COLORADO PERA

ANNUAL COMPREHENSIVE FINANCIAL REPORT
FOR THE YEAR ENDED DECEMBER 31, 2022

Guiding our mission with integrity and purpose

PUBLIC EMPLOYEES' RETIREMENT ASSOCIATION OF COLORADO

2022 IN REVIEW

Facts and Figures as of December 31, 2022

INVESTMENT PORTFOLIO FAIR VALUE

$55.9 billion

(DEFINED BENEFIT PLANS)

NET RATE OF RETURN

(13.4%)

MEMBERS ACTIVELY CONTRIBUTING TO PERA

206,646

EMPLOYERS

410

TOTAL COVERED PARTICIPANTS

(IN PERACARE HEALTH BENEFITS PROGRAM)

59,778

FUNDED STATUS

69.9%

(DIVISION TRUST FUNDS)

RETIREES AND BENEFIT RECIPIENTS

135,485

ANNUAL RETIREMENT BENEFIT PAYMENTS

$5.2 billion

INVESTED IN COLORADO-BASED COMPANIES, PARTNERSHIPS, AND ASSETS

$948.9 million

30-YEAR RATE OF RETURN

8.3%

(ANNUALIZED, GROSS-OF-FEES)

Annual Comprehensive Financial Report

For the Year Ended December 31, 2022

Public Employees' Retirement Association of Colorado

Prepared by Colorado PERA's Accounting Division in coordination with staff from other divisions

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June 16, 2023

Dear Colorado PERA Members, Benefit Recipients, Employers, and Members of the Board of Trustees:

Amy C. McGarrity
Interim Executive Director/ Chief Investment Officer

I'm pleased to present this *Annual Comprehensive Financial Report (ACFR)* prepared by the Public Employees' Retirement Association of Colorado (PERA), which details the plan's performance from January 1, 2022, through December 31, 2022.

PERA manages an investment portfolio of $55.9 billion for the defined benefit plans and $5.1 billion for the defined contribution plans on behalf of the many retirees and public employees who have dedicated their careers to public service. It is their commitment and service to their local communities and our state that help guide our mission with integrity and purpose. That purposeful approach to PERA's mission guides our investment strategy in both up and down markets.

While global markets finished strong in 2021, 2022 was a very challenging year, with major indexes down for the year. PERA, as an investor in those markets, was not immune to those losses. The defined benefit trust funds ended the year with a time-weighted return of negative 13.4% net-of-fees, compared to the benchmark's negative 13.7% return.

PERA's strategic asset allocation, set by the Board of Trustees (Board), ensures that we have a well-diversified portfolio that can withstand different market environments. We may experience losses in any given year, but our portfolio is designed to deliver returns for our members over several decades. Our 10-year annualized time-weighted return is 8.0% net-of-fees, while the benchmark earned 7.1%.

The value of that strategic asset allocation, as well as our plan design, is evident in that PERA remains on track to reach its long-term funding goal. The Fund's negative return did not trigger modifications to the plan under the Automatic Adjustment Provision (AAP) implemented by the General Assembly in 2018. That means member and employer contributions, as well as the annual benefit increase of 1.0% paid to most eligible retirees, will remain unchanged in 2024.

That's good news for the near term, but it's important that we keep our sights on our long-term goals and the responsibility we have to our stakeholders to stay on track. The AAP calculation is conducted annually, and we will continue to assess our progress each year and make adjustments as established in state statute to ensure we don't fall behind.

On behalf of PERA's leadership team, I want to thank the hardworking staff who work every day to execute the Board's strategic vision and administer benefits to the more than 670,000 members, retirees, and beneficiaries who rely on them. In 2022, we continued work on important member-focused initiatives, such as improving service levels and reducing call times in the Customer Service Center, redesigning our website to improve the user experience, and launching new on-demand educational content for members, among many other projects.

Colorado's public employees provide vital services to their communities and to our state, and we owe it to them to stay committed to the values of integrity and purpose that guide our mission. By keeping our focus on our funding goals, investing for the future, and evolving our service delivery, we will continue to provide retirement security to Colorado's public workforce for many decades to come.

Mail: PO Box 5800, Denver, CO 80217-5800 | 1.800.759.PERA (7372) | **copera.org**

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2022 Legislation

During the 2022 legislative session, four bills pertaining to PERA passed the Colorado General Assembly and were signed into law.

House Bill 22-1029: Compensatory Direct Distribution to PERA

The bill required a payment to PERA from the PERA Payment Cash Fund for $380 million. This amount reflects the suspended direct distribution payment to PERA of $225 million from July 2, 2020, plus $155 million in order to reduce two future direct distributions. The future direct distribution payments will be reduced based on the interest that accrues from the initial $380 million payment as follows:

- Fiscal year 2023-24 (July 1, 2023), the payment is reduced by an amount between $155 million to $190 million, resulting in a direct distribution payment amount between $35 million to $70 million; and
- Fiscal year 2024-25 (July 1, 2024), the payment is reduced by up to $27.55 million, resulting in a direct distribution payment of no less than $197.45 million, unless the actual rate of return is zero or less, in which case there may be no reduction.

The PERA Board supported restoring the missed direct distribution.

Governor Jared Polis signed the bill into law on June 7, 2022.

House Bill 22-1057: PERA Employment After Teacher Retirement

Under current law, PERA retirees are limited in how many days they can work for a PERA employer after retirement without reducing their benefit. This bill temporarily waives those limits for qualified service retirees working as substitute teachers in any school district while there are critical substitute teacher shortages.

The PERA Board opposed this bill. Expanding working after retirement provisions to allow retirees to work without a reduction will increase PERA's liabilities. As fiduciaries, pursuant to its funding policy, the PERA Board opposes legislation that increases liabilities or reduces contributions until PERA is fully funded.

Governor Jared Polis signed the bill into law on March 17, 2022.

House Bill 22-1087: Special District Director Retirement Benefits

Special district board members are considered employees of the special district, and prior to this bill, their compensation was subject to PERA contributions as PERA members (if the special district is an employer affiliated with PERA). This bill excludes special district board members who begin their service on or after July 1, 2022, from being eligible for membership in PERA for their service as directors.

The PERA Board did not take a position on this bill, as it has no actuarial impact on the fund.

Governor Jared Polis signed the bill into law on March 24, 2022.

House Bill 22-1101: PERA Service Retiree Employment in Rural Schools

Under current law, retired teachers, bus drivers, or food service workers in rural districts of the School Division may be rehired and receive salary without reduction in benefits under certain limitations. These provisions were scheduled to repeal on July 1, 2023, and this bill expanded them to include school nurses and paraprofessionals to those retirees eligible for full-time reemployment, as well as eliminated the scheduled repeal date, thus making the provisions permanent.

The PERA Board opposed this bill. Expanding working after retirement provisions to allow retirees to work without a reduction will increase PERA's liabilities. As fiduciaries, pursuant to its funding policy, the PERA Board opposes legislation that increases liabilities or reduces contributions until PERA is fully funded.

Governor Jared Polis signed the bill into law on March 18, 2022.

Economic Environment

The Federal Reserve (Fed) raised its target rate from near zero in March of 2022 in what would become the fastest and steepest tightening of monetary policy in decades. The Fed raised rates seven times throughout the year, including four consecutive 75 basis points (bps) rate increases, and ended the year with a federal funds rate upper bound of 4.5%. This rapid increase impacted rate-sensitive sectors of the economy more immediately and real estate was among the sectors to feel the effects most acutely. Mortgage rates more than doubled over the year and were above 7.0% for a period before settling at 6.4%. Total U.S. home sales were down 17.8% from the prior year, although the median national home price was still up 10.2%. Rising rates and inflation resulted in positive news for savers and social security recipients. High-yield savings account interest rates approached 4.0% at the end of 2022 while social security benefits increased 5.9%.

The U.S. economy moderated from 2021's record growth with 2022 real gross domestic product (GDP) posting an increase of 2.1%. The unemployment rate returned to its pre-pandemic low of 3.5% as employers faced intense competition for workers. The competition for talent has caused wage and salary growth for civilian workers to soar over the last two years, with an increase of 5.1% for the 12-months ending in December, on top of 2021's increase of 4.5%. Gains in wage and salary growth were largely offset by rising inflation with the Consumer

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Price Index (CPI) continuing its upward course into 2022. The CPI all items index (headline inflation) rose 6.5% for the 12-month period ending in December while CPI less food and energy (core inflation) rose 5.7%. The Personal Consumption Expenditures (PCE) price index, the Fed's preferred method to measure inflation, rose 5.3% from December 2021, while PCE less food and energy rose 4.6%.

The global economy underperformed growth forecasts with real global GDP increasing 2.9% across all economies. Emerging market and developing economies experienced growth of 3.4% while advanced economies realized growth of 2.5%. Among advanced economies, the United States and Japan underperformed, with the latter's economy slowing even further from the prior year to 1.2%, while the Euro area managed real GDP growth of 3.3%. Within emerging market and developing economies, China's economy slowed markedly from the prior year to 2.7% and the Russian Federation contracted 3.5% as sanctions and restrictions on energy exports took a toll on productivity and government revenue. The easy monetary and fiscal policy that was abundant during the pandemic faded quickly in 2022, with monetary policy being rapidly tightened by central banks around the globe to head off rising prices. The combined efforts by central banks appeared to bear fruit as inflation showed signs that it may have peaked in the year's second half.

Colorado's economy slowed from the sharp recovery of 2021 but was among the top 10 fastest-growing economies in the nation in 2022 and posted a rate of growth more than a full percent above that for the U.S. The Rocky Mountain region was the strongest-performing regional economy in 2022 and Colorado realized a real GDP growth rate of 3.2%. Colorado's unemployment rate neared pre-pandemic lows at 2.8%, owing to one of the most highly educated workforces in the nation. Colorado's labor force participation rate continued to be one of the highest in the country, ending 2022 at 68.0%. The state's population increased by 0.5%, the slowest rate of population growth since the 1980s. Colorado's pandemic housing frenzy came to a standstill in 2022 on the heels of the Fed's aggressive monetary tightening. The inventory of single-family homes increased 70% statewide to over 11,000 homes as of December, although this resulted in just 1.7 months of inventory, which is well below the six months that is seen as making a balanced market. The still limited housing supply helped to moderate any drop in prices with the median price through December unchanged year-over-year at $530,000 statewide. Although the double-digit appreciation of the past few years has abated, housing affordability has decreased as mortgage rates have risen and the monthly mortgage payment (principal and interest only with a 20% down payment) on a $530,000 home increased by over 40%, or $800 more per month, during the 2022 calendar year.

Investments

Investment portfolio income is a significant source of revenue to PERA. The Board's Investment Committee is responsible for assisting the Board in overseeing PERA's investment program.

In 2022, there was a net investment loss of $9.8 billion compared with total member contributions of $1.4 billion and employer contributions of $2.2 billion.

For the year ended December 31, 2022, the defined benefit funds had a time-weighted rate of return of negative 13.4% net-of-fees. The annualized, net-of-fees, time-weighted, rates of return over the last three and five years were 5.7% and 6.5%, respectively, and over the last 10 years it was 8.0%. The 30-year annualized, gross-of-fees, time-weighted, rate of return was 8.3%.

Prudent funding and healthy investment returns are important to the financial soundness of PERA. More information on the composition of the portfolio is reflected in the Investment Summary on page 130.

An integral part of the overall investment policy is the strategic asset allocation. The strategic asset allocation is designed to provide appropriate diversification and balance expected total rates of return with the volatility of expected returns. The fund is to be broadly diversified across and within asset classes to limit the volatility of the total fund investment returns and to limit the impact of large losses on individual investments. Both traditional and nontraditional assets are incorporated into the asset allocation mix.

In addition to asset class targets, the Board sets ranges within which asset classes are maintained. The yearly Policy Benchmark weight and long-term asset allocation target, as well as the specified ranges for each asset class are presented on page 125. All of the asset classes were within their specified ranges at year-end.

PERA's investment policy is summarized in the Report on Investment Activity on page 125.

Investment Stewardship

It is PERA's fiduciary duty to serve as stewards of capital for more than 670,000 members, participants, and beneficiaries. Foundational to PERA's investment stewardship are cost-consciousness, integration of material factors in PERA's investment and proxy voting decisions, market advocacy, and the ongoing evaluation of our holdings. Collectively, these efforts are intended to strengthen PERA's investment stewardship across all asset classes in the portfolio as we continue to prioritize financial sustainability.

Within the Board's strategic objective to fortify the resilience of PERA's portfolio, the Investment Committee undertook an initiative to update *PERA's Proxy Voting Policy (Policy)*. The Board approved updates to the *Policy* in January 2021, and staff implemented the updated *Policy* effective February 2021.

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Through careful deliberation, the Board continues to uphold its fiduciary duty in setting parameters for PERA's investment program.

In 2022, senior members of PERA staff served on advisory groups and boards to advocate for robust capital markets and business practices that are accretive to long-term investment value. Our participation in the Investor Advisory Group of the Public Company Accounting Oversight Board (PCAOB), and on the boards of the Council of Institutional Investors (CII) and International Corporate Governance Network (ICGN) demonstrate PERA's commitment to strong investment stewardship.

Major Initiatives

The 2022 major initiatives continued with the momentum and foundation built in 2021 as we focused on our constant evolution to implement solutions that better serve our members and retirees as well as our own employees. These initiatives required coordination and cooperation across the organization and a shared vision to take improvements and innovation to new levels.

Redesigned PERA Website and Enhancements to Secure Site

A full redesign of our public website delivered an improved member-first experience with a new look and feel, simpler navigation menus, and improved search functionality. A companion project in 2022 was a redesign of our secure site to match the public site design and improve functionality. Additional enhancements include offering more self-service opportunities for members and personalized benefit information front and center on member dashboards to highlight the most requested information.

Unitization Project

In 2021, a cross-departmental team began evaluating the process for unitizing the Fixed Income asset class in the defined benefit plan. Unitization can be likened to a mutual fund – multiple individuals invest through a fund manager, who pools the monies received to buy securities. Each investor owns units (or shares) in a pool of assets, but not the underlying assets themselves. Unitization provides a compelling opportunity for defined contribution plan participants to gain access to PERA's low cost, institutional quality, internal asset management capabilities by investing alongside the defined benefit plan. The project was completed during the summer of 2022 and the internally managed PERA unitized product replaced one of the underlying managers in the PERAdvantage Fixed Income Fund. These fund participants benefit from PERA's internal fixed income expertise and a reduction of the investment management fee. PERA staff is evaluating additional unitization opportunities.

Call Verification System

Over the past two years, PERA's Customer Service Center has experienced a significant increase in calls received along with longer call times on average. In 2022, Vericall software was implemented to help representatives verify 80% of members with just one question. This streamlining of verification procedures not only improved the members' experience as Customer Service saw a 16% improvement in service-level goals, but it also reduced the potential for fraud incidents. Additional internal procedures were incorporated to standardize calls and reduce call times by almost two minutes from 2021.

Net Promoter Score Survey

Much of the work completed in 2021 was driven by the results of our Net Promoter Score (NPS) Survey that was conducted in 2019. It provided invaluable feedback on what we could do better to meet the needs of members, retirees, and affiliated employers. The feedback inspired us to rethink how we conduct business and positioned us to take the member experience to new levels. We launched our second NPS Survey in 2022 and improved customer satisfaction. In 2019 we had an NPS score of 5 and in 2022 we improved to 29 reflecting an unweighted improvement of 24 points. However, to more accurately capture the real difference between 2019 and 2022, an adjusted NPS score was created by weighting the results based on the distribution of each member type (retiree, active, vested inactive). This adjustment lowered the NPS score in 2019 to negative 4 and in 2022 to 5, but still showing an improved satisfaction score of 9 points over 2019. While achieving strong customer satisfaction scores are not the primary goal, improving how we serve our membership is and the NPS Survey provides insights about how we communicate with members, retirees, and employers, processes that work, and what will be expected in the future.

Lower Cost PERACare Health Plans

The PERACare health benefits program available to benefit recipients and their eligible dependents implemented lower-cost health plans in 2022 by switching to UnitedHealthcare and UMR for nearly 54,000 PERACare enrollees in Pre-Medicare and Medicare plans. This change significantly reduces the monthly premium for Medicare enrollees in addition to consolidating both medical and pharmacy benefits into one carrier.

LEAD Pacesetter Program

To further PERA's commitment to organizational excellence now and in the future, the LEAD Pacesetter program was developed in 2022 to encourage growth and development for team leads and those who are interested in gaining or advancing knowledge and skills. The purpose of this program is to provide education, insight, and competencies related to leadership through a variety of learning opportunities. The LEAD Pacesetter program is a dynamic 12-month experience investing in employee professional development further inspiring and equipping talent, while strengthening PERA's succession pipeline.

Actuarial Results

Actuarial valuations involve assumptions about the probability of events far into the future in order to estimate the financial and actuarial status of the defined benefit trust funds. Two types of actuarial valuations are required to be performed for PERA's five defined benefit pension and two other postemployment benefit (OPEB) trust funds: one for financial accounting and reporting purposes and the other for funding purposes. The results of both actuarial valuations are included in this report. The actuarial valuations performed for financial accounting and reporting purposes are prepared in accordance with Governmental Accounting Standards Board (GASB) requirements. Pension liabilities, OPEB liabilities, and other related amounts calculated in accordance with these standards emphasize the costs incurred by PERA-affiliated employers for providing benefits to their employees as part of the employment-exchange process. Assets are required to be stated at fair value and the liabilities are determined using a consistent, standardized methodology, which allows for transparency and the comparability of amounts calculated for financial accounting and reporting purposes across U.S. governmental defined benefit pension and OPEB systems.

The actuarial valuations for funding purposes are prepared in accordance with Actuarial Standards of Practice and the Board's pension and OPEB funding policies. Liabilities and other actuarial metrics are calculated for the purpose of determining a systematic approach to pre-funding costs of the five defined benefit pension and two OPEB trust funds, as well as to assess the adequacy of moneys that are available to pay post-employment benefits earned by the membership. Pre-funding future liabilities defrays the ultimate cost of providing benefits as dollars held in the trust funds generate investment returns. The amount of actuarial accrued liability (AAL) in excess of the actuarial value of assets is referred to as the unfunded actuarial accrued liability (UAAL). The ratio of assets to AAL represents the funded status of each plan.

