.105 %	9.105 %
State (ARC)	30.855	31.855	30.665	31.665
Total**	39.960 %	40.960 %	39.77 %	40.770 %
Life Insurance Trust:				
State	0.060 %	0.060 %	0.080 %	0.080 %
Health Insurance Trust:				
Member	3.750 %	3.750 %	3.750 %	3.750 %
State match	3.750	2.750	3.750	2.750
Total	7.500 %	6.500 %	7.500 %	6.500 %
Total Contributions	47.520 %	47.520 %	47.350 %	47.350 %
Member statutory	12.855 %	12.855 %	12.855 %	12.855 %
State statutory	16.105	16.105	16.105	16.105
Required increase	16.180	16.180	15.780	15.780
State special	2.380	2.380	2.610	2.610
Total	47.520 %	47.520 %	47.350 %	47.350 %

**Includes a load for administrative expenses for the contribution rates for fiscal year ending June 30, 2024.*
*** Total contribution rates for fiscal year ending June 30, 2024 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. See Schedule H for anticipated contribution rate increases.*

2. 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.
3. Comments on the valuation results as of June 30, 2021, are given in Section IV and further discussion of the contribution levels is set out in Sections V and VI.
4. Schedule B shows the development of the actuarial value of assets.
5. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation. Since the previous valuation, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2020. The valuation liabilities fully reflect the impact of all assumption changes. However direct-rate smoothing is used to phase in the required contributions over a five-year period. The assumption changes adopted by the board September 20, 2021, are summarized below.
    - Price inflation assumed rate changed from 3% to 2.5%
    - Wage inflation assumed rate changed from 3.5% to 2.75%
    - Assumed investment rate of return changed from 7.5% to 7.1%
    - Assumed salary scale changed to a service-based table and adjusted to reflect a decrease of .25% in merit and promotion for all ages
    - An administrative expense load of .32% of payroll has been added to the normal cost rate
    - Assumed rates of mortality have been revised to the Pub-2010 (Teachers Benefit-Weighted) Mortality Table projected generationally with the MP-2020 improvement scale with various set-forwards, set-backs and adjustments
    - Assumed rates of withdrawal, disability, and retirement have been adjusted to reflect experience more closely
    - Increased load for unused sick leave from 2% to 3% for all active liability at the time of retirement

6. 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.
7. The funded ratio shown in the Summary of Principal Results, is the ratio of actuarial value of assets to the actuarial accrued liability. The funded status would be different based on the 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 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, 2021, on the basis of which the valuation was prepared.

Group	Number	Annual Salaries *(In thousands)*
University hired before July 1, 2008	1,197	$ 91,384
University hired after July 1, 2008	1,850	100,077
Non-university full time hired before July 1, 2008	28,937	2,038,325
Non-university full time hired after July 1, 2008	28,866	1,497,694
Non-university part time hired before July 1, 2008	914	8,393
Non-university part time hired after July 1, 2008	7,492	48,527
Total	69,256	$ 3,784,400

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.

The Number and Annual Retirement Allowances of Annuitants and Beneficiaries on the Roll as of June 30, 2021

Group	Number	Annual Retirement Allowances[1] *(In thousands)*
Service retirements	50,129	$ 2,061,901
Disability retirements	2,831	88,783
Beneficiaries of deceased members	4,505	114,639
Total	57,465	$ 2,265,323

[1]Includes cost-of-living adjustments effective through July 1, 2021.

In addition, there are 10,538 terminated vested employees entitled to benefits in the future and 50,697 inactive non-vested members.

3. 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, 2021, the market value of Retirement Annuity Trust assets for valuation purposes held by the system amounted to $25.94 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, 2021, on a market value basis was 29.6%. 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, 2021, was $22.62 billion. The estimated investment return for the plan year ending June 30, 2021, on an actuarial value of assets basis was 12.9%, compared to the assumed investment rate of return for the period of 7.5%. Schedule B shows the development of the actuarial value of assets as of June 30, 2021.
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
2021	29.6%	12.9%
2020	5.5%	7.0%
2019	5.6%	7.1%
2018	10.5%	9.1%
2017	15.0%	9.3%

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 as of June 30, 2021. 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 $19.39 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 $24.86 billion of which $649.9 million is for special appropriations remaining 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 $503.8 million. The total prospective liabilities of the system amounts to $44.76 billion. Against these liabilities, the system has present assets for valuation purposes of $22.62 billion. When this amount is deducted from the total liabilities of $44.76 billion, there remains $22.13 billion as the present value contributions to be made in the future.
3. The employer's contributions to the system consist of normal contributions and actuarial accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 12.28% of payroll for university and 16.41% of payroll for non-university 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 $5.18 billion. When this amount is subtracted from $22.13 billion, which is the present value of the total future contributions to be made by the employer, there remains $16.96 billion as the amount of future unfunded actuarial accrued liability contributions.
5. The unfunded actuarial accrued liability increased by approximately $2.2 billion for the plan year ending June 30, 2021, and the funding ratio decreased from 58.4% to 57.2%. These results were mainly due to the assumption changes that were made as a result of the experience study for the five-year period ending June 30, 2020, offset by the investment experience for the fiscal year ending June 30, 2021. See Section VII for a complete breakdown of the experience of the system.

Section V — Contributions Payable Under the System

1. Section 161.540 of the retirement law provides that each university member 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. Section 161.550 provides that the state will match a portion of the member contributions and contribute a supplemental 3.25% of members' salaries towards discharging the system's unfunded obligations. Additional contributions are made to the Health Insurance Trust as required under 161.550(3).
3. Therefore for university members, 10.875% of the salaries of active members who become members before July 1, 2008, and 11.875% of the salaries of active members who become members on or after July 1, 2008, is funded by statute or

supplemental funding for the Retirement Annuity Trust and Life Insurance Trust. For non-university members, 12.355% of the salaries of active members who become members before July 1, 2008 and 13.355% of the salaries of active members who become members on or after July 1, 2008, is funded by statute or supplemental funding for the Retirement Annuity Trust and Life Insurance Trust. Of these amounts, 0.06% of payroll will be allocated to the Life Insurance Trust.

4. Based on the results of the valuation, an additional 23.05% of payroll for both university and non-university 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 16.18% of payroll for the fiscal year ending June 30, 2024.
5. An additional special appropriation of 2.38% of total payroll will be made by the state. Therefore, the total actuarially determined employer contribution rate to the Retirement Annuity Trust is 29.375% for university members who become members before July 1, 2008, and 30.375% for university members who become members on or after July 1, 2008. The total actuarially determined employer contribution rate to the Retirement Annuity Trust is 30.855% for non-university members who become members before July 1, 2008, and 31.855% for non-university members who become members on or after July 2008. The total member and employer contribution rates to the Retirement Annuity Trust are shown in the following tables.

Contribution Rates by Source
University

Member	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Statutory total	10.400%	10.400%
Statutory Medical Insurance Trust	(2.775)	(2.775)
Contribution to Retirement Annuity Trust	7.625%	7.625%
Employer		
Statutory matching total	10.400%	10.400%
Statutory Medical Insurance Trust	(2.775)	(1.775)
Supplemental funding	3.250	3.250
Subtotal	10.875%	11.875%
Life insurance	(0.060)%	(0.060)%
Additional to comply with board funding policy	16.180	16.180
Special appropriation	2.380	2.380
Contribution to Retirement Annuity Trust	29.375%	30.375%
Total contribution to Retirement Annuity Trust	37.000%	38.000%

Contribution Rates by Source
Non-University

	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Member		
Statutory total	12.855%	12.855%
Statutory Medical Insurance Trust	(3.750)	(3.750)
Contribution to Retirement Annuity Trust	9.105%	9.105%
Employer		
Statutory matching total	12.855%	12.855%
Statutory Medical Insurance Trust	(3.750)	(2.750)
Supplemental funding	3.250	3.250
Subtotal	12.355%	13.355%
Life insurance	(0.060)%	(0.060)%
Additional to comply with board funding policy	16.180	16.180
Special appropriation	2.380	2.380
Contribution to Retirement Annuity Trust	30.855%	31.855%
Total contribution to Retirement Annuity Trust	39.960%	40.960%

6. The valuation indicates that normal contributions at the rate of 12.28% of active university members' salaries and 16.41% of active non-university members' salaries are required. 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 24.72% for university members hired before July 1, 2008; 25.72% for university members hired on and after July 1, 2008; 23.55% for non-university members hired before July 1, 2008; and 24.55% for non-university members hired on and after July 1, 2008. These rates include special appropriations of 2.38% of payroll to be made by the state. These rates are shown in the following table.

Actuarially Determined Contribution Rates

	Percentage of Active Members' Salaries			
	University		Non-University	
Rate	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Normal*	12.28%	12.28%	16.41%	16.41%
Accrued liability**	24.72	25.72	23.55	24.55
Total***	37.00%	38.00%	39.96%	40.96%

**Includes a load for administrative expenses.*

***Includes special appropriations of 2.38% of payroll to be made by the state.*

****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. Please see the projections in Schedule H of the report for anticipated increases to the total contribution rates.*

7. 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	$ 15,366,216	23	$ 1,058,344
New incremental June 30, 2015	(351,610)	(335,907)	14	(32,292)
New incremental June 30, 2016*	340,766	330,271	15	30,192
New incremental June 30, 2017	(428,468)	(420,716)	16	(36,731)
New incremental June 30, 2018	(192,240)	(190,511)	17	(15,945)
New incremental June 30, 2019	53,306	53,138	18	4,278
New incremental June 30, 2020	112,464	112,436	19	8,731
New incremental June 30, 2021*	2,042,379	2,042,379	20	153,407
Total UAAL		$ 16,957,306		$ 1,169,984 **
Blended amortization period (years)				22.9

**Includes assumption changes*

***Before direct rate smoothing*

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, the annual 1.5% increases in the allowances of retired members and beneficiaries, and the liabilities for ad hoc increases and sick leave allowances granted after 1981.
2. The valuation indicates that the present statutory contribution rates, supplemental funding and special appropriations, if continued at the current level percentage, along with an additional required contribution of 16.18%, 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. However, as existing special contributions expire, the statutory contributions or supplemental funding may be required to increase as an equal percentage of payroll.
3. There are no excess assets or contributions available to provide additional benefits, and there is a cumulative increase in the required employer contribution of 16.18% of payroll for the fiscal year ending June 30, 2024, as shown in the following table.

