Teachers' Retirement System of the State of Kentucky

The 80th Comprehensive Annual Financial Report

A Component Unit of the Commonwealth of Kentucky

Fiscal Years Ended June 30, 2020 and 2019

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

Gary L. Harbin, CPA
Executive Secretary

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

Table of Contents

Introductory Section

Chair's Letter 2
Letter of Transmittal 3
Board of Trustees 10
Administrative Staff and Professional Consultants 11
Organizational Chart 12
GFOA Certificate of Achievement 13
PPCC Public Pension Standards Award 14

Financial Section

Independent Auditor's Report 16
Management's Discussion and Analysis 18
Basic Financial Statements
- Statement of Fiduciary Net Position 22
- Statement of Changes in Fiduciary Net Position 24
- Combining Statement of Fiduciary Net Position — Other Funds 27
- Combining Statement of Changes in Fiduciary Net Position — Other Funds 28
- Notes to Financial Statements 30

Required Supplemental Information
- Retirement Annuity Trust
  - Schedule of Changes in the Net Pension Liability 74
  - Schedule of Net Pension Liability 76
  - Schedule of Employer Contributions 77
  - Schedule of Investment Returns 77
- Health Insurance Trust
  - Schedule of Changes in the Net OPEB Liability 78
  - Schedule of Net OPEB Liability 79
  - Schedule of Employer Contributions 79
  - Schedule of Investment Returns 80
- Life Insurance Trust
  - Schedule of Changes in the Net OPEB Liability 81
  - Schedule of Net OPEB Liability 82
  - Schedule of Employer Contributions 82
  - Schedule of Investment Returns 83

Additional Supporting Schedules
- Schedule of Administrative Expenses 83
- Schedule of Professional Fees 84
- Schedule of Contracted Investment Management Expenses 84

Independent Auditor's Report on Internal Control and Compliance 86

Investment Section

Report on Investment Activity 89
Consultant's Letter 90
Retirement Annuity Trust
- Investment Policy Summary, Objectives, Risk Controls and Asset Allocation 91
- Distribution of Investments 93
- Strategic Weightings by Asset Class 94
- Portfolio Results 94
- Schedule of Investment Results 95

Fixed Income Investments	96
Equity Investments	98
Real Estate	99
Alternative Assets	101
Private Equity	101
Timberland	102
Fair Values	102
Investment Summary — Fair Values	105
Investment Counselor Fees and Administrative Expenses	105
Ten Largest Stock Holdings	109
Top 10 Fixed Income Holdings	109
Transaction Commissions	110
Proxy Voting and Corporate Behavior	112
Security Lending	112
Kentucky Investments	113
Professional Service Providers	113
Health Insurance Trust	
Investment Policy, Objectives and Risk Controls	114
Asset Allocation	114
Distribution of Investments — Fair Values	115
Portfolio Results	115
Schedule of Investment Results	116
Portfolio Fair Values	117
Investment Summary — Fair Values	118
Investment Counselor Fees and Administrative Expenses	118
Schedule of Professional Service Providers	120
Actuarial Section	
Annual Valuation of the Retirement Annuity Trust	
Actuary's Certification Letter	123
Summary of Principal Results	125
Membership Data	126
Assets	127
Comments on Valuation	128
Contributions Payable Under the System	128
Comments on Level of Funding	130
Analysis of Financial Experience	131
Accounting Information	132
Sensitivity Analysis	134
Valuation Balance Sheet	136
Solvency Test	137
Development of Actuarial Value of Assets	137
Summary of Receipts and Disbursements	138
Outline of Actuarial Assumptions and Methods	138
Actuarial Cost Method	140
Summary of Main System Provisions as Interpreted for Valuation Purposes	141
Distribution of Active Members	143
Active Member Valuation Data	143
Number of Retired Members and Beneficiaries	144
Retirees, Beneficiaries and Survivors Added to and Removed from Rolls	144
20-Year Baseline Projections	145

Table of Contents

Annual Valuation of the Health and Life Insurance Trusts

- Actuary's Certification Letter 147
- Summary of Principal Results 149
- Membership Data 152
- Assets 152
- Comments on Valuation 152
- Derivation of Experience Gains and Losses 153
- Contributions Payable Under the Plans 154
- Comments on Level of Funding 155
- Accounting Information 156
- Schedules of Funding Progress 156
- Schedules of Employer Contributions 158
- Results of Valuation 159
- Solvency Test 159
- Development of the Actuarial Value of Assets 161
- Summary of Receipts and Disbursements 163
- Statement of Actuarial Assumptions and Methods 164
- Summary of Main Plan Provisions as Interpreted for Valuation Purposes 172
- Table of Distribution of Active Members 177
- Table of Total Active Member Valuation Data 177
- Table of Eligible Deferred Vested Members 178
- All Retirees and Spouses Receiving Health Benefits 179
- Table of Retirees, Beneficiaries and Survivors Added to and Removed from Rolls 179
- Sensitivity Analysis — Health Insurance Trust 180
- Sensitivity Analysis — Life Insurance Trust 183
- 20-Year Baseline Projections 185

Statistical Section

Retirement Annuity Trust

- Additions by Source 189
- Deductions by Type 189
- Changes in Plan Net Position 189

Health Insurance Trust

- Additions by Source 190
- Deductions by Type 190
- Changes in Plan Net Position 190

Life Insurance Trust

- Additions by Source 191
- Deductions by Type 191
- Changes in Plan Net Position 191

Distribution of Active Contributing Members 192

Principal Participating Employers 193

TRS Schedule of Participating Employers 194

Geographical Distribution of Retirement and Medical Payments Statewide 195

Geographical Distribution of Retirement and Medical Payments Worldwide 196

Growth in Annuitants 197

Schedule of TRS Annuitants by Type of Benefit 197

Retirement Annuity Trust Average Initial Benefit Payments for the Past 10 Years 198

Health Insurance Trust Average Premium Supplements for the Past Five Years 199

Summary of Retiree Sick Leave Payments 200

Funding of Additional Payments 200

Introductory Section

Chair's Letter

KENTUCKY

BOARD OF TRUSTEES

ALISON WRIGHT
Chair, Georgetown

HOLLIS GRITTON
Vice Chair, Union

WILLIAM ALVERSON
Paris

ALLISON BALL
State Treasurer

JOHN BOARDMAN
Lexington

FRANK COLLECCHIA
Louisville

BRENDA MCGOWN
Bowling Green

JASON E. GLASS, Ed.D.
Education
Commissioner

LYNN PATTERSON, Ed.D.
Murray

LAURA SCHNEIDER
Walton

JOSH UNDERWOOD
Tollesboro

GARY L. HARBIN, CPA
Executive Secretary

Teachers' Retirement System of the State of Kentucky

December 7, 2020

Dear Members:

On behalf of the Board of Trustees and staff, I am pleased to present this Comprehensive Annual Financial Report of the Teachers' Retirement System of the State of Kentucky for the years ending June 30, 2020 and 2019, the 80th 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 2020 fiscal year with 73,151 active members, 56,629 retirees and annual annuity and medical insurance benefits of $2.3 billion.

The Board of Trustees 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 of Trustees 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 7, 2020

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

Dear Governor Beshear:

It is my pleasure to submit the 80th Comprehensive Annual Financial Report (CAFR) 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, 2020 and 2019. 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 third 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 $22.4 billion net assets at the close of the fiscal year, which is an improvement of almost $550 million over the prior year and a $4.7 billion improvement in fiduciary net position since 2016. All of this was done against the backdrop of the global COVID-19 coronavirus pandemic where for almost the last four months of this year, TRS's information technology infrastructure and staff allowed the system to provide all benefits and services safely and without interruption as nearly all employees worked from home across a dozen Kentucky counties.

TRS produced this annual report, which is required by state law and contains the annual audit and actuarial valuations of the retirement system, that provides you, the General Assembly and the public with information necessary to better understand TRS, which is the largest financial institution in the commonwealth. Contained within are numerous examples of how Kentucky teachers' future well-being is being provided for at a low cost 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 there and receive 91% of the retirement annuity benefits paid by TRS. TRS paid $2.3 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, 2020 and 2019. Discussion and analysis of net assets and related additions and deductions are presented in Management's Discussion and Analysis in the Financial Section of this report.

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 systems of internal control 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 this appropriate balance. The system of internal controls includes policies and procedures and an internal audit department that reports to the Board of Trustees.

Profile of TRS

TRS began operations 80 years ago 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 contained in the preceding board chair's letter. From the $2.3 billion paid in total benefits, which is a record, the average annuity is $38,800 and, for most TRS retirees, replaces Social Security. TRS usually provides a higher benefit with a normal cost that is comparable 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 the effective and efficient operation of TRS. Reports from the board's independent auditor and the board's independent actuary are enclosed in this CAFR. 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 of the organization. The latest affirmation of this, elaborated upon later in this letter, came with the independent annual audit that resulted in no findings.

During the past year, TRS continued work on several major initiatives concerning funding, investments, benefit administration and cost containment. Before any discussion of those efforts individually, it should be noted how all these were accomplished amid the disruption of a 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 since March.

TRS operations have continued seamlessly and safely thanks to the efforts of the information technology team getting 95% of the TRS workforce set up to work from home. To ensure safety for any employees at TRS's Frankfort offices, measures taken include masks, social distancing, temperature scanners at doors to check any employee entering and a document drop-off box on the front door to receive member documents. Replicating office discussions through secure videoconferencing, I meet daily with directors to review recent and upcoming 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 in the last months of the fiscal year 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 best fits 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. Personalized medicine helps retirees avoid taking ineffective medications that even could be fatal, while potentially saving the system on prescription and 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. The coalition, a purchasing collaborative founded with TRS, reduces cost for members like TRS while providing personal service to customers.

As anticipated, the results, according to Coriell, have been impressive. For 28% of participants, DNA test results led to a recommended change in medication. The program, in its first 16 months saw a 14% reduction in spending for those involved. Costs for a control group not in the program increased 3.2% in that same timeframe. Other metrics of success include 87% of medication change recommendations being accepted by the prescriber, a 22% reduction in hospitalizations and a 27% reduction in slip-and-fall accidents.

TRS is expanding this program for which national interest continues. During the year, TRS staff reported on the initial results at numerous conferences, including at the

Personalized Medicine Conference hosted by the Personalized Medicine Coalition held at Harvard Medical School. Other presentations involved staff from the office of Sen. Mitch McConnell, of Kentucky and the majority leader of the U.S. Senate.

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 only a decade, the health insurance fund has achieved a 61.7% funded ratio compared to pay-as-you-go status before the law took effect. This remarkable improvement confirms that the medical insurance fund is on schedule to be funded fully in 20 years. The success of Shared Responsibility for the retirement security of current and future retired teachers is a national model.

An anniversary celebration for the decade of Shared Responsibility and its success was held in February at the Kentucky History Center, attended by many of the supporters who helped transform the idea into law.

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. The cost of coverage for 2021 is a reduction for the third straight year and is less than it was two decades ago.

Some recent cost-saving initiatives include 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 the Know Your Rx Coalition, 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 are filled with generic drugs 89% of the time this calendar year, up from 73% in 2012. Additionally, coalition pharmacists work with retired teachers and their physicians to maximize prescription dollars both for the retiree and the medical plan, including supporting the personalized medicine program.

Investing

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.

The Investment Section of this report contains asset allocations, strategic target ranges for investments, discussion of the current year market environment and historical performance schedules, among others.

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

The investment objectives of the board are to ensure that funds shall be invested solely in the interest of its members and their beneficiaries and that investment income shall be used for the exclusive purpose of providing benefits to the members and their beneficiaries, while making payment of reasonable expenses in administering the plan and its trust funds. The investment program shall also provide a reasonable rate of total return with major emphasis being placed upon the protection of the invested assets.

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

A multiyear program of diversifying the portfolio continued in line with TRS's focus on fundamental value and risk control. These ongoing 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 that it will do so in the future. TRS's investment program continues to be recognized as a leader in the public pension community for governance structure, trustee education and cost effectiveness.

As a measure of this, the long-term performance of TRS's investment program compared against the average of other pension plans has resulted in an additional $3.6 billion in the pension fund alone in the last 12 years, as measured by the public fund index of Aon, TRS's independent investment consultant.

For the year ended June 30, 2020, the market value of TRS's investments in the Retirement Annuity Trust rebounded from the economic crash in March as a result of the coronavirus pandemic to increase 5.8% gross and 5.5%

net. This performance pushed total plan assets for all trusts to a record of $22.4 billion.

The fiscal year was characterized by the strong rebound in global equity markets from a severe pullback due to economic disruptions related to COVID-19. Bond markets were strong and interest rates declined in response.

Although a one-year period is not determinative for a long-term investor such as TRS, the performance for the most recent year and longer periods follows TRS's historical record of top-tier performance. TRS's investment performance finished in the top decile among public plans with assets over $1 billion as ranked by Aon for periods ending June 30, 2020. TRS achieved top 5% for the fiscal year, top 4% for three years, top 7% for five years and top 3% investment performance during the last 10 years. Moreover, during the last 30 years, TRS investment returns of 7.98% have bettered the long-term assumed rate of return of 7.5%. Net returns exceeded the assumed rate as well for the three-, and 10-year periods. This record validates policy changes adopted by the board and implemented by the Investment Committee over the last several years. TRS's commitment to best practices, stringent risk controls and fundamental value philosophy in investing helps ensure long-term retirement security for Kentucky's teachers.

TRS's investment portfolio experienced an increase in market value during the 2020 fiscal year, increasing to $22.15 billion from $21.63 billion. The increase in value of the portfolio was the result of market conditions and additional funding provided in the biennial budget for TRS. Interest income, dividends and employer and employee contributions also added significantly to the portfolio.

Investment income totaled $1.16 billion, roughly equal to the prior year. The net appreciation in fair value of investments was $746.5 million compared to $719.1 million at June 30, 2019.

Benefits Administration
To improve the administration of benefits, TRS implemented a new return-to-work administrative regulation in January to ensure compliance with federal tax law. TRS also filed a new regulation to explain the application of the anti-spiking law governing annuities. The regulation is expected to be effective in March 2021.

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 the experience of TRS. Many of these involved presentations to the Public Pension Oversight Board (PPOB) and General Assembly committees. Among those were presentations on coronavirus response; quarterly investment-return and cash-flow updates; the biennial budget request; and responding to questions about contract information posted to the TRS website with regard to Senate Bill 2 (2017 RS).

The independent review of the retirement system 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, 2020 and 2019.

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 CAFR for the fiscal years ended June 30, 2019 and 2018. The certificate is a prestigious national 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 CAFRs must satisfy both generally accepted accounting principles and applicable legal requirements.

TRS has received the certificate for the last 32 consecutive years (fiscal years 1988-2019). TRS believes the current report, which is being submitted to GFOA, continues to conform to the Certificate of Achievement program requirements. I anticipate this trend will continue.

The Public Pension Coordinating Council (PPCC) recognized TRS with the Public Pension Standards Award for Funding and Administration for 2020. 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 implementing and 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 existence for many years. As evidence, a 1958 member handbook stated: "Individual problems are important to members, and thus are important to the staff of the Retirement System. We not only welcome but encourage members to contact the Retirement Office concerning their individual problems. … (R)est assured your inquiries will be most welcome." This remains true today, even – and maybe especially – in a pandemic.

To reach members more easily, TRS continued using Facebook and Twitter accounts to communicate information about the system on a timelier basis. In less than four years, the Facebook account has received more than 3,300 likes, and posts often reach more than 1,000 users — led this past year by more than 18,100 users who saw a post that sought to dispel misinformation about health care benefits.

Also, TRS continued informational offerings for members. Regarding active members alone, about 154 attended seminars in addition to about 631 people who participated in live webinars and 740 views of recordings. About 182 members were seen at locations around the state for retirement counseling sessions. The 19 TRS counselors saw more than 4,400 visitors in the office – through March – and completed more than 19,100 retirement estimates. This is in addition to the hundreds of retirees spoken to during presentations to retiree groups regarding pension and medical benefits.

The ways of reaching members changed through the year, in part because of improved capabilities and in part necessitated by the response to the pandemic.

Seminars provided by Member Services and Insurance counselors were conducted virtually from March through the remainder of the review period because of the coronavirus pandemic. Counseling was offered by live videoconference and by phone.

For the first time, a mass mailed postcard was used to increase electronic voting through Pathway for Board of Trustees elections. Also, for the first time, TRS used a mass email to more senior retirees to promote a staff-produced online video of me speaking about how to stay safe during the pandemic and how to interact with TRS. Other retirees who didn't have emails on file were telephoned.

Staff took part in virtual meetings of constituent groups, including another staff-produced video for the Kentucky Retired Teachers Association (KRTA) fall conferences that featured several TRS directors. This was in lieu of the 14 KRTA regional workshops that TRS staff typically attend when held in person.

Staff members, including me, delivered communications to members, retirees, the education community, political leaders and the public regarding the value of TRS. This included illustrations of the top-decile performance of TRS's investing; what that meant in dollars for Kentucky teachers' pensions compared to the average pension plan; the success of Shared Responsibility; TRS's low investment fees and administrative costs; and how a 33-year history of TRS shows investment returns – not contributions from active members – are what pays the bulk of retiree benefits.

General Administration
TRS continued 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. The number of ballots cast electronically increased to 1,113 from 308.

Funding Progress
Retirement Annuity Trust
Teachers saw the continued benefits of increased funding by the state. Where the 2016-2018 biennium saw nearly full funding, TRS received full funding in the just completed 2018-2020 biennium, the first full retirement annuity funding in a decade. Another year of full funding is underway, with the budget for the second year of the current biennium to be determined in the 2021 legislative session.

The current fiscal year 2021 Executive Branch Budget (2020 RS HB 352), which is a one-year funding plan, provided TRS full retirement annuity funding, consisting of about $730 million in total and including the full $551 million requested in additional funding to address the unfunded liability.

Including the near-full funding of the 2016-2018 budget, now marks five consecutive years of full or nearly full funding for TRS, which followed about a decade of no additional funding.

The most recent financial and actuarial reports show, thanks to funding and investment returns on it, that the fiduciary net position of all TRS funds improved more than $4.7 billion over that timeframe since June 30, 2016.

Based on recommendations of the board, 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 year 2009 through fiscal year 2018, the state had not paid the full recommended annual employer contribution necessary to prefund the benefit requirements of members of the retirement system as determined by the actuary. Over this period, because of not making the additional appropriation beyond salary-based contributions, the actuary says the state's annual additionally required employer contributions have grown significantly from $60.5 million (fiscal year 2009) to $629.4 million (fiscal year 2023). The following schedule details the growth of the additional annual employer 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

Source: Annual Valuation of the Retirement Annuity Trust

The board always has acted as required by state law and recommended annual employer contributions payable by the state that would ensure that the state meets the 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 budget.

The latest actuarial valuation for the Retirement Annuity Trust was for the period ending June 30, 2020. This report reflects TRS's actuarial value of assets totaling $20.8 billion and actuarially determined liabilities totaling $35.58 billion. The funded ratio of actuarial assets to liabilities, now 58.4%, increased for the fourth straight year aided by investment returns that were supported by additional legislative appropriations. 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 defined benefit plan are provided in the Schedule of Employer Contributions in the Required Supplemental Information of the Financial Section of this report. Based on the 2020 valuation report, the actuary recommends a cumulative increase in employer contributions of 15.78% of pay for the 2023 fiscal year as detailed in the contribution rates tables in the Summary of Principal Results in the Actuarial Section of this report.

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 10 years, the Health Insurance Trust has reached 61.7% funding compared to pay-as-you-go status before the law took effect (with the most recent year being a gain of 15.7 percentage points). The results confirm that the Health Insurance Trust is on schedule to be funded fully and that the 2010 solution is working. 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, 2020, indicated that the trust has an unfunded liability of $1.06 billion, a reduction of $634 million from the prior valuation. 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's opinion is that "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."

A surplus in the state's fiscal year 2019 budget resulted in a $70 million appropriation in fiscal year 2020 for retiree health insurance, which continues the record of full funding for retiree medical since Shared Responsibility was implemented in 2010.

Additionally, the board is pursuing steps to realize true cost containment at both the state and national levels, and teachers and taxpayers will continue to benefit from those efforts.

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

The preparation of 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 located at the TRS web address https://trs.ky.gov/financial-reports-information/#CAFR and is made available to all 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 retirement system. Again, thanks to you and the General Assembly for your support for full pension funding that ensures retirement security for teachers as TRS sets out on its next 80 years. Your support is an essential part of this commitment, and we look forward to continuing to work with you.

Respectfully submitted,

Gary L. Harbin, CPA
Executive Secretary

Board of Trustees

Alison Wright
Chair
Active Teacher Trustee
Georgetown

Hollis Gritton
Vice Chair
Lay Trustee
Union

Allison Ball
Ex Officio Trustee
State Treasurer

William Alverson
Lay Trustee
Paris

John Boardman
Appointed Trustee
Lexington

Frank Collecchia
Appointed Trustee
Louisville

Jason E. Glass, Ed.D.
Ex Officio Trustee
Education Commissioner

Brenda McGown
Retired Teacher Trustee
Bowling Green

Lynn Patterson, Ed.D.
Active Teacher Trustee
Murray

Laura Schneider
Active Teacher Trustee
Walton

Josh Underwood
Active Teacher Trustee
Tollesboro

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

Actuary

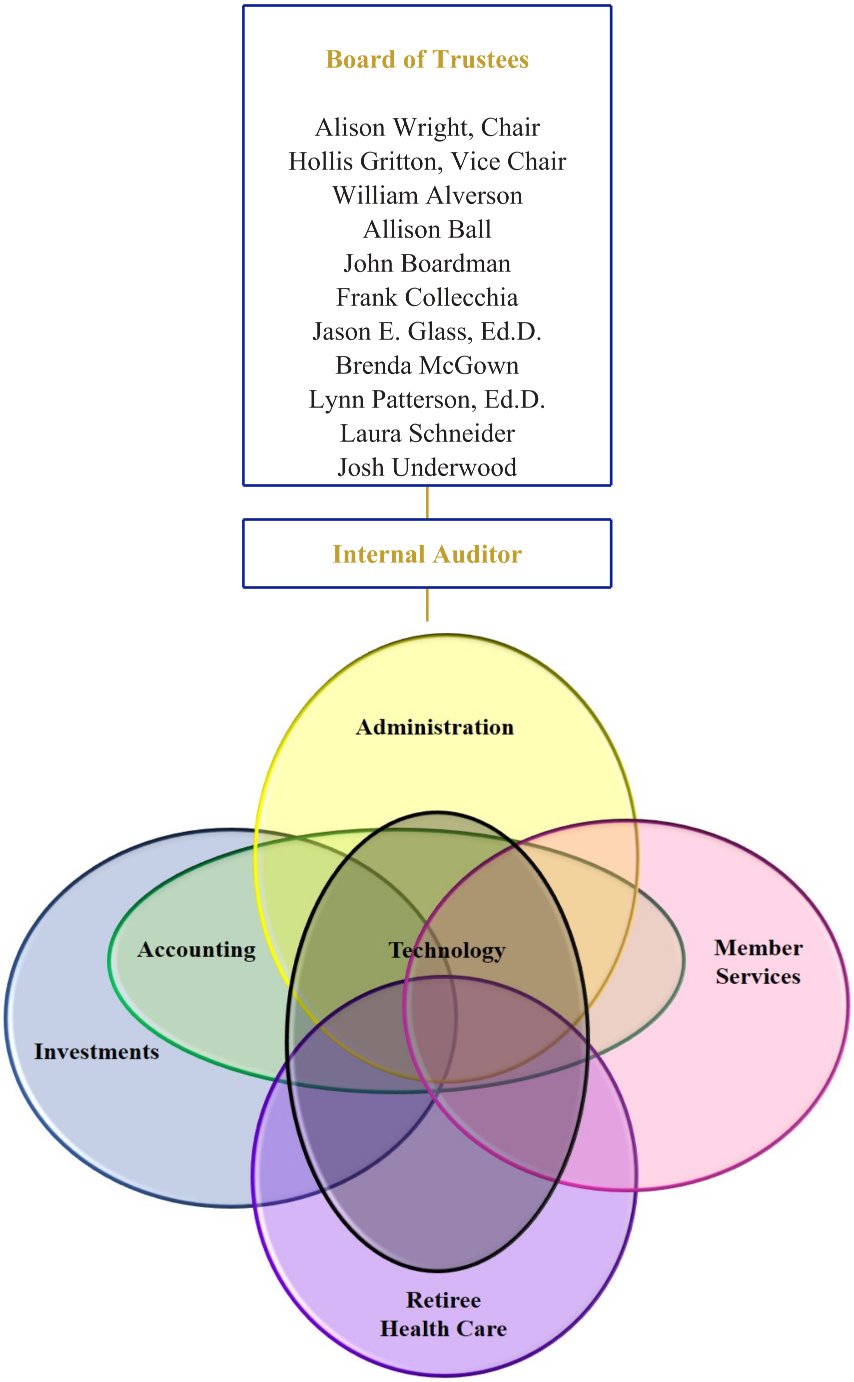
Cavanaugh Macdonald Consulting, LLC
3550 Busbee Parkway, Suite 250
Kennesaw, GA 30144

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 106, 110, 113, 119 and 120 for a list of investment fees and external asset managers.