For the year ended December 31, 2022, the UAAL calculated for purposes of systematically funding the five defined benefit pension trust funds was $26.3 billion compared to the unfunded liabilities, referred to as the net pension liabilities calculated for accounting and financial reporting purposes of $31.0 billion. Although some of the objectives and calculation methodologies of these valuations are similar, the liabilities calculated for financial reporting purposes and funding purposes can be notably different under certain circumstances. For the year ended, December 31, 2021, the UAAL calculated for purposes of systematically funding the five defined benefit pension trust funds was $27.2 billion compared to the net pension liabilities calculated for accounting and financial reporting purposes of $18.9 billion.

The increase in the unfunded liabilities calculated for accounting and financial reporting purposes is primarily due to unfavorable investment performance during 2022. In accordance with GASB 67 and GASB 74, the discount rate determination for 2022 required the use of the long-term expected rate of return of 7.25% for the five pension and two OPEB trust funds. When calculating the AAL for purposes of funding, the discount rate used is always equal to the long-term expected rate of return set by the Board.

Information on certain actuarial metrics that assess the moneys required to systematically fund the five defined benefit pension and two OPEB trust funds can be found in the Management's Discussion and Analysis (MD&A) on pages 35-38 of the Financial Section. A comprehensive discussion of the results of the actuarial valuation performed for financial accounting and reporting purposes can be found in the MD&A on pages 39-40, as well as in Notes 10 and 11 of the Notes to the Financial Statements in the Financial Section. A comprehensive discussion of the results of the actuarial valuations performed for funding purposes, as well as other analysis utilized by PERA can be found as follows and in the Actuarial Section.

Funding

On December 31, 2022, the funded ratio for PERA's five defined benefit pension trust funds was 69.9% compared to 67.8% on December 31, 2021. The actuarial value of plan assets as of December 31, 2022, was $60.9 billion. Although the 2022 investment return was unfavorable when compared to the long-term expected rate of return of 7.25%, the actuarial value of assets increased by approximately $3.7 billion from the prior year, due to the favorable investment performance for 2021, 2020, and 2019. The unfunded liability as of December 31, 2022, was $26.3 billion, a decrease of approximately $0.9 billion from the previous year, reflecting a net demographic actuarial loss and graded smoothing of the unfavorable investment return for 2022 mitigated by the favorable investment returns over the three prior years.

The development and ongoing review of a pension funding policy are responsibilities of the Board. PERA's current pension funding policy was initially adopted by the Board in March 2015, and last revised in November 2018, for the five defined benefit pension trust funds. The Board adopted a similarly structured OPEB funding policy in January 2018. Both policies focus on the determination of an actuarially determined contribution reflecting closed and layered 30-year amortization periods. The purpose of each policy is three-fold: (1) to define the overall funding benchmarks of the trust fund, (2) to assess the adequacy of the contribution rates set by the Colorado Legislature by comparing each trust fund's statutorily set contribution rate to an actuarially determined contribution benchmark, and (3) to define the annual actuarial metrics which will assist in assessing the sustainability of the plan. The results of these three items help guide the Board when considering whether to pursue or support proposed contribution and benefit legislation.

A goal of the Board's pension and OPEB funding policies is the achievement of a combined Division Trust Fund and a combined Health Care Trust Fund actuarial funded ratio equal to or greater than 110%.

Investment income is the most significant driver of the funded status in a defined benefit plan. To understand the significance of this assumption, a sensitivity analysis is included in the Actuarial Section on page 181 for the Division Trust Funds and page 205 for the Health Care Trust Funds. Additional information on PERA's funded ratio, unfunded liabilities, and actuarial assumptions may be found in the Actuarial Section starting on page 153 for the Division Trust Funds and on page 190 for the Health Care Trust Funds.

Employer contributions are also a driver of the funded status. 2022 is only the second year within the last 20 years that the actual employer contributions received pursuant to statute for the five defined benefit pension trust funds were in excess, or $417.4 million greater than the required actuarially determined contributions. However, two years of excess does not fully compensate for the 18 years of deficiency, which has accumulated over the 20-year period to $5.1 billion as of December 31, 2022. See page 37 of the MD&A in the Financial Section for additional details.

Investment Rate of Return Sensitivity Effect on Projected Amortization Periods

In addition to the annual actuarial funding valuation, the Board's actuary performs actuarial projections for each Division Trust Fund. These projections are forward-looking and take into consideration the many tiers of PERA benefit provisions and the statutory contribution rate structures, including the effective date of each tier or contribution rate. The projections also reflect applicable salary, demographic, and economic actuarial assumptions, as well as anticipated member growth. Considering the various benefit tiers currently in effect within PERA, the Board believes the results of the actuarial projections provide the best insight into the long term impact of the pension reforms adopted in 2010 and 2018.

The main focus of these projections is to provide, by division, the amortization or funding period, stated more simply as the expected number of years until full funding status is achieved. The projected amortization periods reflect all actuarial assumptions and the benefit and contribution provisions currently enacted, even if not yet effective.

The following table shows the projected amortization periods under two scenarios: (1) as of the December 31, 2022, actuarial valuation, reflecting the unfavorable 2022 investment return, other plan experience, and legislative changes pursuant to House Bill (HB) 22-1029 and Senate Bill (SB) 23-056, and (2) as of the December 31, 2021, actuarial valuation, considering the AAP adjustments effective July 1, 2022.

	Projected Amortization Periods (in years)	
Division Trust Fund	2022 Valuation Results Considering HB 22-1029 and SB 23-056	2021 Valuation Results
State	32	16
School	34	16
Local Government	23	2
Judicial	12	3
DPS	13	2

Since the projections are based on a wide variety of assumptions, it is important to understand the risks related to defined benefit plans, specifically the risks associated with the selection and application of the long-term expected rate of return on investments. Given the long-term funding horizon and anticipated ongoing aspect of such defined benefit plans, particularly those providing benefits in the public sector, it is generally understood that the existence of the plan, itself, is not tied to the financial performance of private enterprise, but rather to the ongoing nature of governmental services. Therefore, it is common practice for plan sponsors/administrators of governmental or public sector pension plans also to apply the expected long-term rate of return as the discount rate used to determine the liabilities of the plan.

In order to derive the long-term rate of return assumption, the Board looks to the expertise of its investment and actuarial consultants to perform a comprehensive asset/liability study on a periodic basis (generally every three to five years). In conjunction with this study, the Board reviews capital market data from numerous sources. PERA concluded the most recent asset/liability study in November 2019. As a result of that study, the Board updated and approved long-term asset allocations and target ranges effective January 1, 2020, and reaffirmed the current 7.25% long-term expected rate of return applicable to all five Division Trust Funds as well as the two Health Care Trust Funds.

The following table illustrates the projected amortization periods, in years, of the School Division Trust Fund under the various return scenarios (used for both assumed investment return and to discount liabilities of the plan) which correspond to the confidence levels (probabilities of investment return) as indicated. This table reflects the results and experience of the December 31, 2022, actuarial funding valuation and the revised actuarial assumptions adopted November 20, 2020, first effective for the December 31, 2020, actuarial valuations and measurement date. The projected funding periods reflect 50-year probability outlooks (Monte Carlo simulations), provided by the Board's actuaries, and are based on 30-year capital market assumptions, employed in the most recent asset/liability study as previously described, provided by the Board's investment consultants.

Projected Amortization Periods—School Division Trust Fund

Probability of Achieving at Least the Rate of Return Displayed (or Better), per Annum	Long-Term Expected Investment Return & Discount Rate				
	4.35%	6.18%	7.25%	8.63%	10.47%
95th Percentile	Infinite				
75th Percentile		92			
53rd Percentile			34		
25th Percentile				14	
5th Percentile					4

PERAPlus 401(k)/457 and Defined Contribution Retirement Plans

PERA offers members opportunities to save for retirement through the PERAPlus 401(k), PERAPlus 457, and Defined Contribution Retirement (DC) Plans. All employees working for a PERA-affiliated employer may contribute to the PERAPlus 401(k) Plan. As of December 31, 2022, there were a total of 208 employers who recognized the value of offering more choices in savings by affiliating with the PERAPlus 457 Plan. The Roth option was added to the PERAPlus 401(k) and 457 Plans at the end of 2014. As of December 31, 2022, there were a total of 175 employers who have adopted the Roth option. The Roth option in these plans offers advantages over a Roth IRA, including higher contribution limits and no income-based contribution limitations.

The fiduciary net position of the PERAPlus 401(k), PERAPlus 457, and DC Plans decreased for the year ended December 31, 2022. The PERAPlus 401(k), PERAPlus 457, and DC Plans lost $761.9 million, $189.0 million, and $63.5 million of investment income with a fiduciary net position of $3.8 billion, $1.1 billion, and $339.5 million, respectively.

Overview of Colorado PERA

Established in 1931, PERA operates by authority of the Colorado General Assembly and is administered under Title 24, Article 51 of the Colorado Revised Statutes. Initially covering all State employees, PERA has expanded to include all Colorado school districts, the State's judicial system, and many municipalities and other local government entities. See Notes 1, 8, and 9 of the Notes to the Financial Statements in the Financial Section for participant information and services provided by PERA.

Employer Affiliation

On July 1, 2022, the Behavioral Health Administration (BHA) began reporting to PERA when it became operational with the passage of House Bill 21-1278, which officially established the duties of the BHA. This new cabinet member-led agency within the State of Colorado is currently operating within the Department of Human Services until a permanent location is determined by the General Assembly on or before November 1, 2024. The BHA is designed to be the single entity responsible for driving coordination and collaboration across state agencies to address behavioral health needs. PERA welcomes the BHA and its employees.

Board Composition

PERA is governed by a 16-member Board of Trustees; 11 Trustees are elected by the membership for staggered four-year terms and serve without compensation except for necessary expenses. In addition, there are three Governor-appointed Trustees confirmed by the Senate who receive limited compensation. The State Treasurer serves as a voting ex officio Trustee, and the DPS Division elects one member to serve as a non-voting ex officio Trustee.

In June 2022, as a result of the 2022 Board election, two Trustees were elected to the Board and two Trustees were appointed to vacant seats. Scott Smith, Chief Financial and Operating Officer at Cherry Creek School District 5, was elected to fill the School Division seat held by Guillermo Barriga, who did not seek re-election. Trustee Smith will serve a four-year term that expires in June 2026. Tracy Marie Rushing, a Supervisor in the Division of Vocational Rehabilitation at the Colorado Department of Labor and Employment, was elected to the State Division to fulfill the remaining two-year seat held by Ashley Smith, who was appointed to the Board in 2021. Trustee Rushing's term expires in June 2024.

In addition, the Board appointed Trina Ruhland to represent the Local Government Division. Trustee Ruhland is a Deputy County Attorney with the Boulder County Attorney's Office and fills a seat vacated by Cheryl Pattelli, who left the Board in November 2021. The Board also appointed JB Phillips, a Middle School Science Teacher in Mesa County Valley School District 51, to fill a seat vacated by Tina Mueh, who retired in June 2022. Both Trustees Ruhland and Phillips are serving one-year terms until the Board election in 2023.

In July 2022, Governor Jared Polis appointed Jennifer Pasquino to the seat previously held by Thomas Barrett, whose term expired in July. Pasquino is a retired chief financial officer and senior finance leader who has also served as an investor relations officer and chief

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accounting officer with various Fortune 500 companies. By law, Governor-appointed Trustees must have experience and competence in investment management, finance, banking, economics, accounting, pension administration, or actuarial analysis. Trustee Pasquino's term expires in July 2026.

In January 2023, the Board nominated and re-elected Trustee Marcus A. Pennell as Board Chair and Trustee Suzanne Kubec as Vice Chair. Board officers serve for terms of two years.

Management Changes

Ron Baker's tenure as PERA's Executive Director ended June 1, 2023. He served as Executive Director since 2018. Pursuant to PERA's organizational chart and succession planning policy, I have been serving as Acting Executive Director since Mr. Baker went on a leave of absence March 8, 2023, and was named Interim Executive Director on June 1, 2023.

In March 2023, PERA's Benefit Services Division underwent a realignment of staff to support business process improvement and modernization efforts. Matthew Carroll was promoted to the newly created position of Senior Director of Benefit Services. Matt joined PERA in 2006 as a Benefits Counselor and was promoted to Director of Benefit Services in April 2011. He holds the Certified Retirement Counselor® designation from the International Foundation for Retirement Education. As Senior Director of Benefit Services, Matt will oversee the strategic direction and modernization efforts within the Benefit Services Division.

Additionally, two new subdivisions were created within the Benefit Services Division, Member Services and Benefits Administration, to focus on the day-to-day administration of the defined benefit plan. The Member Services area is responsible for the delivery and administration of services to members of the defined benefit plan and the Benefits Administration area is responsible for the administration and related services of PERA's defined benefit plan for retirees and employers.

Overseeing the daily operations and responsibilities of these two new subdivisions are Una Bearden and Nancy Graham. Una Bearden was promoted to Director of Benefit Services, Member Services. She joined PERA in August 2021 as Assistant Director of Benefit Services. Previously, Una was a Client Service Manager at Milliman. Nancy Graham was promoted to Director of Benefit Services, Benefits Administration. Nancy joined PERA in June 2000 as a Customer Service Front Desk Representative and was promoted to Assistant Director of Benefit Services in September 2012.

Also in March, Laura Lamb, Director of Operations Support, moved into a new position as Senior Administrative and Data Specialist within the Operations Support Division. Laura continues to report directly to Jeremy Hill, Chief Administrative Officer. A decision has not been made at this time regarding the hiring of a new director.

Financial Information and Management Responsibility

Our *ACFR* must comply with the reporting requirements under Title 24, Article 51, Section 204(8) of the Colorado Revised Statutes.

PERA's financial statements are prepared by management, who is responsible for the integrity and fairness of the data presented, including the many amounts which must, out of necessity, be based on estimates and judgments. This *ACFR* was prepared to conform to the accounting principles generally accepted in the United States of America. Financial information presented through the report is consistent with that which is displayed in the basic financial statements.

Ultimate responsibility for the basic financial statements and *ACFR* rests with PERA management; the Board provides an oversight role over financial reporting. The Board is assisted in its responsibilities by the Audit Committee, which consists of no fewer than five Board members and two independent outside members. A more detailed description of the Audit Committee's role can be found in their report on pages 16-17.

Management is responsible for establishing and maintaining adequate internal control over financial reporting. PERA's internal control over financial reporting is designed to provide reasonable, but not absolute assurance, regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. The internal control over financial reporting includes those policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of assets;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures are being made only in accordance with authorizations of management; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of assets that could have a material effect on the financial statements.

LETTER OF TRANSMITTAL

Management has concluded that the system of internal controls over financial reporting is effective, as of December 31, 2022.

There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error, the circumvention or overriding of controls, and that the cost of a control should not exceed the benefits to be derived. Accordingly, even an effective internal control system may not prevent or detect misstatements and can provide only reasonable assurance with respect to financial statement preparation. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

State law requires that the State Auditor conducts or causes to be conducted an annual audit of PERA. Pursuant to this requirement, under the direction of the State Auditor, CliftonLarsonAllen LLP audited PERA's 2022 basic financial statements in accordance with auditing standards generally accepted in the United States of America and Government Auditing Standards. CliftonLarsonAllen LLP issued an unmodified opinion on PERA's financial statements, which can be found in the Independent Auditors' Report in the Financial Section on pages 25-28. Management has provided the auditors with full and unrestricted access to PERA's records and staff to discuss their audit and related findings, to facilitate independent validation of the integrity of the plan's financial reporting and to consider the effectiveness of internal controls.

The Financial Section of the *ACFR* also contains the MD&A that serves as a narrative introduction, overview, and analysis of the basic financial statements. This Letter of Transmittal is designed to complement the MD&A and should be read in conjunction with it.

Recognition of Achievements

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to PERA for its *ACFR* for the year ended December 31, 2021. This was the 37th consecutive year that PERA has achieved this prestigious award. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized annual comprehensive financial report. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current *ACFR* continues to meet the Certificate of Achievement Program's requirements, and we are submitting it to the GFOA to determine its eligibility for another certificate.

The GFOA also awarded PERA an Award for Outstanding Achievement in Popular Annual Financial Reporting for its *Popular Annual Financial Report* for the year ended December 31, 2021. The Award for Outstanding Achievement in Popular Annual Financial Reporting is a prestigious national award recognizing conformance with the highest standards for preparation of state and local government popular reports.

In order to receive an Award for Outstanding Achievement in Popular Annual Financial Reporting, a government unit must publish a Popular Annual Financial Report, whose contents conform to program standards of creativity, presentation, understandability, and reader appeal.

An award for Outstanding Achievement in Popular Annual Financial Reporting is valid for a period of one year only. PERA has received a Popular Award for the last 20 consecutive years. We believe our current report continues to conform to the Popular Annual Financial Reporting requirements, and we are submitting it to the GFOA.

PPCC Standards Award Program

The Public Pension Coordinating Council (PPCC) presented PERA with a Public Pension Standards Award for Funding and Administration in 2022 for meeting professional standards for funding and plan administration as set forth in the Public Pension Standards. This is the 20th consecutive year that PERA has received this annual award. The PPCC is a coalition of three national associations that represent public retirement systems and administrators—the National Association of State Retirement Administrators, National Council on Teacher Retirement, and National Conference on Public Employee Retirement Systems. These three associations represent more than 500 of the largest pension plans in the U.S.

LETTER OF TRANSMITTAL

Acknowledgements

This *ACFR* reflects the combined efforts of PERA staff and is the responsibility of PERA management. I extend my sincere appreciation to all who assisted in and contributed toward its completion. Our *ACFR* is intended to provide complete and reliable information for transparent communication and to serve as a resource. We take our fiscal responsibility very seriously as we serve as diligent stewards of the assets held in trust for the membership of PERA.