Valuation Date	Fiscal Year	Increase/ (Decrease)	Cumulative Increase	Amount
June 30, 2004	June 30, 2007	0.11%	0.11%	$ 3,174,600
June 30, 2005	June 30, 2008	1.21	1.32	38,965,900
June 30, 2006	June 30, 2009	0.56	1.88	60,499,800
June 30, 2007	June 30, 2010	0.58	2.46	82,331,200
June 30, 2008	June 30, 2011	1.13	3.59	121,457,000
June 30, 2009	June 30, 2012	2.22	5.81	208,649,000
June 30, 2010	June 30, 2013	1.46	7.27	260,980,000
June 30, 2011	June 30, 2014	0.75	8.02	299,420,000
June 30, 2012	June 30, 2015	2.40	10.42	386,400,000
June 30, 2013	June 30, 2016	2.55	12.97	487,400,000
June 30, 2014	June 30, 2017	0.83	13.80	520,372,000
June 30, 2015	June 30, 2018	(0.31)	13.49	512,883,000
June 30, 2016	June 30, 2019	1.12	14.61	553,597,000
June 30, 2017	June 30, 2020	(0.51)	14.10	538,253,000
June 30, 2018	June 30, 2021	0.17	14.27	551,092,000
June 30, 2019	June 30, 2022	0.55	14.82	579,208,000
June 30, 2020	June 30, 2023	0.96	15.78	629,415,000
June 30, 2021	June 30, 2024	0.40	16.18	646,456,000

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. Effective September 21, 2020, the amount to be provided by the state shall not be less than the prior year's dollar amount until the plan reaches a funded ration of 100%. In addition, as existing special contributions expire, the statutory contributions or supplemental funding may be required to increase as an equal percentage of payroll, in order to amortize the unfunded actuarial accrued liability in accordance with the board funding policy. Any further benefit improvements must be accompanied by the entire additional contributions necessary to support the benefits.

Section VII — Analysis of Financial Experience

The following table shows the estimated gain or loss from various factors that resulted in an increase of $2.2 billion in the unfunded actuarial accrued liability from $14.78 billion to $16.96 billion during the year ending June 30, 2021. The increase in the unfunded actuarial accrued liability was primarily due to the assumption changes from the experience study. There were also demographic losses due to turnover and retirements, and mortality. These losses were partially offset by a gain due to investment return on an actuarial value basis that was greater than expected and gain due to salary increases that were less than expected.

Analysis of Financial Experience
(In thousands)

Item		Amount of Increase/ (Decrease)
Interest (7.5%) added to previous unfunded accrued liability	$	1,108,932
Expected accrued liability contribution		(966,928)
Experience:		
Valuation asset growth		(1,096,513)
Pensioners' mortality		15,649
Turnover and retirements		64,350
New entrants		34,518
Salary increases		(48,593)
Amendments		0
Assumption changes		3,060,136
Method changes		0
Total	$	2,171,551

Section VIII — Accounting Information

The information required under Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 will be 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, 2021

Group	Number
Retirees and beneficiaries currently receiving benefits	57,465
Terminated vested employees entitled to benefits but not yet receiving benefits	10,538
Inactive non-vested members	50,697
Active plan members	69,256
Total	187,956

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)
2012	$ 14,691,371	$ 26,973,854	$ 12,282,483	54.5 %	$ 3,479,567	353.0 %
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

* *Reflects change in assumptions and methods.*

3. The information presented above was determined as part of the actuarial valuation at June 30, 2021. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2021	Actuarial Assumptions:
Actuarial cost method	Entry age	Investment rate of return* 7.1%
Amortization method	Level percent of pay, closed	Projected salary increases** 3.0 - 7.5%
Remaining amortization period	22.9 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
2012	$ 757,822,190	$ 557,339,552	74
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

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.

Section X — 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, 2021
(Dollars in thousands)

	Decrease Discount Rate	Valuation Results	Increase Discount Rate
Actuarial accrued liability	$ 44,406,323	$ 39,581,704	$ 35,572,290
Actuarial value of assets	22,624,398	22,624,398	22,624,398
Unfunded actuarial accrued liability	$ 21,781,925	$ 16,957,306	$ 12,947,892
Funded ratio	50.9%	57.2%	63.6%
Employer ADEC - university*	47.645%	37.245%	28.295%
Employer ADEC - non-university*	49.125%	38.725%	29.775%
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 members hired before July 1, 2008. The ADEC rates do not include the impact of direct-rate smoothing.*

Table 2
Price Inflation Assumption Sensitivity Analysis
As of June 30, 2021
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 39,581,704	$ 40,564,606	$ 41,592,224
Actuarial value of assets	22,624,398	22,624,398	22,624,398
Unfunded actuarial accrued liability	$ 16,957,306	$ 17,940,208	$ 18,967,826
Funded ratio	57.2 %	55.8 %	54.4 %
Employer ADEC - university*	37.245 %	39.755 %	42.385 %
Employer ADEC - non-university*	38.725 %	41.235 %	43.865 %
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 members hired before July 1, 2008. The ADEC rates do not include the impact of direct-rate smoothing.*

Table 3
Wage Inflation Assumption Sensitivity Analysis
As of June 30, 2021
(Dollars in thousands)

	Valuation Results	Decrease Wage Inflation to 1.25%	No Wage Inflation
Actuarial accrued liability	$ 39,581,704	$ 39,581,704	$ 39,581,704
Actuarial value of assets	22,624,398	22,624,398	22,624,398
Unfunded actuarial accrued liability	$ 16,957,306	$ 16,957,306	$ 16,957,306
Funded ratio	57.2%	57.2%	57.2%
Employer ADEC - university*	37.245%	42.075%	46.465%
Employer ADEC - non-university*	38.725%	43.555%	47.945%
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 members hired before July 1, 2008. 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, 2021

(In thousands)

Actuarial Liabilities

(1)	Present value of prospective benefits payable on account of present active members			
	- Service retirement benefits	$ 18,372,260		
	- Disability retirement benefits	679,933		
	- Death and survivor benefits	113,044		
	- Refunds of member contributions	224,966		
	Total		$	19,390,203
(2)	Present value of prospective benefits payable on account of present retired and disabled members, and beneficiaries of deceased members			
	- Service retirement benefits	$ 22,895,771		
	- Disability retirement benefits	1,001,568		
	- Death and survivor benefits	966,503		
	Total		$	24,863,842
(3)	Present value of prospective benefits payable on account of inactive members and members entitled to deferred vested benefits		$	503,788
(4)	Total Actuarial Liabilities		$	44,757,833

Present and Prospective Assets

(5)	Actuarial value of assets		$	22,624,398
(6)	Present value of total future contributions = (4)-(5)	$ 22,133,435		
(7)	Present value of future member contributions and employer normal contributions		$	5,176,129
(8)	Prospective unfunded accrued liability contributions = (6)-(7)		$	16,957,306
(9)	Total Present and Prospective Assets		$	44,757,833

Solvency Test
(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)
2012	$3,415.2	$16,472.2	$7,086.4	$14,691.4	100 %	68 %	0 %
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

Schedule B

Development of Actuarial Value of Assets

(1)	Actuarial value of assets beginning of year		$ 20,796,494,009
(2)	Net position at market value at end of year		25,935,779,206
(3)	Net position at market value at beginning of year		20,717,000,324
(4)	Cash flow		
	a.	Contributions	1,474,810,846
	b.	Benefit payments	2,260,614,434
	c.	Administrative expense	12,601,841
	d.	Net: (4)a - (4)b - (4)c	(798,405,429)
(5)	Investment income		
	a.	Market total: (2) - (3) - (4)d	6,017,184,311
	b.	Assumed rate	7.5 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	1,523,834,821
	d.	Amount for phased-in recognition: (5)a - (5)c	4,493,349,490
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	898,669,898
	b.	First prior year	(81,156,976)
	c.	Second prior year	(77,474,783)
	d.	Third prior year	115,121,921
	e.	Fourth prior year	247,314,723
	f.	Total recognized investment gain	1,102,474,783
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		$ 22,624,398,184
(8)	Difference between market & actuarial values: (2) - (7)		$ 3,311,381,022
(9)	Net investment rate of return on actuarial value		12.9 %

Schedule C

Summary of Receipts & Disbursements*
(Market Value)

	For the Year Ending	
Receipts for the Year	**June 30, 2021**	**June 30, 2020**
Contributions		
Members	$ 327,833,177	$ 324,664,055
Employers	1,146,977,669	1,134,281,095
Total	1,474,810,846	1,458,945,150
Net investment income	6,017,184,311	1,094,023,378
Total	7,491,995,157	2,552,968,528
Disbursements for the Year		
Benefit payments	2,235,240,616	2,167,239,241
Refunds to members	25,373,818	28,472,217
Miscellaneous, including expenses	12,601,841	12,166,651
Total	2,273,216,275	2,207,878,109
Excess of Receipts over Disbursements	5,218,778,882	345,090,419
Reconciliation of Net Position		
Net position as of the beginning of the year	20,717,000,324	20,371,909,905
Excess of receipts over disbursements	5,218,778,882	345,090,419
Net position as of the end of the year	$ 25,935,779,206	$ 20,717,000,324
Net investment rate of return on market value	29.6 %	5.5 %

**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

			Withdrawal			Retirement	
			Service			Before 27 Years of Service	After 27 Years of Service**
Age	Death*	Disability	0 - 4	5 - 9	10+		
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		17.00%
50	0.115	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	0.304	0.50	15.00	0.00	0.00	13.50	33.00
62	0.366	0.50	15.00	0.00	0.00	15.00	30.00
65	0.478	0.50	20.00	0.00	0.00	20.00	30.00
70	0.723	0.50	20.00	0.00	0.00	25.00	30.00
75	1.141	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

			Withdrawal			Retirement	
			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 bu 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 98%.

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.

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. 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/her behalf.

4. 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.

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, 2021. 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 Members Before July 1, 2008

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 Members on and after July 1, 2008
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.

Disability Retirement Allowance
Condition for Allowance — Totally and permanently incapable of being employed as a teacher and under age 60 but after completing five years of service.

Amount of Allowance — The disability allowance is equal to the greater of the service retirement allowance or 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 contribute 7.625% of salary to the retirement trust. Non-university members contribute 9.105% of salary to the retirement trust. Member contributions are picked up by the employer.