Organizational Chart



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
Nate 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, 2019

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 32 consecutive years (fiscal years ended 1988-2019).

PPCC Public Pension Standards Award

PPCC

Public Pension Coordinating Council

Public Pension Standards Award
For Funding and Administration
2020

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 2020 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

80 YEARS

TEACHERS' Retirement System

TRS

KENTUCKY

Since 1940

Independent Auditor's Report

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

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

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

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

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

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

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

Opinions

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

Other Matters

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

Report on Required Supplementary Information

Accounting principles generally accepted in the United States of America require that management's discussion and analysis on pages 18 through 21, and the defined benefit pension plan and other postemployment benefit plan supplemental schedules on pages 74 through 83, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audits of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audit was conducted for the purpose of forming an opinion on the 2020 financial statements that collectively comprise TRS's basic financial statements. The additional supporting schedules (pages 83 through 85) are presented for purposes of additional analysis and are not a required part of the basic financial statements. The Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are fairly stated, in all material respects, in relation to the 2020 basic financial statements as a whole. The 2019 information on the additional supporting schedules (pages 83 to 85) was subject to the auditing procedures applied in the 2019 audit of the basic financial statements by other auditors, whose report on such information stated that it was fairly stated in all material respects in relation to the 2019 basic financial statements.

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

Blue & Co., LLC

Lexington, Kentucky
November 13, 2020

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

This discussion and analysis of the financial performance of Teachers' Retirement System of the State of Kentucky (TRS or system) provides an overview of the Retirement Annuity Trust, the Health Insurance Trust and the Life Insurance Trust for the fiscal years ended June 30, 2020, and 2019. It should be read in conjunction with the respective financial statements, which begin on page 22. 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 comprehensive annual financial report (CAFR) 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 22-25). The Notes to the Financial Statements are an essential part of the basic financial statements. They provide important background and detailed information about TRS, the plan and the basic financial statements themselves.

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

Teachers' Retirement System as a Whole

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

Summary of Fiduciary Net Position
(In millions)

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

Trust Totals* **

(In millions)

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

*Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund. Other Funds had a combined fiduciary net position of $1.1 million for 2020, $1.2 million for 2019 and $1.1 million for 2018.
**Amounts above may not agree to the financial statements due to rounding.

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

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

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

Summary of Changes in Fiduciary Net Position

(In millions)

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

Trust Totals* **

(In millions)

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

*Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund.
**Amounts above may not agree to the financial statements due to rounding.

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

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

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

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

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

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

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

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

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

Historical Trends

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

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

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

Basic 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 27.

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

Statement of Fiduciary Net Position
As of June 30, 2019

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

The Combining Statement of Fiduciary Net Position — Other Funds is presented on page 27.
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 28.
The accompanying notes, are an integral part of these financial statements.

Statement of Changes in Fiduciary Net Position
For the Year Ended June 30, 2019

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

The Combining Statement of Changes in Fiduciary Net Position — Other Funds is presented on page 29.
The accompanying notes are an integral part of these financial statements.

Page intentionally left blank

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

Combining Statement of Fiduciary Net Position — Other Funds
As of June 30, 2019

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

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 investment expense			504	504
Less securities lending expense				
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.

Combining Statement of Changes in Fiduciary Net Position — Other Funds
For the Year Ended June 30, 2019

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Other Benefits

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

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

Note 2
Summary of Significant Accounting Policies

Basis of Accounting

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

Cash

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

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

Capital Assets

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

Investments

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

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

Compensated Absences

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

Risk Management

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

Other Receivables

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

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

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

Use of Estimates
The preparation of financial statements in accordance with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results could differ from those estimates. The most significant estimates impacting the financial statements relate to the actuarial assumptions.

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

Note 3
Contributions and Funds of the Plan

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

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

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

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

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

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

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

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

Note 4
Net Pension Liability of Employers

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

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

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

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

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

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

Target Allocations
The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

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

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

Discount Rate

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

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

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

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

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

2019

(In thousands)		**1% Decrease (6.5%)**		**Current Discount (7.5%)**		**1% Increase (8.5%)**
Net pension liability	$	18,252,330	$	14,294,885	$	10,964,314

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

TPL Roll Forward 2020

(Dollars in thousands)

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

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

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

TPL Roll Forward 2019

(Dollars in thousands)

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

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

Legal Provisions for Investments

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

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

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

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

- Not more than 15% of the assets at fair value shall be invested in any additional category or categories of investments. The board shall approve by resolution such additional category or categories of investments.

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

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

Cash and Cash Equivalents

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

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

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

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

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

Investments

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

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

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

Schedules of Investments
Retirement Annuity Trust

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

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

Health Insurance Trust

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

Life Insurance Trust

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

Custodial Credit Risk

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

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

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

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

As of June 30, 2020, cash collateral reinvestment securities acquired through securities lending for the Retirement Annuity Trust by TRS's custodian amounted to $951.3 million in relation to the $938.1 million securities lent consistent with the lending agreement with the custodian. Cash collateral reinvestment securities lending for the Life Insurance Trust by TRS's custodian amounted to $13.3 million in relation to the $13.2 million securities lent consistent with the lending agreement with the custodian. The custodian also is the lending agent and counterparty.

Interest Rate Risk

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

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

Retirement Annuity Trust

	2020			2019		
Investment Type	Fixed Income	Additional Categories	Average Maturity (years)	Fixed Income	Additional Categories	Average Maturity (years)
U.S. government	$ 889,924,118	$	11.04	$ 1,297,994,618	$	9.77
Agency bonds	55,122,909		6.41	77,746,291		7.33
Mortgage-backed securities	132,326,674		18.99	101,618,762		19.33
Asset-backed securities	51,470,861		11.28	48,533,798		12.01
Commercial mortgage-backed securities	32,705,450		17.92	28,030,171		22.26
Collateralized mortgage obligations	34,109,190		13.52	22,172,884		15.36
Municipal bonds	303,262,635		12.14	284,472,393		12.50
Corporate bonds	1,443,496,021	629,837,577	9.16	1,367,374,528	530,949,357	8.42
Corporate loans		303,538,415	4.42		316,960,140	4.54
Total	$ 2,942,417,858	$ 933,375,992	9.89	$ 3,227,943,445	$ 847,909,497	9.26

Health Insurance Trust

	2020			2019		
Investment Type	Fixed Income	Additional Categories	Average Maturity (years)	Fixed Income	Additional Categories	Average Maturity (years)
U.S. government	$ 28,776,155	$	9.36	$ 30,905,025	$	8.39
Agency bonds	1,006,590		3.20	1,014,190		4.19
Mortgaged-backed securities	1,437,464		28.61			
Collateralized mortgage obligations	1,074,579		9.29			
Municipal Bonds	5,986,249		6.77	3,200,070		7.38
Corporate bonds	90,465,904	133,717,678	6.47	77,511,459	98,976,970	6.30
Corporate loans		36,903,439	4.67		38,791,797	4.82
Total	$ 128,746,941	$ 170,621,117	6.65	$ 112,630,744	$ 137,768,767	6.34

Life Insurance Trust

Investment Type	2020 Fixed Income	2020 Additional Categories	2020 Average Maturity (years)	2019 Fixed Income	2019 Additional Categories	2019 Average Maturity (years)
U.S. government	$ 3,596,065	$	1.68	$ 11,529,380	$	8.42
Mortgage-backed securities	491,359		13.40	577,168		13.90
Municipal bonds	2,889,990		9.68	2,601,460		10.85
Corporate bonds	7,166,110	42,116	14.50	5,151,036		8.67
Total	$ 14,143,524	$ 42,116	10.23	$ 19,859,044	$	8.96

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

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

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

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

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

Commercial mortgage-backed securities represent interests in the cash flows from pools of mortgage loans on commercial properties. The interests in a securitized pool of loans are divided generally into various tranches based upon planned payment order and level of seniority. TRS's commercial mortgage-backed securities consist of highly rated, relatively senior tranches. The average maturity of TRS's commercial mortgage-backed securities in the schedule above reflects the legal maturity of these holdings. Most of the tranches held are earlier in the planned payment order than the legal maturity suggests. The Retirement Annuity Trust held $32.7 million in commercial mortgage-backed securities investments as of June 30, 2020, compared to $28 million as of June 30, 2019.

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

2020 Retirement Annuity Trust

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

2019 Retirement Annuity Trust

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

2020 Health Insurance Trust

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

2019 Health Insurance Trust

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

2020 Life Insurance Trust

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

2019 Life Insurance Trust

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

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

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

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

Concentration of Credit Risk

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

Foreign Currency Risk

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

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

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

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

Retirement Annuity Trust

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

Health Insurance Trust

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

Life Insurance Trust

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

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

Retirement Annuity Trust

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

Health Insurance Trust

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

Life Insurance Fund

Currency	2020	2019	Currency	2020	2019
Argentine peso	$	$ 13,630	Malaysian ringgit	$ 86,313	$ 98,206
Australian dollar	743,270	812,170	Mexican peso	79,790	113,425
Bermudian dollar		23,587	Netherlands Antillean guilder		4,928
Brazilian real	242,444	334,292	New Zealand dollar	43,618	40,682
British pound sterling	1,993,870	2,121,683	Norwegian krone	83,570	100,646
Canadian dollar	1,592,200	1,153,330	Pakistani rupee	3,159	4,014
Cayman Islands dollar	42,796	15,032	Panamanian balboa		90
Chilean peso	27,712	43,545	Papua new guinean kina		4,740
Chinese yuan	185,097	1,138,624	Philippine peso	36,541	48,519
Columbian peso	9,775	25,520	Polish zloty	35,310	47,698
Czech koruna	4,554	7,027	Qatari rial	37,100	40,579
Danish krone	302,707	231,412	Russian ruble	101,369	159,886
Egyptian pound	6,320	8,814	Saudi riyal	117,666	60,142
Euro	3,913,839	4,111,786	Singapore dollar	137,420	162,565
Guernsey pound		4,797	Sol		2,522
Hong Kong dollar	1,531,046	666,709	South African rand	166,674	253,881
Hungarian forint	9,740	11,937	Swedish krona	416,873	392,526
Indian rupee	380,144	427,653	Swiss franc	990,590	1,033,663
Indonesian rupiah	68,337	94,245	Taiwan new dollar	601,247	506,921
Israeli new shekel	52,679	83,831	Thai baht	107,620	140,767
Japanese yen	2,970,885	2,954,539	Turkish lira	22,755	24,870
Jersey pound	67,721	5,290	UAE dirham	24,274	30,206
Korean won	551,428	554,273	Uruguayan peso		606
Macanese pataca		11,866	Various		1,043
			Total	$ 17,788,453	$ 18,128,717

Fair Value Measurement

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

Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or liability. Level 2 inputs may include quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets 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 2020

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

Schedule of Investments at Net Asset Value (NAV) 2020

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

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

Schedule of Investments at Fair Value Level 2019

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

Schedule of Investments at NAV 2019

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

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

Health Insurance Trust

Schedule of Investments at Fair Value Level 2020

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

Schedule of Investments at NAV 2020

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

Schedule of Investments at Fair Value Level 2019

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

Schedule of Investments at NAV 2019

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

Life Insurance Trust

Schedule of Investments at Fair Value Level 2020

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

Schedule of Investments at NAV 2020

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

Schedule of Investments at Fair Value Level 2019

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

Schedule of Investments at NAV 2019

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

Securities Lending

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

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

Securities Lending Net Earnings

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

*This schedule includes the Losey Scholarship fund.

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

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

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

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

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

Retirement Annuity Trust

2020

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

2019

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

Life Insurance Trust

2020

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

2019

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

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

Annual Rate of Return Net of Investment Fees and Expenses

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

Note 6
Retirement Plans for TRS Employees

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

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

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

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

Note 7
Description of Other Funds

403(B) Tax-Sheltered Annuity Plan

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

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

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

Supplemental Benefit Fund

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

Junita Losey Scholarship Fund

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

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

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

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

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

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

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

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

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

Net OPEB Liability of Employers

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

Net OPEB Liability of Employers
(Dollars in thousands)

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

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

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

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

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

Target Allocations
The long-term expected rate of return on OPEB investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

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

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

Discount Rate

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

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

  To reflect these adjustments, open group projections were used and assumed an equal, pro rata reduction to the current statutory amounts in the years if the health trust is projected to achieve a funded ratio of 100% or more. Here, the current statutory amounts are adjusted to achieve total contributions equal to the actuarially determined contribution, as determined by the prior year's valuation and in accordance with the health trust's funding policy (Schedule E). As the specific methodology to be used for the adjustments has yet to be determined, there may be differences between the projected results and future experience. This also may include any changes to retiree contributions for KEHP coverage pursuant to KRS 161.675(4)(b).
- In developing the adjustments to the statutory contributions in future years, the following was assumed:
    - Liabilities and cash flows are net of expected retiree contributions and any implicit subsidies attributable to coverage while participating in KEHP.
    - A 0% active member growth rate was assumed for the purposes of developing estimates for new entrants (membership dates beyond June 30, 2019).

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

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

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

Schedule of Net OPEB Liability and Health Care Cost Trend Rates 2020
(In thousands)

		Health Care Cost Trend Rates		
		1% Decrease	**Current**	**1% Increase**
	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	

Schedule of Net OPEB Liability and Health Care Cost Trend Rates 2019
(In thousands)

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

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

TOL Roll-Forward 2020
(In thousands)

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

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

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

TOL Roll-Forward 2019
(In thousands)

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

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

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

Plan Description

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

Net OPEB Liability of Employers

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

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

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

Actuarial Assumptions

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

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

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

Target Allocations

The long-term expected rate of return on OPEB investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

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

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

Discount Rate

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

- Total payroll for the initial projection year consists of the payroll of the active membership present on the valuation date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.5%.
- The employer will contribute the actuarially determined contribution (ADC) in accordance with the Life Insurance Trust's funding policy (Schedule E) determined by a valuation performed on a date two years prior to the beginning of the fiscal year in which the ADC applies.
- As administrative expenses were assumed to be paid in all years by the employer as they come due, they were not considered.

- Active employees do not contribute to the plan.
- Cash flows occur midyear.

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

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

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

Schedule of Net OPEB Liability 2020
(In thousands)

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

Schedule of Net OPEB Liability 2019
(In thousands)

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

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

TOL Roll-Forward 2020
(In thousands)

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

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

TOL Roll-Forward 2019
(In thousands)

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

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

Note 10
Contingencies

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

Page intentionally left blank

Required Supplementary Information

Retirement Annuity Trust

Schedule of Changes in Net Pension Liability

(In thousands)

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

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

Schedule of Changes in Net Pension Liability
(In thousands)

	2016	2015	2014
Total pension liability			
Service cost	$ 1,120,893	$ 1,015,080	$ 1,002,338
Interest	2,027,457	2,029,372	1,956,610
Difference between expected and actual experience	(58,035)		
Changes of assumptions	4,030,834	1,511,960	(353,043)
Benefit payments	(1,833,199)	(1,741,456)	(1,654,376)
Refunds of contributions	(27,748)	(23,033)	(25,462)
Net change in total pension liability	5,260,202	2,791,923	926,067
Total pension liability - beginning	42,476,699	39,684,776	38,758,709
Total pension liability - ending (a)	47,736,901	42,476,699	39,684,776
Plan net position			
Contributions - state	484,987	480,073	483,330
Contributions - other employers	80,468	79,506	79,996
Contributions - members	313,044	308,160	304,982
Net investment income	(245,215)	862,179	2,803,249
Benefit payments	(1,833,199)	(1,741,456)	(1,654,376)
Administrative expense	(8,636)	(8,869)	(7,956)
Refunds of contributions	(27,748)	(23,033)	(25,462)
Net change in plan net position	(1,236,299)	(43,440)	1,983,763
Plan net position - beginning	18,049,131	18,092,571	16,108,808
Plan net position - ending (b)	16,812,832	18,049,131	18,092,571
Net pension liability - ending (a)-(b)	$ 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 2016 valuation, rates of withdrawal, retirement, disability, mortality and rates of salary increase were adjusted to more closely reflect actual experience. In the 2016 valuation and later, the expectation of retired life mortality was changed to the RP-2000 Mortality Tables projected to 2025 with projection scale BB, set forward two year for males and one year for females rather than the RP-2000 Mortality Tables projected to 2020 with projection scale AA, which was used prior to 2016.

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

Schedule of Net Pension Liability
(Dollars in thousands)

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

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

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

Schedule of Employer Contributions
(Dollars in thousands)

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

See accompanying independent auditor’s report.

Actuarial Methods and Assumptions

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

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

Schedule of Investment Returns

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

2020	2019	2018	2017	2016	2015	2014
5.47%	5.56%	10.5%	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)

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

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

Net OPEB Liability

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

Changes of benefit terms. None

Changes of assumptions. None

Schedule of Net OPEB Liability

(Dollars in thousands)

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

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

Schedule of Employer Contributions

(Dollars in thousands)

Valuation Year June 30	Actuarially Determined Employer Contribution	Contributions in Relation to the Actuarially Determined Contribution	Annual Contribution Deficiency/ (Excess)	Covered Payroll	Actual Contributions as a % of Covered Payroll
2020	$ 43,909	$ 184,625	$ (140,716)	$ 3,569,262	5.17
2019	76,597	183,146	(106,549)	3,497,216	5.24
2018	118,837	187,102	(68,265)	3,455,660	5.41
2017	102,854	180,376	(77,522)	3,415,432	5.28
2016	97,983	178,638	(80,655)	3,390,539	5.27
2015	106,606	168,084	(61,478)	3,455,008	4.86
2014	159,583	162,568	(2,985)	3,317,422	4.90
2013	186,726	166,611	20,115	3,310,710	5.03
2012	470,217	177,748	292,469	3,310,176	5.37
2011	477,723	188,735	288,988	3,283,749	5.75

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

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

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

Schedule of Investment Returns

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

2020	2019	2018	2017	2016	2015	2014
2.3%	6.11%	8.4%	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)

	2020	2019	2018	2017
Total OPEB liability				
Service cost	$ 1,299	$ 1,271	$ 1,068	$ 1,067
Interest	8,563	8,256	8,026	7,761
Changes of benefit terms				
Difference between expected and actual experience	705	(204)	(717)	
Changes of assumptions				
Benefit payments	(5,317)	(5,153)	(5,453)	(5,151)
Net change in OPEB liability	5,250	4,170	2,924	3,677
Total OPEB liability - beginning	116,830	112,660	109,736	106,059
Total OPEB liability - ending (a)	122,080	116,830	112,660	109,736
Plan Net Position				
Contributions - state	1,543	1,209	897	$ 882
Contributions - other employers	253	212	161	168
Contributions - active members				
Net investment income	5,167	5,058	1,111	915
Benefit payments	(5,317)	(5,153)	(5,453)	(5,151)
Administrative expense	(36)	(30)	(31)	(28)
Other				
Net change in plan net position	1,610	1,296	(3,315)	(3,214)
Plan net position - beginning	85,758	84,462	87,777	90,991
Plan net position - ending (b)	87,368	85,758	84,462	87,777
Net OPEB liability - ending (a) - (b)	$ 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. None

Schedule of Net OPEB Liability

(Dollars in thousands)

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

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

Schedule of Employer Contributions

(Dollars in thousands)

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

See accompanying independent auditor's report.

Actuarial Methods and Assumptions

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

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

Schedule of Investment Returns

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

2020	2019
6.32%	6.49%

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

Additional Supporting Schedules

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

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

See accompanying independent auditor's report.

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

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

See accompanying independent auditor's report.

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

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

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

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

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

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

Independent Auditor's Report on Internal Control and Compliance

CPAs / ADVISORS

blue

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

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

Independent Auditor's Report

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

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

Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Kentucky Teachers Retirement System's internal control over financial reporting (internal control) to determine the 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 determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

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

Blue & Co., LLC

Lexington, Kentucky
November 13, 2020

Investment Section

80 YEARS

TEACHERS' Retirement System

TRS

KENTUCKY

Since 1940

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, 2020

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

The Teachers' Retirement System of Kentucky (TRS) investment program produced a total return of 5.8% for the twelve-month period ended June 30, 2020, exceeding the return of the Policy Benchmark by a meaningful margin of 2.2 percentage points. Impressively, the fiscal year return ranked near the top of a universe of public pension funds with assets greater than $1 billion (5th percentile ranking). On an absolute basis, the U.S. equity and fixed income portfolios contributed to results with returns above 6%, while the additional categories 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 ten-year periods.

Over the past fiscal year, the equity markets experienced volatility due to the spread of coronavirus and slowing global growth. Despite the headwinds, U.S. stocks proved to be resilient as the top performing region within the global equity market. The U.S. equity portfolio advanced 6.6%, and the international equity component returned 5.6% for the fiscal year. The international equity portfolio significantly outperformed its benchmark due to the strong performance of its growth-oriented manager, Baillie Gifford International Growth. Growth stocks continued to perform better than their value counterparts by substantial margins.

In the bond market, the 10-year U.S. Treasury yield ended the fiscal year at 0.66%, 134 basis points lower than the beginning of the fiscal year. The sharp decline in interest rates resulted in a positive return of 10.5% for the fixed income portfolio, which outperformed the Bloomberg Barclays U.S. Government/Credit Index by approximately 50 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 negative absolute return for the fiscal year as credit spreads widened.

Returns in the real estate market moderated during the fiscal year because of slowing global economic growth. The diversification in TRS's real estate allocation aided relative performance as the real estate portfolio outperformed its benchmark by 1.9 percentage points in the fiscal year. In addition to real estate, TRS has diversified its alternatives portfolio across different private equity and infrastructure strategies over the past 10 years.

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, CFA, CAIA
Partner

Brandon J. Patterson, CAIA
Associate Partner

Aon
200 E. Randolph Street, Suite 700 | Chicago, IL 60601
t +1.312.381.1200 | f +1.312.381.1366 | aon.com
Investment advice and consulting services provided by Aon Investments USA Inc.

Retirement Annuity Trust

Investment Policy Summary

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

Investment Objectives

TRS invests the members' funds in several diverse classes of assets, including equities, bonds and real estate. This diversification helps us earn the highest possible long-term rate of return within appropriate risk levels. In turn, this enables TRS to pay guaranteed benefits to members and their beneficiaries at the lowest possible cost to participating employers and taxpayers. Generally, the retirement system's liabilities will not be paid for as many as 30 to 40 years. Therefore, as a long-term investor, TRS holdings can withstand some short-term volatility. The Retirement Annuity Trust's long-term investment objective is to achieve an annualized rate of return of 7.5%.

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, 2020, and June 30, 2019, as well as the target and strategic range for each asset class for fiscal year 2020.