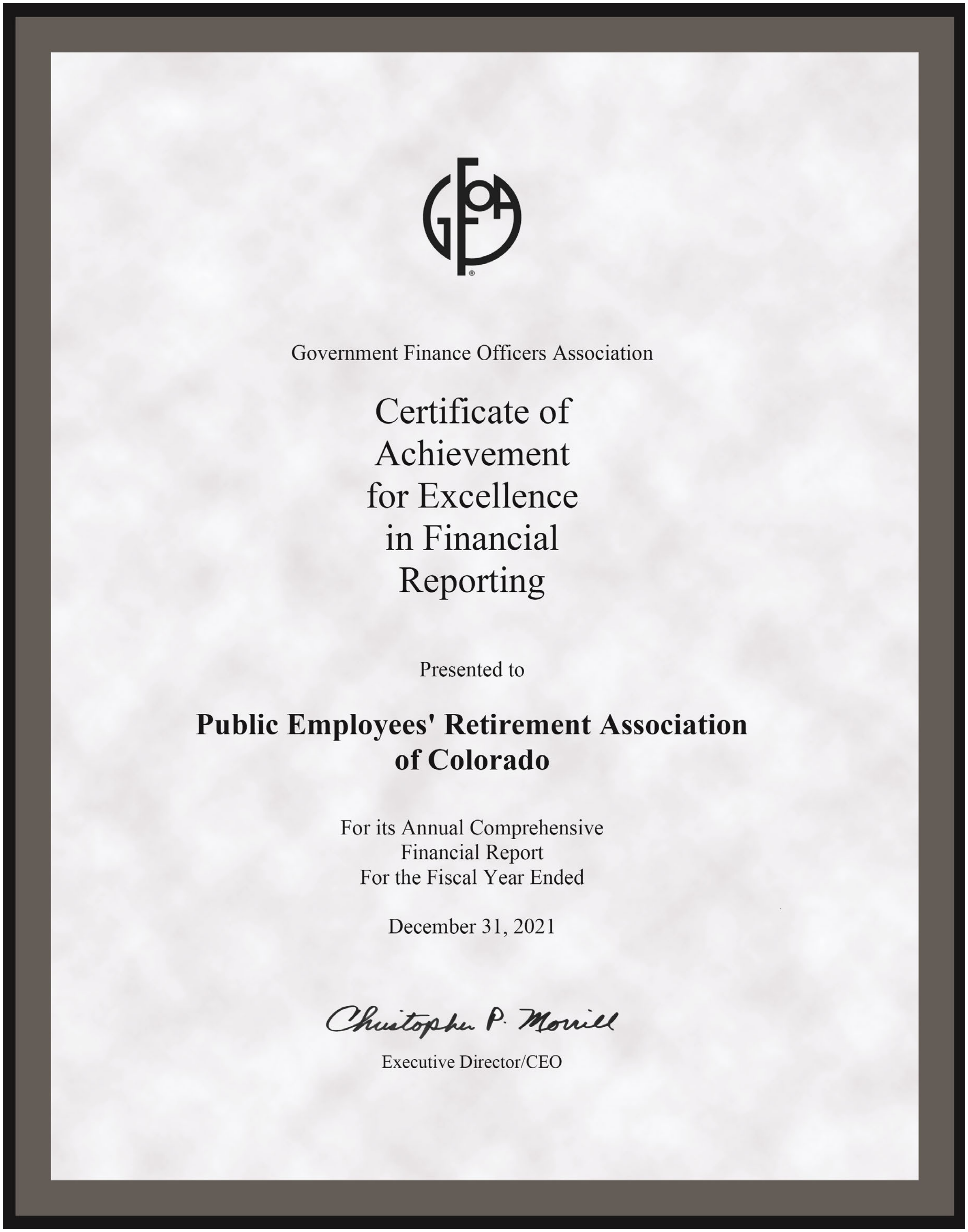
As we remain focused on our funding goals and investing for the future, I would like to thank our affiliated employers for their continued support and cooperation, it is vital to the success of PERA. I would also like to thank the PERA Board and staff for their hard work and many contributions on behalf of Colorado's public employees. We are all committed to the values and purpose to help guide our mission forward.

An email with a link to this *ACFR is* provided to all PERA-affiliated employers and other interested parties; a summary (*Popular Annual Financial Report*) is distributed to members and benefit recipients. Electronic versions of both reports are available on the PERA website at copera.org.

Respectfully submitted,

Amy C. McGarrity
Colorado PERA Interim Executive Director/
Chief Investment Officer

PROFESSIONAL AWARDS



Government Finance Officers Association

Certificate of
Achievement
for Excellence
in Financial
Reporting

Presented to

**Public Employees' Retirement Association
of Colorado**

For its Annual Comprehensive
Financial Report
For the Fiscal Year Ended

December 31, 2021

Christopher P. Morrill

Executive Director/CEO

PROFESSIONAL AWARDS

PPCC

Public Pension Coordinating Council

Public Pension Standards Award
For Funding and Administration
_2022_

Presented to

Colorado PERA

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

BOARD CHAIR'S REPORT

Marcus Pennell
Board Chair

June 16, 2023

Dear Colorado PERA Members, Benefit Recipients, and Employers:

As Chair of the Board of Trustees (Board), I am pleased to present this *Annual Comprehensive Financial Report* for the year ended December 31, 2022.

The year presented many challenges, as most investment markets saw a decline while consumer prices increased dramatically. I want to acknowledge the impact high inflation had on our membership last year. Through this year's tough economic conditions, the Board continued its focus on the members and their financial stability by ensuring that the fund that pays benefits for past, current, and future public employees is managed well and sustainably. While the effects of inflation are challenging, the guardrails established in Senate Bill 200 in 2018 help ensure we can pay benefits to all who rely on them, now and for many decades to come.

In late 2022, the Board began the process of developing PERA's next five-year strategic plan. We will always be focused on PERA's long-term sustainability and committed to the members and retirees who depend on us. As we assess where PERA is today and where we want the organization to be five years down the road, you can expect an improved member experience backstopped by the adoption of more modern practices throughout the organization. The future will no doubt bring new opportunities and challenges, and PERA will innovate and adapt along the way.

As I write this letter, the Board is in the process of searching for a new Executive Director following the termination of Ron Baker's employment contract on June 1. The Board named Amy C. McGarrity as Interim Executive Director and she will serve until a permanent executive director is hired. An Ad Hoc Committee of the Board was formed to conduct the search process for a permanent executive director. I'd like to thank Ms. McGarrity for stepping into that role and express the Board's confidence in PERA's leadership. PERA members and retirees will continue to receive excellent service during this period of transition.

I want to recognize PERA's staff for their continued dedication to the important work of administering retirement and other benefits for current and former public employees. The dedication by PERA staff and leadership to the membership is foundational to PERA's success, and the Board thanks you.

I'd also like to thank the Trustees who left the Board in 2022: Thomas Barrett, Guillermo Barriga, Tina Mueh, and Ashley Smith; and welcome five new Trustees: JB Phillips, Trina Ruhland, Tracy Marie Rushing, Jennifer Pasquino, and Scott Smith.

During my time on this Board, I've been continually impressed by the thoughtfulness and care the Trustees have given to the important work with which we are tasked. The Board cares deeply about the fiduciary duty we have to our stakeholders, and I am humbled by the integrity, skill, and sense of purpose with which the Board and staff serve our more than 670,000 members.

Sincerely,

Marcus Pennell (He/Him)
Chair, Colorado PERA Board of Trustees

Mail: PO Box 5800, Denver, CO 80217-5800 | 1.800.759.PERA (7372) | **copera.org**

REPORT OF THE COLORADO PERA AUDIT COMMITTEE

As described more fully in its Charter, the purpose of the Colorado PERA Audit Committee (Audit Committee) is to assist the Board of Trustees (Board) in fulfilling its fiduciary responsibilities as they relate to accounting policies and financial reporting, the system of internal control, PERA's *Standards of Professional and Ethical Conduct*, the internal audit process, and the practices of the Director of Internal Audit. Management is responsible for the preparation, presentation, and integrity of PERA's financial statements; accounting and financial reporting principles; PERA's system of internal control; and procedures designed to reasonably ensure compliance with accounting standards, applicable laws, and regulations. PERA has a full-time Internal Audit Division that reports functionally to the Audit Committee. The Internal Audit Division is responsible for independently and objectively reviewing and evaluating the effectiveness and efficiency of PERA's system of internal control.

CliftonLarsonAllen LLP is responsible for performing an independent audit of PERA's financial statements in accordance with generally accepted auditing standards and the standards applicable to financial audits contained in Government Auditing Standards issued by the Comptroller General of the United States. In accordance with law, the Colorado State Auditor has ultimate authority and responsibility for selecting, evaluating, and, when appropriate, replacing PERA's Independent Auditor.

The Audit Committee serves a Board-level oversight role in which it provides advice, counsel, and direction to management and to the Internal Audit function on the basis of the information it receives, discussions with management and Internal Audit, and the experience of the Audit Committee's members in business, financial, and accounting matters. In this role, the Audit Committee also reviews the audit plan of the Independent Auditor, the results of the audit, and the status of management's actions to implement recommendations from the audit.

The Audit Committee believes that a candid, substantive, and focused dialogue with the internal auditors and the Independent Auditor is fundamental to the Audit Committee's oversight responsibilities. To support this belief, the Audit Committee periodically meets separately with both the Director of Internal Audit and the Independent Auditor, without management present. In the course of its discussions in these meetings, the Audit Committee asked a number of questions intended to bring to light any areas of potential concern related to PERA's financial reporting and internal control. These questions include, but are not limited to:

- Are there any significant accounting judgments, estimates, or adjustments made by management in preparing the financial statements that would have been made differently had the Independent Auditor prepared and been responsible for the financial statements?
- Based on the Independent Auditor's expertise, and its knowledge of PERA and PERA's financial statements, have subsequent events been appropriately disclosed in the financial statements?
- Based on the Independent Auditor's experience, and its knowledge of PERA, do PERA's financial statements fairly present to users, with clarity and completeness, PERA's financial position and performance for the reporting period in accordance with generally accepted accounting principles?
- Based on the Independent Auditor's experience, and its knowledge of PERA, has PERA implemented internal control and internal audit procedures that are appropriate for PERA?
- Are the Independent Auditor and internal auditors getting the support they need from management to execute their duties?

Questions raised by the Audit Committee regarding these matters were answered to the Audit Committee's satisfaction.

The Audit Committee had an agenda for 2022 that included the following items:

- Recommending the *Annual Comprehensive Financial Rep*ort to the Board for its approval;
- Reviewing and approving the plan and budget of the Internal Audit Division;
- Reviewing the adequacy of resources made available to the Internal Audit Division;
- Reviewing the scope, objectives, and timing of the annual independent audit of PERA's financial statements;

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REPORT OF THE COLORADO PERA AUDIT COMMITTEE

- Providing input into the Executive Director's annual performance evaluation of the Director of Internal Audit;
- Reviewing PERA's compliance with its *Standards of Professional and Ethical Conduct*;
- Meeting with the Independent Auditor separately, without management present;
- Meeting separately with the Executive Director, Director of Internal Audit, Director of Accounting/Controller, and General Counsel; and
- Meeting with the Director of Internal Audit and with management to discuss the effectiveness of PERA's system of internal control.

The Audit Committee has reviewed and discussed the audited financial statements for the year ended December 31, 2022, with management and the Independent Auditor. Management represented to the Audit Committee that PERA's audited financial statements were prepared in accordance with accounting principles generally accepted in the United States of America that apply to governmental accounting for fiduciary funds. The Independent Auditor represented that their presentations to the Audit Committee included the matters required by auditing standards on auditor communication to be discussed with the Independent Auditor. This review included a discussion with management of the quality (not merely the acceptability) of PERA's accounting principles, the reasonableness of significant estimates and judgments, and the clarity of disclosure in PERA's financial statements, including the disclosures related to critical accounting estimates.

In reliance on these reviews and discussions, and the reports of the Independent Auditor and the Director of Internal Audit, the Audit Committee has recommended to the Board, and the Board has approved PERA's *Annual Comprehensive Financial Report* for the year ended December 31, 2022.

Audit Committee as of June 15, 2023

Timothy M. O'Brien, Chairman

Ramon Alvarado

Norm Franke

Julie Friedemann

Mary-Margaret Henke

Tammie Lowrie

Taylor McLemore

Jennifer Pasquino

Trina Ruhland

BOARD OF TRUSTEES

Serving from January 1, 2022, to June 16, 2023

By State law, authority over the public employees' retirement association is vested in the Board of Trustees (Board). The Board is composed of the following 16 Trustees:

- Nine members elected by members from their respective Divisions to serve on the Board for four-year terms; four from the School Division, three from the State Division, one from the Local Government Division, and one from the Judicial Division.
- Two retirees elected by retirees to serve on the Board for four-year terms.
- Three Trustees appointed by the Governor and confirmed by the State Senate to serve on the Board for four-year terms.
- The State Treasurer.
- One ex officio (non-voting) member or retiree elected by members and retirees of the Denver Public Schools (DPS) Division to serve on the Board for a four-year term.

If a Board member resigns, a new Trustee is appointed from the respective Division until the next election of Trustees.

Marcus A. Pennell
Chair

Elected by School Members
Physics Teacher
Jefferson County School District R-1
Current term expires June 30, 2025

Suzanne E. Kubec
Vice Chair

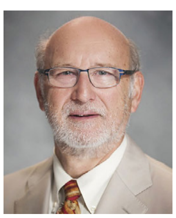
Elected by State Members
Liability Program Manager
State Office of Risk Management
Current term expires June 30, 2025

Ramon Alvarado

Elected by State Members
Adjunct Faculty/Professor
Metropolitan State University of Denver
Current term expires June 30, 2026

Honorable Rebecca R. Freyre

Appointed to Judicial Division seat
Judge
Colorado Court of Appeals
Current term expires June 30, 2027



Thomas J. Barrett

Appointed by the Governor
Term expired July 10, 2022

Julie Friedemann

Elected by Retirees
Retired Mathematics Teacher
Jefferson County School District R-1
Current term expires June 30, 2025

Guillermo Barriga

Elected by School Members
Project Manager
Aurora Public Schools
Term expired June 30, 2022

Nathan Geroche

Appointed to School Division seat
Science Teacher
Boulder Valley School District
Current term expires June 30, 2024

Norm Franke

Appointed by the Governor
Current term expires July 10, 2025

Amy Grant

Non-voting, Ex officio member
Elected by DPS Division active members and retirees
Former Chair of the Denver Public Schools Retirement System Board
Retired Secretary
Current term expires June 30, 2024

BOARD OF TRUSTEES

Serving from January 1, 2022, to June 16, 2023

Taylor McLemore

Appointed by the Governor
Current term expires July 10, 2024

Trina Ruhland

Appointed to Local Government Division seat
Deputy County Attorney
Boulder County Attorney's Office
Current term expires June 30, 2023

Tina Mueh

Elected by School Members
Middle School Science Teacher
Boulder Valley School District
Resigned from the Board June 1, 2022

Tracy Marie Rushing

Elected by State Members
Supervisor in Division of Vocational Rehabilitation
Colorado Department of Labor and Employment
Current term expires June 30, 2024

Timothy M. O'Brien

Elected by Retirees
Retired Colorado State Auditor
Office of the State Auditor
Current term expires June 30, 2023

Ashley M. Smith

Appointed to State Division seat
Advanced Analytics Services Manager
Pinnacol Assurance
Term expired June 30, 2022

Jennifer Pasquino

Appointed by the Governor
Current term expires July 10, 2026

Scott Smith

Elected by School Members
Chief Financial and Operating Officer
Cherry Creek School District
Current term expires June 30, 2026

JB Phillips

Appointed to School Division seat
Computer Science Teacher
Mesa County Valley School District 51
Current term expires June 30, 2023

Honorable Dave Young

Ex officio member
State Treasurer
Continuous term effective January 2019

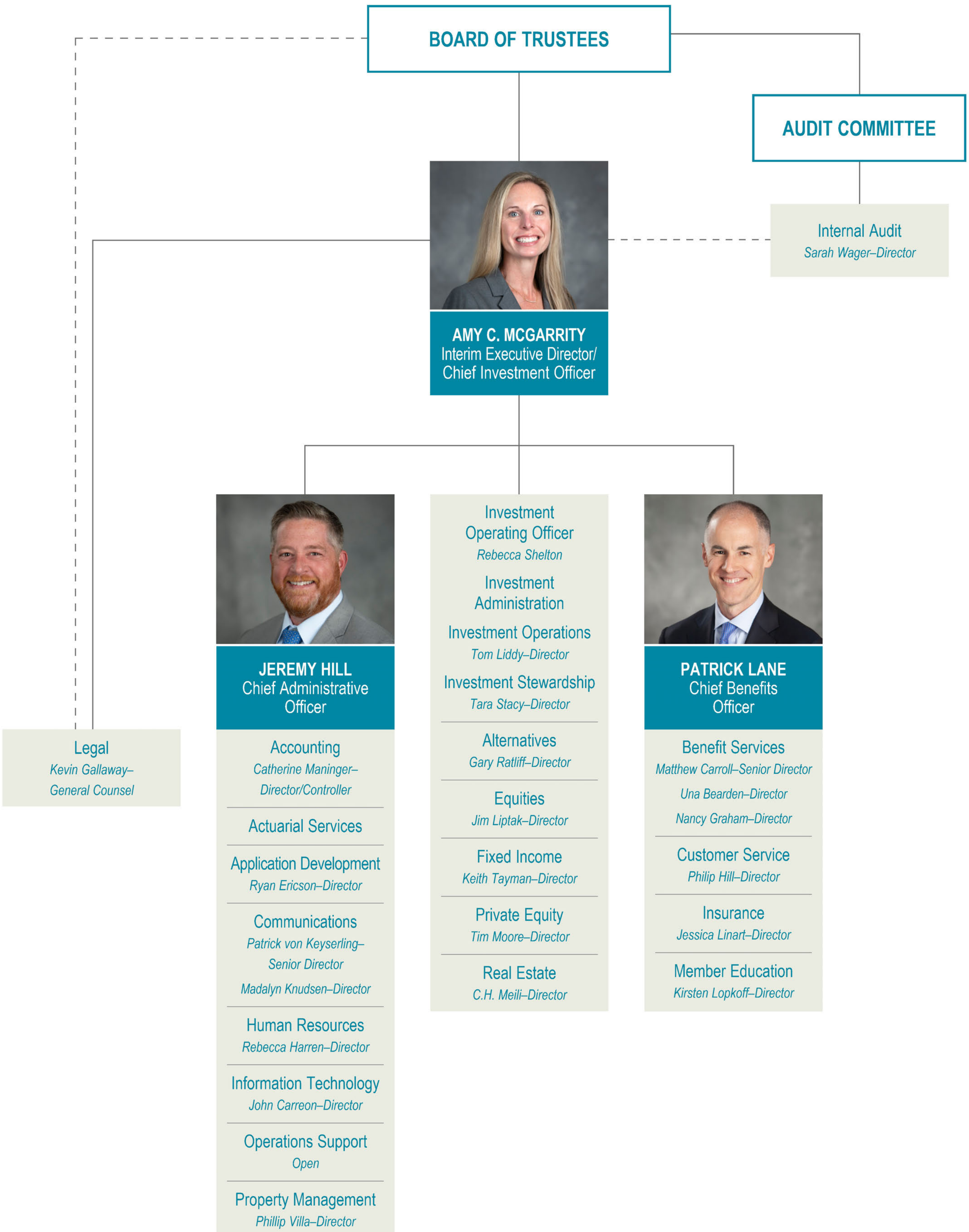
Eric Rothaus

Deputy State Treasurer
Delegated Substitute for the State Treasurer
Continuous term effective January 2019

Additional detail about Trustees can be found in Board Composition on pages 9-10 in the Letter of Transmittal.