Schedule G

Table 1
Age - Service Table
Distribution of Active Members as of June 30, 2021
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	1,532	1,856	4							3,392	90,641,018
25 to 29	632	4,433	1,933							6,998	299,260,435
30 to 34	418	1,885	4,250	1,499	2					8,054	404,571,295
35 to 39	370	1,328	2,108	4,212	1,596	6				9,620	546,010,412
40 to 44	402	1,176	1,363	2,008	4,383	1,308	4			10,644	653,419,418
45 to 49	258	859	988	1,336	1,995	3,895	1,012	3		10,346	680,678,821
50 to 54	459	704	642	1,005	1,360	2,001	2,425	374	4	8,974	582,342,175
55 to 59	605	717	422	535	843	1,017	802	291	23	5,255	301,740,472
60 to 64	452	766	281	256	421	433	356	113	63	3,141	147,378,070
65 to 69	357	568	221	103	137	186	121	49	32	1,774	57,690,361
70 & Over	252	410	174	59	52	37	34	15	25	1,058	20,667,746
Total Count	5,737	14,702	12,386	11,013	10,789	8,883	4,754	845	147	69,256	3,784,400,223

Average Age: 43.4

Average Service: 11.7

Table 2
Schedule of Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2012	75,951	$ 3,479,567,004	$ 45,813	1.33
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

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

Attained Age	Number of Members	Total Annual Payments	Average Annual Benefits
49 & Under	803	$ 9,465,245	$ 11,787
50 - 54	1,602	67,058,670	41,859
55 - 59	4,217	189,483,762	44,933
60 - 64	7,032	301,805,954	42,919
65 - 69	10,932	453,797,433	41,511
70 - 74	14,216	568,443,423	39,986
75 - 79	9,002	345,260,894	38,354
80 - 84	5,226	190,248,293	36,404
85 - 89	2,804	93,145,292	33,219
90 - 94	1,246	36,594,008	29,369
95 & Over	385	10,020,384	26,027
Total	57,465	$ 2,265,323,358	$ 39,421

Average Current Age: **70.7**

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

	Add to Rolls		Removed from Rolls		Rolls at End of Year			
Year Ended June 30	Number	Annual Allowances *(In millions)*	Number	Annual Allowances *(In millions)*	Number	Annual Allowances *(In millions)*	Increase In Annual Allowances	Average Annual Allowances
2012	2,513	$ 111.2	838	$ 19.4	46,094	$ 1,525.2	6.4%	$ 33,089
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	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	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

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 22.9-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	Funding Ratio	Actuarially Determined Contribution using Direct Rate Smoothing	Salary Percentage Contribution in Dollars	Additional for Unfunded Accrued Liability
2024	$ 3,741	$ 186	$ 3,927	$ 16,957	57.2%	$ 1,237	$ 590	$ 647
2025	3,820	186	4,006	16,130	60.1	1,263	588	675
2026	3,899	187	4,086	15,390	62.8	1,307	588	719
2027	3,976	189	4,165	14,546	65.6	1,343	588	755
2028	4,051	191	4,242	13,580	68.6	1,370	589	781
2029	4,130	195	4,325	13,462	69.5	1,400	596	804
2030	4,213	198	4,411	13,298	70.4	1,431	604	827
2031	4,298	202	4,500	13,093	71.5	1,463	612	851
2032	4,388	205	4,593	12,842	72.5	1,496	621	875
2033	4,480	209	4,689	12,542	73.6	1,530	630	900
2034	4,574	213	4,787	12,187	74.8	1,565	639	926
2035	4,675	217	4,892	11,773	76.0	1,601	648	953
2036	4,781	221	5,002	11,295	77.3	1,640	658	982
2037	4,893	226	5,119	10,749	78.8	1,679	669	1,010
2038	5,011	230	5,241	10,126	80.3	1,769	681	1,088
2039	5,134	236	5,370	9,421	81.9	1,769	694	1,075
2040	5,265	242	5,507	8,626	83.6	1,873	708	1,165
2041	5,403	248	5,651	7,684	85.6	1,948	723	1,225
2042	5,548	254	5,802	6,677	87.6	1,997	737	1,260
2043	5,698	261	5,959	5,493	90.0	2,034	753	1,281
2044	5,855	268	6,123	4,151	92.5	1,805	767	1,038
2045	6,019	276	6,295	2,666	95.3	1,941	788	1,153
2046	6,191	284	6,475	1,042	98.2	2,072	810	1,262
2047	6,369	292	6,661		100.0		832	
2048	6,554	301	6,855		100.0		856	
2049	6,747	310	7,057		100.0		881	
2050	6,957	319	7,276		100.0		906	
2051	7,169	327	7,496		100.0		933	
2052	7,388	335	7,723		100.0		962	
2053	7,612	343	7,955		100.0		991	

Annual Valuation of the Health and Life Insurance Trusts

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 12, 2021

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, 2021. 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 4.64% as of percentage of active member payroll for the health trust payable for the fiscal year ending June 30, 2022 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 1.865% and 0.89% 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.

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. We will continue to monitor the situation and advise the board in the future of any adjustments that we believe would be appropriate.

The Life Insurance Plan valuation indicates a total actuarially determined contribution of 0.06% of active member payroll payable for the fiscal year ending June 30, 2024, is required 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.

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 19-year period for the retiree medical plan and a 23-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.

Board of Trustees
November 12, 2021
Page 2

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, 2021	June 30, 2020
Number of active members*	65,604	73,151
Annual salaries	$ 3,784,400	$ 3,723,482
Number of deferred vested members	7,658	7,270
Number of annuitants in medical plans	41,175	41,154
Number of spouses and beneficiaries in medical plans**	6,728	6,883
Total	47,903	48,037
Assets:		
Market value	$ 2,300,504	$ 1,616,675
Actuarial value	$ 2,072,648	$ 1,700,968
Unfunded actuarial accrued liability	$ 1,384,029	$ 1,056,685
Funded ratio based on actuarial value of assets	60.0%	61.7%
Amortization period (years)	19	20
Discount rate	7.1%	8%

**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. Beginning with the June 30, 2021 valuation date, the active member count in the exhibit above reflects the adjustment. prior to June 30, 2021, the exhibit reflected the initial member counts.*

*** Spouses of post-65 retirees, as well as 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. The non-Medicare dependent subsidy amount dropped to two thirds in calendar year 2019 and one third in 2020 and is not allowed starting in 2021.*

Health Insurance Trust Contribution Rates for University Members

Valuation Date	**June 30, 2021**		**June 30, 2020**	
Contribution For Fiscal Year Ending	June 30, 2022		June 30, 2021	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Normal	1.92%	1.92%	1.48%	1.48%
Accrued liability	2.72	2.72	2.06	2.06
Total	4.64%	4.64%	3.54%	3.54%
Member	2.775%	2.775%	2.775%	2.775%
Employer (ARC)	2.775	1.775	2.775	1.775
State (ARC)	2.330	2.330	2.320	2.320
Statutorily Required Prefunding*	(3.240)	(2.240)	(4.330)	(3.330)
Total	4.640%	4.640%	3.540%	3.540%

**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, 2021**		**June 30, 2020**	
Contribution For Fiscal Year Ending	June 30, 2022		June 30, 2021	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Normal	1.92%	1.92%	1.48%	1.48%
Accrued liability	2.72	2.72	2.06	2.06
Total	4.64%	4.64%	3.54%	3.54%
Member	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	3.000	3.000	3.000	3.000
State (ARC)	2.330	2.330	2.320	2.320
Statutorily Required Prefunding*	(4.440)	(4.440)	(5.530)	(5.530)
Total	4.640%	4.640%	3.540%	3.540%

**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, 2021**		**June 30, 2020**	
Contribution For Fiscal Year Ending	June 30, 2022		June 30, 2021	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Normal	1.92%	1.92%	1.48%	1.48%
Accrued liability	2.72	2.72	2.06	2.06
Total	4.64%	4.64%	3.54%	3.54%
Member	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	3.750	2.750	3.750	2.750
State (ARC)	2.330	2.330	2.320	2.320
Statutorily Required Prefunding*	(5.190)	(4.190)	(6.280)	(5.280)
Total	4.640%	4.640%	3.540%	3.540%

**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).*

Life Insurance Trust

(Dollars in thousands)

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

Life Insurance Contribution Rates

Contribution for fiscal year ending	**June 30, 2024**	**June 30, 2023**
Normal	0.02%	0.03%
Accrued liability	0.04	0.05
Total	0.06%	0.08%

**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 their 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. Beginning with the June 30, 2021 valuation date, the counts in the exhibit above reflect all adjustments. Prior to June 30, 2021, the exhibit reflected the initial member counts.*

*** 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 4.64% of active member payroll would be sufficient to support the current benefits of the retiree medical plan and state contributions of 0.06% 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, 2021, 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 trust and 7.1% for Life Insurance Trust.
4. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation. Since the previous valuation, the initial per capita costs of health care and the rates of health care inflation used to project the per capita health care costs have been revised to reflect recent experience. Additionally, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2020. The changes adopted by the board on September 20, 2021, include various demographic and economic assumptions summarized below:
    - Price inflation changed assumed rate from 3% to 2.5%
    - Wage inflation changed assumed rate from 3.5% to 2.75%
    - Assumed investment rate of return changed from 8% for the Health Insurance Trust and 7.5% for the Life Insurance Trust to 7.1% for both
    - Assumed salary scale adjusted to reflect a decrease of 0.25% in merit and promotion for all ages
    - Assumed rates of mortality have been revised to the Pub-2010 (Teachers Benefit-Weighted) Mortality Table projected generationally with the MP-2020 improvement scale with various set-forwards, set-backs, and adjustments

- Assumed rates of withdrawal, disability, retirement, and mortality have been adjusted to more closely reflect experience
- Assumed rates of member and spousal participation have been adjusted to more closely reflect experience

5. The impact of the COVID-19 pandemic was considered in this valuation, however, no changes were incorporated at this time due to the level of uncertainty regarding the impact on both plan costs and contribution levels going forward. Given the uncertainty regarding COVID-19 (e.g., the impact of routine care being deferred, direct COVID-19 treatment and prevention costs, changes in contribution and budget projections), continued monitoring of the impact on the plan's liability will be required. TRS and UnitedHealthcare have a gain share in place should actual claims costs drop below a medical loss ratio of 90%. Due to deferred care in 2020 because of COVID-19, TRS will receive approximately $16 million to $18 million in subsidy revenue returned from UnitedHealthcare in early 2022.
6. Provisions of the system, as summarized in Schedule E, were taken into account in the current valuation. As in the previous valuation, the phase out of the KEHP dependent subsidies offered to retirees has been reflected. In calendar year 2020, one-third of the non-single premium was contributed. Beginning in 2021, no subsidy is allowed by law.
7. The funded ratio shown in the Summary of Principal Results, is the ratio of actuarial value of assets to the actuarial accrued liability. The funded status would be different based on the 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, 2021, upon which the valuation was based. Detailed tabulations of the data are given in Schedule F.