Retirement Annuity Trust

	June 30, 2020*	Percent	June 30, 2019**	Percent
Cash equivalents***	$ 464,341,762	2.3	$ 359,010,254	1.8
Fixed income	3,081,756,123	15.0	3,435,032,446	17.0
Domestic equities	8,170,741,415	39.8	7,971,948,673	39.4
International equities	4,546,983,468	22.1	4,427,770,148	21.9
Real estate	1,227,834,915	6.0	1,223,062,000	6.0
Private equity	1,209,514,167	5.9	1,176,784,326	5.8
Timberland	255,553,556	1.2	182,590,093	0.9
Additional categories	1,579,354,782	7.7	1,455,807,805	7.2
Totals	$ 20,536,080,188	100	$ 20,232,005,745	100

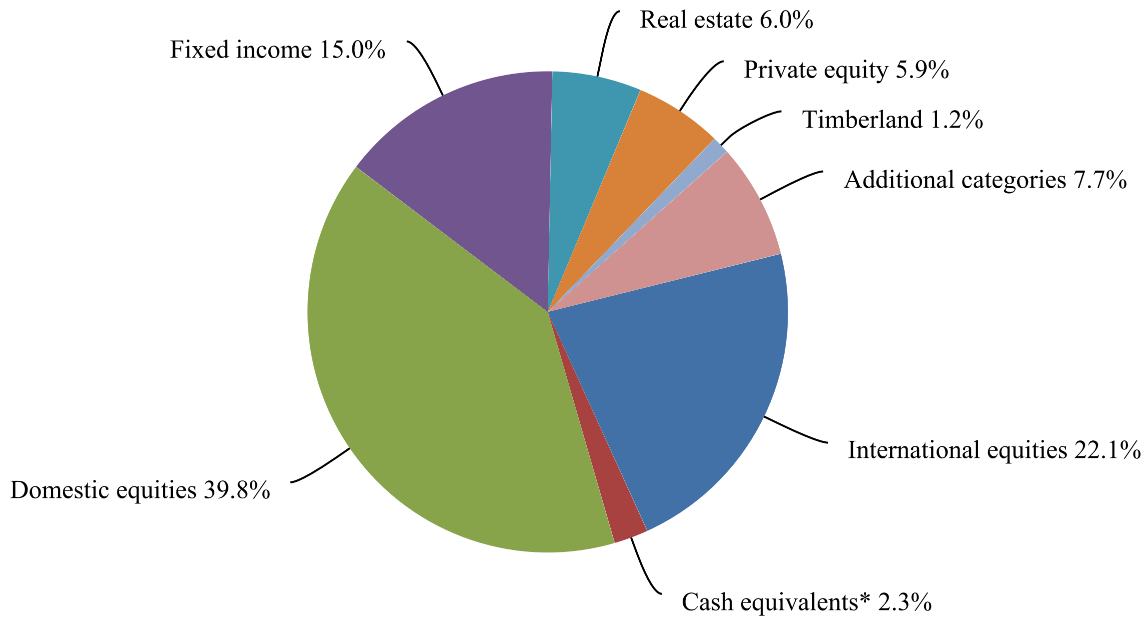
*Includes Tax Shelter Annuity value of $310,423
**Includes Tax Shelter Annuity value of $310,063 and 401(h) value of $22,754,728
***Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Life Insurance Trust

	June 30, 2020	Percent	June 30, 2019	Percent
Cash equivalents*	10,757,865	12.4	6,345,861	7.5
Fixed income	15,175,494	17.4	26,556,641	31.2
Equities	56,010,942	64.3	48,669,442	57.1
Real estate	2,399,699	2.8	2,107,202	2.5
Alternative investments	361,320	0.4	48,510	0.1
Additional categories	2,313,869	2.7	1,354,418	1.6
Totals	87,019,189	100	$ 85,082,074	100

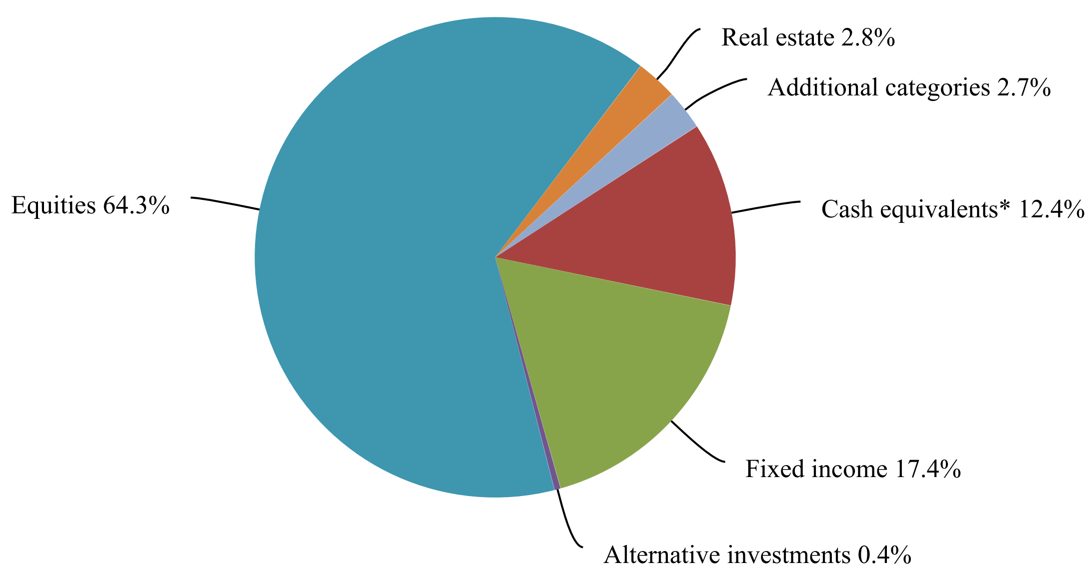
*Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.

Retirement Annuity Trust
Distribution of Investments — Fair Values as of June 30, 2020



*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, 2020



*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, 2020 (FV)*
Cash equivalents**		1-3%	2%	2.3%
Fixed income		12-19	15	15.0
Government/agency/other	Unlimited			7.8
Corporate	35%			7.2
Equity	65%	57-65	62	61.9
Domestic large cap		32-40	35	35.0
Domestic mid cap		1-5	3	3.0
Domestic small cap		1-3	2	1.8
International***	30%	18-25	22	22.1
Real estate	10%	4-10	7	6.0
Alternative investments*	10%	4-10	7	7.1
Additional categories	15%	4-10	7	7.7
Total			100%	100%

*Includes private equity and timberland.
**Reflects only cash balances not allocated to other asset classes. Any uninvested manager cash balances are represented in the asset class of the respective managers.
***As of June 30, 2020, 24.6% 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 5.8%, ahead of the policy benchmark return of 4.23%. Domestic equities returned 6.63% versus 6.08% for the Standard & Poor's 1500 Index, while international equities returned 5.64% versus -4.39% for the MSCI All Country World ex-U.S. Index. Fixed income investments outperformed, returning 10.45% versus 10.02% 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 2020 was -$1.5 million, consisting by asset class of -$1.0 million in private equity, $2.3 million in private real estate and -$2.8 million in private credit.

The table below details historical performance for the Retirement Annuity Trust and its component asset classes for the period ended June 30, 2020. 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 CAFRs 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	**5.80**	**7.48**	**7.23**	**9.59**	**6.09**
Policy benchmark**	4.23	6.97	7.21	9.25	
Equities	**6.32**	**8.01**	**7.93**	**11.83**	**5.61**
Domestic equity	**6.63**	**9.22**	**9.15**	**13.54**	**6.40**
S&P 1500 Index	6.08	9.91	10.20	13.75	5.86
All cap equities	**9.98**	**9.54**			
Russell 3000 Index	6.53	10.04			
Large cap equities	**8.16**	**9.92**	**9.53**	**13.69**	
S&P 500 Index	7.51	10.73	10.73	13.99	
Mid cap equities	**-2.35**	**6.32**	**7.86**	**12.81**	
S&P 400 Index	-6.70	2.39	5.22	11.34	
Small cap equities	**-6.76**	**2.01**	**5.25**	**12.27**	
S&P 600 Index	-11.29	0.56	4.48	11.24	
International equity	**5.64**	**5.88**	**5.47**	**7.63**	
MSCI AC World ex U.S. Index	-4.39	1.61	2.74	5.45	
Fixed income	**10.45**	**6.28**	**5.15**	**4.75**	**5.90**
Bloomberg Barclay's U.S. Government/Credit Index	10.02	5.87	4.74	4.13	5.31
Total real estate	**4.54**	**8.59**	**9.63**	**8.84**	**9.16**
In-house real estate equity	**2.83**	**8.58**	**8.81**	**8.23**	**8.61**
CPI plus 2%	2.72	3.78	3.63	3.74	4.03
Core real estate	**6.46**	**7.72**	**9.03**	**11.74**	
NCREIF ODCE Index (VW)	2.22	5.66	7.31	10.80	
Non-core real estate	**4.00**	**9.50**	**11.69**		
NCREIF Property Index	2.69	5.44	6.77		
Alternative investments					
Private equity	**0.18**	**10.65**	**9.70**	**11.75**	
Mature private equity	**-2.56**	**8.29**	**6.83**		
S&P 500 Index plus 3%	10.73	14.05	14.05		
Private equity < 5 Years	**2.07**	**12.47**	**11.98**		
Timberland	**4.36**	**0.59**	**1.94**	**3.94**	
NCREIF Timberland Index	0.34	2.28	2.71	4.39	
Additional categories	**-2.78**	**2.93**	**3.45**	**6.42**	
BofA Merrill Lynch U.S. High Yield Master II Index	-1.10	2.94	4.58	6.48	
Cash (unallocated)	**1.31**	**1.67**	**1.16**	**0.63**	**1.78**
90-day Treasury Bill	1.63	1.77	1.17	0.62	1.58
Total 30-year trust return*	**7.98**				

*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

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

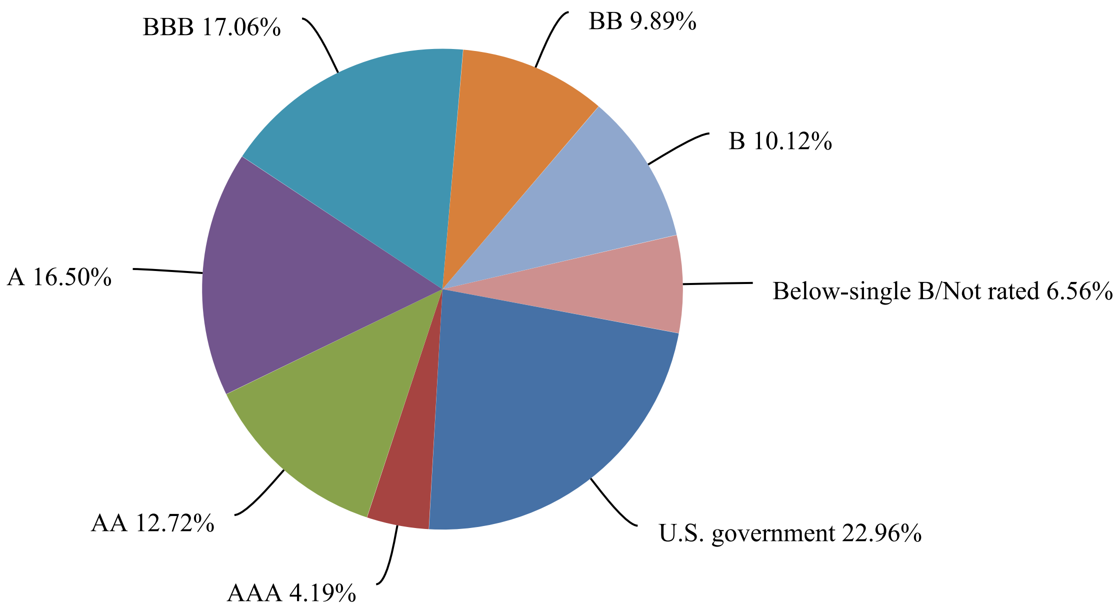
2020	6.32 %
2019	6.49

Fixed Income Investments
As of June 30, 2020, the Retirement Annuity Trust had approximately $3.1 billion, which is 15% of total assets, in fixed income. The fund's fixed income investments as of June 30, 2020, maintained the average investment grade rating required by administrative regulation.

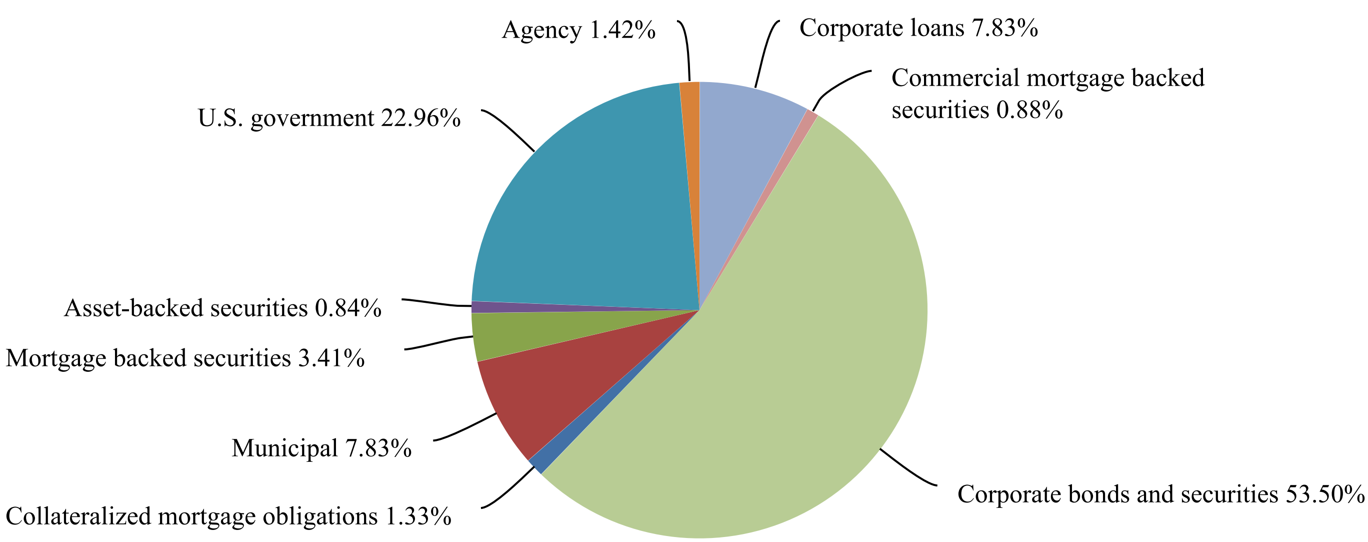
In addition, the trust had $1.58 billion, which is 7.7% of total assets, in other debt-related investments under a regulatory provision that allows for up to 15% of assets in additional categories approved by the board. Investments under this authorization included three high-yield bond portfolios and 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 10.45% for the year ended June 30, 2020. This compares favorably to the fund's benchmark, the Bloomberg Barclays U.S. Government/Credit Index, which returned 10.02%. TRS's overweighting in corporate bonds, which provided a higher coupon than government bonds of similar duration, drove the outperformance.

Solid returns masked extreme volatility throughout the year. The first seven months of the fiscal year were relatively calm. Then the COVID-19 pandemic hit, resulting in one of history's most rapid and severe market crashes for fixed income. Credit spreads widened at a frenetic pace fueled by corporate default concerns and exacerbated by investors forced to sell at the worst possible time. The Federal Reserve and U.S. government created multiple fiscal and monetary policies to help support the markets and economy. The U.S. Federal Open Market Committee (FOMC) ramped up the purchase of Treasurys starting in March and amassing over $4 trillion as of June. The FOMC began purchasing corporate bonds during the last quarter via programs it established as part of its pandemic response. The Fed ordered banks to cut dividends and halt stock buybacks following stress tests amid the prospect of an extended economic downturn where loan defaults would increase. The Fed's approach was swift intervention in recognition of the severe economic outcomes of the COVID-19 societal shutdown. The fixed income market, as a result, stabilized and the impact, while painful, was far less than the Great Recession.

In the fiscal third quarter, long Treasurys returned 20.9% while long corporates declined 4.5%, a spread of over 25%. Investment-grade corporates tightened by 1.26% during the last quarter of fiscal 2020. Industrials and utilities outperformed financials, while longer-duration corporates had higher returns than shorter-duration corporates. This quarter provided a recovery as long corporates returned 11.4% while long Treasurys returned only 0.3%. Despite the tightening of spreads, a wave of corporate defaults remains likely, as the number of defaults for companies with liabilities in excess of $50 million increased to 76, a level last seen in the Great Recession. Corporate bond issuance continued to shatter records, including, for example, $284 billion in April March, April and May stand as the top three months of issuance on record. Companies in some of the hardest hit industries such as airlines, lodging, casinos, retail and energy were able to access the debt market, helping to provide cash to fund operations.

Amid the negative trends from the ever-evolving situation from COVID-19, some bright spots were seen during the fiscal year's last quarter. The personal savings rate, which had been between 7.4% and 8.4% from 2019 to early February 2020, spiked in March as people were forced to stay home and, consequently, spent less of their income. Retail sales dropped 8% in March and 14% in April, before increasing 18% in May as states started reopening. U.S. manufacturing contracted sharply in April before improving in May and returning to growth in June. Non-farm payroll data was unprecedented with massive job losses of 20.8 million in April. Jobs slowly returned as economies reopened with 2.7 million jobs added in May and 4.8 million in June. The unemployment rate peaked at 14.7% in April before finishing the quarter at 11.1%. Despite the improvement during the last quarter, unemployment remained well above the recent low of 3.5% from February. Through late June, American workers submitted more than a million unemployment claims for 14 consecutive weeks (a record level of joblessness in the data series' 50-plus years).

Equity Investments

As of June 30, 2020, the Retirement Annuity Trust's public equity investments had a fair value of $12.7 billion, representing 61.9% of total assets. The trust's U.S. equity portfolio returned 6.63% for the fiscal year and outperformed its policy benchmark by 0.55 percentage points. The annuity trust divides its public equity into two broad categories: domestic and international.

The domestic portfolio had a fair value of $8.17 billion as of June 30, 2020, representing 39.8% 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. Twelve 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 nine portfolios are managed externally by five 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, 2020, was $4.55 billion, representing 22.1% of total assets. The Retirement Annuity Trust's international equity portfolio returned 5.64%, a 10.03 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 26 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, dominant themes from the past few quarters continued to persist, such as tariffs and trade wars. Signs of global economic weakness and geopolitical concerns caused the International Monetary Fund (IMF) to lower the global growth rate for calendar 2019 to 3% from 3.2%. Treasury yields declined due to weakened expectations of growth and inflation. Multiple maturity points on the Treasury yield curve continued to invert, with three-month bills yielding almost half a percentage point higher than 10-year bonds. An inversion of this degree has been a near-perfect indicator of an economic recession occurring within the next 12 to 18 months. The Fed took steps to mitigate concerns of a weakening economy by setting interest rates a quarter of 1% lower to a target range of 1.75% to 2%. In September, the repurchase agreement (repo) rate soared to more than 7 percentage points above the federal funds rate, restricting the availability of lendable cash in the marketplace. In response, the Fed provided liquidity by initiating open-market operations that returned the repo rate back to its expected ranges.

The S&P 500 returned 1.7%. Internationally, the MSCI All Country World ex-U.S. Index declined 1.8%, with value stocks, small-caps and developed markets outperforming growth stocks, large-caps and emerging markets, respectively. The European Central Bank cut deposit rates. The U.S. Dollar Total Weighted Index appreciated.

During the fiscal year's second quarter, all asset classes except long-duration government bonds ended higher. This period was especially strong for global equity markets, with returns ranging from high single digits to low double digits. Multiple expansion, which is exiting an investment at a higher multiple than the entrance multiple, drove most of the robust performance rather than improved fundamentals. The driver for the multiple expansion was falling discount rates and the optimism toward a U.S.-China trade deal as a result of the partial rollback of certain tariffs. Economic data released was mostly positive. Non-farm payrolls continued to grow, with job creation expanding to an average of 184,000 jobs per month in the second quarter and the unemployment rate falling to 3.5%. However, the Institute for Supply Management's (ISM) Purchase Managers Index (PMI) was below 50 for the fifth straight month, signifying a contraction. The Fed chose to leave interest rates unchanged. The S&P 500 returned 9.1% for the quarter and 31.5% for calendar 2019. Both large- and mid-caps lagged small-caps, with the Russell 2000 returning 9.9%. Growth stocks outperformed value stocks. The United States remained the largest driver of developed economies, with Japan and much of Europe continuing to struggle. Internationally, the MSCI Europe, Australasia and Far East (EAFE) Index returned 8.2% while the MSCI Emerging Market (EM) Index returned 11.8%. Growth stocks, small-caps and emerging markets outperformed value stocks, large-caps, and developed markets, respectively. The Bank of Japan and the European Central Bank left rates unchanged. The U.S. Dollar Total Weighted Index depreciated.

In the third quarter, the S&P 500 closed at a record 3,386 on Feb. 19. Over the following three weeks, the index fell 33.9% because of the reaction to COVID-19. The market began to price in severely elevated credit risks with spreads rising. Lower-quality credit assets fell in excess of 20% intramonth while investment-grade debt and high-quality structured credit also suffered severe losses. In response, the Fed announced emergency cuts, to a target range of 0% to 0.25%. In addition, the Fed announced open-ended quantitative easing alongside a host of other liquidity enhancing programs. Buoyed by these measures, the market gained 15.5% from the trough to the end of the third quarter, yet the S&P 500 still finished the quarter down 19.6%. Small- and mid-cap stocks were hardest hit with the Russell 2000 and Russell Mid-Cap indices down 30.6% and 27.1%, respectively. The most recent IMF World Economic Outlook forecasted a decrease in global gross domestic product of 3% for calendar 2020. Employment data for the three weeks ending April 4 was bleak, as 16.8 million Americans filed for jobless claims. Internationally, the MSCI EAFE Index dropped 22.8% while the MSCI EM Index lost 23.6%as value stocks significantly underperformed growth, and large-cap stocks outperformed small. Asian countries, such as China and Taiwan, buoyed emerging markets, whereas performance in Latin America was more challenged. The U.S. Dollar Total Weighted Index appreciated by nearly 10% from March 3 through March 23.

The fiscal year's fourth quarter showed the staggering disconnect between economic conditions and investor risk appetite. Governments and global central banks implemented fiscal relief and liquidity-reinforcing programs in response to COVID-19. Both the Nasdaq and the Dow Jones Industrial Average experienced their best quarter in about 20 years. The modest economic recoveries in May and June lagged significantly behind the V-shaped market recovery. Companies with investment-grade ratings issued over $1.2 trillion in debt during the first six months of calendar 2020, double the amount realized over the same period in 2019. The number of defaults for companies with liabilities in excess of $50 million increased to 76, a level last seen in 2009 during the financial crisis. Unemployment rates were lower than expected with a June unemployment rate of 11.1% and higher than anticipated non-farm payroll growth. The swift rally pushed the S&P 500 quarter-to-date returns as high as 25% in early June. The Russell 2000 and Mid-Cap indices returned 25.4% and 24.6%, respectively, while the Russell Top 200 lagged its smaller-cap counterparts, finishing the quarter up 20.9%. Internationally, the MSCI EAFE Index returned 14.9% while the MSCI EM Index returned 18.1%, with value stocks underperforming growth and small-cap stocks outperforming their larger counterparts. Government programs bolstered markets with trillions in fiscal stimulus by the European Commission and Japan. Emerging markets outpaced developed markets, with emerging countries and sectors seeing positive returns for the quarter. The U.S. Dollar Total Weighted Index depreciated slightly.

In summary, U.S. equity markets experienced historic volatility because of COVID-19. While the U.S. economy continues to be uncertain, discussion of a recession continues with better-than-expected unemployment and non-farm payrolls. Inflation increased in the third quarter to the low-end of its historical range, driven by lower interest rates. U.S. monetary policy responded quickly to the economic shutdown with low interest rates and quantitative easing alongside other liquidity-enhancing programs. Internationally, government programs supported markets with trillions in fiscal stimulus. Emerging markets outperformed developed markets but underperformed the U.S. market. Domestic equities ended the fiscal year with uncertainty and volatility, and global markets finished similarly to the American markets.

Real Estate

The Retirement Annuity Trust's real estate investments had a market value of $1.23 billion as of June 30, 2020, representing 6% of total assets. The trust's real estate investments seek to provide attractive long-term returns, generate reliable cash flow and provide diversification, thereby reducing the volatility of the overall portfolio. TRS's real estate portfolio outperformed its benchmarks for the fiscal year in each of the respective categories. The In-House Real Estate Equity Fund beat its benchmark, the

Consumer Price Index plus 2%, returning 2.83% compared to 2.72%. Core Real Estate outperformed the NCREIF ODCE 6.46% vs. 2.23%. Lastly, Non-Core Real Estate bested the NCREIF Property Index 4% to 2.69%. TRS's combined real estate investments yielded 4.54% for the 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 lease agreements with high-credit-quality tenants. TRS Kentucky also is invested in three commingled, evergreen real estate funds. Two are managed by Prudential Real Estate Investors (PRISA) and TA Realty (TA Core Property Fund). These funds are core real estate equity funds, which invest primarily in existing income-producing properties with strong cash flows and the potential for capital appreciation. While the third is invested in Carlyle Property Investors, a core-plus commingled fund. The funds are diversified across several property types including office, retail, industrial, apartment, self-storage and hotel.

Additionally, the annuity trust is invested in 16 real estate limited partnerships: Carlyle Realty Partners VI, Carlyle Realty Partners VII, Carlyle Realty Partners VIII, Blackstone Real Estate Partners VII, Blackstone Real Estate Partners VIII, Blackstone Real Estate Partners IX, Rockwood Capital Real Estate 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.

Real Estate Overview

Throughout the first two quarters of the fiscal year, U.S. real estate investment markets were robust and on track for a record year. The U.S. economic expansion was nearing 11 years, and growth was moderating amid labor shortages in nearly all sectors. U.S. real estate transactions set a record of $600 billion in 2019. At the start of 2020, occupier market fundamentals drove rent growth across most sectors — notably excluding retail.

Office market vacancies were at near 20-year lows, with moderate supply and rental growth that was decelerating but still positive. In the industrial sector, demand from both tenants and investors remained robust, driving sustained capital value growth. While supply had picked up in recent years, it remained well below historical averages — especially given record-low vacancies. Apartment supply had been running at a higher pace than other property types and higher than its average since 2013, but this was consistently matched by sustained growth in demand as household formations increased.

The only major soft spot was the retail sector, which continued to contend with store closures and a structural shift to e-commerce that adds pressure to revenues and expenses. Average capital values for retail properties that already had been falling since early 2018, led lower by malls, provided a stark contrast to the rest of the real estate market.