ADMINISTRATIVE ORGANIZATIONAL CHART AND EXECUTIVE MANAGEMENT

As of June 1, 2023



CONSULTANTS

As of December 31, 2022

Disability and Life Insurance Consultant

Milliman, Inc.
121 Middle Street
Suite 401
Portland, ME 04101

Fiduciary Counsel

Cohen Milstein Sellers & Toll PLLC
1100 New York Ave. NW
Fifth Floor
Washington, DC 20005

Governance Consultant

Mosaic Governance Advisors, LLC
PO Box 350604
Westminster, CO 80035

Health Care Program Consultant

Segal
7951 East Maplewood Avenue
Suite 327
Greenwood Village, CO 80111

Independent Auditors

CliftonLarsonAllen, LLP
370 Interlocken Boulevard
Suite 500
Broomfield, CO 80021

Investment Performance Consultants

Aon Investments USA, Inc.
200 East Randolph Street Suite 700
Chicago, IL 60601

The Northern Trust Company
333 S Wabash, NE-36
Chicago, IL 60604

Investments—Portfolio Consultant

Aon Investments USA, Inc.
200 East Randolph Street Suite 700
Chicago, IL 60601

Master Custodian

The Northern Trust Company
333 S Wabash, NE-36
Chicago, IL 60604

Pension and Health Care Program Actuary

Segal
7951 East Maplewood Avenue
Suite 327
Greenwood Village, CO 80111

Pharmacy Benefits Consultant

Segal
7951 East Maplewood Avenue
Suite 327
Greenwood Village, CO 80111

Risk Management

IMA of Colorado
1705 17th Street
Suite 100
Denver, CO 80202

Voluntary Investment Program, Defined Contribution Retirement, and Deferred Compensation Plan Investment and Performance Consultant

Callan, LLC
1900 16th Street
Suite 1175
Denver, CO 80202

Voluntary Investment Program, Defined Contribution Retirement, and Deferred Compensation Plan Service Provider

Empower
8515 East Orchard Road
Greenwood Village, CO 80111

A list of PERA's Investment Brokers/Advisers, the Schedule of Commissions, and other information related to investment expenses can be found in the Investment Section on pages 127-129.

COLORADO PERA®

Financial Section

COLORADO PERA®

INDEPENDENT AUDITORS' REPORT

CliftonLarsonAllen LLP
CLAconnect.com

INDEPENDENT AUDITORS' REPORT

Board of Trustees
Public Employees' Retirement Association of Colorado
Denver, Colorado

Report on the Audit of the Financial Statements

Opinions

We have audited the accompanying financial statements of Public Employees' Retirement Association of Colorado (Colorado PERA), including the individual fund financial statements, as of and for the year ended December 31, 2022, and the related notes to the financial statements, which collectively comprise Colorado PERA's basic financial statements, as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of Colorado PERA as of December 31, 2022, and the changes in its fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America. In addition, in our opinion, the financial statements referred to previously present fairly, in all material respects, the respective fiduciary net position of each individual fund of Colorado PERA as of December 31, 2022, and the respective changes in fiduciary net position thereof for the year then ended in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of Colorado PERA and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Financial Statements

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

INDEPENDENT AUDITORS' REPORT

Board of Trustees
Public Employees' Retirement Association of Colorado

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

Auditors' Responsibilities for the Audit of the Financial Statements

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

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Colorado PERA's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about Colorado PERA's ability to continue as a going concern for a reasonable period of time.

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

INDEPENDENT AUDITORS' REPORT

Board of Trustees
Public Employees' Retirement Association of Colorado

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, the division trust funds' schedules of changes in net pension liability and related ratios, employer and nonemployer contributions, and investment returns and related notes, and the health care trust funds' schedules of changes in net OPEB liability and related ratios, contributions from employers and other contributing entities, and investment returns and related notes, as listed in the table of contents, be presented to supplement the basic financial statements. Such information is the responsibility of management and, 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 GAAS, 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 audit 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.

Supplementary Information

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise Colorado PERA's basic financial statements. The schedules of administrative expenses, other additions, other deductions, investment expenses, and payments to consultants (supplementary information) are presented for purposes of additional analysis and are not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit 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 GAAS. In our opinion, the supplementary information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Other Information

Management is responsible for the other information included in the annual report. The other information comprises the introductory, investment, actuarial and statistical sections but does not include the basic financial statements and our auditors' report thereon. Our opinions on the basic financial statements do not cover the other information, and we do not express an opinion or any form of assurance thereon.

In connection with our audit of the basic financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the basic financial statements, or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

INDEPENDENT AUDITORS' REPORT

Board of Trustees
Public Employees' Retirement Association of Colorado

Report on Summarized Comparative Information

We have previously audited Colorado PERA's 2021 financial statements, and we expressed unmodified opinions on the respective financial statements of Colorado PERA and of each individual fund as displayed in the basic financial statements in our report dated June 17, 2022. In our opinion, the summarized comparative information presented herein as of and for the year ended December 31, 2021, is consistent, in all material respects, with the audited financial statements from which it has been derived.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated June 16, 2023, on our consideration of Colorado PERA's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of Colorado PERA's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Colorado PERA's internal control over financial reporting and compliance.

CliftonLarsonAllen LLP

CliftonLarsonAllen LLP

Denver, Colorado
June 16, 2023

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

(Dollars in Thousands)

This Management's Discussion and Analysis (MD&A) section provides a narrative overview and analysis of the financial activities of the Public Employees' Retirement Association of Colorado (PERA) for the year ended December 31, 2022. Please consider the information presented here in conjunction with additional information in the Letter of Transmittal starting on page 3 of this *Annual Comprehensive Financial Report (ACFR)* and with the basic financial statements of PERA on pages 44-47.

In addition to historical information, this MD&A includes forward-looking statements, which involve certain risks and uncertainties. PERA's actual results, performance, and achievements may differ materially from the results, performance, and achievements expressed or implied in such forward-looking statements, due to a wide range of factors, including changes in interest rates, changes in the capital markets, general economic conditions, legislative changes, as well as other factors.

Overview of the Association

PERA administers the following 11 fiduciary funds:

Plan Name
Defined Benefit Pension Plans (Division Trust Funds)
State Division Trust Fund
School Division Trust Fund
Local Government Division Trust Fund
Judicial Division Trust Fund
Denver Public Schools (DPS) Division Trust Fund
Defined Benefit Other Postemployment Benefit Plans (Health Care Trust Funds)
Health Care Trust Fund (HCTF)
Denver Public Schools Health Care Trust Fund (DPS HCTF)
Defined Contribution Plans
Voluntary Investment Program
Defined Contribution Retirement Plan
Deferred Compensation Plan
Private Purpose Trust Fund
Life Insurance Reserve

Additional information regarding the contribution and benefit provisions of the plans can be found in Notes 1, 4, 8, and 9 of the Notes to the Financial Statements.

Financial Statement Overview

PERA's financial statements are prepared in conformity with generally accepted accounting principles (GAAP) in the United States and all applicable Governmental Accounting Standards Board (GASB) pronouncements. The actuarial valuations that are reported in the Actuarial Section are prepared in accordance with the Actuarial Standards of Practice and the PERA Board's funding policy.

Basic Financial Statements

PERA's financial statements include the following components:

1. Basic Financial Statements

   -Statements of Fiduciary Net Position
   -Statements of Changes in Fiduciary Net Position

2. Notes to the Basic Financial Statements

3. Required Supplementary Information - Unaudited

4. Supplementary Schedules

The Statements of Fiduciary Net Position presents information on PERA's assets, liabilities, and deferred inflows of resources, with the difference reported as fiduciary net position (FNP). Over time, the increase or decrease in FNP serves as an indicator of PERA's financial condition and our ability to fund future benefits.

The Statements of Changes in Fiduciary Net Position reflect how PERA's FNP changed during the fiscal year, and include additions such as contributions and investment income and deductions such as benefit payments and administrative expenses.

Notes to the Financial Statements

The Notes to the Financial Statements provide essential information for understanding the basic financial statements.

Note 1—Plan Description: provides a general description of PERA, the funds administered by PERA, and a general overview of plan provisions for the defined benefit pension trust funds.

Note 2—Summary of Significant Accounting Policies: provides a summary of significant accounting policies, including the basis of accounting for PERA, and management's use of estimates.

Note 3—Interfund Transfers and Balances: provides information related to interfund activity and balances.

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Note 4—Contributions: provides information related to contribution requirements of the defined benefit pension trust funds and the authority for establishing or amending those requirements.

Note 5—Investments: provides information related to deposits and investments, required investment disclosures, and risks related to credit (including custodial credit and concentrations of credit risk), interest rate and foreign currency.

Note 6—Derivative Instruments: provides information on PERA's investment derivative instruments.

Note 7—Commitments and Contingencies: provides a summary of PERA's significant commitments and generally describes any potential contingencies of PERA.

Note 8—Voluntary Investment Program, Defined Contribution Retirement Plan, and Deferred Compensation Plan: identifies and describes the three defined contribution plans.

Note 9—Health Care Trust Funds: identifies and describes the types of defined benefit other postemployment benefit (OPEB) plans.

Note 10—Net Pension Liability (NPL) of the Division Trust Funds: provides a summary of the NPL of employers and the nonemployer contributing entity (if applicable) in accordance with GASB Statement No. 67, *Financial Reporting for Pension Plans*.

Note 11—Net OPEB Liability (NOL) of the Health Care Trust Funds: provides a summary of the NOL of employers in accordance with GASB Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*.

Note 12—Leases: provides information on PERA's leases in accordance with GASB Statement No. 87, *Leases*.

Required Supplementary Information (RSI)

The following 10-year RSI is found after the notes to the basic financial statements:

Division Trust Funds	Health Care Trust Funds
Schedule of Changes in Net Pension Liability and Related Ratios	Schedule of Changes in Net OPEB Liability and Related Ratios
Schedule of Employer and Nonemployer Contributions	Schedule of Contributions from Employers and Other Contributing Entities
Schedule of Investment Returns	Schedule of Investment Returns

Supplementary Information

The section for Supplementary Information includes details on expenses of PERA and a breakdown of other additions and deductions. The schedules available in this section include:

-Schedule of Administrative Expenses
-Schedule of Other Additions
-Schedule of Other Deductions
-Schedule of Investment Expenses
-Schedule of Payments to Consultants

Financial Highlights

PERA's combined assets decreased $12,562,294, or 16.4%, from 2021 to $64,264,683 at December 31, 2022. Investments, at fair value decreased $11,127,593. Additional information on investments can be found in Note 5 and the Investment Section.

PERA's combined liabilities decreased from 2021 by $1,163,081, or 27.8%, to $3,015,393 at December 31, 2022, primarily due to lower pending settlements of fixed income investment purchases.

The change in deferred inflows of resources is due to the adoption of GASB Statement No. 87, Leases. Deferred inflows from tenant leases increased from a restated 2021 by $1,094, or 252.7%, to $1,527 at December 31, 2022. Additional information can be found in Note 12.

PERA's combined FNP decreased $11,400,307, or 15.7%, from 2021 to $61,247,763 at December 31, 2022, primarily due to negative investment returns.

Additional information on additions and deductions can be found in the remainder of the MD&A.

Comparative Financial Statements

Following are the comparative condensed statements of Fiduciary Net Position and Changes in Fiduciary Net Position for five Division Trust Funds, two Health Care Trust Funds, and the Life Insurance Reserve. This information has been derived from PERA's audited financial statements. For the year ended December 31, 2022, the FNP for five Division Trust Funds, two Health Care Trust Funds, and the Life Insurance Reserve decreased by $10,167,651, $50,763, and $4,539 respectively. The decrease was principally due to investment losses. While the annual changes in FNP can provide meaningful insight into the financial activities and financial status, long-term views and trend analysis is a critical factor in reporting and understanding the financial status of PERA.

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(Dollars in Thousands)

FIDUCIARY NET POSITION

As of December 31

	Division Trust Funds			Health Care Trust Funds			Life Insurance Reserve		
	2022	2021	% Chg	2022	2021	% Chg	2022	2021	% Chg
Assets									
Cash and short-term investments	**$1,469,977**	$2,122,587	(30.7%)	**$15,081**	$18,242	(17.3%)	**$666**	$959	(30.6%)
Securities lending collateral	**1,446,765**	1,159,005	24.8%	**14,842**	9,961	49.0%	**655**	524	25.0%
Receivables	**707,509**	1,733,793[1]	(59.2%)	**30,675**	93,132	(67.1%)	**228**	707	(67.8%)
Investments, at fair value	**54,594,299**	64,535,447	(15.4%)	**560,087**	554,650	1.0%	**24,719**	29,162	(15.2%)
Capital assets, net of accumulated depreciation	**15,057**	15,831	(4.9%)	**—**	—	—%	**—**	—	—%
Total assets	**58,233,607**	69,566,663	(16.3%)	**620,685**	675,985	(8.2%)	**26,268**	31,352	(16.2%)
Liabilities									
Investment settlements and other liabilities	**1,361,913**	2,812,213	(51.6%)	**40,947**	50,324	(18.6%)	**2,335**	3,009	(22.4%)
Securities lending obligations	**1,442,558**	1,158,757	24.5%	**14,799**	9,959	48.6%	**653**	524	24.6%
Total liabilities	**2,804,471**	3,970,970	(29.4%)	**55,746**	60,283	(7.5%)	**2,988**	3,533	(15.4%)
Deferred inflows of resources	**1,527**	433[1]	252.7%	**—**	—	—%	**—**	—	—%
Fiduciary net position	**$55,427,609**	**$65,595,260**	**(15.5%)**	**$564,939**	**$615,702**	**(8.2%)**	**$23,280**	**$27,819**	**(16.3%)**

[1] To conform with current year presentation, prior year amounts were restated. See Note 2 of the Notes to the Financial Statements for additional information.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

	Division Trust Funds			Health Care Trust Funds			Life Insurance Reserve		
	2022	2021	% Chg	2022	2021	% Chg	2022	2021	% Chg
Additions									
Employer contributions	**$2,101,327**	$1,949,423	7.8%	**$112,562**	$106,596	5.6%	**$—**	$—	—%
Nonemployer contributions	**605,000**	225,000	168.9%	**—**	—	—%	**—**	—	—%
Member contributions	**1,174,072**	1,062,408	10.5%	**—**	—	—%	**—**	—	—%
Purchased service	**107,526**	114,246	(5.9%)	**—**	—	—%	**—**	—	—%
Net investment income (loss)	**(8,744,360)**	9,190,026	(195.2%)	**(77,787)**	75,282	(203.3%)	**(3,927)**	4,125	(195.2%)
Other	**11,189**	11,642	(3.9%)	**9,310**	8,314	12.0%	**—**	—	—%
Total additions	**(4,745,246)**	12,552,745	(137.8%)	**44,085**	190,192	(76.8%)	**(3,927)**	4,125	(195.2%)
Deductions									
Benefit payments	**5,153,727**	4,984,779	3.4%	**87,167**	67,409	29.3%	**—**	—	—%
Refunds	**201,198**	184,072	9.3%	**—**	—	—%	**—**	—	—%
Disability and life insurance premiums	**2,687**	3,175	(15.4%)	**—**	—	—%	**533**	540	(1.3%)
Administrative expenses	**45,669**	40,739	12.1%	**7,570**	13,615	(44.4%)	**79**	80	(1.3%)
Other	**19,124**	17,919	6.7%	**111**	88	26.1%	**—**	—	—%
Total deductions	**5,422,405**	5,230,684	3.7%	**94,848**	81,112	16.9%	**612**	620	(1.3%)
Change in fiduciary net position	**(10,167,651)**	7,322,061	(238.9%)	**(50,763)**	109,080	(146.5%)	**(4,539)**	3,505	(229.5%)
Fiduciary net position									
Beginning of year	**65,595,260**	58,273,199	12.6%	**615,702**	506,622	21.5%	**27,819**	24,314	14.4%
End of year	**$55,427,609**	**$65,595,260**	**(15.5%)**	**$564,939**	**$615,702**	**(8.2%)**	**$23,280**	**$27,819**	**(16.3%)**

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(Dollars in Thousands)

Additions to Net Position

Investments

INVESTMENT INCOME/(LOSS)

Trust Fund	Net Appreciation/ (Depreciation) in Fair Value	Interest and Dividends	Real Estate, Private Equity, and Alternatives Net Operating Inc	Investment Expenses	Net Securities Lending Income	Net Investment Income/(Loss)
State Division	($2,961,892)	$275,420	$89,793	($63,740)	$3,388	($2,657,031)
School Division	(5,155,092)	480,695	156,716	(111,246)	5,914	(4,623,013)
Local Government Division	(870,905)	80,726	26,318	(18,682)	993	(781,550)
Judicial Division	(70,813)	6,607	2,153	(1,529)	81	(63,501)
DPS Division	(690,504)	64,359	20,983	(14,895)	792	(619,265)
HCTF	(78,883)	7,595	2,476	(1,758)	94	(70,476)
DPS HCTF	(8,174)	780	254	(180)	9	(7,311)
Life Insurance Reserve	(4,378)	407	132	(94)	6	(3,927)
2022 Total	**($9,840,641)**	**$916,589**	**$298,825**	**($212,124)**	**$11,277**	**($8,826,074)**
2021 Total	**$8,386,384**	**$761,721**	**$318,225**	**($203,004)**	**$6,107**	**$9,269,433**
2020 Total	**$7,878,679**	**$760,772**	**$258,171**	**($179,178)**	**$5,293**	**$8,723,737**
2019 Total	**$8,015,889**	**$860,464**	**$271,053**	**($164,013)**	**$7,200**	**$8,990,593**
2018 Total	**($2,588,210)**	**$860,594**	**$271,362**	**($168,193)**	**$9,178**	**($1,615,269)**

The Division Trust Funds, the Health Care Trust Funds, and the Life Insurance Reserve pool their investments into a combined investment fund (CIF). CIF investments are the largest asset in PERA's defined benefit plans. Investment income generated by PERA ultimately defrays the cost of benefits that are provided to PERA's membership. CIF net investment income for the year ended December 31, 2022, was a loss of $8,826,074, a decrease of $18,095,507 from 2021.