Active Members as of June 30, 2021

(Dollars in thousands)

Group	Number*	Annual Salaries
University Full Time hired before July 1, 2008	1,197	$ 91,384
University Full Time hired after July 1, 2008	1,850	100,077
Non-University Full Time hired before July 1, 2008	28,937	2,038,325
Non-University Full Time hired after July 1, 2008	28,866	1,497,694
Non-University Part Time hired before July 1, 2008	914	8,393
Non-University Part Time hired after July 1, 2008	7,492	48,527
Total	69,256	$ 3,784,400

**The active member counts above reflect the initial active membership. Approximately 3,652 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, 2021

	Under Age 65	Age 65 and Over	Total
Number	9,519	31,656	41,175
Average Age	59.6	74.8	71.3

Spouses Receiving Health Benefits as of June 30, 2021

	Under Age 65	Age 65 and Over	Total
Number	1,727	5,001	6,728
Average Age	60.2	75.1	71.2

3. The retiree medical plan valuation includes 7,658 deferred vested members eligible for health care at age 60 and the life insurance plan valuation includes 10,388 deferred vested members eligible for retiree life insurance at age 60. There were initially 10,538 deferred vested members eligible for retiree life insurance at age 60. However, approximately 150 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, 2021, the market value of Health Insurance Trust assets held by the retiree medical plan amounted to $2.3 billion and the market value of Life Insurance Trust assets held by the life insurance plan amounted to $107 million. The estimated market investment return for the plan year was 31.1% for the Health Insurance Trust and 28.2% for the Life Insurance Trust.
2. The five-year market related value of health trust assets used for valuation purposes as of June 30, 2021 was $2.1 billion and the five-year market related value of Life Insurance Trust assets used for valuation purposes as of June 30, 2021 was $95.5 million. Schedule B shows the development of the actuarial value of assets as of June 30, 2021.
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 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 $1.77 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 $54.7 million. The liability on account of benefits payable to retirees and covered spouses amounts to $1.64 billion. The total actuarial accrued liability of the retiree medical plan amounts to $3.46 billion. Against these liabilities, the retiree medical plan has present assets for valuation purposes of $2.07 billion. When this amount is deducted from the actuarial accrued liability of $3.46 billion, there remains $1.38 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 $72.7 million, or 1.92% of payroll.
4. The valuation shows that the life insurance plan has an actuarial accrued liability of $15.99 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 $4.16 million. The liability on account of benefits payable to retirees amounts to $96.5 million. The total actuarial accrued liability of the life insurance plan amounts to $116.7 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 $95.5 million. When this amount is deducted from the actuarial accrued liability of $116.7 million, there remains $21.2 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 $880,340, or 0.02% 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, 2021, is shown below (dollars in thousands).

	Experience Gain/(Loss)* of the:	Health Insurance Trust	Life Insurance Trust
(1)	UAAL as of June 30, 2020	$ 1,056,685	$ 29,965
(2)	Normal cost from last valuation	54,948	1,199
(3)	Expected employer contributions	131,774	2,290
(4)	Interest accrual: [(1) + (2)] x .080 - (3) x .080/2 for MIF [(1) + (2)] x .075 - (3) x .075/2 for LIF	83,660	2,251
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	$ 1,063,519	$ 31,125
(6)	Change due to experience study	369,834	(5,022)
(7)	Change due to claims experience and trend	184,017	—
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 1,617,370	$ 26,103
(9)	Actual UAAL as of June 30, 2021	1,384,029	21,173
(10)	Total gain/(loss): (9) - (8)	(233,341)	(4,930)
	(a) Contribution and investment gain/(loss)	(234,432)	(310)
	(b) Experience gain/(loss) (10) - (10a)	1,091	(4,620)
(11)	Accrued liabilities as of June 30, 2020	$ 2,757,653	$ 122,194
(12)	Experience gain/(loss) as percent of actuarial accrued liabilities at start of year (10b) / (11)	0.0%	(3.8)%

**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. Sections 161.420 and 161.550 of the Kentucky Revised Statutes 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 before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
2.775%	1.775%	3.000%	3.000%	3.750%	2.750%

**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, 2021, 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 19-year period as a level percentage of payroll, the valuation indicates employer and state contributions of 1.865% of payroll for university employees and 0.89% 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, 2023. Based upon the amortization of the unfunded actuarial liability over a 23-year period as a level percentage of payroll, CMC's valuation indicates a contribution of 0.06% for the fiscal year ending June 30, 2024, is required to support sufficiently the benefits of the life insurance plan

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Required Contribution Rates
For Fiscal Year Ending June 30, 2022
Health Insurance Trust

Normal	1.92 %
Accrued liability	2.72 %
Total	4.64 %

	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 before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Members	2.775 %	2.775 %	3.750 %	3.750 %	3.750 %	3.750 %
Employer	2.775	1.775	3.000	3.000	3.750	2.750
State	2.330	2.330	2.330	2.330	2.330	2.330
Statutorily Required Prefunding*	(3.240)	(2.240)	(4.440)	(4.440)	(5.190)	(4.190)
Total	4.640 %	4.640 %	4.640 %	4.640 %	4.640 %	4.640 %

**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, 2024

Normal	0.02 %
Accrued liability	0.04
Total	0.06 %
Member	0.00 %
State	0.06
Total	0.06 %

4. The valuation indicates that a total normal contribution of 1.92% of payroll is required to meet the cost of benefits currently accruing under the retiree medical plan and 0.02% 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 2.72% of payroll for the retiree medical plan and 0.04% of payroll for the life insurance plan.
5. The unfunded actuarial accrued liability amounts to $1.38 billion for the retiree medical plan and $21.2 million for the life insurance plan as of the valuation date. An accrued liability contribution rate of 2.72% of payroll for the retiree medical plan and 0.04% of payroll for the life insurance plan is sufficient to amortize the unfunded actuarial accrued liabilities over a 19-year period for the retiree medical plan and a 23-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 university employees, a member contribution of 2.775% of payroll together with employer and state contributions of 1.865% of payroll are required to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability over a period of 19 years. For the remaining membership, a member contribution of 3.75% of payroll together with employer and state contributions of 0.89% 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 19 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, 2021

Group	Number*
Retirees currently receiving health benefits	41,175
Spouses of retirees currently receiving health benefits	6,728
Terminated employees entitled to benefits but not yet receiving benefits	7,658
Active plan members	65,604
Total	121,165

Number of Active and Retired Members in Life Insurance Plan as of June 30, 2021

Group	Number*
Retirees	51,731
Terminated employees	10,388
Active plan members	65,604
Total	127,723

**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 their 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. Beginning with the June 30, 2021 valuation date, the counts in the exhibit above reflect all adjustments. Prior to June 30, 2021, the exhibit reflected the initial member counts.*

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]
2012	$ 338,746	$ 3,594,540	$ 3,255,794	9.4 %	$ 3,479,567	93.6 %
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

**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]
2012	$ 92,241	$ 91,398	$(843)	100.9 %	$ 3,479,567	(0.02) %
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

**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, 2021. 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, 2021	Entry age	Level percent of pay, closed	19 years retiree medical plan 23 years life insurance plan	Five-year smoothed market	7.1%-retiree medical plan	7.1%-life insurance plan

	Pre-Medicare**	Medicare
Medical Trend Assumption	7%	5.125%
Ultimate Trend Rate	4.5%	4.5%
Year of Ultimate Trend Rate	2031	2024

**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 (A)	Actual Employer Contribution (B)	Percentage of Statutory Contributed (B) / (A)
2014	$ 157,688,414	$ 157,688,414	100%
2015	145,263,926	145,263,926	100
2016	178,638,370	178,638,370	100
2017	180,375,986	180,375,986	100
2018	187,102,413	187,102,413	100
2019	183,146,155	183,146,155	100
2020	184,625,474	184,625,474	100
2021	184,887,065	184,887,065	100

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)
2012	$ 1,732,831	$ 1,684,711	97.2%
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

Schedule A

Results of the Valuation
June 30, 2021
(Dollars in thousands)

	Medical Insurance Trust	Life Insurance Trust
Payroll	$ 3,784,400	$ 3,784,400
Actuarial Accrued Liability		
Present value of prospective benefits payable in respect of:		
(a) Present active members	$ 1,766,336	$ 15,986
(b) Present terminated vested members	54,653	4,162
(c) Present retired members and covered spouses	1,635,688	96,508
(d) Total actuarial accrued liability	$ 3,456,677	$ 116,656
Present Assets for Valuation Purposes	$ 2,072,648	$ 95,483
Unfunded Actuarial Accrued Liability	$ 1,384,029	$ 21,173

Contributions	Fiscal Year Ended June 30, 2022	Fiscal Year Ended June 30, 2024
Normal	1.92 %	0.02 %
Accrued liability	2.72	0.04
Total	4.64 %	0.06 %

Health Insurance Trust
Solvency Test
(Dollars in millions)

Valuation Date June 30	Accrued Liability for (1) Active Member Contributions	(2) Deferred Vested, Retirants and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets (1)	(2)	(3)
2012	n/a	$ 2,046.7	$ 1,547.9	$ 338.7	n/a	17%	0%
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

Life Insurance Trust
Solvency Test
(Dollars in millions)