U.S. real estate markets weakened in the final two months of the fiscal year as the COVID-19 pandemic, with social distancing and temporary closures, impacted all major property sectors. The steep decline in economic activity signals longer-term impact for real estate fundamentals. But not all real estate assets are performing the same during the recovery. Assets that have greater human density have been the hardest hit in the short term, including regional malls, lodging and student housing.

Despite the economic downturn, the industrial market is on solid ground with low vacancy, record asking rents and positive net absorption. The pandemic increased e-commerce's share of retail sales, thereby increasing the demand for warehouse and distribution space. Overall industrial net absorption of 19.2 million square feet in the final fiscal quarter pushed the six-month total to 54.2 million square feet.

The multifamily sector performed well prior to COVID-19 and has remained remarkably stable during the fiscal year's last two quarters, with national vacancies remaining relatively tight near 6.9% at the end of the final quarter. Demand continued to grow, but at a slower pace. Net absorption in apartment markets for the quarter was 46,485 units, a modest slowing from 54,982 units in the fiscal year's third quarter, according to CoStar.

Effective rents nationally declined by 0.4% — the first such decline since the sector began its recovery after the Great Recession — as landlords offered greater rent concessions on new leases. Concessions spiked in markets experiencing elevated new supply deliveries, as projects struggled to lease in an environment of weak demand and limited mobility. Rent collections have been better than initially expected, but still underperformed pre-COVID-19 levels.

The impact of the pandemic is beginning to show up in office market fundamentals. As occupiers take a wait-and-see approach to the long-term impact of COVID-19 on office usage, demand remains weak.

With much of the country moving from the traditional workplace to the home office due to widespread shelter-in-place mandates and ongoing government distancing limitations, office leasing volume dropped nearly 50% year-over-year. This decline, combined with absorption turning negative for the first time in a decade, pushed the national vacancy rate past 10%. This threshold, last breached a few years ago, still is still below the historical average of about 11% and well below the 13%-plus rates following the Great Recession.

The retail sector was among the sectors most impacted by COVID-19, stay-at-home orders and nonessential retail store closures that went into effect late in March. Overall leasing activity came to a near halt, although activity improved after hitting a trough in mid-April. Discount retailers were among the most active lessees throughout this last half of the fiscal year.

Foot traffic at retail centers is showing tentative signs of recovery, but the steady drumbeat of retailer bankruptcies and store closures underscores the difficult road ahead. Necessity-based retailers, such as grocers, continue to exhibit the most resilience.

U.S. commercial real estate transaction activity plunged in the final quarter of fiscal 2020 as the COVID-19 crisis hindered deal making and cast a shadow on future demand for some property types. Transaction volume dropped 68% to the lowest level for the quarter since the Great Recession, according to Real Capital Analytics (RCA). Activity across all major property types tumbled. Industrial sector sales volume was half that of a year earlier, with the other property sectors faring worse. This abrupt slowdown of transactions further limited visibility into price discovery and the potential impact on property valuations in some sectors.

According to RCA, U.S. transaction volume for the three months from April through June sunk below $50 billion for the first time in about a decade, but average prices across all major property types have held firm so far. Through June, RCA's Commercial Property Price Index (All Property) was up 0.9% for the six months, led by a 3.6% year-to-date gain for industrial and a 1.7% increase for apartments.

Alternative Assets

As of June 30, 2020, the Retirement Annuity Trust's alternative asset portfolio, which consisted of private equity investments and timberland, had a market value of $1.465 billion. The percentage of the trust's portfolio invested in alternative assets was 7.1%.

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 Retirement Annuity Trust has a relatively young 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 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

Fiscal 2020 was a tale of two cities in private equity. The first six months of the fiscal year were strong for private equity, generating liquidity for limited partners and finding new and attractive places to invest capital. Deal flow was very robust across primaries, secondaries and co-investments.

The fiscal year's final half was a much different story, set in one of the most challenging and complicated environments in which to invest, monitor and operate a business as the result of COVID-19. Many firms remained in work-from-home mode as the fiscal year closed. As for investing capital, primary and secondary deal flow had been very strong through March before that changed dramatically. Secondary deals came to screeching halt while high-quality general partners continued to raise capital through the pandemic. Newer or lesser-known general partners faced a challenging headwind of travel restrictions, a recession and volatility.

Timberland
As of June 30, 2020, the Retirement Annuity Trust fund owned about 110,000 acres of timberland outright, had a 7.15% interest in a commingled fund that holds approximately 98,000 acres of timberland and is a member of a joint venture that has a current interest in about 74,000 acres of timberland across four Southern states. Timberland is, by nature, a long-term investment as our anticipated time horizon in this asset category generally is a minimum of 10 to 15 years. Timberland provides valuable diversification, current income and a balance against inflation. Due to the low correlation of returns with other asset classes, timberland investments generally 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
New residential construction finished the fiscal year's second quarter on a strong note, with starts rising approximately 17% in December to reach a 13-year high. The expansion of sawmill capacity in the South took a pause from the broad capital expenditures announced by various U.S. and Canadian operators, which should tighten supply in the long term.

The COVID-19 pandemic had a drastic, but mixed, effect on the timberland market and returns since March. Disposable paper products such as toilet paper, paper towels, tissues, masks and protective clothing saw a major increase in demand. Demand for building products was affected, as mills curtailed production in anticipation of a severe housing slowdown. Housing starts fell sharply during March and April, but then rebounded. Thanks to that rebound and demand from home improvement projects during stay-at-home orders, lumber pricing hit all-time highs. Unfortunately, the lumber pricing did not lead timber pricing higher because oversupply issues remain in the marketplace. This supply issue is expected to correct itself in the coming years if the housing market remains strong.

Timberland transactions also slowed dramatically because of the pandemic. Many property buyers put purchase plans on hold to get a better understanding of how the virus would effect timber markets. Travel restrictions also made property transactions more difficult, as potential buyers couldn't visit properties to perform physical due diligence.

Retirement Annuity Trust
Fair Values as of June 30, 2020

Internally Managed	
Cash equivalents (unallocated)	$464,341,762
Fixed income	
Broad Market Bond	775,207,994
Intermediate Bond	439,170,118
Internal Bond	182,897,846
Long Term Bond	607,003,164
403(b) Tax-Sheltered Trust	310,423
Equity	
S&P 400 Stock Index	253,552,330
S&P 500 Stock Index	2,429,307,911
S&P 600 Stock Index	184,786,917
In-house Real Estate	408,820,072
In-house High Yield	108,671,036
Subtotal	$5,854,069,573
Externally Managed	
Fixed income	
Galliard Capital Management Core Fixed	$534,182,313
Fort Washington Core Fixed Income	$542,984,264
Domestic equity	
Baillie Gifford US Equity Growth	369,941,355
Fort Washington Focused Equity	366,599,056
State Street US Premier Growth Equity	813,386,042
Todd Asset Intrinsic Value Opportunity (Alpha)	424,339,708
Todd Asset Large Cap Intrinsic Value	971,623,645
UBS Alpha Equity	308,191,501
UBS Value Oriented (Global)	856,831,962
Wellington Large Cap Equity	639,929,176
Wellington Mid Cap Equity	368,638,460
Wellington Small Cap Equity	183,613,352
International equity	
Baillie Gifford EAFE	1,526,573,085
Barings All Country World Ex US	691,691,999
BlackRock MSCI ACWI Ex US IMI Index	550,875,982
Todd Asset International Intrinsic Value	771,102,937
Todd Asset International Intrinsic Opportunity	79,361,128

continued on next page

UBS All Country World Ex US Equity	$927,378,336
Real estate	
Angelo Gordon Net Lease Realty III	46,339,955
Angelo Gordon Net Lease Realty IV	10,848,931
Blackstone Partners VII	21,433,436
Blackstone Partners VIII	48,141,800
Blackstone Partners IX	13,168,683
Carlyle Realty Partners VI	4,270,704
Carlyle Realty Partners VII	19,578,299
Carlyle Realty Partners VIII	13,987,919
Carlyle Property Investors	61,371,950
Landmark Real Estate Partners VII	19,110,215
Landmark Real Estate Partners VIII	16,755,594
Prudential PRISA	380,476,964
Rockwood Capital Real Estate IX	9,415,835
Rockwood Capital Real Estate X	35,000,595
Rockwood Capital Real Estate XI	1
TA Realty Core Property	59,315,233
The Realty Associates X	5,648,762
The Realty Associates XI	50,116,492
The Realty Associates XII	4,033,476
Alternative investments	
Actis Global IV	27,776,000
Alinda Infrastructure II	14,151,726
Apax VIII	20,525,040
Apax IX	55,751,382
Apax Digital	20,925,064
Audax Mezzanine III	4,070,642
Audax Mezzanine IV	10,150,655
Audax Private Equity IV	11,972,169
Audax Private Equity V	25,058,978
Audax Private Equity VI-A	5,888,428
CapitalSouth Partners III	814,861
Carlyle Asia Partners V	7,039,263
Carlyle Europe Partners IV	43,743,271
Carlyle Europe Partners V	6,021,297
Carlyle Global Financial Services II	22,084,486
Carlyle Global Financial Services III	17,032,255
Fort Washington V	5,297,968
Fort Washington VI	14,999,128
Fort Washington VIII	29,446,867
Fort Washington IX	21,360,379
Fort Washington IX-K	23,027,622
Fort Washington X	7,062,438
Fort Washington X-S	3,535,647
Gavea Investments V	10,480,544
Hancock Bluegrass - Oregon	28,592,975
Hellman & Friedman Capital VII	57,238,186
Hellman & Friedman Capital VIII	47,513,962
IFM Global Infrastructure	167,880,320
J.P. Morgan Global Maritime	$26,809,227
J.P. Morgan Global Maritime II	10,360,043
J.P. Morgan Global Transport Income	51,031,923
KKR 2006	6,426,666
KKR European III	3,333,166
KKR European IV	36,992,974
KKR European V	9,074,994
KKR Americas XII	26,848,137
Landmark Equity Partners XIV	4,831,903
Landmark Equity Partners XV	12,589,894
Landmark Equity Partners XVI	18,090,782
Lexington Capital Partners VII	6,606,442
Lexington Capital Partners VIII	23,846,032
Lexington Capital Partners IX	5,551,208
Molpus Lake Superior Timberlands	174,414,043
Molpus Seven States	52,546,539
NGP Natural Resources X	8,423,857
NGP Natural Resources XI	32,848,966
NGP Natural Resources XII	20,417,321
Oaktree European Principal III	15,492,191
Oaktree European Principal IV	47,518,422
Oaktree European Principal V	9,672,128
Oaktree Mezzanine III	877,160
Oaktree Mezzanine IV	19,374,091
Oaktree Mezzanine V	5,768,470
Public Pension Capital	91,650,610
Riverstone/Carlyle Energy and Power IV	3,514,964
Riverstone Energy and Power V	6,117,669
Riverstone Energy and Power VI	14,218,825
Stepstone Pioneer Capital III	10,377,525
Additional categories	
Avenue Special Situations VI	7,646,300
Barings European Loan	90,730,000
Columbia High Yield Bond	184,717,613
Fort Washington High Yield Bond	301,528,450
Highbridge Specialty Loan III	7,739,524
Lord Abbett High Yield Core	91,268,487
Marathon European Credit Opportunities II	17,150,107
Marathon European Credit Opportunities III	79,784,804
Marathon TRS Credit	327,655,526
Oaktree European Capital Solutions	31,782,486
Oaktree European Dislocation	1,418,094
Oaktree Opportunities IX	28,694,133
Oaktree Opportunities X	21,595,235
Oaktree Opportunities Xb	16,166,412
Shenkman Capital Management	262,806,574
Subtotal	$14,682,010,615
Total*	$20,536,080,188

*Includes 403(b) Tax Sheltered Trust of $310,423.

Life Insurance Trust
Fair Values as of June 30, 2020

Internally Managed		**Externally Managed**	
Cash equivalents (unallocated)	$ 10,757,865	**Domestic equity**	
		Baillie Gifford US Equity Growth	$ 5,388,514
		Fort Washington Focused Equity	1,187,905
Fixed income			
Broad Market Bond	15,175,494	**International equity**	
		Baillie Gifford EAFE	1,332,482
Equity		BlackRock All Country World ex US IMI	16,255,982
S & P 400 Stock Index	3,885,405		
S & P 500 Stock Index	27,164,941	**Real estate**	
S & P 600 Stock Index	795,713	Angelo Gordon Net Lease Realty IV	107,546
		Carlyle Property Investors	1,065,512
Additional categories		Rockwood Capital Real Estate XI	1
In-House High Yield Bond	1,078,150	TA Realty Core Property	1,186,305
		TA Realty Associates XII	40,335
Subtotal	$ 58,857,568		
		Alternative investments	
		Fort Washington X	100,893
		Fort Washington X-S	50,510
		Lexington Capital Partners IX	55,511
		Oaktree European Principal V	96,721
		Oaktree Mezzanine V	57,685
		Additional categories	
		Marathon TRS Credit	1,235,719
		Subtotal	$ 28,161,621
		Total	$ 87,019,189

Retirement Annuity Trust
Investment Summary — Fair Values*
as of June 30, 2020

	Fair Value June 30, 2019	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2020	Percent
Cash equivalents	$ 701,015,628	$ 5,489,544,815		$ 5,432,896,128	$ 757,664,315	3.7
Fixed income	3,227,674,773	2,339,771,018	223,341,373	2,848,684,830	2,942,102,334	14.3
Real estate	1,223,062,000	135,827,178	1,639,881	132,694,144	1,227,834,915	6.0
Alternative	1,359,374,419	625,624,238	(14,011,623)	505,919,310	1,465,067,724	7.1
Equities	12,288,549,261	3,817,520,226	624,501,876	4,136,808,702	12,593,762,661	61.3
Additional categories	1,432,019,602	745,628,142	(112,238,351)	516,071,576	1,549,337,817	7.6
Total	$ 20,231,695,683	$ 13,153,915,617	$ 723,233,156	$ 13,573,074,690	$ 20,535,769,766	100.0

Life Insurance Trust
Investment Summary — Fair Values
as of June 30, 2020

	Fair Value June 30, 2019	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2020	Percent
Cash equivalents	$ 13,451,099	$ 40,656,675	$	$ 41,888,199	$ 12,219,575	14.0
Fixed income	19,859,044	3,230,323	1,412,705	10,358,548	14,143,524	16.3
Equities	48,261,798	10,378,994	2,546,714	5,327,193	55,860,313	64.2
Real estate	2,107,202	253,923	81,356	42,782	2,399,699	2.8
Alternative investments	48,510	456,606	47,617	191,413	361,320	0.4
Additional categories	1,354,418	859,975	(134,099)	45,536	2,034,758	2.3
Total	$ 85,082,071	$ 55,836,496	$ 3,954,293	$ 57,853,671	$ 87,019,189	100.0

Retirement Annuity Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2020
(Dollars in thousands)

Investment Counselor Fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 9,850,078	$ 17,744	18.0
Fixed income manager(s)	1,077,167	515	4.8
Real estate	819,015	11,149	136.1
Additional categories	1,470,684	9,322	63.4
Alternative investments	1,465,068	21,059	143.7
Subtotal	$ 14,682,012	$ 59,789	40.7
Administrative Expenses**		4,274	2.1
Total		$ 64,063	31.2

*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 $20.5 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, 2020
(Dollars in thousands)

Investment Counselor Fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 24,165	$ 16	6.6
Real estate	2,400	31	
Alternative investments	361	11	324.9
Additional categories	1,236	13	102.4
Subtotal	$ 28,162	$ 71	25.3
Administrative Expenses**		165	18.9
Total		$ 236	27.1

*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, 2020

Investment counselor fees	
Fixed income	
Galliard Capital Core Fixed Income	$ 280,065
Fort Washington Core Fixed Income	234,460
Total fixed income	514,525
Domestic equity	
Baillie Gifford US Equity Growth	225,775
Fort Washington Focused Equity	1,197,948
State Street US Premier Growth Equity	800,000
Todd Asset Management	872,688
UBS Global Asset Management	1,970,030
Wellington Management Company	3,339,089
Total domestic equity	8,405,530
International equity	
Baillie Gifford EAFE	4,333,466
Barings All Country World ex US	2,876,162
BlackRock MSCI ACWI Ex US IMI Index	323,386
Todd Asset Management	485,482
UBS All Country World ex US Equity	1,320,000
Total international equity	9,338,496
Real estate	
Angelo Gordon Net Lease Realty III	906,250
Angelo Gordon Net Lease Realty IV	202,400
Blackstone Partners VII	256,727
Blackstone Partners VIII	242,841
Blackstone Partners IX	806,250
Carlyle Realty Partners VI	74,707
Carlyle Realty Partners VII	302,494
Carlyle Realty Partners VIII	653,580
Carlyle Property Investors	469,111
Landmark Real Estate Partners VII	$ 246,473
Landmark Real Estate Partners VIII	499,181
Prudential PRISA	2,804,785
Rockwood Capital Real Estate IX	409,809
Rockwood Capital Real Estate X	655,887
Rockwood Capital Real Estate XI	335,664
TA Realty Core Property	404,710
The Realty Associates X	147,807
The Realty Associates XI	1,051,960
The Realty Associates XII	678,195
Total real estate	11,148,831
Alternative investments	
Actis Global IV	737,915
Alinda Infrastructure II	130,553
Apax VIII	217,125
Apax IX	442,532
Apax Digital	879,113
Audax Mezzanine III	58,749
Audax Mezzanine IV	331,727
Audax Private Equity IV	
Audax Private Equity V	
Audax Private Equity VI	531,754
CapitalSouth Partners III	
Carlyle Asia Partners V	724,940
Carlyle Europe Partners IV	345,741
Carlyle Europe Partners V	736,315
Carlyle Global Financial Services Partners II	346,580
Carlyle Global Financial Services Partners III	658,705
Chrysalis Ventures III	96,899
Fort Washington V	52,714

Continued on next page

Fort Washington VI	$ 131,280
Fort Washington VIII	126,000
Fort Washington IX	126,000
Fort Washington IX-K	126,000
Fort Washington X	61,338
Fort Washington X-S	91,177
Gavea Investments V	172,076
Hancock Bluegrass-Oregon	230,597
Hellman & Friedman Capital VII	76,974
Hellman & Friedman Capital VIII	335,038
IFM Global Infrastructure	1,526,726
J.P. Morgan Global Maritime	568,480
J.P. Morgan Global Maritime II	124,189
J.P. Morgan Global Transport Income	435,527
KKR 2006	6,672
KKR European III	156,929
KKR European IV	245,388
KKR European V	712,426
KKR Americas XII	626,826
Landmark Equity Partners XIV	59,600
Landmark Equity Partners XV	300,000
Landmark Equity Partners XVI	500,000
Lexington Capital Partners VII	72,494
Lexington Capital Partners VIII	271,141
Lexington Capital Partners IX	721,736
Molpus Lake Superior Timberlands	918,980
Molpus Seven States	454,097
NGP Natural Resources X	296,724
NGP Natural Resources XI	603,500
NGP Natural Resources XII	715,252
Oaktree European Principal III	301,390
Oaktree European Principal IV	704,818
Oaktree European Principal V	174,102
Oaktree Mezzanine III	12,120
Oaktree Mezzanine IV	298,490
Oaktree Mezzanine V	60,712
Public Pension Capital	1,457,546
Riverstone/Carlyle Energy and Power IV	47,002

Riverstone Energy and Power V	$ 145,565
Riverstone Energy and Power VI	670,184
Stepstone Pioneer Capital III	102,299
Total alternative investments	21,058,757
Additional categories	
Avenue Special Situations VI	
Barings European Loan	425,877
Columbia High Yield Bond	686,513
Fort Washington High Yield Bond	618,454
Highbridge Specialty Loan III	(6,317)
Lord Abbett High Yield Core	97,354
Marathon European Credit Opportunities II	309,442
Marathon European Credit Opportunities III	946,860
Marathon TRS Credit	3,362,152
Oaktree European Capital Solutions	416,505
Oaktree European Dislocation	31,678
Oaktree Opportunities IX	575,929
Oaktree Opportunities X	327,116
Oaktree Opportunities Xb	454,207
Shenkman Capital Management	1,076,673
Total additional categories	9,322,443
Total investment counselor fees	59,788,582
Administrative expenses	
Custodian	
The Bank of New York Mellon	529,220
Legal and research	
Ice Miller	73,818
Other	
Other administrative and operational	3,173,837
Consultant	
Aon Hewitt	413,850
Bevis Longstreth	52,052
George Philip	31,475
Total consultant	497,377
Total administrative expenses	4,274,252
Grand total	$64,062,834

Life Insurance Trust
Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2020

Investment Counselor Fees	
Domestic equity	
Baillie Gifford US Equity Growth	$ 3,144
Fort Washington Focused Equity	2,820
Total domestic equity	5,964
International equity	
Baillie Gifford EAFE Alpha	3,783
BlackRock All Country World ex US	6,153
Total international equity	9,936
Real estate	
Angelo Gordon Net Lease Realty IV	3,317
Carlyle Property Investors	10,749
Rockwood Capital Real Estate XI	1,975
TA Realty Core Property Fund	8,014
The Realty Associates XII	6,782
Total real estate	30,837
Alternative investments	
Fort Washington X	875
Fort Washington X-S	1,302
Lexington Capital Partners IX	7,215
Oaktree European Principal V	1,741
Oaktree Mezzanine V	607
Total alternative investments	11,740
Additional categories	
Marathon TRS Credit	12,657
Total Investment Counselor Fees	$ 71,134

Administrative Expenses	
Custodian	
The Bank of New York Mellon	$ 20,197
Other	
Other Administrative and Operational	144,687
Total Administrative Expenses	$ 164,884
Grand total	$ 236,018

Retirement Annuity Trust
Ten Largest Stock Holdings Ranked by Fair Value*
June 30, 2020

		Fair Value	Percent of Equities
1	Amazon.com	$ 310,761,761	2.44
2	Apple	294,176,544	2.31
3	Microsoft Corp.	294,025,346	2.31
4	Facebook	147,411,346	1.16
5	United Health Group	114,294,305	0.90
6	Alphabet Class A	112,563,391	0.89
7	Alphabet Class C	105,214,992	0.83
8	Visa	86,037,338	0.68
9	Abbvie	71,049,528	0.56
10	JP Morgan Chase and Co.	70,483,767	0.55

*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, 2020

		Maturity	Coupon	Par Value	Fair Value	Percent of Fixed Income
1	U.S. Treasury Note	Mar. 31, 2022	0.375	$ 55,965,000	$ 56,163,938	1.82
2	U.S. Treasury Bond	Aug. 15, 2049	2.250	34,903,000	41,974,948	1.36
3	U.S. Treasury Bond	May 15, 2050	1.250	40,930,000	39,326,375	1.28
4	U.S. Treasury Bond	Aug. 15, 2023	6.250	31,900,000	37,932,340	1.23
5	U.S. Treasury Note	Jan. 31, 2022	1.375	33,460,000	34,092,603	1.11
6	U.S. Treasury Note	Oct. 31, 2024	1.500	32,335,000	34,084,324	1.11
7	U.S. Treasury Note	May 15, 2024	2.500	31,000,000	33,728,242	1.09
8	U.S. Treasury Bond	Aug. 15, 2029	6.125	22,000,000	32,864,219	1.07
9	U.S. Treasury Note	Aug. 31, 2023	2.750	25,000,000	27,021,485	0.88
10	U.S. Treasury Bond	May 15, 2040	1.125	25,100,000	24,865,668	0.81