PERA's target and actual investment allocation includes equity and fixed income investments in public markets and private equity, real estate, and alternatives in private markets. A modest cash balance provides ongoing liquidity to meet PERA's cash needs. Additional information on limitations, an overview of the investment policy, the targeted investment asset allocation, as well as the permissible ranges of asset allocation for PERA's investment program can be found on page 125 of the Investment Section.

The global equity market, in which over 50% of the portfolio is invested, is the single greatest driver of PERA's annual return. The benchmark for this asset class, MSCI ACWI IMI, returned negative 18.2% in 2022. Most equity markets had their worst calendar year since the global financial crisis as war in Ukraine, COVID lockdowns in China, supply chain bottlenecks, high inflation, and rising interest rates threatened the global growth outlook.

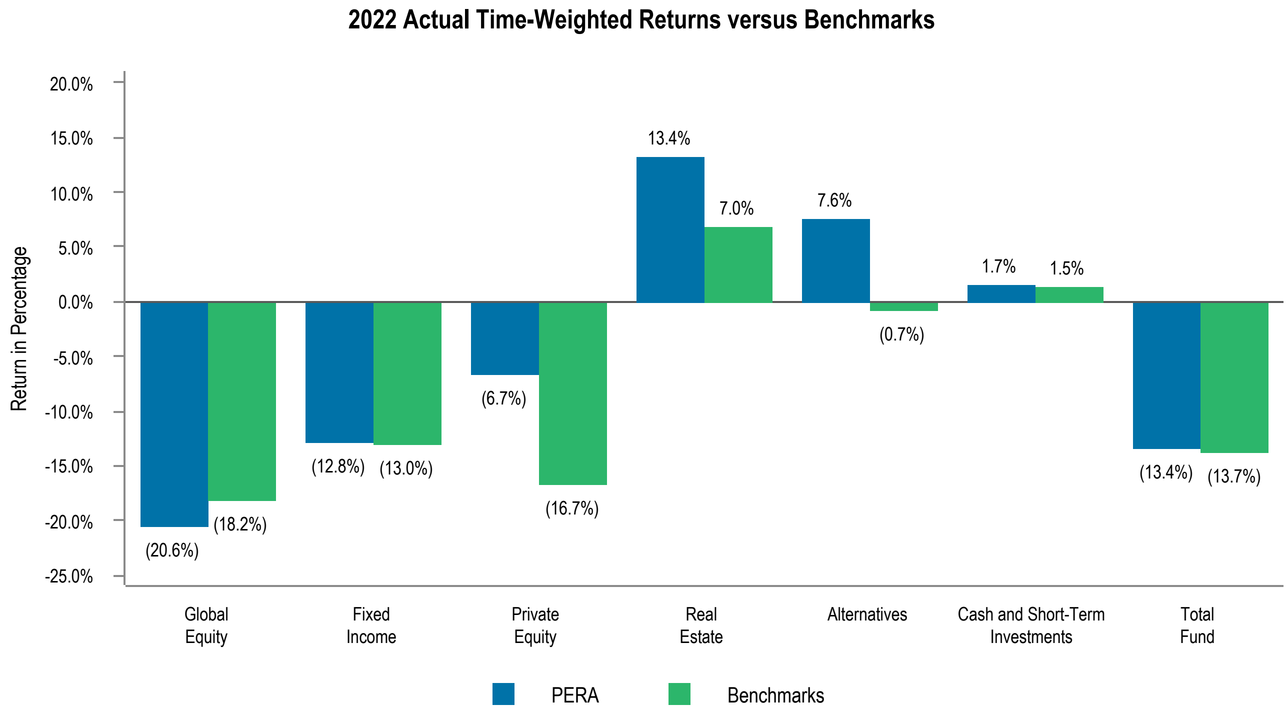
PERA's fixed income investments comprise nearly 20% of the portfolio. The benchmark for this asset class, Bloomberg U.S. Aggregate Bond Index, had a negative 13.0% return in 2022. The Federal Reserve raised its benchmark rate seven times through the course of the year, bringing the effective rate to a range of 4.25%-4.50%, and bonds had their worst year in modern history because of surging yields of all maturities.

The private market asset classes (private equity, real estate, and alternatives) experienced mixed results in 2022 with private equity posting negative returns and real estate and alternatives posting positive returns. Cash and Short-Term Investments ended the year with a positive return of 1.7%.

PERA's actual net-of-fees, time-weighted rate of return was negative 13.4% for the year ended December 31, 2022. To assess investment performance, PERA closely monitors the performance of the Board's selected benchmarks to actual performance returns. For the year ended December 31, 2022, PERA's investments outperformed the total fund's policy benchmark by 30 basis points. The time-weighted rates of return of the various asset classes, the total fund, and the various benchmarks can be found as follows.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

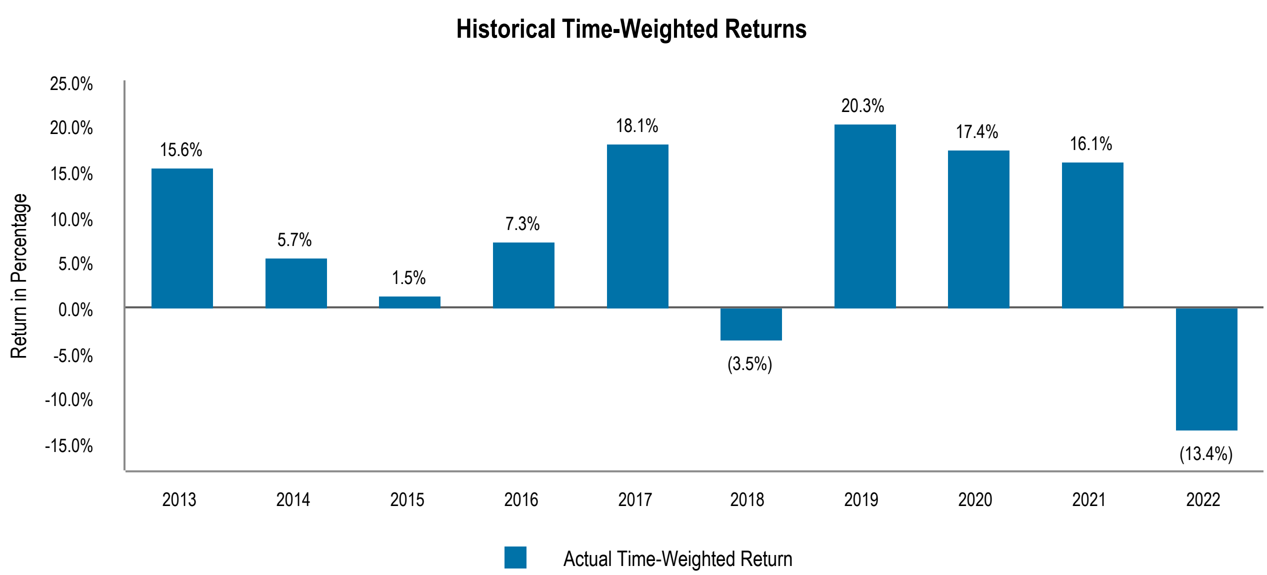
(Dollars in Thousands)



Long-Term Investment Returns

While the annual investment returns can provide meaningful insight into the financial activities and financial status, long-term views and trend analysis are critical factors in understanding the financial status of PERA. The following chart shows the annual investment returns for the total fund for each of the past 10 years.

Additional information on longer-term investment returns for the investment program and benchmarks for the three-, five-, and 10-year periods for each investment asset class, as well as a comprehensive discussion of the 2022 performance evaluation can be found in the Investment Section.



MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

(Dollars in Thousands)

Contributions

TOTAL CONTRIBUTIONS FOR DIVISION AND HEALTH CARE TRUST FUNDS

Trust Fund	Employer Contributions[1]	Nonemployer Contributions[2]	Member Contributions	Purchased Service	Other	Total Contributions and Other
State Division	$704,797	$198,247	$360,523	$35,699	$171	$1,299,437
School Division	1,201,265	350,393	642,202	57,469	5,545	2,256,874
Local Government Division	108,748	—	71,339	9,420	73	189,580
Judicial Division	12,318	3,576	7,844	978	4,525	29,241
DPS Division	74,199	52,784	92,164	3,960	875	223,982
HCTF	103,818	—	—	—	9,004	112,822
DPS HCTF	8,744	—	—	—	306	9,050
2022 Total	**$2,213,889**	**$605,000**[4]	**$1,174,072**	**$107,526**	**$20,499**	**$4,120,986**
2021 Total	**$2,056,019**	**$225,000**	**$1,062,408**	**$114,246**	**$19,956**	**$3,477,629**
2020 Total	**$1,954,366**	**$—**[3]	**$938,121**	**$75,623**	**$20,228**	**$2,988,338**
2019 Total	**$1,854,288**	**$225,000**	**$817,241**	**$66,453**	**$17,299**	**$2,980,281**
2018 Total	**$1,726,701**	**$225,000**	**$737,781**	**$61,956**	**$26,258**	**$2,777,696**

[1] Employer contributions include the employer statutory rates, AED, and SAED, less an offset of 11.47% in 2022 for the DPS Division as required by C.R.S. § 24-51-412 *et seq.*

[2] Beginning in 2018, contributions from a nonemployer contributing entity are required by C.R.S. § 24-51-414 *et seq.*

[3] HB 20-1379 suspended the 2020 contribution for the State's 2020-21 fiscal year.

[4] HB 22-1029 required a restorative payment for the suspended 2020 contribution.

Contribution rates are set in statute and are thus determined by the Colorado General Assembly. See pages 247-252 in the Statistical Section for the Schedule of Contribution Rate History.

Contributions	2022	2021
From members to the Division Trust Funds	**$1,174,072**	$1,062,408
From employers to the Division Trust Funds, HCTF, and DPS HCTF	**2,213,889**	2,056,019

Contributions increased due to increases in payroll and increases in member and employer contribution rates subject to Colorado Revised Statutes (C.R.S.) § 24-51-413. The contribution of $225 million (actual dollars) from the nonemployer contributing entity commenced in 2018 in accordance with C.R.S. § 24-51-414. House Bill (HB) 22-1029, enacted June 7, 2022, required a restorative payment for the suspended 2020 direct distribution. The State treasurer issued a warrant to PERA in the amount of $380 million (actual dollars), upon enactment, with reductions, as applicable, to future direct distributions scheduled to occur July 1, 2023, and July 1, 2024. See Note 4 of the Notes to the Financial Statements for more information.

At the end of 2022, PERA had benefit receivables in the amount of $226,910 which primarily represents contributions owed by members and employers for service credit earned in December 2022. Over the past 30 years, employer contributions (including nonemployer contributing entities and disaffiliation payments) represent 23% of the inflows into the Division Trust Funds and Health Care Trust Funds. Member contributions and purchased service represent 15% of the inflows into these funds.

C.R.S. § 24-51-412 *et seq.* provides for a unique offset to the employer contributions that otherwise would go toward financing the unfunded actuarial accrued liability (UAAL) of the DPS Division, allowing relief to DPS Division employers by recognizing the dollars they contribute toward the pension certificates of participation (PCOPs). The statute states that as long as the funded status of the DPS Division exceeds that of the School Division, the Denver Public Schools is allowed this offset to the DPS Division employer contribution rate. The offset, expressed as a percentage of payroll, is equal to the annual assumed payment obligations for PCOPs issued in 1997 and 2008, including subsequent refinancing by the Denver Public Schools at a fixed effective annual interest rate of 8.50%. At a minimum, the DPS Division employer contribution rate must be sufficient to fund the DPS HCTF (1.02%) and the Annual Increase Reserve (AIR) (1.00%) applicable to the DPS Division. The annual increase (AI) is a post-retirement, cost-of-living adjustment meeting certain criteria as described in Note 1 of the Notes to the Financial Statements. The staff of Denver Public Schools calculated the PCOP offset rate of 11.47% for 2022.

C.R.S. § 24-51-401(1.7)(e) requires a periodic "true-up" calculation to be performed beginning in 2015 and every

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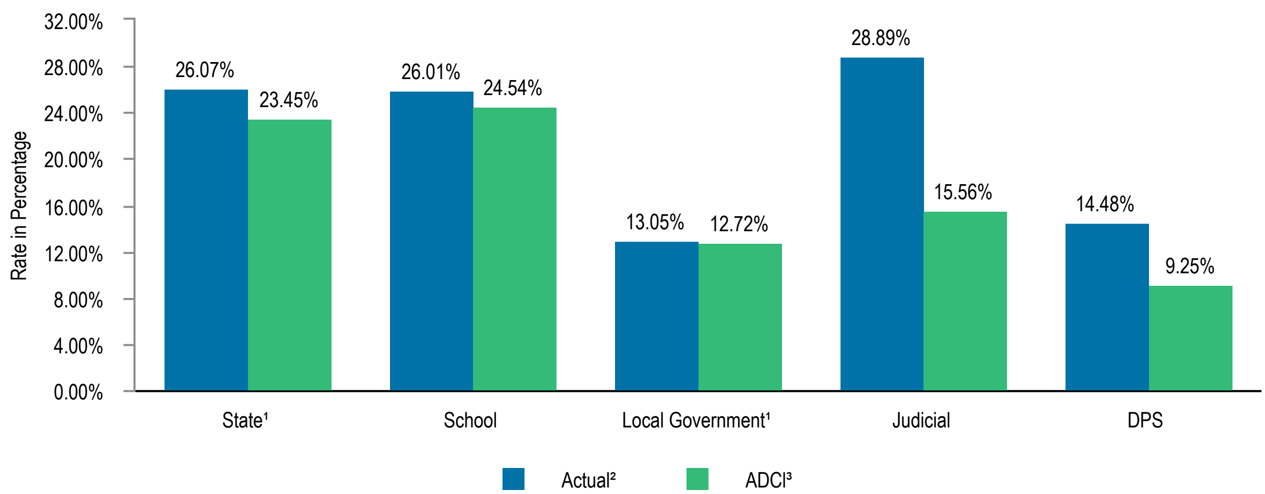
(Dollars in Thousands)

five years following, with the purpose of determining the total DPS Division employer contribution rate that would result in the equalization of the ratio of UAAL over payroll between the DPS and School Divisions at the end of the 30-year period beginning January 1, 2010. The 2020 calculation indicated that a reduction to the total DPS Division employer rate would be needed to equalize the defined ratio. It should be noted that the automatic adjustment provision (AAP) compares the blended actual contribution rates to the blended actuarially determined contribution rates, resulting in one ratio considering all five Division Trust Funds. Therefore, a reduction in an employer contribution rate for any one Division Trust Fund could potentially influence the outcome of the AAP assessment. A failed assessment would trigger additional employer and member contributions for all divisions, and a decrease in the AI cap, affecting all benefit recipients of the plan.

While the annual contribution amounts can provide meaningful insight into the financial activities and financial status of PERA, the assessment of the adequacy of contributions on an actuarial funding basis is a critical factor in reporting the financial status of PERA. In accordance with the actuarial standards of practice and the Board's pension and OPEB funding policies, a plan-specific actuarially determined contribution (ADC) benchmark is developed against which to gauge the adequacy of PERA's statutory contribution rates for the five Division Trust Funds and two OPEB Funds. The ADC for each trust fund is developed annually and reported by management to be used as a benchmark for contributions two years in the future.

The following two charts show the ADC and actual contributions as a percentage of covered payroll for each trust fund for 2022. Additional information on long-term trends can be found in the Actuarial Section.

State, School, Local Government, Judicial, and DPS Divisions
2022 Year-End Actual Contributions/ADC Comparison



[1] Actual rates are for members other than State Troopers and include the applicable defined contribution (DC) supplement pursuant to SB 18-200.

[2] Actual contributions include employer, AED, SAED, and nonemployer, as applicable, less the AIR and health care contributions.

[3] ADC rates for 2022 are based on the 2020 actuarial valuations.

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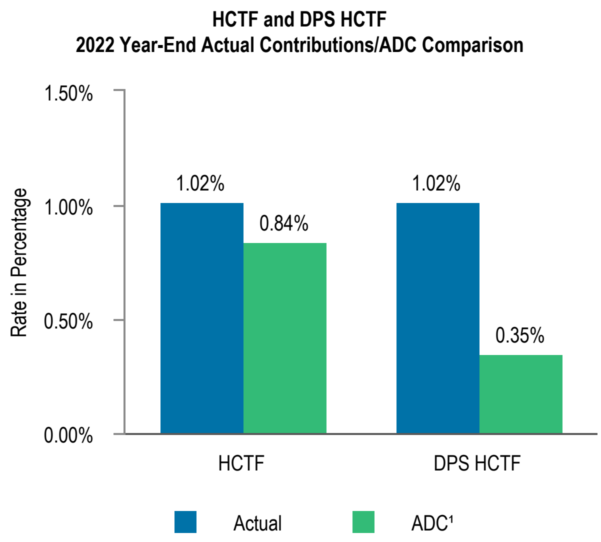

[1] ADC rates for 2022 are based on the 2020 actuarial valuations.