Valuation Date June 30	Accrued Liability for (1) Active Member Contributions	(2) Deferred Vested, Retirants and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets (1)	(2)	(3)
2012	n/a	$75.2	$16.2	$92.2	n/a	100%	105%
2013	n/a	78.1	16.2	94.9	n/a	100	104
2014	n/a	81.0	16.3	96.1	n/a	100	93
2015	n/a	82.7	16.0	97.2	n/a	100	91
2016	n/a	89.0	17.1	97.3	n/a	100	49
2017	n/a	92.1	17.0	95.7	n/a	100	21
2018	n/a	94.2	18.3	93.8	n/a	99	0
2019	n/a	99.1	18.4	92.5	n/a	93	0
2020	n/a	103.5	18.7	92.2	n/a	89	0
2021	n/a	100.7	16.0	95.5	n/a	95	0

Schedule B

Development of the Actuarial Value of Assets
Health Insurance Trust
June 30, 2021

(1)	Actuarial value of assets beginning of year		$1,700,968,245
(2)	Market value of assets end of year		2,300,504,416
(3)	Market value of assets beginning of year		1,616,675,260
(4)	Cash flow		
	a.	Contributions	433,785,743
	b.	Benefit payments	251,429,328
	c.	Administrative expense	1,728,008
	d.	Net: (4)a - (4)b - (4)c	180,628,407
(5)	Investment Income		
	a.	Market total: (2) - (3) - (4)d	503,200,749
	b.	Assumed rate	8 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	136,559,157
	d.	Amount for phased-in recognition: (5)a - (5)c	366,641,592
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	73,328,318
	b.	First prior year	(17,490,773)
	c.	Second prior year	(5,362,227)
	d.	Third prior year	(2,260,479)
	e.	Fourth prior year	6,277,741
	f.	Total recognized investment gain	54,492,580
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		2,072,648,389
(8)	Difference between market & actuarial values: (2) - (7)		$ 227,856,027
(9)	Rate of return on actuarial value		10.67 %

Development of the Actuarial Value of Assets
Life Insurance Trust
June 30, 2021

(1)	Actuarial value of assets beginning of year		$ 92,228,536
(2)	Market value of assets end of year		107,426,916
(3)	Market value of assets beginning of year		87,367,891
(4)	Cash flow		
	a.	Contributions	2,138,375
	b.	Benefit payments	6,120,000
	c.	Administrative expense	34,498
	d.	Net: (4)a - (4)b - (4)c	(4,016,123)
(5)	Investment Income		
	a.	Market total: (2) - (3) - (4)d	24,075,148
	b.	Assumed rate	7.5 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	6,401,987
	d.	Amount for phased-in recognition: (5)a - (5)c	17,673,161
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	3,534,632
	b.	First prior year	(226,459)
	c.	Second prior year	(227,080)
	d.	Third prior year	(1,061,385)
	e.	Fourth prior year	(1,150,796)
	f.	Total recognized investment gain	868,912
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		95,483,312
(8)	Difference between market & actuarial values: (2) - (7)		$ 11,943,604
(9)	Rate of return on actuarial value		8.06 %

Schedule C

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

	For the Year Ended June 30, 2021	For the Year Ended June 30, 2020
Receipts for the Year		
Contributions		
Members statutory	$ 128,117,484	$ 133,588,771
Payment by retired members	59,507,609	59,220,473
Total members	187,625,093	192,809,244
State statutory contributions	23,155,586	23,157,120
Employer contributions	106,670,323	107,434,414
State statutory - transition fund/KEHP	55,061,156	54,033,940
Total employer	184,887,065	184,625,474
Total receipts	372,512,158	377,434,718
Recovery income	120,781,194	100,375,749
Net investment income	503,200,749	32,474,949
Total	996,494,101	510,285,416
Disbursements for the Year		
Administrative expense	1,728,008	2,047,238
Medical insurance expense	310,936,937	305,582,974
Total disbursements	312,664,945	307,630,212
Excess of Receipts Over Disbursements	683,829,156	202,655,204
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	1,616,675,260	1,414,020,056
Excess of receipts over disbursements	683,829,156	202,655,204
Asset balance as of the end of the year	$2,300,504,416	$ 1,616,675,260
Investment rate of return on market value	31.10%	2.30%

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

	For the Year Ended	
	June 30, 2021	June 30, 2020
Receipts for the Year		
Contributions		
Members	$	$
State	1,852,447	1,543,413
Employer	285,928	252,976
Total	2,138,375	1,796,389
Net investment income	24,075,148	5,166,203
Total	26,213,523	6,962,592
Disbursements for the Year		
Benefit payments	6,120,000	5,317,000
Miscellaneous, including expenses	34,498	35,980
Total	6,154,498	5,352,980
Excess of Receipts Over Disbursements	20,059,025	1,609,612
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	87,367,891	85,758,279
Excess of receipts over disbursements	20,059,025	1,609,612
Asset balance as of the end of the year	$107,426,916	$ 87,367,891
Investment rate of return on market value	28.17 %	6.32 %

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, 2021

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.

Fiscal Year Ended	Annual Trend Rate Medicare Part B	Under Age 65	Age 65 and Over
2022	6.97%	7.00%	5.125%
2023	6.73	6.75	5.00
2024	5.22	6.50	4.75
2025	4.96	6.25	4.50
2026	5.68	6.00	4.50
2027	5.82	5.75	4.50
2028	5.91	5.50	4.50
2029	5.65	5.25	4.50
2030	5.27	5.00	4.50
2031	5.06	4.75	4.50
2032	4.87	4.50	4.50
2033	4.62	4.50	4.50
2034 and beyond	4.50	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, 2022

Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
Single	$ 750.30	$ 772.16	$ 721.54	$ 642.02
Parent Plus	1,036.40	1,101.08	994.72	914.78
Couple	1,453.30	1,691.64	1,537.72	1,407.32
Family	1,623.94	1,883.60	1,713.58	1,566.78
Family Cross-Reference	866.72	929.70	846.38	772.32

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, 2022

Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
Single	$ 53.46	$ 89.14	$ 28.34	$ 25.50
Parent Plus	137.06	254.10	67.52	60.78
Couple	339.34	571.76	281.42	253.28
Family	398.92	716.64	337.68	303.92
Family Cross-Reference*	86.90	170.48	31.50	28.34
Spouse - Single	758.30	780.16	729.54	650.02
Spouse - Parent Plus	1,044.40	1,109.08	1,002.72	922.78

** 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, 2022

Plan	Years of Service	Single	Parent Plus	Couple	Family	Family C-R
Living Well CDHP	5-9.99	$ 559.76	$ 762.26	$ 976.88	$ 1,087.94	$ 642.74
	10-14.99	422.67	625.17	839.79	950.85	505.65
	15-19.99	285.59	488.09	702.71	813.77	368.57
	20 or More	148.50	351.00	565.62	676.68	231.48
Living Well PPO	5-9.99	549.39	709.90	982.80	1,029.88	622.14
	10-14.99	415.76	572.81	845.71	892.79	485.05
	15-19.99	282.13	435.73	708.63	755.71	347.97
	20 or More	148.50	298.64	571.54	618.62	210.88
Living Well Basic	5-9.99	5,570.30	790.12	1,119.22	1,238.82	677.80
	10-14.99	420.85	653.03	982.13	1,101.73	540.71
	15-19.99	284.68	515.95	845.05	964.65	403.63
	20 or More	148.50	378.86	707.96	827.56	266.54
Living Well Limited	5-9.99	499.52	716.92	1,016.96	1,125.78	606.90
	10-14.99	382.51	579.83	879.87	988.69	469.81
	15-19.99	265.51	442.75	742.79	851.61	332.73
	20 or More	148.50	305.66	605.70	714.52	195.64

Time-Specific Adjustments for Retirees Employed On/After July 1, 2002, as of Jan. 1, 2021

Plan	Years of Service	Single	Parent Plus	Couple	Family	Family Cross-Reference
Living Well CDHP	5-9.99	$ 642.01	$ 844.51	$ 1,059.13	$ 1,170.19	$ 724.99
	10-14.99	559.76	762.26	976.88	1,087.94	642.74
	15-19.99	450.09	652.59	867.21	978.27	533.07
	20-24.99	340.42	542.92	757.54	868.60	423.40
	25-25.99	203.33	405.83	620.45	731.51	286.31
	26-26.99	175.92	378.42	593.04	704.10	258.90
	27 or More	148.50	351.00	565.62	676.68	231.48
Living Well PPO	5-9.99	629.57	792.15	1,065.05	112.13	704.39
	10-14.99	549.39	709.90	982.80	1,029.88	622.14
	15-19.99	442.49	600.23	873.13	920.21	512.47
	20-24.99	335.59	490.56	763.46	810.54	402.80
	25-25.99	201.95	353.47	626.37	673.45	265.71
	26-26.99	175.23	326.06	598.96	646.04	238.30
	27 or More	148.50	298.64	571.54	618.62	210.88
Living Well Basic	5-9.99	638.73	872.37	1,201.47	1,321.07	760.05
	10-14.99	557.03	790.12	1,119.22	1,238.82	677.80
	15-19.99	448.09	680.45	1,009.55	1,129.15	568.13
	20-24.99	333.23	559.21	880.29	996.97	449.63
	25-25.99	201.28	426.37	747.45	864.13	316.79
	26-26.99	174.89	399.81	720.89	837.57	290.23
	27 or More	148.50	373.24	694.32	811.00	263.66
Living Well Limited	5-9.99	556.18	780.05	1,072.77	1,178.93	672.71
	10-14.99	499.52	716.92	1,016.96	1,125.78	606.90
	15-19.99	405.92	607.25	907.29	1,016.11	497.23
	20-24.99	312.31	497.58	797.62	906.44	387.56
	25-25.99	195.30	360.49	660.53	769.35	250.47
	26-26.99	171.91	333.08	633.12	741.94	223.06
	27 or More	148.50	305.66	605.72	714.52	195.64

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	LivingWell Limited HDP
54%	42%	3%	1%

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 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.

TRS and the UnitedHealthcare have a gain share in place should actual claims costs drop below a medical loss ratio of 90%. Due to deferred care in 2020 because of COVID-19, TRS will receive approximately $16 million to $18 million in subsidy revenue returned from UnitedHealthcare in early 2022.