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

Transaction Commissions for the Year Ended June 30, 2020

Companies	Shares Traded	Commissions	Commission Per Share	Percent of Total
Abel Noser	8,434,962	$ 71,076	$ 0.008	5.07
Allen & Co.	124,987	3,993	0.032	0.28
Bank of America	303,783	5,410	0.018	0.39
Bank of New York Mellon	164,566	823	0.005	0.06
Barclays	407,656	10,856	0.027	0.77
Barclays Capital, London	5,606	159	0.028	0.01
Blair, William & Co..	74,408	857	0.012	0.06
BMO Capital Markets	68,233	2,285	0.033	0.16
BTIG	475,220	14,537	0.031	1.04
Canacocrd Genuity, Inc.	32,585	927	0.028	0.07
Cantor Fitzgerald & Co.	24,856	716	0.029	0.05
CIBC Worldmarket	8,891	231	0.026	0.02
Citigroup Global	142,420	4,567	0.032	0.33
ConvergEx - Algos	10,811,404	55,408	0.005	3.95
ConvergEx - FS	3,696,814	21,439	0.006	1.53
ConvergEx - Transitions	14,469,576	72,348	0.005	5.16
ConvergEx ADR Conversions	12,989,561	192,335	0.015	13.72
Cornerstone	249,984	7,499	0.030	0.54
Cowen & Co.	1,106,717	19,248	0.017	1.37
Credit Suisse Securities	1,019,131	28,817	0.028	2.06
Cuttone & Co.	8,871	89	0.010	0.01
D A Davidson & Co.	1,387	28	0.020	0.00
Default broker	492,063	3,818	0.008	0.27
Deutsche Bank	900	5	0.006	0.00
Evercore Group	71,667	840	0.012	0.06
Fidelity Capital Markets	71,876	779	0.011	0.06
First Kentucky Securities Corp.	77,785	2,333	0.030	0.17
Freidman Billings	2,304	46	0.020	0.00
Goldman Sachs	824,235	15,918	0.019	1.14
Guggenheim Capital Markets	4,331	140	0.032	0.01
Heflin & Co.	400	3	0.008	0.00
Hilltop Securities	2,368	47	0.020	0.00
ICBC Financial Services	2,319	58	0.025	0.00
Instinet	74,637	640	0.009	0.05
Investment Tech Grp Transition	37,670,597	282,530	0.008	20.16
Investment Technology Group	8,999,429	89,356	0.010	6.38
ISI Algos	1,769,296	17,693	0.010	1.26
ISI Group	756,647	21,092	0.028	1.51
J.J.B. Hilliard, W.L. Lyons	222,832	6,685	0.030	0.48
Janney Montgomery Scott	20,133	403	0.020	0.03
Jefferies & Co.	1,005,309	14,656	0.015	1.05
JMP Securities	115,575	3,067	0.027	0.22
Jones & Associates	24,146	844	0.035	0.06
JP Morgan & Chase	734,132	15,293	0.021	1.09
Keefe Bruyette & Woods	84,302	1,968	0.023	0.14
Keybanc Capital	64,004	1,873	0.029	0.13
Leerink Swann & Co.	34,433	1,178	0.034	0.09
Liquidnet Inc	6,164,262	60,873	0.010	4.34
Liquidnet Inc - Transition	5,474,544	27,443	0.005	1.96
Luminex Trading	500	2	0.005	0.00

Continued on next page

Companies	Shares Traded	Commissions	Commission Per Share	Percent of Total
MacQuarie Securities	16,936	$ 662	$ 0.039	0.05
Merrill Lynch	4,670,318	68,899	0.015	4.92
Merrill Lynch, Pierce & Fenner	4,381	—	0.000	0.00
Mizuho Securities USA	10,606	333	0.031	0.02
MKM Partners	1,062	21	0.020	0.00
Morgan Stanley	467,433	11,059	0.024	0.79
Needham	15,952	329	0.021	0.02
Oppenheimer & Co.	35,717	1,031	0.029	0.07
Pershing	7,146	188	0.026	0.01
Pickering Energy Partners	16,932	339	0.020	0.02
Piper Jaffray	794,581	24,213	0.030	1.73
Pulse Trading	1,800	54	0.030	0.00
R W Baird	266,161	8,267	0.031	0.59
Raymond James & Assoc.	1,446,803	43,337	0.030	3.09
RBC Capital Markets	16,273,764	86,747	0.005	6.19
Result of Rights Exercise	1,299	—	0.000	0.00
Sanford C Bernstein	334,708	3,549	0.011	0.25
State Street Global	13,681	482	0.035	0.03
Stephens	65,479	1,452	0.022	0.10
Stifel, Nicolaus & Co.	672,083	20,208	0.030	1.44
Stuart Frankel	2,900	29	0.010	0.00
Suntrust Capital Markets	2,715	95	0.035	0.01
Suntrust Robinson	25,518	771	0.030	0.06
Susquehanna Brokerage	5,200	156	0.030	0.01
System Default	200	2	0.010	0.00
Tradebook	3,783,167	18,916	0.005	1.35
UBS Financial Services	199,525	2,683	0.013	0.19
UBS/Paine Webber Securities	249,164	7,228	0.029	0.52
Virtu Americas	290,714	2,447	0.008	0.18
Wall Street Access	697,538	5,336	0.008	0.38
Wedbush Morgan Securities	10,323	285	0.028	0.02
Weeden & Co.	164,489	4,946	0.030	0.35
Wells Fargo Securities	151,886	4,180	0.028	0.30
Totals*	150,086,825	$ 1,401,475	$ 0.009	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 2020, the Retirement Annuity Trust bought small capitalization IPOs that generated $192,171 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 $266 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
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

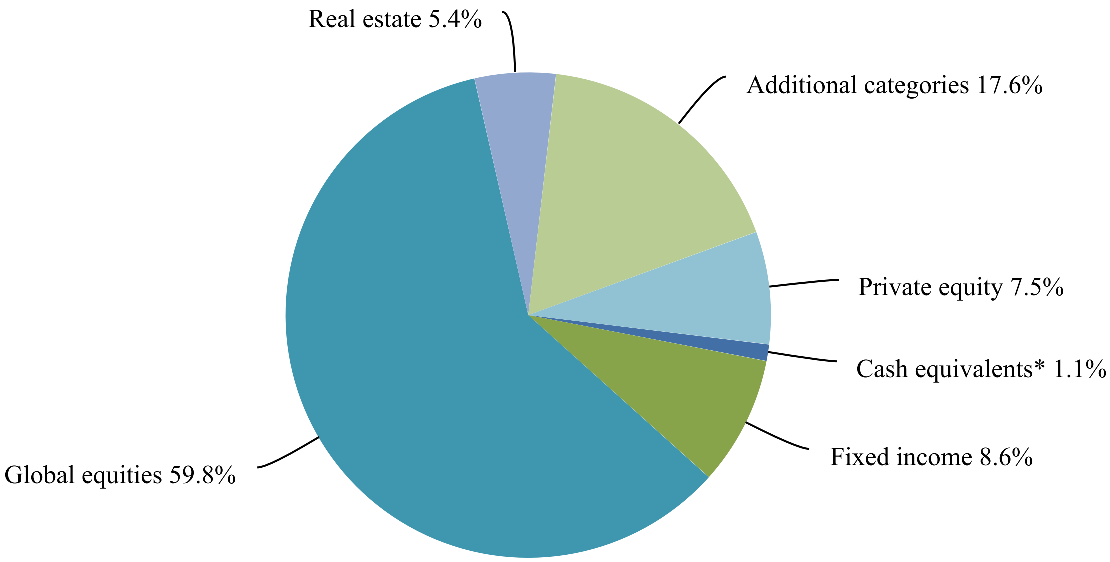
As of June 30, 2020, the Health Insurance Trust had $1.52 billion in assets. This included $131.8 million in investment-grade bonds. This trust also had $140.7 million in high-yield bonds, $914.5 million in public equity investments, $113.7 million in private equity, $43.7 million in bank loans, $85.2 million in alternative credit funds and $82.4 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, 2020 and 2019.

	June 30, 2020	Percent	June 30, 2019**	Percent
Cash equivalents*	$ 16,448,674	1.1	$ 38,615,515	2.9
Fixed income	131,887,681	8.6	119,411,206	9.1
Global equities	914,544,057	59.8	769,850,833	58.6
Real estate	82,393,040	5.4	75,296,027	5.8
Additional categories	269,584,086	17.6	207,630,407	15.8
Private equity	113,773,956	7.5	102,153,229	7.8
Totals	$ 1,528,631,494	100.0	$ 1,312,957,217	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.
**Does not include 401(h) value of $22,754,728

Distribution of Investments — Fair Values
As of June 30, 2020



*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 2020, the Health Insurance Trust's portfolio returned 2.69% versus a policy index of 2.6%. The fund's public equities returned 3.24% versus 1.17% for the MSCI All Country World IMI Index. A high-quality bond fund returned 10.4% versus 10.02% for the Barclays Government/Credit Index. This was the fifth 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 were down 2.91% versus a 1.1% loss 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 2020 was -$1.1 million, consisting by asset class of -$1.2 million in private equity, $349,600 in private real estate and -$274,100 in private credit.

Schedule of Investment Results — Gross

	1-year	3-year*	5-year*
Total Plan	**2.69**	**6.02**	**6.10**
Policy benchmark**	2.60	5.80	6.31
Equities	**3.24**	**6.46**	**6.74**
All cap equities	**17.14**	**11.18**	
Russell 3000	6.53	10.04	
Global equities	**1.57**	**5.87**	**6.48**
MSCI AC World IMI (Net)	1.17	5.55	6.11
Fixed income	**10.40**	**5.80**	**4.48**
Barclays Government Credit	10.02	5.87	4.74
Total real estate	**6.05**	**9.12**	**11.67**
Core real estate	**6.88**	**7.87**	
NCREIF ODCE (VW)	2.23	5.66	
Non-core real estate	**5.43**	**10.08**	**12.43**
NCREIF Property Index	2.69	5.44	6.77
Private equity	**-1.05**	**9.66**	**12.03**
Mature private equity	**-3.79**	**9.96**	**12.38**
S&P 500 plus 3%	10.73	14.05	14.05
Private equity < 5 Years	**-1.60**	**9.39**	
Additional categories:	**-2.91**	**2.59**	**3.28**
B of A Merrill Lynch High Yield Master II	-1.10	2.94	4.58
Cash (unallocated)	**1.32**	**1.74**	**1.19**
90-day Treasury Bill	1.63	1.77	1.17

*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

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, 2020

Internally Managed		
Cash collections (unallocated)	$	16,448,674
Fixed income		
Internal Bond		131,887,681
In-house High Yield		7,561,036
Subtotal		155,897,391
Externally Managed		
Domestic equity		
Baillie Gifford US Equity Growth		61,644,109
Fort Washington Focused Equity		40,730,010
International equity		
Blackrock B		812,169,938
Real estate		
Angelo Gordon Net Lease Realty IV		2,150,914
Blackstone Partners VIII		9,628,357
Blackstone Partners IX		1,316,869
Carlyle Realty Partners VII		3,915,659
Carlyle Realty Partners VIII		2,797,584
Carlyle Property Advisors		12,274,389
Landmark Real Estate Partners VII		3,822,043
Landmark Real Estate Partners VIII		3,351,119
Prudential PRISA		13,442,946
Rockwood Capital Real Estate X		7,000,119
Rockwood Capital Real Estate XI		1
The Realty Associates XI		10,023,299
The Realty Associates XII		806,695
TA Realty Core Property		11,863,046
Alternative investments		
Actis Global IV		2,776,000
APAX IX		11,150,281
Apax Digital		4,185,013
Audax Private Equity V		8,352,993
Carlyle Asia V		1,407,852
Carlyle Europe Partners IV		8,748,638
Carlyle Europe V	$	1,166,918
Carlyle Global Financial Services Partners III		3,406,450
Fort Washington PE Opportunities III		2,300,066
Fort Washington VII		3,178,120
Fort Washington VIII		8,413,393
Fort Washington IX		6,102,826
Fort Washington IX-K		6,579,320
Fort Washington X		1,008,920
Fort Washington X-S		505,092
KKR European IV		7,398,588
KKR European V		907,498
KKR Americas XII		5,369,622
Landmark Equity Partners XV		2,098,315
Landmark Equity XVI		3,618,157
Lexington Capital Partners IX		555,115
NGP Natural Resources XI		6,569,799
NGP Natural Resources XII		4,083,466
Oaktree European Principal IV		9,503,687
Oaktree European Principal V		967,213
Oaktree Mezzanine V		576,847
Riverstone E & P VI		2,843,767
Additional categories		
Columbia High Yield		49,292,658
Fort Washington High Yield Bond		48,406,708
Highbridge Principal Strategies III		773,953
Lord Abbett High Yield Core		35,470,085
Marathon European Credit Opportunities II		1,143,340
Marathon European Credit Opportunities III		10,637,974
Marathon TRS Credit		63,007,367
Oaktree European Capital Solutions		6,354,251
Oaktree Opportunities Xb		3,233,282
Shenkman Capital Management		43,703,432
Subtotal		1,372,734,103
Total	**$**	**1,528,631,494**

Investment Summary — Fair Values as of June 30, 2020*

	Fair Value June 30, 2019	Acquisitions	Appreciation (Depreciation)	Sales Redemptions, Maturities & Paydowns	Fair Value June 30, 2020	Percent
Cash equivalents	$ 51,350,270	$ 432,611,225	$	$ 457,052,961	$ 26,908,534	1.8
Fixed income	112,630,744	28,363,069	9,309,351	21,556,223	128,746,941	8.4
Real estate	75,296,027	16,798,905	2,834,280	12,536,172	82,393,040	5.4
Equities	768,005,547	198,968,409	29,105,334	82,068,717	914,010,573	59.8
Alternative	102,153,229	42,893,423	(2,648,282)	28,624,414	113,773,956	7.4
Additional categories	203,521,400	170,449,772	(19,343,827)	91,828,894	262,798,450	17.2
Total	$ 1,312,957,217	$ 890,084,803	$ 19,256,856	$ 693,667,381	$ 1,528,631,494	100.0

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2020

(Dollars in thousands)

Investment Counselor Fees	Assets Under Management	Expense	Basis Points*
Equity manager(s)	$ 914,544	$ 498	5.4
Fixed income manager(s)			
Real estate	82,393	1,348	163.6
Additional categories	262,023	1,381	52.7
Alternative investments	113,774	2,037	179.0
Subtotal	$ 1,372,734	$ 5,264	38.3
Administrative Expenses**		396	2.6
Total		$ 5,660	37.0

*One basis point is one hundredth of one percent or the equivalent of 0.0001. Total basis points is weighted.

**Basis points for administrative expenses are calculated against the $1.3 billion in assets under management for the trust.

Schedule of Investment Counselor Fees and Administrative Expenses
For the Year Ended June 30, 2020

Investment Counselor Fees	
Domestic equity	
Baillie Gifford US Equity Growth	$ 37,624
Fort Washington Focused Equity	133,317
Total domestic equity	170,941
International equity	
BlackRock Fund B	326,712
Total international equity	326,712
Real estate	
Angelo Gordon Net Lease Realty IV	64,448
Blackstone Partners VIII	48,568
Blackstone IX	80,625
Carlyle Realty Partners VII	60,498
Carlyle Realty Partners VIII	130,715
Carlyle Property Advisors	93,821
Landmark Real Estate Partners VII	49,165
Landmark Real Estate Partners VIII	99,836
Prudential PRISA	98,912
Rockwood Capital Real Estate X	135,177
Rockwood Capital Real Estate XI	59,235
The Realty Associates XI	210,389
The Realty Associates XII	135,639
TA Realty Core Property	81,142
Total real estate	1,348,170
Alternative investments	
Actis Global IV	73,892
APAX IX	88,506
Apax Digital	175,823
Audax Private Equity V	
Carlyle Asia V	144,988
Carlyle Europe Partners IV	69,148
Carlyle Europe V	142,697
Carlyle Global Financial Services Partners	131,740
Fort Washington PE Opportunities III	17,591
Fort Washington VII	24,601
Fort Washington VIII	36,000
Fort Washington IX	36,000
Fort Washington IX-K	36,000
Fort Washington X	8,763
Fort Washington X-S	13,026
KKR Americas XII	125,366
KKR IV	$ 49,077
KKR European V	71,242
Landmark Equity Partners XV	50,000
Landmark Equity Partners XVI	100,000
Lexington Capital Partners IX	72,175
NGP Natural Resources XI	120,700
NGP Natural Resources XII	143,051
Oaktree European Principal IV	140,964
Oaktree European Principal V	17,410
Oaktree Mezzanine V	6,070
Riverstone E & P VI	142,018
Total alternative investments	2,036,848
Additional categories	
Columbia High Yield Bond	183,362
Fort Washington High Yield Bond	96,013
Highbridge Specialty Loan III	(631)
Lord Abbett High Yield Core	36,681
Marathon European Credit Opportunities II	20,629
Marathon European Credit Opportunities III	126,248
Marathon TRS Credit	565,054
Oaktree European Capital Solutions	83,301
Oaktree Opportunities Xb	90,841
Shenkman Capital Management	179,564
Total additional categories	1,381,062
Total Investment Counselor Fees	5,263,733
Administrative Expenses	
Custodian	
The Bank of New York Mellon	95,575
Other	
Other Administrative and Operational	300,288
Total Administrative Expenses	395,863
Grand Total	$ 5,659,596

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
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

Attorneys
Ice Miller
Reinhert, Boerner, Van Deuren

Actuarial Section

Annual Valuation of the Retirement Annuity Trust

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 13, 2020

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, 2020. 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, 2023 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	36.81%
University members hired on or after July 1, 2008	37.81%
Non-University members hired before July 1, 2008	39.77%
Non-University members hired on or after July 1, 2008	40.77%

These rates represent an increase since the previous valuation in the total pension actuarially determined employer contribution rates (ADEC) of 0.51% of payroll for the fiscal year ending June 30, 2023.

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

- a decrease in the expected state special appropriation from 3.05% to 2.61%, or 0.44% of payroll
- an increase in the amount required for life insurance benefits from 0.07% to 0.08% of payroll
- the additional required increase of 0.96%, from 14.82% to 15.78%

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 3.5% annually. The assumptions recommended by the actuary and adopted by the board are reasonably related to the experience under the system and to reasonable expectations of anticipated experience under the system.

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

Board of Trustees
November 13, 2020
Page 2

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. 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, additional appropriations of $553.6 million and $538.3 million were made for fiscal years 2019 and 2020, respectively, which was enough to satisfy the actuarially determined 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 2021. **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, EA , FCA MAAA
Chief Executive Officer

Alisa Bennett,FSA,EA,FCA,MAAA
President

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, 2020		June 30, 2019
Number of active members		73,151		72,647
Annual salaries	$	3,723,482	$	3,648,428
Number of annuitants and beneficiaries		56,629		55,613
Annual allowances	$	2,198,098	$	2,124,452
Assets				
Market value	$	20,717,000	$	20,371,910
Actuarial value		20,796,494		20,154,161
Actuarial accrued liability	$	35,582,250	$	34,676,713
Unfunded actuarial accrued liability (UAAL)	$	14,785,756	$	14,522,552
Funded ratio		58.4 %		58.1 %
Amortization period (years)		24.4	$	25.4

Contribution Rates for University Members

Valuation Date	June 30, 2020		June 30, 2019	
For fiscal year ending	June 30, 2023		June 30, 2022	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Retirement Annuity Trust:				
Normal	10.570 %	10.570 %	10.690 %	10.690 %
Actuarial accrued liability	26.240	27.240	25.610	26.610
Total	36.810 %	37.810 %	36.300 %	37.300 %
Member	7.625 %	7.625 %	7.625 %	7.625 %
State (ARC)	29.185	30.185	28.675	29.675
Total	36.810 %	37.810 %	36.300 %	37.300 %
Life Insurance Trust:				
State	0.080 %	0.080 %	0.070 %	0.070 %
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	42.440 %	42.440 %	41.920 %	41.920 %
Member statutory	10.400 %	10.400 %	10.400 %	10.400 %
State statutory	13.650	13.650	13.650	13.650
Required increase	15.780	15.780 %	14.820	14.820
State special	2.610	2.610 %	3.050	3.050
Total	42.440 %	42.440 %	41.920 %	41.920 %

Contribution Rates for Non-University Members

Valuation Date	**June 30, 2020**		**June 30, 2019**	
For fiscal year ending	June 30, 2023		June 30, 2022	
	Members hired before July 1, 2008	Members hired on or after July 1, 2008	Members hired before July 1, 2008	Members hired on or after July 1, 2008
Retirement Annuity Trust:				
Normal	14.820 %	14.820 %	14.840 %	14.840 %
Actuarial accrued liability	24.950	25.950	24.420	25.420
Total	39.770 %	40.770 %	39.260 %	40.260 %
Member	9.105 %	9.105 %	9.105 %	9.105 %
State (ARC)	30.665	31.665	30.155	31.155
Total	39.770 %	40.770 %	39.26 %	40.260 %
Life Insurance Trust:				
State	0.080 %	0.080 %	0.070 %	0.070 %
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	47.350 %	47.350 %	46.830 %	46.830 %
Member statutory	12.855 %	12.855 %	12.855 %	12.855 %
State statutory	16.105	16.105	16.105	16.105
Required increase	15.780	15.780	14.820	14.820
State special	2.610	2.610	3.050	3.050
Total	47.350 %	47.350 %	46.830 %	46.830 %

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 will be prepared separately.
3. Comments on the valuation results as of June 30, 2020, 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. The assumed investment rate of return is 7.5%. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation. There have been no changes since the previous valuation.
5. Provisions of the system, as summarized in Schedule F, were taken into account in the current valuation. There have been no changes since the previous valuation.
6. 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, 2020, on the basis of which the valuation was prepared.

Group	Number		Annual Salaries *(In thousands)*
University hired before July 1, 2008	1,294	$	98,639
University hired after July 1, 2008	1,827		93,852
Non-university full time hired before July 1, 2008	30,530		2,109,507
Non-university full time hired after July 1, 2008	26,638		1,340,951
Non-university part time hired before July 1, 2008	1,563		13,321
Non-university part time hired after July 1, 2008	11,299		67,212
Total	73,151	$	3,723,482

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, 2020

Group	Number		Annual Retirement Allowances[1] *(In thousands)*
Service retirements	49,414	$	2,001,837
Disability retirements	2,848		88,179
Beneficiaries of deceased members	4,367		108,082
Total	56,629	$	2,198,098

[1]*Includes cost-of-living adjustments effective through July 1, 2020.*

In addition, there are 9,139 terminated vested employees entitled to benefits in the future and 47,609 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, 2020, the market value of Retirement Annuity Trust assets for valuation purposes held by the system amounted to $20.72 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, 2020, on a market value basis was 5.47%. 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, 2020, was $20.80 billion. The estimated investment return for the plan year ending June 30, 2020, on an actuarial value of assets basis was 7.03%, 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, 2020.

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
2020	5.5%	7.0%
2019	5.6%	7.1%
2018	10.5%	9.1%
2017	15.0%	9.3%
2016	(1.0)%	7.6%

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, 2020. 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 $17.19 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 $22.72 billion of which $650.4 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 $438.8 million. The total prospective liabilities of the system amounts to $40.35 billion. Against these liabilities, the system has present assets for valuation purposes of $20.80 billion. When this amount is deducted from the total liabilities of $40.35 billion, there remains $19.55 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 10.57% of payroll for university and 14.82% of payroll for non-university are required.
4. Prospective normal employer and employee contributions have a present value of $4.77 billion. When this amount is subtracted from $19.55 billion, which is the present value of the total future contributions to be made by the employer, there remains $14.78 billion as the amount of future unfunded actuarial accrued liability contributions.
5. The unfunded actuarial accrued liability increased by approximately $263.2 million for the plan year ending June 30, 2020, however, the funding ratio increased from 58.1% to 58.4%. 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, 0.08% of payroll will be allocated to the Life Insurance Trust. Based on the results of the valuation, an additional 15.78% 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. An additional special appropriation of 2.61% of total payroll will be made by the state. Therefore, the total actuarially determined employer contribution rate to the Retirement Annuity Trust is 29.185% for university members who become members before July 1, 2008, and 30.185% 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 30.665% for non-university

members who become members before July 1, 2008, and 31.665% for non-university members who become members on or after July 1, 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	(0.080)%	(0.080)%
Additional to comply with board funding policy	15.780	15.780
Special appropriation	2.610	2.610
Contribution to Retirement Annuity Trust	29.185%	30.185%
Total contribution to Retirement Annuity Trust	36.810%	37.810%

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	(0.080)%	(0.080)%
Additional to comply with board funding policy	15.780	15.780
Special appropriation	2.610	2.610
Contribution to Retirement Annuity Trust	30.665%	31.665%
Total contribution to Retirement Annuity Trust	39.770%	40.770%

4. The valuation indicates that normal contributions at the rate of 10.57% of active university members' salaries and 14.82% 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, is 26.24% for university members hired before July 1, 2008; 27.24% for university members hired on and after July 1, 2008; 24.95% for non-university members hired before July 1, 2008; and 25.95% for non-university members hired on and after July 1, 2008. These rates include special appropriations of 2.61% 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	10.57%	10.57%	14.82%	14.82%
Accrued liability*	26.24	27.24	24.95	25.95
Total	36.81%	37.81%	39.77%	40.77%

**Includes special appropriations of 2.61% of payroll to be made by the state.*

5. 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.

.