Contribution Deficiency/(Excess)

Governmental accounting standards require the disclosure of the amount of contributions recognized by the defined benefit plan, the ADC amount, and the difference between these two amounts as RSI. An annual contribution deficiency arises when actual contributions are less than the ADC and an annual contribution excess arises when the actual contributions are greater than the ADC. The ADC is calculated using the investment rate of return and discount rate assumptions according to the Board's funding policies. The ADC for 2022 was determined based on the results of the December 31, 2020, actuarial valuation. The 10-year schedules illustrating the annual contribution deficiency/(excess) can be found in the RSI on pages 100-102 and 112-113.

Contribution deficiency/(excess) on an actuarial funding basis is determined through a similar process. Each year, the actuaries assess the increase or decrease to the expected unfunded liability by comparing the expected dollar inflows into each fund versus the actual dollar amounts recognized. This calculation for funding purposes is slightly different than the approach required by governmental accounting standards in that it considers additional contributions occurring during each year from all sources, as well as the timing of contributions made during the year. Taking these factors into consideration results in a total contribution excess of $417.4 million for the Division Trust Funds in 2022. During the past 20 years, contribution experience for the Division Trust Funds has resulted in 18 years of deficiencies, two years of excess, and an accumulated shortfall of $5.1 billion.

Due to legislative actions such as the implementation of the AAP, specifically designed to better align actual contributions with actuarially determined contributions, and the State's annual direct distribution, progress is being made to dampen and eventually eliminate contribution deficiencies. A chart with the breakdown of benefit structures by division and type can be found on page 227 in the Statistical Section.

Senate Bill (SB) 18-200 implemented the AAP, which annually assesses actual contributions compared to required contributions to ascertain if adjustments to certain plan provisions are required in accordance with State statute beginning July 1, 2020. Based on certain statutory parameters, the AAP requires, as necessary, adjustments to member contributions, employer contributions, the direct distribution from the State, and the AI cap. The AAP is designed to help mitigate future contribution deficiencies and to keep PERA on the path to full funding. Additional information on this AAP can be found in Note 4 of the Notes to the Financial Statements starting on page 63, the Actuarial Section starting on page 178, and C.R.S. § 24-51-413.

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(Dollars in Thousands)

CONTRIBUTION DEFICIENCY/(EXCESS)

(Dollars in Millions)

Trust Fund	2022	2021	2020	2019	2018	Cumulative Deficiency/(Excess) 2003–2022
State Division[1]	**($163.3)**	($83.2)	$93.5	$21.1	$117.8	$1,603.5
School Division[1]	**(178.1)**	(102.0)	155.9	94.2	261.2	2,643.3
State and School Division[2]	**N/A**	N/A	N/A	N/A	N/A	685.5
Local Government Division	**(13.5)**	(15.1)	3.6	(6.3)	17.8	(219.7)
Judicial Division[1]	**(7.6)**	(3.3)	0.3	(0.1)	4.4	13.3
DPS Division[1,3]	**(54.9)**	(13.0)	26.9	24.0	48.8	422.1
Total Division Trust Funds	**($417.4)**	**($216.6)**	**$280.2**	**$132.9**	**$450.0**	**$5,148.0**
HCTF	**($32.7)**	($23.8)	($15.9)	($1.0)	($0.9)	($162.4)
DPS HCTF[3]	**(6.5)**	($5.4)	(4.5)	(3.5)	(2.9)	(34.0)
Total OPEB Trust Funds	**($39.2)**	**($29.2)**	**($20.4)**	**($4.5)**	**($3.8)**	**($196.4)**

1 Beginning in 2018, includes contributions from a nonemployer contributing entity as required by C.R.S. § 24-51-412 *et seq.*, HB 20-1379, and HB 22-1029.

2 The State and School Divisions merged July 1, 1997, and separated on January 1, 2006.

3 The DPS Division and DPS HCTF were established on January 1, 2010.

Amortization of Unfunded Actuarial Accrued Liabilities

The following table shows the amortization periods for the Division Trust Funds and Health Care Trust Funds for the prior and current valuation year. The amortization periods determined as of the December 31, 2022 and 2021, actuarial valuations consider the AAP adjustments effective July 1, 2022:

	Actuarial Funding Valuation Results	
Trust Fund	2022 Amortization Period	2021 Amortization Period
State Division	**20 Years**	23 Years
School Division	**24 Years**	26 Years
Local Govt Division	**9 Years**	12 Years
Judicial Division	**6 Years**	7 Years
DPS Division[1]	**7 Years**	9 Years
HCTF	**11 Years**	13 Years
DPS HCTF	**0 Years**	2 Years

1 The calculation considers declining PCOP offset rate as described in statute.

The amortization periods for the Judicial Division consider the future additional contributions of Amortization Equalization Disbursement (AED) and Supplemental Amortization Equalization Disbursement (SAED) which began in 2019 with continued increases scheduled through 2023. The calculation of the amortization period for the DPS Division considers the declining PCOP offset rate as described in statute. The amortization periods for the five Division Trust Funds do not include the full effect of legislation enacted in 2006, 2010, and 2018. This legislation includes plan changes designed to lower the AED and normal cost over time as new members are added to PERA's population, and to allow a greater proportion of the employers' contribution to be used to amortize the unfunded liability. The 2018 legislation also increases future contributions to the Division Trust Funds in order to further accelerate the amortization of the unfunded liability. The amortization periods, determined on a valuation or closed-group basis, for all Division and Health Care Trust Funds decreased from 2021 to 2022. This decrease is primarily due to favorable investment experience during 2019, 2020, and 2021, through the application of an actuarial value of assets, smoothing asset returns over a four-year period, which mitigated the effect of the unfavorable investment return experienced during 2022.

Unless otherwise temporarily altered by statute, the amortization periods shown in the previous table consider ongoing employer, member, AED, and SAED contributions, including any future statutory increases, and the direct distribution, where applicable.

C.R.S. § 24-51-211 states that a maximum amortization period of 30 years shall be deemed actuarially sound.

As stated by Segal in the Certification Letter on pages 145-151 in the Actuarial Section:

> "The results indicate that for all Division Trust Funds, the combined employer and member contribution rates, including the direct distribution from the State, as appropriate, are sufficient to fund the normal cost for all members and each division's UAAL, with consideration of the amounts allocated to finance the

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

(Dollars in Thousands)

Annual Increase Reserve (AIR) Funds, and provide additional contributions to help finance both Health Care Trust Funds. In addition, the employer contribution rate with anticipated service purchase transfers is sufficient to eventually finance benefits for the HCTFs."

"At the direction of PERA, Segal has prepared deterministic financial projections for all Division Trust Funds with the lower cost benefit structure for new members and using the following assumptions:

- All actuarial assumptions, including assuming 7.25% investment returns are realized each year
- Performed on an open-group basis with assumed active membership growth, as follows:
  –For School, Local Government and Denver Public Schools—1.00% per year
  –For State and Judicial—0.25% each year

These projections indicate that fully funding the actuarial accrued liability under the PERA revised benefit structure created by SB 18-200 is achievable within a projection period of 34 years and includes the impact of AAP adjustments effective July 1, 2022, and the impact of legislative changes pursuant to HB 22-1029 and SB 23-056."

Deductions from Net Position

Benefits

SUMMARY OF BENEFITS AND EXPENSES BY TRUST FUND

Trust Fund	Benefit Payments	Refunds	Disability and Life Insurance Premiums	Administrative Expenses	Other	Total Deductions
State Division	$1,778,067	$82,321	$849	$13,312	$9,139	$1,883,688
School Division	2,723,667	88,355	1,435	25,562	3,935	2,842,954
Local Government Division	336,721	13,391	195	3,450	5,794	359,551
Judicial Division	32,715	218	18	212	33	33,196
DPS Division	282,557	16,913	190	3,133	223	303,016
HCTF	83,145	—	—	7,136	110	90,391
DPS HCTF	4,022	—	—	434	1	4,457
Life Insurance Reserve	—	—	533	79	—	612
2022 Total	**$5,240,894**	**$201,198**	**$3,220**	**$53,318**	**$19,235**	**$5,517,865**
2021 Total	**$5,052,188**	**$184,072**	**$3,715**	**$54,434**	**$18,007**	**$5,312,416**
2020 Total	**$4,881,951**	**$148,014**	**$4,776**	**$51,094**	**$18,274**	**$5,104,109**
2019 Total	**$4,770,406**	**$161,202**	**$6,641**	**$49,076**	**$15,091**	**$5,002,416**
2018 Total	**$4,677,060**	**$168,387**	**$6,920**	**$62,446**	**$14,923**	**$4,929,736**

At the end of 2022, PERA was paying benefits to more than 135,000 retired public employees and their beneficiaries who received an average benefit of $3,212 per month (actual dollars). Historical information about benefit payments, average benefit payments, and the number of retirees receiving payments and earned service credit can be found in the Statistical Section.

There are many changes to plan provisions that have been enacted into law since 2000 that do not have an immediate effect on PERA's financial activities and financial status, but have had an effect over time. On average, members are retiring with generally lower monthly benefit amounts than members who retired in prior years. This trend will continue and become more evident over time, as each year a larger portion of the retirement calculations will reflect the recent changes to benefit provisions (retirement eligibilities, determination of highest annual salary, etc.). The effect of these changes are tracked and monitored by PERA's management and reported as part of the overall governance structure of PERA.

Other Changes: Division Trust Funds, Health Care Trust Funds, and Life Insurance Reserve

For the year ended December 31, 2022, PERA had cash and short-term investments of $1,485,724, a decrease of $656,064 from 2021. The decrease was primarily due to a reduced overall need for year-end liquidity.

For the year ended December 31, 2022, PERA had securities lending collateral of $1,462,262 and securities lending obligations of $1,458,010, an increase of $292,772 and $288,770, respectively, from 2021. The securities lending collateral and obligations increased primarily due to an increase in the securities on loan because of increased borrower demand.

For the year ended December 31, 2022, PERA had total receivables of $738,412, a decrease of $1,089,220 from 2021. The decrease was primarily due to lower pending settlements of fixed income investment sales. The decrease in receivable for the Health Care Trust Funds was also due to a lower amount of health care subsidy payments and prescription rebates owed to PERA at year-end.

For the year ended December 31, 2022, PERA had investment settlements and other liabilities of $1,405,195, a decrease of $1,460,351 from 2021. The decrease was primarily due to lower pending settlements of fixed income investment purchases.

Nonemployer contributions for the Division Trust Funds increased from $225,000 in 2021 to $605,000 in 2022. The increase was due to the receipt of $380,000 from the State as a nonemployer contributing entity to recompense PERA for the direct distribution originally scheduled for receipt on July 1, 2020, which was suspended by HB 20-1379.

For the year ended December 31, 2022, benefit payments for the Health Care Trust Funds increased from $67,409 in 2021 to $87,167 in 2022. The increase was primarily due to a reduction in subsidies and retiree premiums received creating a net increase in benefit payments as the result of a change in the self-insured carrier and plan structure.

Administrative expenses of the Health Care Trust Funds decreased from $13,615 in 2021 to $7,570 in 2022. The decrease was primarily due to a change in the self-insured carrier and plan structure resulting in lower expenses along with an implementation credit from the new carrier.

Other deductions of the Health Care Trust Funds increased from $88 in 2021 to $111 in 2022. The increase was primarily due to vendor expenses for retiree services related to Medicare enrollment.

Actuarial Valuations: Accounting

Separate actuarial valuations are prepared for accounting and funding purposes for the Division Trust Funds and the Health Care Trust Funds. Calculations for purposes of financial reporting for the pension and OPEB plans are determined in accordance with GASB 67 and GASB 74, respectively.

The actuarial valuation for accounting purposes emphasizes the obligation an employer incurs to employees through the employment-exchange process. The primary purpose of the valuation for accounting purposes is to provide a consistent, standardized methodology that allows comparability of amounts and increased transparency of liabilities across U.S. plans complying with GASB 67 and GASB 74.

One of the key measurements in the accounting valuation which assesses the pension liabilities for financial reporting purposes is the NPL. The NPL is the difference between the FNP and the total pension liability (TPL). Similarly, one of the key measurements which assesses the OPEB liabilities for financial reporting purposes is the NOL. The NOL is the difference between the FNP and the total OPEB liability (TOL). The individual components which collectively comprise the FNP can be found in the Statements of Fiduciary Net Position on pages 44-45.

PERA-affiliated employers who comply with GASB 68 and GASB 75 are required to report their proportionate share of the collective NPL, collective NOL, and other related amounts for the plan(s) in which they participate. GASB requires that employer contributions and nonemployer contributions (if applicable) be used as a basis for the proportion.

The following schedules show the collective NPLs or NPAs and collective NOLs as of December 31, 2022, and December 31, 2021, as well as the breakdown of changes in the collective liabilities or assets for 2022. The increase in NPLs for all five Division Trust Funds primarily is due to unfavorable investment performance during 2022. The decrease in NOLs for the HCTF and DPS HCTF largely is due to favorable demographic experience and changes in assumptions, for 2022 and prior, that offset the unfavorable investment performance experienced during 2022.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY

	State Division Trust Fund	School Division Trust Fund	Local Government Division Trust Fund	Judicial Division Trust Fund	DPS Division Trust Fund	All Division Trust Funds[1]
2021 Net pension liability (asset)	$7,375,039	$11,637,366	($85,737)	$9,172	$5,971	$18,941,811
Service cost	401,939	815,689	93,983	9,790	113,836	1,435,237
Interest	1,945,315	3,313,326	411,598	34,772	333,769	6,038,780
Changes of benefit terms	—	—	(9,807)	—	—	(9,807)
Differences between expected and actual experience	(229,762)	47,448	(8,688)	5,974	15,514	(169,514)
Changes of assumptions or other inputs	—	—	—	—	—	—
Contributions—employer	(704,797)	(1,201,265)	(108,748)	(12,318)	(74,199)	(2,101,327)
Contributions—nonemployer	(198,247)	(350,393)	—	(3,576)	(52,784)	(605,000)
Contributions—active member (includes purchased service)	(396,222)	(699,671)	(80,759)	(8,822)	(96,124)	(1,281,598)
Net investment loss	2,657,031	4,623,013	781,550	63,501	619,265	8,744,360
Administrative expense	13,312	25,562	3,450	212	3,133	45,669
Other	8,968	(1,610)	5,721	(4,492)	(652)	7,935
2022 Net pension liability	**$10,872,576**	**$18,209,465**	**$1,002,563**	**$94,213**	**$867,729**	**$31,046,546**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

SCHEDULE OF CHANGES IN NET OPEB LIABILITY

	Health Care Trust Fund	DPS Health Care Trust Fund	All Health Care Trust Funds[1]
2021 Net OPEB liability	$862,305	$10,519	$872,824
Service cost	15,727	1,095	16,822
Interest	101,209	4,675	105,884
Changes of benefit terms	(43)	—	(43)
Differences between expected and actual experience	(59,877)	(2,353)	(62,230)
Changes of assumptions or other inputs	(65,295)	(3,703)	(68,998)
Contributions—employer	(103,818)	(8,744)	(112,562)
Purchased service transfers	(6,533)	(168)	(6,701)
Net investment gain	70,476	7,311	77,787
Administrative expense[2]	4,689	294	4,983
Other	(2,361)	(137)	(2,498)
2022 Net OPEB liability	**$816,479**	**$8,789**	**$825,268**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

[2] Excludes administrative and other health care claims processing fees.

Additional information regarding the NPL, NOL, assumptions used to determine total pension and OPEB liabilities, sensitivity analysis of pension liabilities based on different discount rates, sensitivity analysis of OPEB liabilities based on different discount and health care trend rates, and development of the investment rate of return assumption can be found in Notes 10 and 11 of the Notes to the Financial Statements.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

(Dollars in Thousands)

Defined Contribution Plans

Comparative Financial Statements

PERA administers three defined contribution plans. The following tables are the comparative condensed statements of Fiduciary Net Position and Changes in Fiduciary Net Position for the Voluntary Investment Program (PERAPlus 401(k) Plan), Defined Contribution Retirement Plan (DC Plan), and Deferred Compensation Plan (PERAPlus 457 Plan), collectively known as the Capital Accumulation Plans (CAPs). This information has been derived from PERA's audited financial statements. While the annual changes in FNP can provide meaningful insight into the financial activities and financial status of PERA, long-term views and trend analysis are critical factors in reporting and understanding the financial status of the plans.

DEFINED CONTRIBUTION PLANS FIDUCIARY NET POSITION

As of December 31

	2022	2021	% Chg
Assets			
Cash and short-term investments	**$67,307**	$68,506	(1.8%)
Securities lending collateral	**126,862**	89,517	41.7%
Receivables	**81,723**	99,284	(17.7%)
Investments, at fair value	**5,108,231**	6,295,670	(18.9%)
Total assets	**5,384,123**	6,552,977	(17.8%)
Liabilities			
Investment settlements and other liabilities	**25,728**	54,191	(52.5%)
Securities lending obligations	**126,460**	89,497	41.3%
Total liabilities	**152,188**	143,688	5.9%
Fiduciary net position	**$5,231,935**	**$6,409,289**	**(18.4%)**

DEFINED CONTRIBUTION PLANS CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

	2022	2021	% Chg
Additions			
Employer contributions	**$26,382**	$24,254	8.8%
Member contributions	**249,158**	242,881	2.6%
Net investment income (loss)	**(1,014,369)**	894,888	(213.4%)
Other	**4,236**	6,212	(31.8%)
Total additions	**(734,593)**	1,168,235	(162.9%)
Deductions			
Distributions	**437,452**	388,714	12.5%
Administrative expenses	**3,384**	3,376	0.2%
Other	**1,925**	2,944	(34.6%)
Total deductions	**442,761**	395,034	12.1%
Change in fiduciary net position	**(1,177,354)**	773,201	(252.3%)
Fiduciary net position			
Beginning of year	**6,409,289**	5,636,088	13.7%
End of year	**$5,231,935**	**$6,409,289**	**(18.4%)**

Investments

Investments for the CAPs are managed in a single investment pool. Underlying investments are grouped into one of 17 white label PERAdvantage funds which participants can choose to contribute to and/or make transfers from on a daily basis. In addition, participants can choose to select their own investments by transferring funds into a TD Ameritrade Self-Directed Brokerage Account. The PERAdvantage funds provide diversification and cover a wide risk/return spectrum within each of the seven primary investment options and 10 target retirement date funds. The target retirement date funds are broadly diversified across global asset classes and automatically adjust the underlying asset allocation to become more conservative over time. By investing in a single target retirement date fund, participants may capture diversified investment opportunities without having to manage multiple funds. More information about investment options and results can be found in the Investment Section on pages 137-142.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

(Dollars in Thousands)

For the year ended December 31, 2022, the CAPs net investment income changed from $894,888 in 2021 to a loss of $1,014,369 in 2022, a decrease of $1,909,257. Investments at fair value decreased by $1,187,439 or 18.9% for the year ended December 31, 2022. The decrease in investment income was primarily due to declining global markets. Additional information on longer-term performance and benchmarks for the three-, five-, and 10-year periods for each investment option can be found in the Investment Section.