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	0.0309%	0.01%	20.00%				
25	0.0200	0.01	11.00	3.25%			
30	0.0315	0.01	10.00	3.60	2.80%		
35	0.0419	0.02	11.00	3.60	1.55		
40	0.0522	0.07	12.50	4.00	1.25		
45	0.0722	0.18	11.50	4.00	1.10		17.0%
50	0.1153	0.28	14.25	4.50	1.10		25.0
55	0.1871	0.40	15.00	6.00	1.25	5.25%	40.0
60	0.3041	0.50	15.00	0.00	0.00	13.5	33.0
62	0.3660	0.50	15.00	0.00	0.00	15.0	30.0
65	0.4775	0.50	20.00	0.00	0.00	20.0	30.0
70	0.7232	0.50	20.00	0.00	0.00	25.0	30.0
75	1.1408	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	0.0135%	0.01%	13.00%				
25	0.0099	0.01	9.00	4.50%			
30	0.0134	0.02	11.00	4.25	1.00%		
35	0.0215	0.06	11.00	3.50	1.60		
40	0.0299	0.10	12.50	4.00	1.20		
45	0.0405	0.24	13.50	4.00	1.00		17.0%
50	0.0584	0.38	15.00	4.50	1.25		20.0
55	0.0908	0.50	15.00	5.00	1.60	5.0%	50.0
60	0.1407	0.60	17.50	0.00	0.00	15.0	40.0
62	0.1656	0.62	17.50	0.00	0.00	15.0	40.0
65	0.2123	0.65	25.00	0.00	0.00	25.0	40.0
70	0.3435	0.65	25.00	0.00	0.00	30.0	35.0
75	0.6389	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 98%.

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 as Interpreted for Valuation Purposes

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.

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 January 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	148.50	148.50	148.50

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

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 2022, the TRS Board of Trustees approved a single contributions amount of up to $696.84. TRS will contribute this amount towards insurance costs, less the Shared Responsibility cost of $148.50. 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, 2022

Tier Elected	Under Age 65 (KEHP) LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	Ages 65 and Older (MEHP)
Single	$750.30	$772.16	$721.54	$642.02	$ 211.00
Parent Plus	1,036.40	1,101.08	994.72	914.78	n/a
Couple	1,453.30	1,691.64	1,537.72	1,407.32	n/a
Family	1,623.94	1,883.60	1,713.58	1,566.78	n/a
Family Cross-Reference	866.72	929.70	846.38	772.32	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 2021, 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, 2022

Tier Elected by Surviving Spouse	Under Age 65 (KEHP) LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	Age 65 and Older (MEHP)
Single	$ 758.30	$ 780.16	$ 729.54	$ 650.02	$ 211.00
Parent Plus	1,044.40	1,109.08	1,002.72	922.78	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.*

For 2022, the TRS Board of Trustees approved a single contributions amount of up to $696.84. TRS will contribute this amount towards insurance costs, less the Shared Responsibility cost of $148.50. 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 System Contribution Rate Basis
Effective Jan. 1, 2022

	Under Age 65 (KEHP)				
Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	Ages 65 and Older (MEHP)
Single	$ 750.30	$ 772.16	$ 721.54	$ 642.02	$ 211.00
Parent Plus	1,036.40	1,101.08	994.72	914.78	n/a
Couple	1,453.30	1,691.64	1,537.72	1,407.32	n/a
Family	1,623.94	1,883.60	1,713.58	1,566.78	n/a
Family Cross-Reference	866.72	929.70	846.38	772.32	n/a

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 Before July 1, 2008	Hired on or After July 1, 2008	Hired Before July 1, 2008	Hired on or After July 1, 2008
2.775 %	2.775 %	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. 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. 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, 2021
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	1,532	1,856	4							3,392	$ 90,641,018
25 to 29	632	4,433	1,933							6,998	299,260,435
30 to 34	418	1,885	4,250	1,499	2					8,054	404,571,295
35 to 39	370	1,328	2,108	4,212	1,596	6				9,620	546,010,412
40 to 44	402	1,176	1,363	2,008	4,383	1,308	4			10,644	653,419,418
45 to 49	258	859	988	1,336	1,995	3,895	1,012	3		10,346	680,678,821
50 to 54	459	704	642	1,005	1,360	2,001	2,425	374	4	8,974	582,342,175
55 to 59	605	717	422	535	843	1,017	802	291	23	5,255	301,740,472
60 to 64	452	766	281	256	421	433	356	113	63	3,141	147,378,070
65 to 69	357	568	221	103	137	186	121	49	32	1,774	57,690,361
70 & Over	252	410	174	59	52	37	34	15	25	1,058	20,667,746
Total Count	5,737	14,702	12,386	11,013	10,789	8,883	4,754	845	147	69,256	$3,784,400,223

**The active member counts above reflect the initial active membership. Approximately 3,652 of these active members were ultimately valued in their retired status.*

Average Age: 43.4 Average Service: 11.7

Table 2

Schedule of Total Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	Percentage Increase in Average Pay
2012	75,951	$3,479,567,004	$45,813	1.33%
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

Table 3

Eligible Deferred Vested Members
Male and Female Demographic Breakdown
as of June 30, 2021
Health Insurance Trust

Attained Age	Number of Males	Number of Females	Total Number
Under 30	0	0	0
30-34	30	59	89
35-39	217	761	978
40-44	374	1042	1,416
45-49	314	1,093	1,407
50-54	335	1249	1,584
55-59	263	901	1,164
60 & Over	238	782	1,020
Total	1,771	5,887	7,658

Life Insurance Trust

Attained Age	Number of Males	Number of Females	Total Number*
Under 30	25	76	101
30-34	188	602	790
35-39	348	1,195	1,543
40-44	473	1,371	1,844
45-49	390	1,369	1,759
50-54	387	1,460	1,847
55-59	304	1,025	1,329
60 & Over	287	888	1,175
Total	2,402	7,986	10,388

**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 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, 2021
Male and Female Demographic Breakdown

Attained Age	Number of Males	Number of Females	Total Number
Under 40	1	12	13
40-44	5	29	34
45-49	55	128	183
50-54	383	994	1,377
55-59	1107	2,440	3,547
60-64	1,837	4,255	6,092
65-69	2,887	6,935	9,822
70-74	3,922	8,213	12,135
75-79	2,556	4,582	7,138
80-84	1,428	2,702	4,130
85-89	774	1,438	2,212
90-94	246	702	948
95-99	47	189	236
100 and over	7	29	36
Total	15,255	32,648	47,903

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
2012	1,996	702	2,698	1,029	616	1,645	36,000	7,008	43,008
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

**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
2012	2,364	$11,820	880	$4,400	42,602	$213,010	3.61%	$5,000
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

** 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 52,960 retired or disabled members. However, 1,229 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, 2021, 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. The assumed decreases in inflation are not assumed to impact the assumed rates of health care inflation (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	$ 3,961,216	$ 3,456,677	$ 3,045,462
Actuarial value of assets	2,072,648	2,072,648	2,072,648
Unfunded liability	$ 1,888,568	$ 1,384,029	$ 972,814
Funded ratio	52.32 %	59.96 %	68.06 %
Contributions			
Normal cost	2.55 %	1.92 %	1.45 %
Accrued liability	3.45 %	2.72 %	2.06 %
Total	6.00 %	4.64 %	3.51 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.96)%	(2.96)%	(2.96)%
State	(2.33)%	(2.33)%	(2.33)%
Statutorily Required Prefunding*	(2.99)%	(4.35)%	(5.48)%
Discount rate	6.10 %	7.10 %	8.10 %
Payroll growth	2.75 %	2.75 %	2.75 %
Inflation rate	2.50 %	2.50 %	2.50 %

**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	$ 3,456,677	$ 3,588,768	$ 3,729,282
Actuarial value of assets	2,072,648	2,072,648	2,072,648
Unfunded liability	$ 1,384,029	$ 1,516,120	$ 1,656,634
Funded ratio	59.96 %	57.75 %	55.58 %
Contributions			
Normal cost	1.92 %	2.05 %	2.18 %
Accrued liability	2.72 %	2.99 %	3.27 %
Total	4.64 %	5.04 %	5.45 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.96)%	(2.96)%	(2.96)%
State	(2.33)%	(2.33)%	(2.33)%
Statutorily Required Prefunding*	(4.35)%	(3.95)%	(3.54)%
Discount rate	7.10 %	6.85 %	6.60 %
Payroll growth	2.75 %	2.50 %	2.25 %
Inflation rate	2.50 %	2.25 %	2.00 %

**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	$ 3,456,677	$ 3,456,677	$ 3,456,677
Actuarial value of assets	2,072,648	2,072,648	2,072,648
Unfunded liability	$ 1,384,029	$ 1,384,029	$ 1,384,029
Funded ratio	59.96 %	59.96 %	59.96 %
Contributions			
Normal cost	1.92 %	1.92 %	1.92 %
Accrued liability	2.72 %	3.04 %	3.33 %
Total	4.64 %	4.96 %	5.25 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.96)%	(2.96)%	(2.96)%
State	(2.33)%	(2.33)%	(2.33)%
Statutorily Required Prefunding*	(4.35)%	(4.03)%	(3.74)%
Discount rate	7.10 %	7.10 %	7.10 %
Payroll growth	2.75 %	1.25 %	0.00 %
Inflation rate	2.50 %	2.50 %	2.50 %

**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	$ 3,005,712	$ 3,456,677	$ 4,022,592
Actuarial value of assets	2,072,648	2,072,648	2,072,648
Unfunded liability	$ 933,064	$ 1,384,029	$ 1,949,944
Funded ratio	68.96 %	59.96 %	51.53 %
Contributions			
Normal cost	1.51 %	1.92 %	2.48 %
Accrued liability	1.84 %	2.72 %	3.84 %
Total	3.35 %	4.64 %	6.32 %
Member	(3.70)%	(3.70)%	(3.70)%
Employer	(2.96)%	(2.96)%	(2.96)%
State	(2.33)%	(2.33)%	(2.33)%
Statutorily Required Prefunding*	(5.64)%	(4.35)%	(2.67)%
Discount rate	7.10 %	7.10 %	7.10 %
Payroll growth	2.75 %	2.75 %	2.75 %
Inflation rate	2.50 %	2.50 %	2.50 %