Total UAAL and UAAL Contribution Payment
(Dollars in thousands)

	Original UAAL	Current UAAL	Remaining Amortization Period (years)	Amortization Payment
Legacy	$ 14,010,205	$ 15,243,438	24	$ 985,971
New incremental June 30, 2015	(351,610)	(341,789)	15	(30,451)
New incremental June 30, 2016	340,766	334,601	16	28,430
New incremental June 30, 2017	(428,468)	(424,616)	17	(34,538)
New incremental June 30, 2018	(192,240)	(191,635)	18	(14,972)
New incremental June 30, 2019	53,306	53,293	19	4,011
New incremental June 30, 2020	112,464	112,464	20	8,177
Total UAAL		$ 14,785,756		$ 946,628
Blended amortization period (years)				24.4

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 15.78%, 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 15.78% of payroll for the fiscal year ending June 30, 2023, 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

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 $263.2 million in the unfunded actuarial accrued liability from $14.52 billion to $14.78 billion during the year ending June 30, 2020. The increase in the unfunded actuarial accrued liability was primarily due to demographic losses in turnover and retirement, as well as investment return on an actuarial value basis that was less than expected. These losses were partially offset by a gain in 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	$ 1,089,191
Expected accrued liability contribution	(961,029)
Experience:	
Valuation asset growth	92,211
Pensioners' mortality	33,916
Turnover and retirements	70,319
New entrants	44,463
Salary increases	(105,867)
Amendments	0
Assumption changes	0
Method changes	0
Total	$ 263,204

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, 2020

Group	Number
Retirees and beneficiaries currently receiving benefits	56,629
Terminated vested employees entitled to benefits but not yet receiving benefits	9,139
Inactive non-vested members	47,609
Active plan members	73,151
Total	186,528

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)
2011	$ 14,908,138	$ 25,968,692	$ 11,060,554	57.4 %	$ 3,451,756	320.4 %
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

* *Reflects change in assumptions and methods.*

3. The information presented above was determined as part of the actuarial valuation at June 30, 2020. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2020	Actuarial Assumptions:
Actuarial cost method	Entry age	Investment rate of return* 7.5%
Amortization method	Level percent of pay, closed	Projected salary increases** 3.5 - 7.3%
Remaining amortization period	24.4 years	
Asset valuation method	Five-year smoothed market	Cost-of-living adjustments 1.5% annually

**Includes price inflation at 3%*

***Includes wage inflation at 3.5%*

Schedule of Employer Contributions

Fiscal Year Ended June 30	Actuarially Determined Employer Contributions	Actual Employer Contributions	Percentage Contributed
2011*	$ 678,741,428	$ 1,037,935,993	153
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

**Includes pension obligation bond proceeds of $465,384,165.*

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, 7.5%, 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 3% and the wage inflation assumption is held constant at 3.5%.
- **Table 2** - The price inflation assumption sensitivity analysis shows the valuation results with the baseline underlying price inflation rate assumption, 3%, together with decreases in the price inflation rate to 2.75% and 2.5%. Under this scenario, the decrease in the underlying price inflation rate assumption leads to corresponding decreases in the discount rate (7.25% and 7%, respectively), the wage inflation assumption (3.25% and 3%, 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, 3.5%, together with decreases in the wage inflation assumption to 2% 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, 2020
(Dollars in thousands)

	Decrease Discount Rate	Valuation Results	Increase Discount Rate
Actuarial accrued liability	$ 39,646,802	$ 35,582,250	$ 32,170,538
Actuarial value of assets	20,796,494	20,796,494	20,796,494
Unfunded actuarial accrued liability	$ 18,850,308	$ 14,785,756	$ 11,374,044
Funded ratio	52.5%	58.4%	64.6%
Employer ADEC - university*	38.815%	30.185%	22.675%
Employer ADEC - non-university*	40.295%	31.665%	24.155%
Discount rate	6.5%	7.5%	8.5%
Wage inflation rate	3.5%	3.5%	3.5%
Price inflation rate	3%	3%	3%

** Less 1% for members hired before July 1, 2008*

Table 2
Price Inflation Assumption Sensitivity Analysis
As of June 30, 2020
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 35,582,250	$ 36,409,033	$ 37,270,778
Actuarial value of assets	20,796,494	20,796,494	20,796,494
Unfunded actuarial accrued liability	$ 14,785,756	$ 15,612,539	$ 16,474,284
Funded ratio	58.4 %	57.1 %	55.8 %
Employer ADEC - university*	30.185 %	32.255 %	34.425 %
Employer ADEC - non-university*	31.665 %	33.735 %	35.905 %
Discount rate	7.5 %	7.25 %	7 %
Wage inflation rate	3.5 %	3.25 %	3 %
Price inflation rate	3 %	2.75 %	2.5 %

** Less 1% for members hired before July 1, 2008*

Table 3
Wage Inflation Assumption Sensitivity Analysis
As of June 30, 2020
(Dollars in thousands)

	Valuation Results	Decrease Wage Inflation to 2%	No Wage Inflation
Actuarial accrued liability	$ 35,582,250	$ 35,582,250	$ 35,582,250
Actuarial value of assets	20,796,494	20,796,494	20,796,494
Unfunded actuarial accrued liability	$ 14,785,756	$ 14,785,756	$ 14,785,756
Funded ratio	58.4%	58.4%	58.4%
Employer ADEC - university*	30.185%	34.395%	40.685%
Employer ADEC - non-university*	31.665%	35.875%	42.165%
Discount rate	7.5%	7.5%	7.5%
Wage inflation rate	3.5%	2%	0%
Price inflation rate	3%	3%	3%

** Less 1% for members hired before July 1, 2008*

Schedule A

Valuation Balance Sheet
Showing the Present and Prospective Assets and Liabilities
As of June 30, 2020
(In thousands)

Actuarial Liabilities

(1)	Present value of prospective benefits payable on account of present active members	$ 16,088,383	
	- Service retirement benefits		
	- Disability retirement benefits	707,182	
	- Death and survivor benefits	129,283	
	- Refunds of member contributions	269,828	
	Total		$ 17,194,676
(2)	Present value of prospective benefits payable on account of present retired and disabled members, and beneficiaries of deceased members		
	- Service retirement benefits	$ 20,997,811	
	- Disability retirement benefits	837,243	
	- Death and survivor benefits	884,806	
	Total		$ 22,719,860
(3)	Present value of prospective benefits payable on account of inactive members and members entitled to deferred vested benefits		$ 438,783
(4)	Total Actuarial Liabilities		$ 40,353,319

Present and Prospective Assets

(5)	Actuarial value of assets	$ 20,796,494
(6)	Present value of total future contributions = (4)-(5)	$ 19,556,825
(7)	Present value of future member contributions and employer normal contributions	$ 4,771,069
(8)	Prospective unfunded accrued liability contributions = (6)-(7)	$ 14,785,756
(9)	Total Present and Prospective Assets	$ 40,353,319

Solvency Test
(Dollars in millions)

Valuation Date June 30	(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)
	Aggregate Actuarial Accrued Liability for						
2011	$3,325.7	$15,557.9	$7,085.1	$14,908.1	100 %	74 %	0 %
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

Schedule B

Development of Actuarial Value of Assets

(1)	Actuarial value of assets beginning of year		$ 20,154,160,629
(2)	Net position at market value at end of year		20,717,000,324
(3)	Net position at market value at beginning of year		20,371,909,905
(4)	Cash flow		
	a.	Contributions	1,458,945,150
	b.	Benefit payments	2,195,711,458
	c.	Administrative expense	12,166,651
	d.	Net: (4)a - (4)b - (4)c	(748,932,959)
(5)	Investment income		
	a.	Market total: (2) - (3) - (4)d	1,094,023,378
	b.	Assumed rate	7.5 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	1,499,808,257
	d.	Amount for phased-in recognition: (5)a - (5)c	(405,784,879)
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	(81,156,976)
	b.	First prior year	(77,474,783)
	c.	Second prior year	115,121,921
	d.	Third prior year	247,314,724
	e.	Fourth prior year	(312,346,804)
	f.	Total recognized investment gain	(108,541,918)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		$ 20,796,494,009
(8)	Difference between market & actuarial values: (2) - (7)		$ (79,493,685)
(9)	Net investment rate of return on actuarial value		7.03 %

Schedule C

Summary of Receipts & Disbursements*
(Market Value)

	For the Year Ending	
Receipts for the Year	**June 30, 2020**	**June 30, 2019**
Contributions		
Members	$ 324,664,055	$ 321,172,166
Employers	1,134,281,095	1,123,034,823
Total	1,458,945,150	1,444,206,989
Net investment income	1,094,023,378	1,085,189,349
Total	2,552,968,528	2,529,396,338
Disbursements for the Year		
Benefit payments	2,167,239,241	2,094,364,072
Refunds to members	28,472,217	32,403,149
Miscellaneous, including expenses	12,166,651	12,352,308
Total	2,207,878,109	2,139,119,529
Excess of Receipts over Disbursements	345,090,419	390,276,809
Reconciliation of Net Position		
Net position as of the beginning of the year	20,371,909,905	19,981,633,096
Excess of receipts over disbursements	345,090,419	390,276,809
Net position as of the end of the year	$ 20,717,000,324	$ 20,371,909,905
Net investment rate of return on market value	5.5 %	5.6 %

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

Schedule D

Outline of Actuarial Assumptions and Methods

The assumptions and methods used in the valuation were selected based on the actuarial experience study prepared as of June 30, 2015, submitted to and adopted by the board on Sept. 19, 2016.

Investment Rate of Return: 7.5% per annum, compounded annually, including price inflation at 3% per annum.

Salary increases: Representative values of the assumed annual rates of future salary increases are as follows and include wage inflation at 3.5% per annum:

Age	20	25	30	35	40	45	50	55	60	65
Annual Rate	7.2 %	6.4 %	5.4 %	4.7 %	4.2 %	3.8 %	3.7 %	3.5 %	3.5 %	3.5 %

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	0.019 %	0.01%	11.00 %				
25	0.021	0.01	11.00	3.00%			
30	0.025	0.01	11.00	3.00	3.00%		
35	0.043	0.04	12.00	3.50	1.40		
40	0.060	0.09	12.00	4.50	1.40		
45	0.084	0.20	12.00	4.50	1.30		17.0%
50	0.119	0.30	14.00	4.50	1.90		17.0
55	0.202	0.58	15.00	4.50	2.40	5.0%	45.0
60	0.340	0.75	15.00	4.00	2.40	13.0	35.0
62	0.419	0.75	15.00	3.80	2.40	15.0	25.0
65	0.565	0.75	15.00	3.50	2.40	20.0	25.0
70	0.913	0.75	20.00	0.00	0.00	20.0	20.0
75	1.556	0.75	20.00	0.00	0.00	100.0	100.0

**Plus 7.5% 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	0.007 %	0.01 %	9.00 %				
25	0.008	0.01	9.00	4.00 %			
30	0.010	0.03	12.00	4.00	1.65 %		
35	0.018	0.06	12.00	4.00	1.50		
40	0.026	0.12	12.00	4.00	1.30		
45	0.042	0.25	13.00	4.00	1.20		15.0 %
50	0.062	0.44	13.00	5.00	1.50		18.0
55	0.096	0.65	15.00	5.00	2.00	5.5 %	50.0
60	0.157	0.85	15.00	5.00	2.00	14.0	40.0
62	0.197	0.85	15.00	4.60	2.00	14.0	40.0
65	0.287	0.85	15.00	4.00	2.00	22.0	35.0
70	0.495	0.85	15.00	0.00	0.00	20.0	35.0
75	0.831	0.85	15.00	0.00	0.00	100.0	100.0

**Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.*

Deaths After Retirement — The RP-2000 Combined Mortality Table projected to 2025 using scale BB (set forward two years for males and one year for females) is used for death after service retirement and beneficiaries. The RP-2000 Disabled Mortality Table (set forward two years for males and seven years for females) is used for death after disability retirement. There is a margin for future mortality improvement in the tables used by the system. Based on the results of the most recent experience study adopted by the board on Sept. 19, 2016, the numbers of expected future deaths are 15-19% less than the actual number of deaths that occurred during the study period for healthy retirees and 13-17% less than expected under the selected table for disabled retirees. 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	
Age	**Male**	**Female**	**Male**	**Female**
45	0.1609 %	0.1135 %	2.3306 %	1.2482 %
50	0.2474	0.1718	2.9279	1.5650
55	0.4246	0.2658	3.4400	1.7807
60	0.6985	0.4409	3.5881	2.3164
65	1.1300	0.8100	3.8275	3.1687
70	1.8697	1.3739	4.7566	4.4032
75	3.2147	2.2899	6.3153	6.0857
80	5.5160	3.7551	8.3527	8.4679
85	9.5631	6.3873	10.9122	12.7572
90	17.2787	11.2476	17.2787	19.4718
95	27.1263	18.1190	27.1263	24.2074

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 7.5%. The amount recognized each year is 20% of the difference between market value and expected actuarial value.

Expense Load — None.

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

Loads — Unused sick leave: 2% of active liability.

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 (currently at 7.5%), 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, 2020. 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.

Table 1

Age - Service Table

Distribution of Active Members as of June 30, 2020

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	1,644	1,754	4							3,402	82,097,488
25 to 29	963	4,538	1,801							7,302	292,413,583
30 to 34	660	1,914	4,403	1,546	3					8,526	408,737,279
35 to 39	645	1,540	2,187	4,310	1,627	2				10,311	556,918,177
40 to 44	604	1,244	1,362	2,058	4,210	1,270	5			10,753	630,994,996
45 to 49	450	946	1,046	1,422	2,042	3,849	1,095	2		10,852	683,664,756
50 to 54	614	713	674	988	1,316	1,844	2,184	368	3	8,704	537,397,081
55 to 59	881	844	432	583	877	941	854	248	42	5,702	297,546,435
60 to 64	772	938	318	255	455	464	360	112	50	3,724	149,382,482
65 to 69	605	820	270	126	138	173	130	50	47	2,359	60,865,741
70 & Over	407	610	266	72	56	37	33	14	21	1,516	23,463,558
Total Count	8,245	15,861	12,763	11,360	10,724	8,580	4,661	794	163	73,151	3,723,481,576

Average Age: 43.8

Average Service: 11.1

Table 2

Schedule of Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2011	76,349	$ 3,451,756,287	$ 45,210	3.97
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

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	842	$ 10,508,714	$ 12,481
50 - 54	1,559	64,582,634	41,426
55 - 59	4,207	186,408,305	44,309
60 - 64	7,274	308,255,456	42,378
65 - 69	11,727	482,331,176	41,130
70 - 74	13,753	537,860,706	39,109
75 - 79	8,176	308,673,013	37,754
80 - 84	4,798	168,549,094	35,129
85 - 89	2,691	86,189,692	32,029
90 - 94	1,212	35,037,099	28,908
95 & Over	390	9,702,024	24,877
Total	56,629	$ 2,198,097,913	$ 38,816

Average Current Age: **70.4**

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

Table 4

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

Year Ended June 30	Add to Rolls		Removed from Rolls		Rolls at End of Year		Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances *(In millions)*	Number	Annual Allowances *(In millions)*	Number	Annual Allowances *(In millions)*		
2011	2,133	$ 98.9	848	$ 17.7	44,419	$ 1,433.4	6%	$ 32,270
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	34.0	56,629	2,198.1	3.5%	38,816

Schedule G

20-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 (twenty 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 provided on the following page.

Active Employee Growth Rate — 0%

Valuation Discount Rate — 7.5%

Investment Rate of Return — 7.5% 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 24.4-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.

20-Year Baseline Projection

(Dollars in thousands)

Fiscal Year End	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Actuarially Determined Contribution
2023	$ 3,716,763	$ 188,454	$ 3,905,217	$ 14,785,756	58.4%	$ 1,210,385
2024	3,810,973	188,452	3,999,425	14,650,560	59.6	1,229,553
2025	3,907,520	189,788	4,097,308	14,877,747	59.9	1,278,091
2026	4,003,397	191,807	4,195,204	15,210,791	59.9	1,338,585
2027	4,098,744	194,531	4,293,275	15,467,177	60.1	1,395,827
2028	4,194,908	198,021	4,392,929	15,617,027	60.5	1,449,944
2029	4,295,997	201,887	4,497,884	15,721,663	61.0	1,507,464
2030	4,400,886	205,828	4,606,714	15,778,267	61.7	1,566,858
2031	4,509,648	210,000	4,719,648	15,786,666	62.4	1,627,370
2032	4,623,125	214,241	4,837,366	15,742,286	63.2	1,692,458
2033	4,741,595	218,364	4,959,959	15,638,654	64.0	1,758,709
2034	4,863,604	223,292	5,086,896	15,467,326	65.0	1,826,947
2035	4,993,467	227,687	5,221,154	15,223,595	66.1	1,899,024
2036	5,129,751	232,104	5,361,855	14,894,761	67.4	1,973,468
2037	5,273,440	237,377	5,510,817	14,474,653	68.8	2,051,322
2038	5,425,178	242,986	5,668,164	13,950,121	70.4	2,186,112
2039	5,585,919	249,262	5,835,181	13,311,620	72.1	2,223,629
2040	5,755,718	255,985	6,011,703	12,548,475	74.1	2,376,657
2041	5,935,708	263,325	6,199,033	11,592,219	76.4	2,500,570
2042	6,125,444	270,819	6,396,263	10,529,322	78.9	2,596,353

Annual Valuation of the Health and Life Insurance Trusts

Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

November 12, 2020

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, 2020. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

The valuation indicates a total actuarially determined contribution of 3.54% as of percentage of active member payroll for the health trust payable for the fiscal year ending June 30, 2021 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 0.765% and (0.21)% respectively, as the remaining actuarially determined contribution. This actuarially determined contribution reflects the actuarial value of assets of the Health Insurance Trust and an 8% 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. Beginning in plan year 2021, the Medicare Advantage plan premium rates exclude the Affordable Care Act Health Insurer Fee, which was repealed on December 20, 2019, resulting in lower claims projections.

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 0.08% of active member payroll payable for the fiscal year ending June 30, 2023, 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 7.5% 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 20-year period for the retiree medical plan and a 24-year period for the life insurance plan, on the assumption that payroll will increase by 3.5% 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.

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144
Phone (678) 388-1700 • Fax (678) 388-1730
www.CavMacConsulting.com
Offices in Englewood, CO • Kennesaw, GA • Bellevue, NE

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

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, 2020	June 30, 2019
Number of active members	73,151	72,647
Annual salaries	$ 3,723,482	$ 3,648,428
Number of deferred vested members	7,270	7,268
Number of annuitants in medical plans	41,154	40,711
Number of spouses and beneficiaries in medical plans*	6,883	7,569
Total	48,037	48,280
Assets:		
Market value	$ 1,616,675	$ 1,414,020
Actuarial value	$ 1,700,968	$ 1,442,522
Unfunded actuarial accrued liability	$ 1,056,685	$ 1,690,680
Funded ratio based on actuarial value of assets	61.7 %	46.0 %
Amortization period (years)	20	21
Discount rate	8 %	8 %

* *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, 2020		June 30, 2019	
Contribution For Fiscal Year Ending	June 30, 2021		June 30, 2020	
	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	1.48%	1.48%	1.62%	1.62%
Accrued liability	2.06	2.06	3.27	3.27
Total	3.54%	3.54%	4.89%	4.89%
Member	2.775%	2.775%	2.775%	2.775%
Employer (ARC)	2.775	1.775	2.775	1.775
State (ARC)	2.320	2.320	2.190	2.190
Statutorily Required Prefunding*	(4.330)	(3.330)	(2.850)	(1.850)
Total	3.540%	3.540%	4.890%	4.890%

**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, 2020**		**June 30, 2019**	
Contribution For Fiscal Year Ending	June 30, 2021		June 30, 2020	
	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	1.48%	1.48%	1.62%	1.62%
Accrued liability	2.06	2.06	3.27	3.27
Total	3.54%	3.54%	4.89%	4.89%
Member	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	3.000	3.000	3.000	3.000
State (ARC)	2.320	2.320	2.190	2.190
Statutorily Required Prefunding*	(5.530)	(5.530)	(4.050)	(4.050)
Total	3.540%	3.540%	4.890%	4.890%

**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, 2020**		**June 30, 2019**	
Contribution For Fiscal Year Ending	June 30, 2021		June 30, 2020	
	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	1.48%	1.48%	1.62%	1.62%
Accrued liability	2.06	2.06	3.27	3.27
Total	3.54%	3.54%	4.89%	4.89%
Member	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	3.750	2.750	3.750	2.750
State (ARC)	2.320	2.320	2.190	2.190
Statutorily Required Prefunding*	(6.280)	(5.280)	(4.800)	(3.800)
Total	3.540%	3.540%	4.890%	4.890%

**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, 2020**	**June 30, 2019**
Number of active members	73,151	72,647
Annual salaries	$ 3,723,482	$ 3,648,428
Number of vested former members	9,139	8,992
Number of retirees in life insurance plan	52,262	51,438
Assets:		
Market value	$ 87,368	$ 85,758
Actuarial value	$ 92,229	$ 92,506
Unfunded actuarial accrued liability*	$ 29,965	$ 24,979
Funded ratio based on actuarial value of assets	75.5 %	78.7 %
Amortization period (years)	24	25
Discount rate	7.5 %	7.5 %

Life Insurance Contribution Rates

Contribution for fiscal year ending	**June 30, 2023**	**June 30, 2022**
Normal	0.03 %	0.03 %
Accrued liability	0.05	0.04
Total	0.08 %	0.07 %

** 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 3.54% of active member payroll would be sufficient to support the current benefits of the retiree medical plan and state contributions of 0.08% of active member payroll would be sufficient to support the current benefits of the life insurance plan. Comments on the valuation results as of June 30, 2020, 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 8% for health trust and 7.5% 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. Beginning in plan year 2021, the MAPD plan premium rates exclude the ACA Health Insurer Fee, which was repealed on December 20, 2019, resulting in lower claim projections.
5. The impact of COVID-19 pandemic was considered in this valuation, however, no changes were incorporated at this time due to the level of uncertainty regarding the impact on both plan costs and contribution levels going forward. Given the uncertainty regarding COVID-19 (e.g., the impact of routine care being deferred, direct COVID-19 treatment and prevention costs, changes in contribution and budget projections), continued monitoring of the impact on the plan's liability will be required.
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, 2020, upon which the valuation was based. Detailed tabulations of the data are given in Schedule F.

Active Members as of June 30, 2020

(Dollars in thousands)

Group	Number	Annual Salaries
University Full Time hired before July 1, 2008	1,294	$ 98,639
University Full Time hired after July 1, 2008	1,827	93,852
Non-University Full Time hired before July 1, 2008	30,530	2,109,507
Non-University Full Time hired after July 1, 2008	26,638	1,340,951
Non-University Part Time hired before July 1, 2008	1,563	13,321
Non-University Part Time hired after July 1, 2008	11,299	67,212
Total	73,151	$ 3,723,482

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, 2020

	Under Age 65	Age 65 and Over	Total
Number	9,934	31,220	41,154
Average Age	59.6	74.6	70.9

Spouses Receiving Health Benefits as of June 30, 2020

Number	1,925	4,958	6,883
Average Age	60.0	75.0	70.8

3. The retiree medical plan valuation includes 7,270 deferred vested members eligible for health care at age 60 and the life insurance plan valuation includes 9,139 deferred vested members eligible for retiree life insurance at age 60.

Section III — Assets

1. As of June 30, 2020, the market value of Health Insurance Trust assets held by the retiree medical plan amounted to $1.62 billion and the market value of Life Insurance Trust assets held by the life insurance plan amounted to $87.4 million. The estimated market investment return for the plan year was 2.3% for the Health Insurance Trust and 6.32% for the Life Insurance Trust.
2. The five-year market related value of health trust assets used for valuation purposes as of June 30, 2020 was $1.7 billion and the five-year market related value of Life Insurance Trust assets used for valuation purposes as of June 30, 2020 was $92.2 million. Schedule B shows the development of the actuarial value of assets as of June 30, 2020.
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 $1.4 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 $41.4 million. The liability on account of benefits payable to retirees and covered

spouses amounts to $1.31 billion. The total actuarial accrued liability of the retiree medical plan amounts to $2.76 billion. Against these liabilities, the retiree medical plan has present assets for valuation purposes of $1.7 billion. When this amount is deducted from the actuarial accrued liability of $2.76 billion, there remains $1.06 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 $54.9 million, or 1.48% of payroll.
4. The valuation shows that the life insurance plan has an actuarial accrued liability of $18.68 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 $4.04 million. The liability on account of benefits payable to retirees amounts to $99.5 million. The total actuarial accrued liability of the life insurance plan amounts to $122.2 million. This amount includes liability for death in active service. The liability for death in active service could be segregated from the OPEB liability and assets could be split for active and post-employment purposes. As this could be administratively burdensome and, as death in active service liabilities can be considered de minimis, we will consider the entire liability an OPEB liability under GASB 74 and 75. Against these liabilities, the life insurance plan has present assets for valuation purposes of $92.2 million. When this amount is deducted from the actuarial accrued liability of $122.2 million, there remains $30 million as the unfunded actuarial accrued liability for the life insurance plan.
5. The normal contribution is equal to the actuarial present value of benefits accruing during the current year. The normal contribution for the life insurance plan is determined to be $1.2 million, or 0.03% of payroll.

Section V — Derivation of Experience Gains and Losses

1. Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) for the year ended June 30, 2020, is shown below (dollars in thousands).