The administrative fee for the PERAPlus 401(k) Plan and the PERA DC Plan consists of a flat $1.00 (actual dollars) per month per participant per plan and an asset-based fee of up to 0.03% on each underlying PERAdvantage fund. The PERAPlus 401(k) asset-based fee was waived through 2022. The administrative fee for the PERAPlus 457 Plan consists of a flat $1.50 (actual dollars) per month per participant per plan and an asset-based fee of up to 0.03% on each underlying PERAdvantage fund.

Participants also pay investment management fees. Investment management fees as of December 31, 2022, are shown in the following table:

Fund	2022	2021
PERAdvantage Capital Preservation Fund	**0.21%**	0.21%
PERAdvantage Fixed Income Fund	**0.13%**	0.17%
PERAdvantage Real Return Fund	**0.17%**	0.17%
PERAdvantage Socially Responsible Investment Fund	**0.19%**	0.19%
PERAdvantage U.S. Large Cap Stock Fund	**0.05%**	0.05%
PERAdvantage U.S. Small and Mid Cap Stock Fund	**0.15%**	0.15%
PERAdvantage International Stock Fund	**0.27%**	0.26%
PERAdvantage Target Retirement Date Funds	**0.07%**	0.07%

Note: Fees shown are investment management fees. Participants who have a Self-Directed Brokerage Account pay an annual $50 (actual dollars) self-directed brokerage fee.

Plan Participants and Contributions

In 2022, overall participation in the CAPs decreased by 633 participants from 2021. The following table shows the number of participants in each plan at the end of fiscal years 2022 and 2021:

Plan	2022	2021	Change
PERAPlus 401(k) Plan	**67,040**	67,887	(847)
DC Plan	**7,846**	7,673	173
PERAPlus 457 Plan	**20,063**	20,022	41
Total	**94,949**	**95,582**	**(633)**

The following table shows the breakdown of the number of accounts for the specified ranges in participant contributions recognized during 2022 and 2021 within the PERAPlus 401(k) Plan and PERAPlus 457 Plan. See current annual contribution limits in Note 8 of the Notes to the Financial Statements on pages 77-78.

	PERAPlus 401(k) Plan		PERAPlus 457 Plan	
Annual contribution ranges (actual dollars)	2022	2021	2022	2021
$0 - $5,000	**17,675**	18,652	**6,978**	7,153
$5,001 - $10,000	**3,625**	3,455	**1,452**	1,379
$10,001 - $15,000	**1,393**	1,354	**636**	631
$15,001 and above	**2,522**	2,493	**2,019**	2,032

Note: Includes all accounts with contribution activity.

Distributions

Participants can take normal distributions when they reach the minimum age designated by the plan. Participants can also take in-service withdrawals and can transfer funds after termination of employment. For the year ended December 31, 2022, the CAPs had distributions of $437,452, an increase of $48,738 from 2021. See Note 8 of the Notes to the Financial Statements for additional information about allowable in-service withdrawals in each plan.

Other Changes

For the year ended December 31, 2022, the CAPs had securities lending collateral of $126,862 and securities lending obligations of $126,460, an increase of $37,345 and $36,963, respectively, from 2021. The securities lending collateral and obligations increased primarily due to an increase in the securities on loan as a result of increased borrower demand.

For the year ended December 31, 2022, the CAPs had investment settlements and other liabilities of $25,728, a decrease of $28,463 from 2021. The decrease was primarily due to lower pending settlements of fixed income investment purchases.

For the year ended December 31, 2022, the CAPs had other additions of $4,236, a decrease of $1,976 from 2021. The decrease was primarily due to the new recordkeeper's recognition of assessed but not paid interest on loans in 2021.

For the year ended December 31, 2022, the CAPs had other deductions of $1,925, a decrease of $1,019 from 2021. The decrease was primarily due to lower participant managed account fees.

COLORADO PERA®

STATEMENTS OF FIDUCIARY NET POSITION

As of December 31, 2022, with Summarized Financial Information for 2021

(Dollars in Thousands)

	State Division Trust Fund	School Division Trust Fund	Local Government Division Trust Fund	Judicial Division Trust Fund	Denver Public Schools Division Trust Fund	Total Defined Benefit Pension Plans
Assets						
Cash and short-term investments						
Cash and short-term investments	$443,542	$781,248	$129,952	$10,833	$104,402	$1,469,977
Securities lending collateral	436,539	768,910	127,901	10,662	102,753	1,446,765
Total cash and short-term investments	880,081	1,550,158	257,853	21,495	207,155	2,916,742
Receivables						
Benefit	81,735	93,469	10,475	2,696	13,036	201,411
Interfund	118	208	35	3	28	392
Investment settlements and income	152,117	267,936	44,569	3,715	35,806	504,143
Leases	432	928	96	4	103	1,563
Total receivables	234,402	362,541	55,175	6,418	48,973	707,509
Investments, at fair value						
Global equity	8,745,498	15,404,144	2,562,342	213,594	2,058,535	28,984,113
Fixed income	3,153,284	5,554,130	923,880	77,014	742,227	10,450,535
Private equity	1,540,298	2,713,050	451,291	37,619	362,559	5,104,817
Real estate	1,986,338	3,498,695	581,977	48,513	467,549	6,583,072
Alternatives	1,047,549	1,845,132	306,921	25,585	246,575	3,471,762
Multi-asset class funds	—	—	—	—	—	—
Self-directed brokerage	—	—	—	—	—	—
Total investments, at fair value	16,472,967	29,015,151	4,826,411	402,325	3,877,445	54,594,299
Capital assets, at cost, net of accumulated depreciation of $30,613 and $29,733 at December 31, 2022, and 2021, respectively	4,165	8,940	921	34	997	15,057
Total assets	17,591,615	30,936,790	5,140,360	430,272	4,134,570	58,233,607
Liabilities						
Investment settlements and other liabilities	411,640	723,578	120,141	9,968	96,586	1,361,913
Securities lending obligations	435,269	766,674	127,529	10,631	102,455	1,442,558
Interfund	—	—	—	—	—	—
Total liabilities	846,909	1,490,252	247,670	20,599	199,041	2,804,471
Deferred inflows of resources	422	907	94	3	101	1,527
Fiduciary net position restricted for pensions and other postemployment benefits, and held in trust for private purpose trust fund participants	**$16,744,284**	**$29,445,631**	**$4,892,596**	**$409,670**	**$3,935,428**	**$55,427,609**

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

STATEMENTS OF FIDUCIARY NET POSITION

As of December 31, 2022, with Summarized Financial Information for 2021
(Dollars in Thousands)

Voluntary Investment Program	Defined Contribution Retirement Plan	Deferred Compensation Plan	Health Care Trust Fund	Denver Public Schools Health Care Trust Fund	Life Insurance Reserve	Total 2022	Total 2021
$41,530	$7,818	$17,959	$13,694	$1,387	$666	**$1,553,031**	$2,210,294
85,650	7,790	33,422	13,477	1,365	655	**1,589,124**	1,259,007
127,180	15,608	51,381	27,171	2,752	1,321	**3,142,155**	3,469,301
52,889	3,444	13,099	24,127	1,372	—	**296,342**	325,714
—	—	—	4	—	—	**396**	246
8,797	610	2,884	4,696	476	228	**521,834**	1,600,523
—	—	—	—	—	—	**1,563**	433
61,686	4,054	15,983	28,827	1,848	228	**820,135**	1,926,916
2,064,668	115,516	525,258	270,003	27,347	13,124	**32,000,029**	41,915,763
621,201	32,324	248,022	97,353	9,860	4,732	**11,464,027**	12,721,298
—	—	—	47,554	4,817	2,311	**5,159,499**	6,049,676
—	—	—	61,325	6,211	2,981	**6,653,589**	5,836,880
—	—	—	32,341	3,276	1,571	**3,508,950**	3,124,814
984,284	174,850	280,118	—	—	—	**1,439,252**	1,686,305
31,585	5,976	24,429	—	—	—	**61,990**	80,193
3,701,738	328,666	1,077,827	508,576	51,511	24,719	**60,287,336**	71,414,929
—	—	—	—	—	—	**15,057**	15,831
3,890,604	348,328	1,145,191	564,574	56,111	26,268	**64,264,683**	76,826,977
18,702	1,035	5,595	38,432	2,515	2,335	**1,430,527**	2,919,491
85,379	7,765	33,316	13,438	1,361	653	**1,584,470**	1,258,737
250	76	70	—	—	—	**396**	246
104,331	8,876	38,981	51,870	3,876	2,988	**3,015,393**	4,178,474
—	—	—	—	—	—	**1,527**	433
$3,786,273	**$339,452**	**$1,106,210**	**$512,704**	**$52,235**	**$23,280**	**$61,247,763**	**$72,648,070**

STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION

For the Year ended December 31, 2022, with Summarized Financial Information for 2021
(Dollars in Thousands)

	State Division Trust Fund	School Division Trust Fund	Local Government Division Trust Fund	Judicial Division Trust Fund	Denver Public Schools Division Trust Fund	Total Defined Benefit Pension Plans
Additions						
Contributions						
Employers	$704,797	$1,201,265	$108,748	$12,318	$74,199	$2,101,327
Nonemployer	198,247	350,393	—	3,576	52,784	605,000
Members	360,523	642,202	71,339	7,844	92,164	1,174,072
Purchased service	35,699	57,469	9,420	978	3,960	107,526
Total contributions	1,299,266	2,251,329	189,507	24,716	223,107	3,987,925
Investment income (loss)						
Net appreciation (depreciation) in fair value of investments	(2,961,892)	(5,155,092)	(870,905)	(70,813)	(690,504)	(9,749,206)
Interest	92,210	160,935	27,027	2,212	21,547	303,931
Dividends	183,210	319,760	53,699	4,395	42,812	603,876
Real estate, private equity, and alternatives net operating income	89,793	156,716	26,318	2,153	20,983	295,963
Less investment expense	(63,740)	(111,246)	(18,682)	(1,529)	(14,895)	(210,092)
Net income (loss) from investing activities	(2,660,419)	(4,628,927)	(782,543)	(63,582)	(620,057)	(8,755,528)
Securities lending income	3,621	6,320	1,061	87	846	11,935
Less securities lending expense	(233)	(406)	(68)	(6)	(54)	(767)
Net income from securities lending	3,388	5,914	993	81	792	11,168
Net investment income (loss)	(2,657,031)	(4,623,013)	(781,550)	(63,501)	(619,265)	(8,744,360)
Other additions	171	5,545	73	4,525	875	11,189
Total additions	(1,357,594)	(2,366,139)	(591,970)	(34,260)	(395,283)	(4,745,246)
Deductions						
Benefits						
Benefits paid to retirees/cobeneficiaries	1,763,225	2,707,594	333,811	32,450	280,944	5,118,024
Benefits paid to survivors	14,842	16,073	2,910	265	1,613	35,703
Benefits paid on behalf of health care participants	—	—	—	—	—	—
Total benefits	1,778,067	2,723,667	336,721	32,715	282,557	5,153,727
Refunds and distributions	82,321	88,355	13,391	218	16,913	201,198
Disability and life insurance premiums	849	1,435	195	18	190	2,687
Administrative expenses	13,312	25,562	3,450	212	3,133	45,669
Other deductions	9,139	3,935	5,794	33	223	19,124
Total deductions	1,883,688	2,842,954	359,551	33,196	303,016	5,422,405
Net increase (decrease) in fiduciary net position	**(3,241,282)**	**(5,209,093)**	**(951,521)**	**(67,456)**	**(698,299)**	**(10,167,651)**
Fiduciary net position restricted for pensions and other postemployment benefits, and private purpose trust fund participants						
Beginning of year	19,985,566	34,654,724	5,844,117	477,126	4,633,727	65,595,260
End of year	**$16,744,284**	**$29,445,631**	**$4,892,596**	**$409,670**	**$3,935,428**	**$55,427,609**

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

STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION

For the Year ended December 31, 2022, with Summarized Financial Information for 2021

(Dollars in Thousands)

Voluntary Investment Program	Defined Contribution Retirement Plan	Deferred Compensation Plan	Health Care Trust Fund	Denver Public Schools Health Care Trust Fund	Life Insurance Reserve	Total	
						2022	2021
$6,792	$19,553	$37	$103,818	$8,744	$—	**$2,240,271**	$2,080,273
—	—	—	—	—	—	**605,000**	225,000
147,445	20,956	80,757	—	—	—	**1,423,230**	1,305,289
—	—	—	—	—	—	**107,526**	114,246
154,237	40,509	80,794	103,818	8,744	—	**4,376,027**	3,724,808
(808,154)	(66,211)	(202,863)	(78,883)	(8,174)	(4,378)	**(10,917,869)**	9,224,697
8,931	519	3,665	2,543	261	136	**319,986**	245,159
39,769	2,437	10,933	5,052	519	271	**662,857**	577,838
—	—	—	2,476	254	132	**298,825**	318,225
(3,037)	(281)	(951)	(1,758)	(180)	(94)	**(216,393)**	(208,043)
(762,491)	(63,536)	(189,216)	(70,570)	(7,320)	(3,933)	**(9,852,594)**	10,157,876
649	49	230	100	10	6	**12,979**	7,124
(38)	(3)	(13)	(6)	(1)	—	**(828)**	(679)
611	46	217	94	9	6	**12,151**	6,445
(761,880)	(63,490)	(188,999)	(70,476)	(7,311)	(3,927)	**(9,840,443)**	10,164,321
2,284	1,456	496	9,004	306	—	**24,735**	26,168
(605,359)	(21,525)	(107,709)	42,346	1,739	(3,927)	**(5,439,681)**	13,915,297
—	—	—	—	—	—	**5,118,024**	4,949,110
—	—	—	—	—	—	**35,703**	35,669
—	—	—	83,145	4,022	—	**87,167**	67,409
—	—	—	83,145	4,022	—	**5,240,894**	5,052,188
318,144	25,334	93,974	—	—	—	**638,650**	572,786
—	—	—	—	—	533	**3,220**	3,715
1,961	849	574	7,136	434	79	**56,702**	57,810
1,275	118	532	110	1	—	**21,160**	20,951
321,380	26,301	95,080	90,391	4,457	612	**5,960,626**	5,707,450
(926,739)	**(47,826)**	**(202,789)**	**(48,045)**	**(2,718)**	**(4,539)**	**(11,400,307)**	8,207,847
4,713,012	387,278	1,308,999	560,749	54,953	27,819	**72,648,070**	64,440,223
$3,786,273	**$339,452**	**$1,106,210**	**$512,704**	**$52,235**	**$23,280**	**$61,247,763**	**$72,648,070**

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Note 1—Plan Description

Organization

Public Employees' Retirement Association of Colorado (PERA) was established in 1931. The statute governing PERA is Title 24, Article 51 of the Colorado Revised Statutes (C.R.S.). PERA administers the following plans:

Plan Name	Type of Plan
Defined Benefit Pension Plans (Division Trust Funds)	
State Division Trust Fund	Cost-sharing multiple-employer
School Division Trust Fund	Cost-sharing multiple-employer
Local Government Division Trust Fund	Cost-sharing multiple-employer
Judicial Division Trust Fund	Cost-sharing multiple-employer
Denver Public Schools (DPS) Division Trust Fund	Single-employer
Defined Benefit Other Postemployment Benefit Plans (Health Care Trust Funds)	
Health Care Trust Fund (HCTF)	Cost-sharing multiple-employer
Denver Public Schools Health Care Trust Fund (DPS HCTF)	Single-employer
Defined Contribution Plans	
Voluntary Investment Program	Multiple-employer
Defined Contribution Retirement Plan	Multiple-employer
Deferred Compensation Plan	Multiple-employer
Private Purpose Trust Fund	
Life Insurance Reserve	Multiple-employer

Responsibility for the organization and administration of these plans rests with the PERA Board of Trustees (Board). The Board is composed of the following 16 Trustees:

- Nine members elected by members from their respective Divisions to serve on the Board for four–year terms; four from the School Division, three from the State Division, one from the Local Government Division, and one from the Judicial Division.
- Two retirees elected by retirees to serve on the Board for four-year terms.
- Three Trustees appointed by the Governor and confirmed by the State Senate to serve on the Board for four-year terms.
- The State Treasurer.
- One ex officio (non-voting) member or retiree elected by members and retirees of the DPS Division to serve on the Board for a four-year term.

This table is the number of active participating employers for the five Division Trust Funds. Guidance under the Governmental Accounting Standards Board (GASB) Statement No. 67 classifies a primary government and its component units as one employer.

Division	As of December 31, 2022[1]
State	32
School	234
Local Government	141
Judicial	2
DPS	1
Total employers	**410**

[1] This employer count is presented for purposes of complying with GASB 67 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA.