**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, 2021, 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:

- 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	$ 133,390	$ 116,656	$ 103,136
Actuarial value of assets	95,483	95,483	95,483
Unfunded liability	$ 37,907	$ 21,173	$ 7,653
Funded ratio	71.58 %	81.85 %	92.58 %
Contributions			
Normal cost	0.03 %	0.02 %	0.02 %
Accrued liability	0.06 %	0.04 %	0.01 %
Total	0.09 %	0.06 %	0.03 %
Member	0%	0%	0%
Employer/state	0.09 %	0.06 %	0.03 %
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	$ 116,656	$ 120,655	$ 124,893
Actuarial value of assets	95,483	95,483	95,483
Unfunded liability	$ 21,173	$ 25,172	$ 29,410
Funded ratio	81.85 %	79.14 %	76.45 %
Contributions			
Normal cost	0.02 %	0.02 %	0.03 %
Accrued liability	0.04 %	0.04 %	0.05 %
Total	0.06 %	0.06 %	0.08 %
Member	0%	0%	0%
Employer/state	0.06 %	0.06 %	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 %

Wage Inflation Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Payroll Growth 1.25%	No Payroll Growth
Actuarial accrued liability	$ 116,656	$ 116,656	$ 116,656
Actuarial value of assets	95,483	95,483	95,483
Unfunded liability	$ 21,173	$ 21,173	$ 21,173
Funded ratio	81.85 %	81.85 %	81.85 %
Contributions			
Normal cost	0.02 %	0.02 %	0.02 %
Accrued liability	0.04 %	0.04 %	0.05 %
Total	0.06 %	0.06 %	0.07 %
Member	0 %	0 %	0 %
Employer/state	0.06 %	0.06 %	0.07 %
Discount rate	7.10 %	7.10 %	7.10 %
Payroll growth	2.75 %	1.25 %	0.00 %
Inflation rate	2.50 %	2.50 %	2.50 %

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 — 19-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	Funding Ratio	Total Employer Contribution
2021	2022	$ 3,592,938	$ 191,462	$ 3,784,400	$ 1,384,029	60.0 %	$ 198,993
2022	2023	3,666,832	187,411	3,854,243	1,146,623	68.4	207,458
2023	2024	3,741,188	185,734	3,926,922	884,279	76.8	216,201
2024	2025	3,820,104	185,749	4,005,853	591,963	85.2	226,110
2025	2026	3,898,507	186,882	4,085,389	254,567	93.9	236,627
2026	2027	3,975,581	188,813	4,164,394		100	83,919
2027	2028	4,050,739	191,451	4,242,190		100	86,327
2028	2029	4,129,944	194,633	4,324,577		100	88,825
2029	2030	4,212,725	197,906	4,410,631		100	91,461
2030	2031	4,298,254	201,505	4,499,759		100	94,299
2031	2032	4,387,777	205,190	4,592,967		100	97,310
2032	2033	4,479,972	208,861	4,688,833		100	100,439
2033	2034	4,574,251	213,126	4,787,377		100	103,712
2034	2035	4,675,295	217,000	4,892,295		100	107,187
2035	2036	4,781,412	220,949	5,002,361		100	110,878
2036	2037	4,893,087	225,617	5,118,704		100	116,700
2037	2038	5,010,582	230,473	5,241,055		100	123,572
2038	2039	5,134,077	235,905	5,369,982		100	132,210
2039	2040	5,264,820	241,651	5,506,471		100	145,618
2040	2041	5,402,983	247,798	5,650,781		100	142,004

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Total Employer Contribution
2041	2042	5,547,579	254,319	5,801,898		100	147,201
2042	2043	5,697,678	261,031	5,958,709		100	152,973
2043	2044	5,855,417	267,978	6,123,395		100	159,056
2044	2045	6,018,865	275,693	6,294,558		100	165,409
2045	2046	6,190,667	283,654	6,474,321		100	172,075
2046	2047	6,368,553	292,095	6,660,648		100	179,046
2047	2048	6,553,581	300,751	6,854,332		100	186,358
2048	2049	6,747,104	309,746	7,056,850		100	194,039
2049	2050	6,956,808	318,529	7,275,337		100	202,429
2050	2051	7,169,332	326,984	7,496,316		100	211,394

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 — 23-year period as of valuation date
- Future Contributions — Based on expected actuarially determined contributions

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	Funding Ratio	Actuarially Determined Contribution
2021	2024	$ 3,592,938	$ 191,462	$ 3,784,400	$ 21,173	81.9 %	$ 2,279
2022	2025	3,666,832	187,411	3,854,243	18,432	84.6	2,135
2023	2026	3,741,188	185,734	3,926,922	14,733	88.0	1,917
2024	2027	3,820,104	185,749	4,005,853	10,995	91.2	1,685
2025	2028	3,898,507	186,882	4,085,389	7,247	94.3	1,437
2026	2029	3,975,581	188,813	4,164,394	7,282	94.4	1,464
2027	2030	4,050,739	191,451	4,242,190	7,299	94.5	1,492
2028	2031	4,129,944	194,633	4,324,577	7,294	94.6	1,522
2029	2032	4,212,725	197,906	4,410,631	7,266	94.7	1,555
2030	2033	4,298,254	201,505	4,499,759	7,210	94.8	1,589

Fiscal Year	Contribution Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Actuarially Determined Contribution
2031	2034	4,387,777	205,190	4,592,967	7,124	95.0	1,623
2032	2035	4,479,972	208,861	4,688,833	7,005	95.1	1,658
2033	2036	4,574,251	213,126	4,787,377	6,846	95.3	1,694
2034	2037	4,675,295	217,000	4,892,295	6,645	95.4	1,732
2035	2038	4,781,412	220,949	5,002,361	6,394	95.6	1,772
2036	2039	4,893,087	225,617	5,118,704	6,089	95.9	1,814
2037	2040	5,010,582	230,473	5,241,055	5,720	96.1	1,860
2038	2041	5,134,077	235,905	5,369,982	5,281	96.5	1,910
2039	2042	5,264,820	241,651	5,506,471	4,760	96.8	1,967
2040	2043	5,402,983	247,798	5,650,781	4,143	97.2	2,033
2041	2044	5,547,579	254,319	5,801,898	3,415	97.7	2,115
2042	2045	5,697,678	261,031	5,958,709	2,551	98.3	2,227
2043	2046	5,855,417	267,978	6,123,395	1,508	99.0	2,430
2044	2047	6,018,865	275,693	6,294,558		100.0	1,099
2045	2048	6,190,667	283,654	6,474,321		100.0	1,052
2046	2049	6,368,553	292,095	6,660,648		100.0	1,050
2047	2050	6,553,581	300,751	6,854,332		100.0	1,051
2048	2051	6,747,104	309,746	7,056,850		100.0	1,051
2049	2052	6,956,808	318,529	7,275,337		100.0	1,053
2050	2053	7,169,332	326,984	7,496,316		100.0	1,054

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

These schedules contain trend information to help the reader understand how TRS's financial performance and well-being have changed over time.

These schedules offer demographic and economic indicators to help the reader understand the environment within which TRS's financial activities take place.

These schedules contain benefits, service and employer contribution data to help the reader understand how TRS's financial report relates to TRS's services and activities.

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
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
2012	557,339,552	309,729,924	309,696,252	1,176,765,728

Deductions by Type

Year	Service Retirees	Disability Retirees	Survivors	Total Benefits	Refunds	Administrative Expense	Total Deductions to Plan Net Position
2021	$1,590,885,515	$ 80,723,365	$ 282,767,120	$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
2012	1,401,380,816	65,297,491	16,260,858	1,482,939,165	19,549,073	7,762,880	1,510,251,118

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2012	1,176,765,728	1,510,251,118	(333,485,390)

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
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
2012	173,966,623	100,346,070	3,781,222	(3,989,202)	274,104,713

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

Deductions by Type

	Insurance Benefit Expense				
Year	Under Age 65	Age 65 & Over	Total Insurance Benefits Expense	Administrative Expense	Total Deductions to Plan Net Position
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
2012	156,228,181	72,746,945	228,975,126	1,201,629	230,176,755

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2012	274,104,713	230,176,755	43,927,958

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
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
2012	1,684,711	6,450,022	8,134,733

Deductions by Type

Year	Life Insurance	Administrative Expense	Total Deductions to Plan Net Position
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
2012	4,397,281	22,886	4,420,167

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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)
2012	8,134,733	4,420,167	3,714,566

Distribution of Active Contributing Members
as of June 30, 2021

By Age

Age	Male	Female
20-24	668	2,774
25-29	1,559	5,478
30-34	1,963	6,149
35-39	2,352	7,325
40-44	2,614	8,086
45-49	2,587	7,827
50-54	2,218	7,024
55-59	1,418	4,223
60-64	856	2,546
65 & over	925	2,157
Total	17,160	53,589

By Service

Years of	Male	Female
Less than 1	1,713	5,392
1-4	3,958	12,312
5-9	2,992	9,484
10-14	2,548	8,038
15-19	2,466	7,913
20-24	2,024	6,485
25-29	1,192	3,283
30-34	223	625
35 or more	44	57
Total	17,160	53,589

Principal Participating Employers
Current Year and Nine Years Ago

Employer	2021 Covered Employees	2021 Rank	2021 Percentage of System	2012 Covered Employees	2012 Rank	2012 Percentage of System
Jefferson County Schools	10,277	1	14.53 %	10,304	1	13.34 %
Fayette County Schools	4,499	2	6.36	4,651	2	6.02
Boone County Schools	2,006	3	2.84	1,866	3	2.42
Warren County Schools	1,483	4	2.10	1,302	6	1.69
Hardin County Schools	1,313	5	1.86	1,402	4	1.82
Oldham County Schools	1,258	6	1.78	1,230	7	1.59
Kenton County Schools	1,255	7	1.77	1,332	5	1.72
Bullitt County Schools	1,197	8	1.69	1,218	8	1.58
Daviess County Schools	1,044	9	1.48	1,118	10	1.45
Madison County Schools	1,025	10	1.45	1,162	9	1.50
Other Employers (see below)	45,392		64.16	51,653		66.88
Total (202 Employers)	70,749		100 %	77,238		100 %

Other Employers
(detailed from above chart)

Type	Number of Employers	Employees
Local School Districts	161	40,520
Higher Education	6	3,127
State Agencies	12	1,266
Educational Cooperatives	8	369
Other	5	110
Total	192	45,392