	Experience Gain/(Loss)* of the:	Health Insurance Trust	Life Insurance Trust
(1)	UAAL as of June 30, 2019	$ 1,690,680	$ 24,979
(2)	Normal cost from last valuation	59,226	1,209
(3)	Expected employer contributions	178,446	1,768
(4)	Interest accrual: [(1) + (2)] x .080 - (3) x .080/2 for MIF [(1) + (2)] x .075 - (3) x .075/2 for LIF	132,855	1,898
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	$ 1,704,315	$ 26,318
(6)	Change due to claims experience	(533,032)	
(7)	Expected UAAL after changes: (5) + (6)	$ 1,171,283	$ 26,318
(8)	Actual UAAL as of June 30, 2020	1,056,685	29,965
(9)	Total gain/(loss): (7) - (8)	114,598	(3,647)
	(a) Contribution and investment gain/(loss)	109,287	(3,533)
	(b) Experience gain/(loss) (9) - (9a)	5,311	(114)
(10)	Accrued liabilities as of June 30, 2019	$ 3,133,202	$ 117,485
(11)	Experience gain/(loss) as percent of actuarial accrued liabilities at start of year (9b) / (10)	0.2%	(0.1)%

* *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, 2020, 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 20-year period as a level percentage of payroll, the valuation indicates employer and state contributions of .765% of payroll for university employees and (.21)% of payroll for all other members.

3. The state is scheduled to contribute 0.07% of salary to the Life Insurance Trust for the fiscal year ending June 30, 2022. Based upon the amortization of the unfunded actuarial liability over a 24-year period as a level percentage of payroll, CMC's valuation indicates a contribution of 0.08% for the fiscal year ending June 30, 2023, is required to support sufficiently the benefits of the life insurance plan

.

Required Contribution Rates
For Fiscal Year Ending June 30, 2020
Health Insurance Trust

Normal	1.48 %
Accrued liability	2.06 %
Total	3.54 %

	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	2.320	2.320	2.320	2.320	2.320	2.320
Statutorily Required Prefunding*	(4.330)	(3.330)	(5.530)	(5.530)	(6.280)	(5.280)
Total	3.540 %	3.540 %	3.540 %	3.540 %	3.540 %	3.540 %

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

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

4. The valuation indicates that a total normal contribution of 1.48% of payroll is required to meet the cost of benefits currently accruing under the retiree medical plan and 0.03% of payroll is required to meet the cost of benefits currently accruing under the life insurance plan. The difference between the total contribution and the normal contribution remains to be applied toward the liquidation of the unfunded actuarial accrued liability. This accrued liability payment is 2.06% of payroll for the retiree medical plan and 0.05% of payroll for the life insurance plan.
5. The unfunded actuarial accrued liability amounts to $1.06 billion for the retiree medical plan and $30 million for the life insurance plan as of the valuation date. An accrued liability contribution rate of 2.06% of payroll for the retiree medical plan and 0.05% of payroll for the life insurance plan is sufficient to amortize the unfunded actuarial accrued liabilities over a 20-year period for the retiree medical plan and a 24-year period for the life insurance plan, based on the assumption that the payroll will increase by 3.5% annually.

Section VII — Comments on the Level of Funding

1. 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, and years of service at retirement. Additionally, beneficiary contributions may vary by 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 contributions of .765% 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 20 years. For the remaining membership, a member contribution of 3.75% of payroll together with employer and state contributions of (.21)% of payroll is required to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability over a period of 20 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, 2020

Group	Number
Retirees currently receiving health benefits	41,154
Spouses of retirees currently receiving health benefits	6,883
Terminated employees entitled to benefits but not yet receiving benefits	7,270
Active plan members	73,151
Total	128,458

Number of Active and Retired Members in Life Insurance Plan as of June 30, 2020

Group	Number
Retirees	52,262
Terminated employees	9,139
Active plan members	73,151
Total	134,552

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]
2011	$ 294,819	$ 3,423,149	$ 3,128,330	8.6 %	$ 3,451,756	90.6 %
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

**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]**
2011	$ 88,527	$ 88,088	$(439)	100.5 %	$ 3,451,756	(0.01) %
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

**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, 2020. Additional information as of the latest actuarial valuation follows.

Valuation Date	Actuarial Cost Method	Amortization Method	Remaining Amortization Period	Asset Valuation Method	Actuarial Assumptions: Rate of Return* Investment	Actuarial Assumptions: Investment Rate of Return*
June 30, 2020	Entry age	Level percent of pay, closed	20 years retiree medical plan 24 years life insurance plan	Five-year smoothed market	8%-retiree medical plan	7.5%-life insurance plan

	Pre-Medicare**	Medicare
Medical Trend Assumption	7%	5.125%
Ultimate Trend Rate	5%	5%
Year of Ultimate Trend Rate	2028	2021

**Includes price inflation at 3%.*

***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	Actuarially Determined Contribution (ADC)	Actual Employer Contribution	Percentage of ADC Contributed
	(A)	(B)	(B) / (A)
2011	$ 477,723,070	$ 188,453,929	39.5 %
2012	470,217,067	177,450,206	37.8
2013	186,725,823	166,611,420	89.2
2014	159,583,400	162,568,395	101.9
2015	106,606,132	168,084,353	157.7
2016	97,982,580	178,638,320	182.3
2017	102,854,017	180,375,986	175.4
2018	118,837,620	187,102,413	157.4
2019	76,596,876	183,146,155	239.1
2020	43,908,838	184,625,474	420.5

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)
2011	$ 1,725,878	$ 1,668,822	96.7%
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

Schedule A

Results of the Valuation
June 30, 2020
(Dollars in thousands)

	Medical Insurance Trust	Life Insurance Trust
Payroll	$ 3,723,482	$ 3,723,482
Actuarial Accrued Liability		
Present value of prospective benefits payable in respect of:		
(a) Present active members	$ 1,403,651	$ 18,680
(b) Present terminated vested members	41,412	4,037
(c) Present retired members and covered spouses	1,312,590	99,477
(d) Total actuarial accrued liability	$ 2,757,653	$ 122,194
Present Assets for Valuation Purposes	$ 1,700,968	$ 92,229
Unfunded Actuarial Accrued Liability	$ 1,056,685	$ 29,965

Contributions	Fiscal Year Ended June 30, 2021	Fiscal Year Ended June 30, 2023
Normal	1.48 %	0.03 %
Accrued liability	2.06	0.05
Total	3.54 %	0.08 %

Health Insurance Trust
Solvency Test
(Dollars in millions)

	Aggregate Actuarial Accrued Liability for				Portion of Accrued Liabilities Covered by Assets		
Valuation Date June 30	**(1) Active Member Contributions**	**(2) Retirants and Beneficiaries**	**(3) Active Members (Employer Financed Portion)**	**Valuation Assets**	**(1)**	**(2)**	**(3)**
2011	n/a	$ 1,910.1	$ 1,513.1	$ 294.8	n/a	15%	0%
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

Life Insurance Trust
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)
2011	n/a	$72.2	$15.9	$88.5	n/a	100%	103%
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

Schedule B

Development of the Actuarial Value of Assets
Health Insurance Trust
June 30, 2020

(1)	Actuarial value of assets beginning of year		$1,442,522,017
(2)	Market value of assets end of year		1,616,675,260
(3)	Market value of assets beginning of year		1,414,020,056
(4)	Cash flow		
	a.	Contributions	318,214,245
	b.	Benefit payments	145,986,752
	c.	Administrative expense	2,047,238
	d.	Net: (4)a - (4)b - (4)c	170,180,255
(5)	Investment Income		
	a.	Market total: (2) - (3) - (4)d	32,474,949
	b.	Assumed rate	8 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	119,928,815
	d.	Amount for phased-in recognition: (5)a - (5)c	(87,453,866)
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	(17,490,773)
	b.	First prior year	(5,362,227)
	c.	Second prior year	(2,260,479)
	d.	Third prior year	6,277,740
	e.	Fourth prior year	(12,827,103)
	f.	Total recognized investment gain	(31,662,842)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		1,700,968,245
(8)	Difference between market & actuarial values: (2) - (7)		$ (84,292,985)
(9)	Rate of return on actuarial value		5.78 %

Development of the Actuarial Value of Assets
Life Insurance Trust
June 30, 2020

(1)	Actuarial value of assets beginning of year		$ 92,505,791
(2)	Market value of assets end of year		87,367,891
(3)	Market value of assets beginning of year		85,758,279
(4)	Cash flow		
	a.	Contributions	1,796,389
	b.	Benefit payments	5,317,000
	c.	Administrative expense	35,980
	d.	Net: (4)a - (4)b - (4)c	(3,556,591)
(5)	Investment Income		
	a.	Market total: (2) - (3) - (4)d	5,166,203
	b.	Assumed rate	7.5 %
	c.	Amount for immediate recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	6,298,499
	d.	Amount for phased-in recognition: (5)a - (5)c	(1,132,296)
(6)	Phased-in recognition of investment income		
	a.	Current year: 0.20 x (5)d	(226,459)
	b.	First prior year	(227,080)
	c.	Second prior year	(1,061,385)
	d.	Third prior year	(1,150,797)
	e.	Fourth prior year	(353,442)
	f.	Total recognized investment gain	(3,019,163)
(7)	Actuarial value of assets end of year: (1) + (4)d + (5)c + (6)f		92,228,536
(8)	Difference between market & actuarial values: (2) - (7)		$ (4,860,645)
(9)	Rate of return on actuarial value		3.61 %

Schedule C

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

	For the Year Ended June 30, 2020	For the Year Ended June 30, 2019
Receipts for the Year		
Contributions		
Members statutory	$ 133,588,771	$ 131,676,820
Payment by retired members	59,220,473	57,767,461
Total members	192,809,244	189,444,281
State statutory contributions	23,157,120	22,674,899
Employer contributions	107,434,414	106,764,314
State statutory - transition fund/KEHP	54,033,940	53,706,942
Total employer	184,625,474	183,146,155
Total receipts	377,434,718	372,590,436
Recovery income	100,375,749	84,357,641
Net investment income	32,474,949	74,385,482
Total	510,285,416	531,333,559
Disbursements for the Year		
Administrative expense	2,047,238	1,803,192
Medical insurance expense	305,582,974	305,791,119
Total disbursements	307,630,212	307,594,311
Excess of Receipts Over Disbursements	202,655,204	223,739,248
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	1,414,020,056	1,190,280,808
Excess of receipts over disbursements	202,655,204	223,739,248
Asset balance as of the end of the year	$1,616,675,260	$ 1,414,020,056
Investment rate of return on market value	2.30%	6.11%

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

	For the Year Ended	
	June 30, 2020	June 30, 2019
Receipts for the Year		
Contributions		
Members	$	$
State	1,543,413	1,209,055
Employer	252,976	212,172
Total	1,796,389	1,421,227
Net investment income	5,166,203	5,058,188
Total	6,962,592	6,479,415
Disbursements for the Year		
Benefit payments	5,317,000	5,153,000
Miscellaneous, including expenses	35,980	30,392
Total	5,352,980	5,183,392
Excess of Receipts Over Disbursements	1,609,612	1,296,023
Reconciliation of Asset Balances		
Asset balance as of the beginning of the year	85,758,279	84,462,256
Excess of receipts over disbursements	1,609,612	1,296,023
Asset balance as of the end of the year	$ 87,367,891	$ 85,758,279
Investment rate of return on market value	6.32 %	6.49 %

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, 2015, submitted to and adopted by the board on Sept. 19, 2016. The health care cost trend rates, and expected plan costs were determined by the actuary based on recent experience.

Valuation Date — June 30, 2020

Discount Rate — 8% per annum, compounded annually for Health Insurance Trust.
7.5% 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
2021	4.40%	7.00%	5.125%
2022	4.31	6.75	5.000
2023	5.83	6.50	5.000
2024	6.00	6.25	5.000
2025	5.85	6.00	5.000
2026	5.76	5.75	5.000
2027	5.79	5.50	5.000
2028	5.71	5.25	5.000
2029	5.72	5.00	5.000
2030	5.49	5.00	5.000
2031	5.12	5.00	5.000
2032 and beyond	5.00	5.00	5.000

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 January 1, 2021

Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
Single	$ 732.26	$ 753.76	$ 704.08	$ 626.48
Parent Plus	1,011.78	1,075.44	970.78	892.76
Couple	1,383.08	1,653.10	1,501.56	1,374.22
Family	1,545.50	1,841.08	1,673.40	1,530.02
Family Cross-Reference	846.00	907.84	825.88	753.62

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 January 1, 2021

Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
Single	$ 52.42	$ 87.40	$ 27.78	$ 25.00
Parent Plus	134.38	249.12	66.20	59.58
Couple	323.18	560.54	275.90	248.32
Family	379.92	702.58	331.06	297.96
Family Cross-Reference*	85.20	167.14	30.88	27.78
Spouse - Single	740.26	761.76	712.08	634.48
Spouse - Parent Plus	1,019.78	1,083.44	978.78	900.76

** 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 January 1, 2021

Plan	Years of Service	Single	Parent Plus	Couple	Family	Family C-R
Living Well CDHP	5-9.99	$ 547.01	$ 744.57	$ 927.07	$ 1,032.75	$ 627.97
	10-14.99	414.17	611.73	794.23	899.91	495.13
	15-19.99	281.34	478.90	661.40	767.08	362.30
	20 or More	148.50	346.06	528.56	634.24	229.46
Living Well PPO	5-9.99	536.90	693.49	959.73	1,005.67	607.87
	10-14.99	407.43	560.65	826.89	872.83	475.03
	15-19.99	277.97	427.82	694.06	740.00	342.20
	20 or More	148.50	294.98	561.22	607.16	209.36
Living Well Basic	5-9.99	544.35	771.75	1,092.83	1,209.51	662.17
	10-14.99	412.40	238.91	959.99	1,076.67	529.33
	15-19.99	280.45	506.08	827.16	943.84	396.50
	20 or More	148.50	373.24	694.32	811.00	263.66
Living Well Limited	5-9.99	488.24	700.35	993.07	1,099.23	593.01
	10-14.99	374.99	567.51	860.23	966.39	460.17
	15-19.99	261.75	434.68	727.40	833.56	327.34
	20 or More	148.50	301.84	594.56	700.72	194.50

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

Plan	Years of Service	Single	Parent Plus	Couple	Family	Family Cross-Reference
Living Well CDHP	5-9.99	$ 626.71	$ 824.27	$ 1,006.77	$ 1,112.45	$ 707.67
	10-14.99	547.01	744.57	927.07	1,032.75	627.97
	15-19.99	440.74	638.30	820.80	926.48	521.70
	20-24.99	334.47	532.03	714.53	820.21	415.43
	25-25.99	201.63	399.19	581.69	687.37	282.59
	26-26.99	175.07	372.63	555.13	660.81	256.03
	27 or More	148.50	346.06	528.56	634.24	229.46
Living Well PPO	5-9.99	614.57	773.19	1,039.43	1,085.37	687.57
	10-14.99	536.90	693.49	959.73	1,005.67	607.87
	15-19.99	433.33	587.22	853.46	899.40	501.60
	20-24.99	329.76	480.95	747.19	793.13	395.33
	25-25.99	200.29	348.11	614.35	660.29	262.49
	26-26.99	174.40	321.55	587.79	633.73	235.93
	27 or More	148.50	294.98	561.22	607.16	209.36
Living Well Basic	5-9.99	623.52	851.45	1,172.53	1,289.21	741.87
	10-14.99	544.35	771.75	1,092.83	1,209.51	662.17
	15-19.99	438.79	665.48	986.56	1,103.24	555.90
	20-24.99	323.61	495.74	739.93	828.66	412.39
	25-25.99	195.53	348.61	566.83	646.13	274.14
	26-26.99	169.92	319.20	532.22	609.63	246.49
	27 or More	148.50	373.24	694.32	811.00	263.66
Living Well Limited	5-9.99	539.99	752.39	1,027.10	1,126.74	651.64
	10-14.99	488.24	700.35	993.07	1,099.23	593.01
	15-19.99	397.64	594.08	886.80	992.96	486.74
	20-24.99	307.05	487.81	780.53	886.69	380.47
	25-25.99	193.80	354.97	647.69	753.85	247.63
	26-26.99	171.15	328.41	621.13	727.29	221.07
	27 or More	148.50	301.84	594.56	700.72	194.50

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	49	20	Not Eligible
15-19.99	70	41	41%
20-24.99	91	61	61
25-25.99	91	76	76
26-26.99	91	84	84
27 or more	91	91	91

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
53%	43%	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, 25% of future male retirees are assumed to cover their spouse and 15% 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.

Payroll Growth — 3.5% per annum, compounded annually.

Price Inflation — 3% 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.

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 8% for the Health Insurance Trust and 7.5% 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	Salary*	Death	Disability	0 - 4	5 - 9	10+	Before 27 Years of Service	After 27 Years of Service **
20	7.20%	0.019%	0.01%	11.00%				
25	6.40	0.021	0.01	11.00	3.00%			
30	5.40	0.025	0.01	11.00	3.00	3.00%		
35	4.70	0.043	0.04	12.00	3.50	1.40		
40	4.20	0.060	0.09	12.00	4.50	1.40		
45	3.80	0.084	0.20	12.00	4.50	1.30		17.0%
50	3.70	0.119	0.30	14.00	4.50	1.90		17.0
55	3.50	0.202	0.58	15.00	4.50	2.40	5.0%	45.0
60	3.50	0.340	0.75	15.00	4.00	2.40	13.0	35.0
62	3.50	0.419	0.75	15.00	3.80	2.40	15.0	25.0
65	3.50	0.565	0.75	15.00	3.50	2.40	20.0	25.0
70	3.50	0.913	0.75	20.00	0.00	0.00	20.0	20.0
75	3.50	1.556	0.75	20.00	0.00	0.00	100.0	100.0

Females: Annual Rate of								
				Withdrawal			Retirement	
				Years of Service				
Age	Salary*	Death	Disability	0 - 4	5 - 9	10+	Before 27 Years of Service	After 27 Years of Service **
20	7.20%	0.007%	0.01%	9.00%				
25	6.40	0.008	0.01	9.00	4.00%			
30	5.40	0.010	0.03	12.00	4.00	1.65%		
35	4.70	0.018	0.06	12.00	4.00	1.50		
40	4.20	0.026	0.12	12.00	4.00	1.30		
45	3.80	0.042	0.25	13.00	4.00	1.20		15.0%
50	3.70	0.062	0.44	13.00	5.00	1.50		18.0
55	3.50	0.096	0.65	15.00	5.00	2.00	5.5%	50.0
60	3.50	0.157	0.85	15.00	5.00	2.00	14.0	40.0
62	3.50	0.197	0.85	15.00	4.60	2.00	14.0	40.0
65	3.50	0.287	0.85	15.00	4.00	2.00	22.0	35.0
70	3.50	0.495	0.85	15.00	0.00	0.00	20.0	35.0
75	3.50	0.831	0.85	15.00	0.00	0.00	100.0	100.0

**Includes wage inflation at 3.5% per annum.*

***Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.*

Deaths After Retirement: The RP-2000 Combined Mortality Table projected to 2025 using scale BB (set forward two years for males and one year for females) is used for death after service retirement and beneficiaries. The RP-2000 Disabled Mortality Table (set forward two years for males and seven years for females) is used for death after disability retirement. There is a margin for future mortality improvement in the tables used by the system. Based on the results of the most recent experience study adopted by the board on Sept. 19, 2016, the numbers of expected future deaths are 15-19% less than the occurred during the study period for healthy retirees and 13-17% less than expected under the selected table for disabled retirees. 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**	
Age	Male	Female	Male	Female
45	0.1609%	0.1135%	2.3306%	1.2482%
50	0.2474	0.1718	2.9279	1.5650
55	0.4246	0.2658	3.4400	1.7807
60	0.6985	0.4409	3.5881	2.3164
65	1.1300	0.8100	3.8275	3.1687
70	1.8697	1.3739	4.7566	4.4032
75	3.2147	2.2899	6.3153	6.0857
80	5.5160	3.7551	8.3527	8.4679
85	9.5631	6.3873	10.9122	12.7572
90	17.2787	11.2476	17.2787	19.4718
95	27.1263	18.1190	27.1263	24.2074

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 eligibility is attained at age 60 with unreduced pension benefits.

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

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 2021, the TRS Board of Trustees approved a single contributions amount of up to $679.84. TRS will contribute this amount towards insurance costs, less the Shared Responsibility cost of $148.50. Starting in 2021, there will be no subsidy for non-single KEHP coverage. 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, 2021

Tier Elected	Under Age 65 (KEHP) LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	Ages 65 and Older (MEHP)
Single	$732.26	$753.76	$704.08	$626.48	$ 178.00
Parent Plus	1,011.78	1,075.44	970.78	892.76	n/a
Couple	1,383.08	1,653.10	1,501.56	1,374.22	n/a
Family	1,545.50	1,841.08	1,673.40	1,530.02	n/a
Family Cross-Reference	846.00	907.84	825.88	753.62	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, 2020

	Under Age 65 (KEHP)				
Tier Elected by Surviving Spouse	**LivingWell CDHP**	**LivingWell PPO**	**LivingWell Basic CDHP**	**LivingWell Limited HDP**	**Age 65 and Older (MEHP)**
Single	$ 740.26	$ 761.76	$ 712.08	$ 634.48	$ 178.00
Parent Plus	1,019.78	1,083.44	978.78	900.76	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 2021, the TRS Board of Trustees approved a single contributions amount of up to $679.84. TRS will contribute this amount towards insurance costs, less the Shared Responsibility cost of $148.50. Starting in 2021, there will be no subsidy for non-single KEHP coverage. 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, 2021

	Under Age 65 (KEHP)				
Tier Elected	**LivingWell CDHP**	**LivingWell PPO**	**LivingWell Basic CDHP**	**LivingWell Limited HDP**	**Ages 65 and Older (MEHP)**
Single	$ 732.26	$ 753.76	$ 704.08	$ 626.48	$ 178.00
Parent Plus	1,011.78	1,075.44	970.78	892.76	n/a
Couple	1,383.08	1,653.10	1,501.56	1,374.22	n/a
Family	1,545.50	1,841.08	1,673.40	1,530.02	n/a
Family Cross-Reference	846.00	907.84	825.88	753.62	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, 2020
by Age and Service Groups

Attained Age	Completed Years of Service: 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	Total: Number	Total: Payroll
Under 25	1,644	1,754	4							3,402	$ 82,097,488
25 to 29	963	4,538	1,801							7,302	292,413,583
30 to 34	660	1,914	4,403	1,546	3					8,526	408,737,279
35 to 39	645	1,540	2,187	4,310	1,627	2				10,311	556,918,177
40 to 44	604	1,244	1,362	2,058	4,210	1,270	5			10,753	630,994,996
45 to 49	450	946	1,046	1,422	2,042	3,849	1,095	2		10,852	683,664,756
50 to 54	614	713	674	988	1,316	1,844	2,184	368	3	8,704	537,397,081
55 to 59	881	844	432	583	877	941	854	248	42	5,702	297,546,435
60 to 64	772	938	318	255	455	464	360	112	50	3,724	149,382,482
65 to 69	605	820	270	126	138	173	130	50	47	2,359	60,865,741
70 & Over	407	610	266	72	56	37	33	14	21	1,516	23,463,558
Total Count	8,245	15,861	12,763	11,360	10,724	8,580	4,661	794	163	73,151	$ 3,723,481,576

Average Age: 43.8 Average Service: 11.1

Table 2
Schedule of Total Active Member Valuation Data

Valuation Date June 30	Number	Annual Payroll	Annual Average Pay	Percentage Increase in Average Pay
2011	76,349	$3,451,756,288	$45,210	3.97%
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

Table 3

Eligible Deferred Vested Members as of June 30, 2020 Health Insurance Trust Male and Female Demographic Breakdown

Attained Age	Number of Males	Number of Females	Total Number
Under 30	0	0	0
30-34	28	80	108
35-39	235	802	1,037
40-44	336	945	1,281
45-49	344	1,122	1,466
50-54	281	1038	1,319
55-59	229	845	1,074
60 & Over	246	739	985
Total	1,699	5,571	7,270

Eligible Deferred Vested Members as of June 30, 2020 Life Insurance Trust Male and Female Demographic Breakdown

Attained Age	Number of Males	Number of Females	Total Number
Under 30	7	25	32
30-34	158	520	678
35-39	341	1,068	1,409
40-44	404	1,141	1,545
45-49	387	1,318	1,705
50-54	306	1,167	1,473
55-59	261	926	1,187
60 & Over	290	820	1,110
Total	2,154	6,985	9,139

Table 4
All Retirees and Spouses Receiving Health Care Benefits
as of June 30, 2020
Male and Female Demographic Breakdown

Attained Age	Number of Males	Number of Females	Total Number
Under 40	2	11	13
40-44	5	34	39
45-49	72	147	219
50-54	413	1,023	1,436
55-59	1118	2,539	3,657
60-64	1,979	4,516	6,495
65-69	3,176	7,453	10,629
70-74	3,768	7,591	11,359
75-79	2,514	4,415	6,929
80-84	1,373	2,482	3,855
85-89	747	1,405	2,152
90-94	234	735	969
95-99	49	208	257
100 and over	4	24	28
Total	15,454	32,583	48,037