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, 2021

County	Payments	Recipients	County	Payments	Recipients
Adair	$ 9,563,098	241	Laurel	$ 31,009,708	772
Allen	8,499,121	199	Lawrence	6,104,428	157
Anderson	9,041,754	253	Lee	3,471,986	90
Ballard	5,089,583	136	Leslie	6,894,458	163
Barren	20,766,732	505	Letcher	13,930,701	367
Bath	5,916,003	163	Lewis	7,788,718	198
Bell	15,165,090	386	Lincoln	12,754,958	318
Boone	49,728,164	1,124	Livingston	3,962,863	96
Bourbon	8,867,512	223	Logan	12,564,423	308
Boyd	23,945,269	588	Lyon	4,732,461	115
Boyle	21,579,965	521	Madison	65,728,623	1,589
Bracken	4,518,430	113	Magoffin	8,747,367	215
Breathitt	9,920,507	260	Marion	8,534,896	220
Breckinridge	9,013,116	222	Marshall	17,315,987	419
Bullitt	22,998,264	521	Martin	6,117,707	159
Butler	5,094,385	120	Mason	9,530,221	248
Caldwell	7,789,395	201	McCracken	30,075,173	761
Calloway	30,636,547	750	McCreary	8,849,011	236
Campbell	34,593,776	788	McLean	5,043,006	124
Carlisle	2,122,145	61	Meade	8,662,228	200
Carroll	4,567,909	104	Menifee	2,784,915	79
Carter	16,460,138	429	Mercer	11,383,671	316
Casey	7,390,815	187	Metcalfe	4,348,907	108
Christian	22,680,752	589	Monroe	7,225,532	174
Clark	16,417,699	402	Montgomery	14,896,073	375
Clay	12,968,407	321	Morgan	7,828,235	201
Clinton	6,533,142	174	Muhlenberg	16,184,895	378
Crittenden	2,576,688	71	Nelson	20,347,985	504
Cumberland	3,950,515	94	Nicholas	2,789,914	72
Daviess	52,554,889	1,300	Ohio	9,101,258	246
Edmonson	4,805,368	123	Oldham	26,674,906	600
Elliott	2,483,622	70	Owen	4,519,703	118
Estill	7,655,653	189	Owsley	4,761,190	120
Fayette	142,714,513	3,520	Pendleton	6,625,979	154
Fleming	7,619,550	198	Perry	18,112,492	436
Floyd	23,153,128	595	Pike	33,083,862	831
Franklin	32,355,562	977	Powell	5,977,678	143
Fulton	3,053,202	80	Pulaski	33,537,396	854
Gallatin	1,906,063	50	Robertson	1,100,925	27
Garrard	9,280,641	228	Rockcastle	8,737,475	210
Grant	8,769,150	203	Rowan	23,194,920	581
Graves	17,932,135	446	Russell	10,780,402	269
Grayson	12,877,666	313	Scott	23,743,318	570
Green	5,917,074	150	Shelby	23,810,325	558
Greenup	17,748,183	439	Simpson	7,059,905	178
Hancock	2,890,024	72	Spencer	7,025,549	162
Hardin	45,608,819	1075	Taylor	14,419,882	370
Harlan	16,743,496	425	Todd	4,401,350	117
Harrison	8,646,965	223	Trigg	7,535,810	194
Hart	7,359,312	167	Trimble	2,784,171	63
Henderson	20,098,420	506	Union	4,930,832	135
Henry	8,533,421	221	Warren	80,557,370	1,960
Hickman	1,446,617	33	Washington	5,520,713	139
Hopkins	20,983,617	499	Wayne	10,042,032	255
Jackson	6,759,365	175	Webster	5,379,452	139
Jefferson	357,904,494	7,639	Whitley	30,490,940	780
Jessamine	20,845,526	515	Wolfe	5,087,375	140
Johnson	15,845,083	375	Woodford	15,503,339	388
Kenton	44,836,586	1,073			
Knott	10,925,879	279	**Total in Kentucky**	**$ 2,153,080,507**	**52,106**
Knox	12,270,129	322			
LaRue	8,051,832	181			

Distribution of Retirement and Health Insurance Payments Worldwide as of June 30, 2021

Number of Recipients in United States Outside Kentucky

183	Alabama	7	Montana
9	Alaska	11	Nebraska
104	Arizona	29	Nevada
35	Arkansas	7	New Hampshire
106	California	14	New Jersey
82	Colorado	19	New Mexico
11	Connecticut	42	New York
15	Delaware	316	North Carolina
8	District of Columbia	2	North Dakota
1,485	Florida	693	Ohio
296	Georgia	34	Oklahoma
10	Hawaii	36	Oregon
12	Idaho	72	Pennsylvania
120	Illinois	3	Rhode Island
853	Indiana	255	South Carolina
24	Iowa	8	South Dakota
36	Kansas	1,133	Tennessee
47	Louisiana	252	Texas
20	Maine	28	Utah
49	Maryland	2	Vermont
27	Massachusetts	179	Virginia
68	Michigan	44	Washington
24	Minnesota	99	West Virginia
63	Mississippi	42	Wisconsin
99	Missouri	10	Wyoming

Number of Recipients Outside United States

5	Military APO
3	Australia
1	Barbados
5	Canada
1	Czech Republic
1	Japan
1	Poland
1	Spain
1	Sweden
1	Switzerland

	Number of Recipients	Amount of Payments
Inside Kentucky	52,106	$ 2,153,080,507
Outside Kentucky	7,143	223,526,138
Total	59,249	$ 2,376,606,645

Growth in Annuitants as of June 30, 2021

Fiscal Year	Service Retirees	Disability Retirees	Beneficiaries of Retired Members	Beneficiaries of Deceased Members Eligible to Retire	Survivors	Disabled Adult Child
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
2012	40,107	2,478	2,126	596	444	304

Schedule of Annuitants by Type of Benefit as of June 30, 2021

Monthly Benefit ($)	Number of Annuitants	Type of Benefit*					
		1	2	3	4	5	6
1 - 500	4,345	3,412	13	188	22	358	352
501 - 1,000	2,979	2,491	131	284	73	0	0
1,001 - 1,500	2,938	2,082	274	490	91	1	0
1,501 - 2,000	3,292	2,364	378	470	80	0	0
2,001 - 2,500	4,126	3,198	465	378	85	0	0
2,501 - 3,000	6,541	5,366	690	390	95	0	0
3,001 - 3,500	9,012	8,129	482	333	68	0	0
3,501 - 4,000	7,673	7,193	220	218	42	0	0
4,001 - 4,500	5,422	5,126	101	162	33	0	0
4,501 - 5,000	3,837	3,672	51	97	17	0	0
5,001 & over	7,462	7,234	35	165	28	0	0
Total	57,627	50,267	2,840	3,175	634	359	352

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, 2021

Monthly Benefit ($)	Option Selected*							
	1	2	3	4	5	6	7	8
1 - 500	2,238	530	310	43	3	427	83	711
501 - 1,000	1,676	440	246	78	10	382	142	5
1,001 - 1,500	1,448	338	292	139	15	377	317	12
1,501 - 2,000	1,631	390	294	132	9	457	355	24
2,001 - 2,500	2,080	452	383	136	3	637	369	66
2,501 - 3,000	3,119	668	569	204	11	1,194	597	179
3,001 - 3,500	4,660	1,092	645	206	3	1,484	856	66
3,501 - 4,000	4,012	956	543	205	8	1,149	762	38
4,001 - 4,500	2,814	621	408	146	5	838	572	18
4,501 - 5,000	1,981	421	318	109	6	575	424	3
5,001 & OVER	3,839	784	669	291	21	1,041	811	6
Total	29,498	6,692	4,677	1,689	94	8,561	5,288	1,128

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, 2012								
Average monthly benefit	$ 175	$ 507	$ 1,170	$ 1,897	$ 2,613	$ 3,674	$ 4,726	**$ 3,148**
Final average salary	$ 3,292	$ 3,759	$ 4,307	$ 4,898	$ 5,219	$ 5,605	$ 6,109	**$ 5,331**
Number of retired members	45	197	146	162	303	778	569	**2,200**
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**
Average final average salary	$ 3,691	$ 3,506	$ 4,588	$ 5,208	$ 5,722	$ 6,024	$ 6,666	**$ 5,514**
Number of retired members	53	259	162	212	346	766	320	**2,118**
Year ending June 30, 2018								
Average monthly benefit	$ 152	$ 486	$ 1,254	$ 2,098	$ 2,990	$ 4,002	$ 5,412	**$ 3,175**
Final average salary	$ 3,760	$ 3,668	$ 4,702	$ 5,397	$ 5,883	$ 6,068	$ 6,980	**$ 5,677**
Number of retired members	64	255	147	193	356	844	330	**2,189**
Year ending June 30, 2019								
Average monthly benefit	$ 130	$ 460	$ 1,190	$ 2,073	$ 2,847	$ 4,027	$ 5,393	**$ 3,078**
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**
Ten Years Ended June 30, 2021								
Average monthly benefit	**$ 151**	**$ 478**	**$ 1,243**	**$ 2,033**	**$ 2,873**	**$ 3,943**	**$ 5,209**	$ 3,136
Final average salary	**$ 3,404**	**$ 3,594**	**$ 4,650**	**$ 5,217**	**$ 5,702**	**$ 6,023**	**$ 6,717**	$ 5,574
Number of retired members	**629**	**2,313**	**1,562**	**1,844**	**3,124**	**7,621**	**3,703**	20,796

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 Eight 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

Retiree Sick Leave Payments
Summary for the Year Ended June 30, 2021

Total members retiring	2,130
Total members receiving sick leave payments	1,461
Total amount of sick leave payments at 12.855% contribution rate	$ 18,652,442
Average sick leave payment per retiree	$ 12,767
Total increase in final three or five year average salary base	$ 4,921,758
Average increase in final average salary	$ 3,369
Total service credit of 1,461 retirees	37,564
Average service credit of 1,461 retirees	25.71

Anticipated Payout of Additional Annuity

Actuarial cost of sick leave as salary credit	$ 40,097,933

Funding of Additional Payments

Member contributions ($18,652,442 x 9.105%)	$ 1,698,305
Employer contributions ($18,652,442 x 12.305%)	2,295,183
Total Contributions	$ 3,993,488
Deficit:	
Anticipated additional payout	$ 40,097,933
Less: total member and state contributions	3,993,488
Subtotal unfunded debt	$ 36,104,445
Less: current year appropriation	4,633,100
Total Unfunded Cost of Sick Leave Payments*	$ 31,471,345

* *This amount will be amortized over a 20-year period per KRS 161.553.*