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
2011	1,770	629	2,399	1,052	541	1,593	35,033	6,922	41,955
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

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
2011	2,025	$10,125	858	$4,290	41,118	$205,590	2.92%	$5,000
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

** 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.*

Sensitivity Analysis — Health Insurance Trust

The June 30, 2020, 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, 8%, together with a decrease in the discount rate to 7% and an increase in the discount rate to 9%. Under this scenario, the underlying inflation rate assumption is held constant at 3% and the payroll growth assumption is held constant at 3.5%.
- The inflation assumption sensitivity analysis shows the valuation results with the baseline underlying inflation rate assumption, 3%, together with decreases in the inflation rate to 2.75% and 2.5%. 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, 3.5%, together with decreases in the wage inflation assumption to 2% 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	$ 3,119,944	$ 2,757,653	$ 2,456,805
Actuarial value of assets	1,700,968	1,700,968	1,700,968
Unfunded liability	$ 1,418,976	$ 1,056,685	$ 755,837
Funded ratio	54.52 %	61.68 %	69.23 %
Contributions			
Normal cost	1.93 %	1.48 %	1.13 %
Accrued liability	2.57 %	2.06 %	1.59 %
Total	4.50 %	3.54 %	2.72 %
Member	(3.7)%	(3.7)%	(3.7)%
Employer/state	0.8 %	(0.16)%	(0.98)%
Discount rate	7 %	8 %	9 %
Payroll growth	3.5 %	3.5 %	3.5 %
Inflation rate	3 %	3 %	3 %

Inflation Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 2,757,653	$ 2,853,851	$ 2,955,697
Actuarial value of assets	1,700,968	1,700,968	1,700,968
Unfunded liability	$ 1,056,685	$ 1,152,883	$ 1,254,729
Funded ratio	61.68 %	59.6 %	57.55%
Contributions			
Normal cost	1.48 %	1.56 %	1.66 %
Accrued liability	2.06 %	2.25 %	2.45 %
Total	3.54 %	3.81 %	4.11 %
Member	(3.7)%	(3.7)%	(3.7)%
Employer/state	(0.16)%	0.11 %	0.41 %
Discount rate	8 %	7.75 %	7.5 %
Payroll growth	3.5 %	3.25 %	3 %
Inflation rate	3 %	2.75 %	2.5 %

Payroll Growth Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Payroll Growth 1.5%	No Payroll Growth
Actuarial accrued liability	$ 2,757,653	$ 2,757,653	$ 2,757,653
Actuarial value of assets	1,700,968	1,700,968	1,700,968
Unfunded liability	$ 1,056,685	$ 1,056,685	$ 1,056,685
Funded ratio	61.68 %	61.68 %	61.68 %
Contributions			
Normal cost	1.48 %	1.48 %	1.48 %
Accrued liability	2.06 %	2.31 %	2.68 %
Total	3.54 %	3.79 %	4.16 %
Member	(3.7)%	(3.7)%	(3.7)%
Employer/state	(0.16)%	0.09 %	0.46 %
Discount rate	8 %	8 %	8 %
Payroll growth	3.5 %	2 %	0 %
Inflation rate	3 %	3 %	3 %

Health Care Trend Assumption Sensitivity Analysis
(Dollars in thousands)

	Decrease Trend Rates 1%	Valuation Results	Increase Trend Rates 1%
Actuarial accrued liability	$ 2,424,293	$ 2,757,653	$ 3,168,458
Actuarial value of assets	1,700,968	1,700,968	1,700,968
Unfunded liability	$ 723,325	$ 1,056,685	$ 1,467,490
Funded ratio	70.2 %	61.68 %	53.68 %
Contributions			
Normal cost	1.18 %	1.48 %	1.87 %
Accrued liability	1.41 %	2.06 %	2.87 %
Total	2.59 %	3.54 %	4.74 %
Member	(3.7)%	(3.7)%	(3.7)%
Employer/state	(1.11)%	(0.16)%	1.04%
Discount rate	8 %	8 %	8 %
Payroll growth	3.5 %	3.5 %	3.5 %
Inflation rate	3 %	3 %	3 %

Sensitivity Analysis — Life Insurance Trust

The June 30, 2020, 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 7.5% together with a decrease in the discount rate to 6.5% and an increase in the discount rate to 8.5%. Under this scenario, the underlying inflation rate assumption is held constant at 3% and the payroll growth assumption is held constant at 3.5%.
- The inflation assumption sensitivity analysis shows the valuation results with the baseline underlying inflation rate assumption, 3%, together with decreases in the inflation rate to 2.75% and 2.5%. 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, 3.5%, together with decreases in the wage inflation assumption to 2% 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	$ 137,911	$ 122,194	$ 109,259
Actuarial value of assets	92,229	92,229	92,229
Unfunded liability	$ 45,682	$ 29,965	$ 17,030
Funded ratio	66.88 %	75.48 %	84.41 %
Contributions			
Normal cost	0.04 %	0.03 %	0.03 %
Accrued liability	0.07 %	0.05 %	0.03 %
Total	0.11 %	0.08 %	0.06 %
Member	0%	0%	0%
Employer/state	0.11 %	0.08 %	0.06 %
Discount rate	6.5 %	7.5 %	8.5 %
Payroll growth	3.5 %	3.5 %	3.5 %
Inflation rate	3 %	3 %	3 %

Inflation Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Inflation Rate 0.25%	Decrease Inflation Rate 0.50%
Actuarial accrued liability	$ 122,194	$ 126,014	$ 130,044
Actuarial value of assets	92,229	92,229	92,229
Unfunded liability	$ 29,965	$ 33,785	$ 37,815
Funded ratio	75.48 %	73.19 %	70.92 %
Contributions			
Normal cost	0.03 %	0.03 %	0.04 %
Accrued liability	0.05 %	6.00 %	0.06 %
Total	0.08 %	6.03 %	0.10 %
Member	0%	0%	0%
Employer/state	0.08 %	6.03 %	0.10 %
Discount rate	7.5 %	7.25 %	7 %
Payroll growth	3.5 %	3.25 %	3 %
Inflation rate	3 %	2.75 %	2.5 %

Payroll Growth Assumption Sensitivity Analysis
(Dollars in thousands)

	Valuation Results	Decrease Payroll Growth 1.5%	No Payroll Growth
Actuarial accrued liability	$ 122,194	$ 122,194	$ 122,194
Actuarial value of assets	92,229	92,229	92,229
Unfunded liability	$ 29,965	$ 29,965	$ 29,965
Funded ratio	75.48 %	75.48 %	75.48 %
Contributions			
Normal cost	0.03 %	0.03 %	0.03 %
Accrued liability	0.05 %	0.06 %	0.07 %
Total	0.08 %	0.09 %	0.1 %
Member	0 %	0 %	0 %
Employer/state	0.08 %	0.09 %	0.1 %
Discount rate	7.5 %	7.5 %	7.5 %
Payroll growth	3.5 %	2 %	0 %
Inflation rate	3 %	3 %	3 %

20-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 provided on the following page.

- Active Employee Growth Rate — 0%
- Valuation Discount Rate — 8%
- Investment Rate of Return — 8% each year
- Actuarial Value of Assets — Five year smoothing, no corridor
- Amortization Method — Level percent of payroll, closed
- Amortization Period — 20-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.

20-Year Baseline Projection

(Dollars in thousands)

Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Actuarially Determined Contribution
2021	$ 3,530,991	$ 192,491	$ 3,723,482	$ 1,056,685	61.7 %	$ 131,774
2022	3,623,284	189,258	3,812,542	882,252	69.6	124,624
2023	3,716,763	188,454	3,905,217	689,384	77.4	115,392
2024	3,810,973	188,452	3,999,425	466,599	85.5	102,908
2025	3,907,520	189,788	4,097,308	208,799	93.8	86,308
2026	4,003,397	191,807	4,195,204		100	72,271
2027	4,098,744	194,531	4,293,275		100	75,791
2028	4,194,908	198,021	4,392,929		100	79,400
2029	4,295,997	201,887	4,497,884		100	83,189
2030	4,400,886	205,828	4,606,714		100	87,224
2031	4,509,648	210,000	4,719,648		100	91,509
2032	4,623,125	214,241	4,837,366		100	96,000
2033	4,741,595	218,364	4,959,959		100	100,739
2034	4,863,604	223,292	5,086,896		100	105,730
2035	4,993,467	227,687	5,221,154		100	111,031
2036	5,129,751	232,104	5,361,855		100	116,639
2037	5,273,440	237,377	5,510,817		100	122,556
2038	5,425,178	242,986	5,668,164		100	128,831
2039	5,585,919	249,262	5,835,181		100	135,444
2040	5,755,718	255,985	6,011,703		100	142,455

20-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 provided on the following page.

- Active Employee Growth Rate — 0%
- Valuation Discount Rate — 7.5%
- Investment Rate of Return — 7.5% each year
- Actuarial Value of Assets — Five-year smoothing, no corridor
- Amortization Method — Level percent of payroll, closed
- Amortization Period — 24-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.

20-Year Baseline Projection

(Dollars in thousands)

Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Actuarially Determined Contribution
2023	$ 3,530,991	$ 192,491	$ 3,723,482	$ 29,965	75.5 %	$ 3,065
2024	3,623,284	189,258	3,812,542	33,396	73.3	3,343
2025	3,716,763	188,454	3,905,217	35,455	72.3	3,552
2026	3,810,973	188,452	3,999,425	36,293	72.2	3,691
2027	3,907,520	189,788	4,097,308	36,802	72.4	3,818
2028	4,003,397	191,807	4,195,204	36,987	72.8	3,933
2029	4,098,744	194,531	4,293,275	37,080	73.2	4,053
2030	4,194,908	198,021	4,392,929	37,070	73.7	4,179
2031	4,295,997	201,887	4,497,884	36,944	74.2	4,308
2032	4,400,886	205,828	4,606,714	36,687	74.7	4,443
2033	4,509,648	210,000	4,719,648	36,284	75.3	4,583
2034	4,623,125	214,241	4,837,366	35,718	76.0	4,729
2035	4,741,595	218,364	4,959,959	34,970	76.7	4,883
2036	4,863,604	223,292	5,086,896	34,019	77.6	5,043
2037	4,993,467	227,687	5,221,154	32,842	78.5	5,212
2038	5,129,751	232,104	5,361,855	31,413	79.6	5,389
2039	5,273,440	237,377	5,510,817	29,703	80.8	5,576
2040	5,425,178	242,986	5,668,164	27,680	82.2	5,776
2041	5,585,919	249,262	5,835,181	25,307	83.8	5,989
2042	5,755,718	255,985	6,011,703	22,542	85.7	6,221

Statistical Section

This section of the Teachers' Retirement System of the State of Kentucky's Comprehensive Annual 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

Financial Trends 189

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

Demographic & Economic Information 192

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

Operating Information 197

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
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
2011	1,037,935,993	302,262,819	2,760,972,224	4,101,171,036

Deductions by Type

Year	Service Retirants	Disability Retirants	Survivors	Total Benefits	Refunds	Administrative Expense	Total Deductions to Plan Net Position
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
2011	1,326,033,698	60,950,214	15,551,801	1,402,535,713	17,325,387	7,322,739	1,427,183,839

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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)
2011	4,101,171,036	1,427,183,839	2,673,987,197

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
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
2011	188,241,202	84,147,337	493,312	8,334,296	281,216,147

**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
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
2011	145,544,405	80,890,958	226,435,363	1,186,029	227,621,392

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2011	281,216,147	227,621,392	53,594,755

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
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
2011	1,668,822	3,094,776	4,763,598

Deductions by Type

Year	Life Insurance	Administrative Expense	Total Deductions to Plan Net Position
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
2011	4,120,000	21,511	4,141,511

Changes in Plan Net Position

Year	Total Additions to Plan Net Position	Total Deductions to Plan Net Position	Changes in Plan Net Position
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
2011	4,763,598	4,141,511	622,087

Distribution of Active Contributing Members as of June 30, 2020

By Age

Age	Male	Female
20-24	686	2,766
25-29	1,685	5,678
30-34	2,017	6,562
35-39	2,499	7,870
40-44	2,617	8,190
45-49	2,716	8,226
50-54	2,150	6,792
55-59	1,487	4,563
60-64	993	3,000
65 & over	1,188	2,939
Total	18,038	56,586

By Service

Years of	Male	Female
Less than 1	2,433	7,818
1-4	4,103	13,073
5-9	3,079	9,555
10-14	2,624	8,281
15-19	2,391	7,881
20-24	2,017	6,169
25-29	1,137	3,183
30-34	207	567
35 or more	47	59
Total	18,038	56,586

Principal Participating Employers
Current Year and Nine Years Ago

Employer	2020 Covered Employees	2020 Rank	2020 Percentage of System	2011 Covered Employees	2011 Rank	2011 Percentage of System
Jefferson County	10,900	1	14.61 %	10,172	1	13.16 %
Fayette County	4,833	2	6.48	4,581	2	5.93
Boone County	2,074	3	2.78	1,832	3	2.37
Warren County	1,501	4	2.01	1,278	6	1.65
Hardin County	1,377	5	1.85	1,413	4	1.83
Kenton County	1,287	6	1.72	1,320	5	1.71
Oldham County	1,260	7	1.69	1,176	8	1.52
Bullitt County	1,250	8	1.68	1,237	7	1.60
Daviess County	1,111	9	1.49	1,112	10	1.44
Madison County	1,090	10	1.46	1,169	9	1.51
All Other*	47,941		64.24	51,995		67.28
Total (207 Employers)	74,624		100 %	77,285		100 %

*In fiscal 2020, All Other consisted of:

Type	Number of Employers	Employees
Local School Districts	163	42,888
Higher Education	6	3,223
State Agencies	14	1,379
Educational Cooperatives	8	335
Other	6	116
Total	197	47,941

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
Silver Grove
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
West Point
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
Education Professional Standards Board
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
West Kentucky Education Cooperative
Western Kentucky University

Distribution of Retirement and Medical Payments Statewide
For the Year Ended June 30, 2020

County	Payments	Recipients	County	Payments	Recipients
Adair	$ 8,871,257	238	Laurel	$ 29,932,992	750
Allen	7,977,309	186	Lawrence	5,841,757	153
Anderson	8,946,246	245	Lee	3,256,337	85
Ballard	4,828,529	128	Leslie	6,803,114	162
Barren	20,100,142	497	Letcher	13,747,857	359
Bath	5,665,406	158	Lewis	7,546,098	195
Bell	14,808,558	386	Lincoln	12,596,104	317
Boone	47,459,541	1,107	Livingston	3,791,861	92
Bourbon	8,602,456	218	Logan	12,355,679	301
Boyd	23,948,460	573	Lyon	4,642,527	113
Boyle	21,034,588	517	Madison	64,301,162	1,553
Bracken	4,498,917	112	Magoffin	8,456,123	210
Breathitt	9,952,922	264	Marion	8,318,823	216
Breckinridge	8,505,410	212	Marshall	16,895,632	415
Bullitt	21,925,329	506	Martin	6,214,956	161
Butler	4,698,298	116	Mason	9,165,121	242
Caldwell	8,000,352	206	McCracken	30,090,297	766
Calloway	29,683,052	731	McCreary	8,681,542	227
Campbell	33,559,721	783	McLean	5,065,055	126
Carlisle	2,006,836	59	Meade	8,761,806	200
Carroll	4,624,856	109	Menifee	2,673,336	76
Carter	15,870,793	422	Mercer	11,070,474	299
Casey	7,215,922	184	Metcalfe	4,251,631	106
Christian	22,677,962	583	Monroe	7,114,512	173
Clark	16,019,866	398	Montgomery	14,421,910	361
Clay	12,784,202	314	Morgan	7,999,452	209
Clinton	6,272,567	168	Muhlenberg	15,720,962	369
Crittenden	2,550,653	71	Nelson	19,505,190	490
Cumberland	3,807,276	89	Nicholas	2,656,084	71
Daviess	50,745,855	1,246	Ohio	8,869,413	234
Edmonson	4,639,484	125	Oldham	25,068,991	570
Elliott	2,516,564	71	Owen	4,544,222	117
Estill	7,450,170	190	Owsley	4,713,554	121
Fayette	139,083,494	3,470	Pendleton	6,181,139	146
Fleming	7,523,733	199	Perry	17,709,762	435
Floyd	23,550,723	606	Pike	32,341,135	819
Franklin	32,103,014	960	Powell	6,185,650	151
Fulton	3,044,492	81	Pulaski	32,116,678	813
Gallatin	1,676,363	43	Robertson	1,042,662	26
Garrard	9,038,662	220	Rockcastle	8,705,635	210
Grant	8,552,595	198	Rowan	22,617,912	579
Graves	17,987,881	449	Russell	10,624,074	263
Grayson	12,385,169	312	Scott	22,680,809	556
Green	5,896,424	145	Shelby	22,809,535	533
Greenup	17,586,502	434	Simpson	6,841,621	172
Hancock	2,827,381	69	Spencer	7,311,133	161
Hardin	42,985,585	1030	Taylor	14,438,260	365
Harlan	16,881,555	434	Todd	4,144,915	113
Harrison	8,286,771	212	Trigg	7,338,048	188
Hart	6,946,105	163	Trimble	2,730,249	64
Henderson	19,561,604	494	Union	4,883,368	132
Henry	8,071,499	210	Warren	78,871,133	1,930
Hickman	1,441,445	33	Washington	5,357,905	138
Hopkins	20,977,320	505	Wayne	9,730,307	248
Jackson	6,313,361	168	Webster	5,366,993	144
Jefferson	352,401,759	7,597	Whitley	29,969,451	767
Jessamine	20,244,672	507	Wolfe	4,912,691	135
Johnson	15,438,420	366	Woodford	14,903,341	380
Kenton	43,855,491	1,060			
Knott	11,122,976	281	**Total in Kentucky**	**$ 2,102,818,158**	**51,263**
Knox	11,952,537	319			
LaRue	7,942,149	179			

Distribution of Retirement and Medical Payments Worldwide as of June 30, 2020

Number of Recipients in United States Outside Kentucky

163	Alabama	11	Montana
5	Alaska	12	Nebraska
104	Arizona	26	Nevada
34	Arkansas	5	New Hampshire
99	California	13	New Jersey
75	Colorado	15	New Mexico
10	Connecticut	44	New York
15	Delaware	303	North Carolina
8	District of Columbia	1	North Dakota
1,447	Florida	689	Ohio
292	Georgia	36	Oklahoma
10	Hawaii	35	Oregon
13	Idaho	70	Pennsylvania
114	Illinois	3	Rhode Island
832	Indiana	250	South Carolina
23	Iowa	7	South Dakota
33	Kansas	1,103	Tennessee
47	Louisiana	228	Texas
19	Maine	28	Utah
48	Maryland	3	Vermont
29	Massachusetts	175	Virginia
62	Michigan	48	Washington
27	Minnesota	107	West Virginia
60	Mississippi	42	Wisconsin
104	Missouri	9	Wyoming

Number of Recipients Outside United States

5	Military APO
2	Australia
1	Barbados
5	Canada
1	Japan
1	Poland
1	Spain
1	Sweden
1	Switzerland

	Number of Recipients	Amount of Payments
Inside Kentucky	51,263	$ 2,102,818,158
Outside Kentucky	6,954	213,162,411
Total	58,217	$ 2,315,980,569

Growth in Annuitants as of June 30, 2020

Fiscal Year	Service Retirees	Disability Retirees	Beneficiaries of Retired Members	Beneficiaries of Deceased Members Eligible to Retire	Survivors	Disabled Adult Child
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
2011	38,705	2,379	2,003	584	430	296

Schedule of Annuitants by Type of Benefit as of June 30, 2020

Monthly Benefit ($)	Number of Annuitants	Type of Benefit*					
		1	2	3	4	5	6
1 - 500	4,248	3,313	12	196	26	352	349
501 - 1,000	2,952	2,464	138	275	75	0	0
1,001 - 1,500	2,923	2,073	270	479	100	1	0
1,501 - 2,000	3,370	2,451	384	455	80	0	0
2,001 - 2,500	4,293	3,333	509	365	86	0	0
2,501 - 3,000	6,902	5,725	695	384	98	0	0
3,001 - 3,500	9,019	8,196	468	287	68	0	0
3,501 - 4,000	7,461	6,996	217	206	42	0	0
4,001 - 4,500	5,109	4,838	95	147	29	0	0
4,501 - 5,000	3,645	3,507	38	85	15	0	0
5,001 & over	6,832	6,630	33	140	29	0	0
Total	56,754	49,526	2,859	3,019	648	353	349

**** Type of Benefit***
1-Normal Retirement for Age & Service
2-Disability Retirement
3-Beneficiaries of Retired Members
4-Beneficiaries of Deceased Member Eligible to Retire
5-Survivor Payments
6-Disabled Adult Child

Schedule of Annuitants by Option Selected as of June 30, 2020

Monthly Benefit ($)	Option Selected*							
	1	2	3	4	5	6	7	8
1 - 500	2,158	506	313	48	2	429	88	704
501 - 1,000	1,679	416	238	83	10	378	140	8
1,001 - 1,500	1,442	339	289	135	16	377	315	10
1,501 - 2,000	1,684	378	299	146	9	474	356	24
2,001 - 2,500	2,145	465	402	151	3	669	379	79
2,501 - 3,000	3,276	713	589	204	11	1,275	642	192
3,001 - 3,500	4,667	1,067	642	213	4	1,458	889	79
3,501 - 4,000	3,892	901	526	201	8	1,130	751	52
4,001 - 4,500	2,650	576	383	141	6	792	542	19
4,501 - 5,000	1,877	398	300	102	6	540	419	3
5,001 & OVER	3,488	703	632	279	21	952	752	5
Total	28,958	6,462	4,613	1,703	96	8,474	5,273	1,175

****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, 2011								
Average monthly benefit	$ 149	$ 519	$ 1,225	$ 1,781	$ 2,529	$ 3,621	$ 4,827	**$ 3,240**
Final average salary	$ 3,570	$ 3,640	$ 4,423	$ 4,825	$ 5,143	$ 5,574	$ 6,235	**$ 5,392**
Number of retired members	45	157	144	112	235	544	617	**1,854**
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**
Average final average salary	$ 3,642	$ 3,791	$ 4,847	$ 5,188	$ 5,777	$ 6,019	$ 6,858	**$ 5,664**
Number of retired members	61	254	194	217	356	807	448	**2,337**
Year ending June 30, 2017								
Average monthly benefit	$ 176	$ 473	$ 1,235	$ 2,039	$ 2,902	$ 3,935	$ 5,179	**$ 3,040**
Final average salary	$ 3,691	$ 3,506	$ 4,588	$ 5,208	$ 5,722	$ 6,024	$ 6,666	**$ 5,514**
Number of retired members	53	259	162	212	346	766	320	**2,118**
Year ending June 30, 2018								
Average monthly benefit	$ 152	$ 486	$ 1,254	$ 2,098	$ 2,990	$ 4,002	$ 5,412	**$ 3,175**
Final average salary	$ 3,760	$ 3,668	$ 4,702	$ 5,397	$ 5,883	$ 6,068	$ 6,980	**$ 5,677**
Number of retired members	64	255	147	193	356	844	330	**2,189**
Year ending June 30, 2019								
Average monthly benefit	$ 130	$ 460	$ 1,190	$ 2,073	$ 2,847	$ 4,027	$ 5,393	**$ 3,078**
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**
Ten Years Ended June 30, 2020								
Average monthly benefit	**$ 158**	**$ 482**	**$ 1,236**	**$ 2,013**	**$ 2,841**	**$ 3,900**	**$ 5,137**	**$ 3,144**
Final average salary	**$ 3,488**	**$ 3,615**	**$ 4,615**	**$ 5,193**	**$ 5,647**	**$ 5,963**	**$ 6,620**	**$ 5,551**
Number of retired members	**591**	**2,251**	**1,575**	**1,777**	**3,075**	**7,405**	**4,071**	**20,745**

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 Seven 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

Retiree Sick Leave Payments
Summary for the Year Ended June 30, 2020

Total members retiring	2,023
Total members receiving sick leave payments	1,263
Total amount of sick leave payments at 12.855% contribution rate	$ 16,728,656
Average sick leave payment per retiree	$ 13,245
Total increase in final three or five year average salary base	$ 4,410,326
Average increase in final average salary	$ 3,492
Total service credit of 1,263 retirees	32,438
Average service credit of 1,263 retirees	25.68

Anticipated Payout of Additional Annuity

Actuarial cost of sick leave as salary credit	$ 36,146,945

Funding of Additional Payments

Member contributions ($16,728,656 x 9.105%)	$ 1,523,144
Employer contributions ($16,728,656 x 12.305%)	2,058,461
Total Contributions	$ 3,581,605
Deficit:	
Anticipated additional payout	$ 36,146,945
Less: total member and state contributions	3,581,605
Subtotal unfunded debt	$ 32,565,340
Less: current year appropriation	4,826,000
Total Unfunded Cost of Sick Leave Payments*	$ 27,739,340

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