Pursuant to C.R.S. § 24-51-414, the State of Colorado (State) is required to make an annual nonemployer contribution to PERA on behalf of all divisions except the Local Government Division.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Membership—Division Trust Funds-Defined Benefit Pension Plans

Benefit recipients and members of PERA consisted of the following as of December 31, 2022, with summarized totals for 2021:

	State Division	School Division	Local Government Division	Judicial Division	DPS Division	2022	2021
Retirees and beneficiaries (includes deferred survivors)	43,860	75,094	8,829	446	7,256	**135,485**	132,111
Inactive members eligible but not yet receiving benefits	9,738	23,817	3,173	31	3,165	**39,924**	33,015
Inactive members not eligible for benefits	91,705	151,524	30,243	7	16,377	**289,856**	277,186
Active members							
Vested members other than State Troopers	28,934	72,499	6,122	247	8,377	**116,179**	115,233
Vested State Troopers	651	—	1	—	—	**652**	682
Non-vested members other than State Troopers	19,886	55,558	5,949	93	6,877	**88,363**	90,415
Non-vested State Troopers	1,421	—	31	—	—	**1,452**	939
Total active members	50,892	128,057	12,103	340	15,254	**206,646**	207,269
Total	**196,195**	**378,492**	**54,348**	**824**	**42,052**	**671,911**	**649,581**

Membership—Voluntary Investment Program, Defined Contribution Retirement Plan, and Deferred Compensation Plan

See Note 8.

Membership—Health Care Trust Funds

See Note 9.

Benefit Provisions—Division Trust Funds

Plan benefits are specified in Title 24, Article 51 of the C.R.S. and applicable provisions of the federal Internal Revenue Code (IRC). Colorado State law provisions may be amended from time to time by the Colorado General Assembly.

Plan Eligibility

All employees of PERA employers who work in a position eligible for PERA membership must be enrolled in the PERA Defined Benefit Plan, except for employees who are hired into a position that makes them eligible for a choice between enrolling in the PERA Defined Benefit Plan or the PERA Defined Contribution Retirement Plan (PERAChoice). PERAChoice eligibility applies to certain employees of the State or Local Government Divisions, classified employees at State colleges and universities, most community colleges, as well as the District Attorney within each Judicial District, and if authorized by the county and the District Attorney, the attorneys within that Judicial District. If an eligible employee does not make a choice of which plan to participate in within 60 days of the starting date of employment, the employee is automatically enrolled in the PERA Defined Benefit Plan. Between the second and fifth year of participation in their original plan, employees may make a one-time, irrevocable election to switch to the other plan. After the fifth year of participation, this option to switch plan participation no longer exists.

Some positions within PERA-affiliated employers are not eligible for PERA membership and may be covered by another separate retirement program.

Benefit Provisions

The Division Trust Funds have various benefit provisions depending upon the member's date of hire or upon the member's date of retirement. The differences in plan benefit provisions are detailed in the following pages in this Note as of December 31, 2022. Following the January 1, 2010, merger of the Denver Public Schools Retirement System (DPSRS) into PERA, the benefit provisions of existing PERA members and all new hires post-merger date are identified as the PERA benefit structure and the benefit provisions originating under DPSRS are referred to as the DPS benefit structure.

Member Accounts

During 2022, most members in the State, School, and DPS Divisions, and Denver County Court judges contributed 10.50% of their PERA-includable salary to their member accounts from January 1 to June 30 and contributed 11.00% from July 1 to December 31. State Troopers (as defined in the next paragraph) contributed 12.50% of their PERA-includable salary from January 1 to June 30 and contributed 13.00% from July 1 to December 31. Most members of the Local Government Division contributed 8.50% of their PERA-includable salary from January 1 to June 30 and 9.00% from July 1 to December 31. C.R.S. § 24-51-401(1.7)(g) increased the member contribution rate for the Judicial Division (excluding judges employed by the Denver County Court) for the State's 2020-21 and 2021-22 fiscal years. These members contributed 15.50% of their PERA-includable salary from January 1 to June 30 and 11.00% from July 1 to December 31.

The term "State Troopers" for PERA purposes has an expanded definition under Colorado law and includes several categories of employees: (1) employees of the Colorado State Patrol or Colorado Bureau of Investigation (CBI) vested with the powers of peace officers; (2) beginning July 1, 2020, new or existing employees of the Division of Fire Prevention and Control in the Department of Public Safety classified as firefighter I through firefighter VII; (3) new members hired on or after January 1, 2020, as a county sheriff, undersheriff, deputy sheriff, noncertified deputy sheriff, or detention officer by a Local Government Division employer; and (4) new members hired on or after January 1, 2020, as a corrections officer classified as I through IV by a State Division employer.

State law authorizes the Board to determine annually the interest to be credited to member accounts, but in no event may the Board specify a rate that exceeds 5%. Effective January 1, 2009, the annual rate was set at 3% and has been reconfirmed each November since adoption.

Service Credit

Members earn service credit for each month of work performed as an employee of a PERA-affiliated employer for which salary is earned for such services.

A full month of service credit is earned for each month of work where the salary earned by the employee is equal to or greater than 80 multiplied by the federal minimum hourly wage in effect for that month. Earned salary which is less than this amount results in a partial month of service credit. Positions with an employment pattern of at least eight months but fewer than 12 months (including, but not limited to, positions in the School and DPS Divisions) receive a higher ratio of service credit for each month worked, up to a maximum of 12 months of service credit per year.

Eligible members may purchase additional service credit based upon (1) other employment that is not covered by PERA or another retirement program or (2) the service credit forfeited as the result of a withdrawn PERA member account. Such service credit purchases are subject to limits in State and federal law. The amounts used to purchase service credit are credited to the member's account and may include tax-paid funds and eligible rollovers of tax-deferred funds. Such amounts are eligible for an interest accrual, but no match if the member account is refunded in a lump-sum distribution.

Refund or Distribution Provisions

Upon termination of employment with all PERA employers, members have the following options concerning their member account:

- Leave the account invested in the Division Trust Funds for a future distribution or retirement benefit; however, a distribution must begin by the member's applicable required beginning date, determined by IRC § 401(a)(9)(C).
- Request a distribution of the member account plus an applicable match. Such a distribution cancels the refunding member's service credit and any benefit entitlements associated with the account. The distribution may be taken as cash with the resulting tax consequences or as a rollover to an eligible qualified plan.

Matching Amounts

Members under the PERA benefit structure who withdraw their accounts on or after reaching retirement eligibility or age 65 receive their member account plus a 100% match on eligible amounts. For members under the PERA benefit structure who withdraw their accounts before reaching retirement eligibility, all contributions received prior to January 1, 2011, are eligible for the 50% match regardless of how much service credit the member has earned. However, contributions received after January 1, 2011, are not eligible for the 50% match until the member earns five years of service credit.

Members under the DPS benefit structure who terminated employment on or after January 1, 2001, and withdraw their accounts on or after reaching retirement eligibility receive their member account plus a 100% match on eligible amounts. Members under the DPS benefit structure who withdraw their accounts before reaching retirement eligibility receive a refund of their member accounts, but do not receive any match.

Members reaching retirement eligibility who choose to take a retirement benefit are entitled to a minimum monthly benefit which incorporates the member's account plus a 100% match on eligible amounts, annuitized into a monthly benefit using PERA's expected rate of return.

Highest Average Salary

Plan benefits generally are calculated as a percentage of the member's three- or five- year Highest Average Salary (HAS). The following conditions apply to the HAS calculation:

- ***For all members of the PERA benefit structure, except judges, who were eligible to retire as of January 1, 2011, who were hired before January 1, 2007, and who retire on or after January 1, 2009:*** HAS is determined by the highest annual salaries associated with four periods of 12 consecutive months of service credit. The four 12-month periods selected do not have to be consecutive nor do they have to include the last four years of membership. The lowest of the four periods becomes a base year used as a starting point for a 15% cap on annual salary increases for the next three periods used to determine the applicable HAS. This salary cap applies regardless of when the annual salaries used in the HAS calculation occurred.
- ***For all members of the PERA benefit structure, except judges, who were not eligible to retire as of***

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

January 1, 2011, or members of the PERA benefit structure who are hired on or after January 1, 2007, who have at least five years of service credit on December 31, 2019: HAS is determined by the highest annual salaries associated with four periods of 12 consecutive months of service credit. The four 12-month periods selected do not have to be consecutive nor do they have to include the last four years of membership. The lowest of the four periods becomes a base year used as a starting point for an 8% cap on annual salary increases for the next three periods used to determine the applicable HAS. This salary cap applies regardless of when the annual salaries used in the HAS calculation occurred.

- ***For all members of the PERA and DPS benefit structures, except judges, regardless of hire date, who do not have at least five years of service credit on December 31, 2019:*** HAS is determined by the highest annual salaries associated with six periods of 12 consecutive months of service credit. The six 12-month periods selected do not have to be consecutive nor do they have to include the last six years of membership. The lowest of the six periods becomes a base year used as a starting point for an 8% cap on annual salary increases for the next five periods used to determine the applicable HAS. This salary cap applies regardless of when the annual salaries used in the HAS calculation occurred.
- ***For members of the Judicial Division Trust Fund (judges) who have at least five years of service credit on December 31, 2019:*** HAS is one-twelfth of the highest annual salary associated with one period of 12 consecutive months of service credit.
- ***For members of the Judicial Division Trust Fund (judges) who do not have at least five years of service credit on December 31, 2019, regardless of the date of hire:*** HAS is determined by the highest annual salaries associated with four periods of 12 consecutive months of service credit. The four 12-month periods selected do not have to be consecutive nor do they have to include the last four years of membership. The lowest of the four periods becomes a base year used as a starting point for an 8% cap on annual salary increases for the next three periods used to determine the applicable HAS. This salary cap applies regardless of when the annual salaries used in the HAS calculation occurred.
- ***For members of the DPS benefit structure who are eligible to retire as of January 1, 2011:*** HAS is the average monthly salary of the 36 months of earned service having the highest salaries.
- ***For members of the DPS benefit structure who are not eligible to retire as of January 1, 2011, and have at least five years of service credit on December 31, 2019:*** HAS is determined by the highest annual salaries associated with four periods of 12 consecutive months of service credit. The four 12-month periods selected do not have to be consecutive nor do they have to include the last four years of membership. The lowest of the four periods becomes a base year used as a starting point for an 8% cap on annual salary increases for the next three periods used to determine the applicable HAS. This salary cap applies regardless of when the annual salaries used in the HAS calculation occurred.

Service Retirement Benefits for Members other than State Troopers—PERA Benefit Structure

Upon termination of PERA-covered employment and reaching eligibility for service retirement benefits, a member may begin receipt of benefits as follows:

Members Hired Before July 1, 2005, With Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
50	30
55	Age and Service = 80 or more
60	20
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

Members Hired on or After July 1, 2005, But Before January 1, 2007, With Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
55	Age and Service = 80 or more
60	20
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Members Hired on or After January 1, 2007, But Before January 1, 2011, With Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
55	30
55	Age and Service = 85 or more
60	25
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

Members Hired Before January 1, 2011, With Less Than Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
55	30
55	Age and Service = 85 or more
60	25
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

Members Hired on or After January 1, 2011, But Before January 1, 2017, or Hired on or After January 1, 2017, But Before January 1, 2020, Whose Most Recent 10 Years of Service are in the School or DPS Divisions

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
58	30
58	Age and Service = 88 or more
60	28
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

Members Hired on or After January 1, 2017, But Before January 1, 2020, Whose Most Recent 10 Years of Service are not in the School or DPS Divisions

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
60	30
60	Age and Service = 90 or more
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

Members Hired on or After January 1, 2020

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
64	30
64	Age and Service = 94 or more
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

Service Retirement Benefits for State Troopers—PERA Benefit Structure

Upon termination of PERA-covered employment and reaching eligibility for service retirement benefits, a State Trooper may begin receipt of benefits as follows:

State Troopers Hired Before January 1, 2020

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	30
50	25
55	20
60	Age and Service = 80 or more
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

State Troopers Hired on or After January 1, 2020

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
55	25
55	Age and Service = 80 or more
65	5
65	Less than 5 but 60 payroll postings[1]

[1] Retiring members who are age 65 and have less than five years of service credit and less than 60 payroll postings will receive a service retirement benefit under the Money Purchase Formula only.

The service retirement benefit for all retiring members is the greater of the Defined Benefit Formula or the Money Purchase Formula explained as follows:

- **Defined Benefit Formula**
  HAS multiplied by 2.5% and then multiplied by years of service credit. The service retirement benefit is limited to 100% of HAS.

- **Money Purchase Formula**
  Values the retiring member's account plus a 100% match on eligible amounts as of the member's retirement date. This amount is then annuitized into a monthly benefit using the retiring member's life expectancy, expected rates of return, and other actuarial factors.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

In all cases, a service retirement benefit cannot exceed the maximum benefit amount allowed by federal law.

Reduced Service Retirement Benefits—PERA Benefit Structure

Reduced service retirement benefits are calculated in the same manner as a service retirement benefit with a reduction for each month prior to the member's first eligible date for a service retirement. The benefit calculation reduction factors applicable to members who were eligible to retire as of January 1, 2011, are specified in C.R.S. § 24-51-605.

Members and State Troopers Hired Before January 1, 2020

Age Requirement (in years)	Service Credit Requirement (in years)
50	25
50 (State Troopers only)	20
55	20
60	5

Members and State Troopers Hired on or After January 1, 2020

Age Requirement (in years)	Service Credit Requirement (in years)
55	25
55 (State Troopers only)	20
60	5

For members not eligible to retire as of January 1, 2011, the early retirement reduction factors used to determine the reduced service retirement benefit reflect an actuarial equivalent reduction.

Service Retirement Benefits—DPS Benefit Structure

Members in the DPS benefit structure are eligible to receive a monthly retirement benefit when they meet the age and service requirements listed as follows:

Members With Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
50	30
55	25[1]
65	5

[1] 15 years must be earned service credit

Member With Less Than Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
Any Age	35
55	30[1]
55	Age and Service = 85 or more[1]
60	25
65	5

[1] 20 years must be earned service credit

Reduced Service Retirement Benefits—DPS Benefit Structure

Member With Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
Less than 50	30
Less than 55	25
55	15

Member With Less Than Five Years of Service Credit on January 1, 2011

Age Requirement (in years)	Service Credit Requirement (in years)
50	25
55	20
60	5

If the member has less than five years of service credit under the DPS benefit structure, the member does not have the option to apply for a benefit and the member is only eligible for a refund of his or her account.

The service retirement benefit for all retiring members is the greater of the two calculations explained as follows:

- HAS multiplied by 2.5% and then multiplied by years of service credit.
- $15 (actual dollars) times the first 10 years of service credit plus $20 (actual dollars) times service credit over 10 years plus a monthly amount equal to the annuitized member balance (which may include matching dollars if eligible) using the retiring member's life expectancy, expected rates of return, and other actuarial factors.

In all cases, a service retirement benefit is limited to 100% of HAS and cannot exceed the maximum benefit amount allowed by federal law.

Disability Program

Eligible active members, other than judges, with five or more years of earned service credit are covered by the PERA Disability Program. Judges are immediately covered under the disability program. The earned service credit requirement may be waived for State Troopers who become disabled as the result of injuries in the line of duty.

Medical determinations for the disability program are made by UNUM, PERA's disability program administrator pursuant to C.R.S. § 24-51-703. Applicants found to be disabled receive payments under one of two tiers:

- **Short-Term Disability:** Disability applicants are eligible for short-term disability payments if they are found to be mentally or physically incapacitated from performance of essential job duties after reasonable accommodation, and who are medically unable to earn at least 75% of their pre-disability earnings from any job, but who are not totally and permanently incapacitated from regular and substantial gainful employment. PERA's short-term disability program is an insurance product with PERA's disability program administrator, and payments are made directly to the individual from PERA's disability program administrator. The maximum income replacement is 60% of the member's pre-disability PERA salary for up to 22 months.

- **Disability Retirement Benefits:** Disability applicants who are found to be totally and permanently mentally or physically incapacitated from regular and substantial gainful employment are eligible for disability retirement benefits. These benefits are paid by PERA for as long as the disability retiree remains disabled. The benefit is calculated as a percentage of the disabled member's HAS using accrued, and in some cases, projected service credit.

Benefit Options

Service retirees in the PERA benefit structure and all members in either the DPS benefit structure or the PERA benefit structure who meet the requirements of a disability retirement may elect to receive their retirement or disability retirement benefits in the form of a single-life benefit payable for the retiree's lifetime only or one of two joint-life benefits payable for the lifetime of the retiree with a continuing benefit paid upon the retiree's death to the retiree's cobeneficiary. Such option designations may only be changed under limited conditions specified in State law. The options are as follows:

- *Option 1:* A single-life benefit payable for the life of the retiree and, upon the death of the retiree, no further monthly benefits are payable.
- *Option 2:* A joint-life benefit payable for the life of the retiree and, upon the death of the retiree, one-half of the benefit becomes payable to the cobeneficiary of the retiree for life. Upon the death of the cobeneficiary prior to the death of the retiree, an Option 1 benefit becomes payable to the retiree.
- *Option 3:* A joint-life benefit payable for the life of the retiree and, upon the death of the retiree, the same benefit becomes payable to the cobeneficiary of the retiree for life. Upon the death of the cobeneficiary prior to the death of the retiree, an Option 1 benefit becomes payable to the retiree.

Options 2 and 3 are reduced to be the actuarial equivalent of Option 1, to ensure equitable benefits are provided regardless of the payment option chosen.

Service retirees in the DPS benefit structure have the following options:

- *Option A:* A single-life benefit payable for the life of the retiree and, upon the death of the retiree, no further monthly benefits are payable.
- *Option B:* A single-life benefit, reduced from an Option A benefit to provide benefits to designated beneficiaries for a fixed period of time after retirement. As part of the retirement calculation, a guaranteed payment period is determined and if the retiree dies before the guaranteed period ends, the benefit will continue to the Option B beneficiary(ies) for the remainder of the guaranteed period. If the death of the retiree occurs after the guaranteed period, the benefit ends.
- *Option P2:* A joint-life benefit payable for the life of the retiree and, upon the death of the retiree, one-half of the benefit becomes payable to the cobeneficiary of the retiree for life. Upon the death of the cobeneficiary prior to the death of the retiree, an Option A benefit becomes payable to the retiree.
- *Option P3:* A joint-life benefit payable for the life of the retiree and, upon the death of the retiree, the same benefit becomes payable to the cobeneficiary of the retiree for life. Upon the death of the cobeneficiary prior to the death of the retiree, an Option A benefit becomes payable to the retiree.

Options B, P2, and P3 are reduced to be the actuarial equivalent of Option A, to ensure equitable benefits are provided regardless of the payment option chosen.

Survivor Benefits Program—PERA Benefit Structure

Members who have at least one year of earned service credit are covered by the PERA survivor benefits program. This one-year requirement is waived if a member's death is job-incurred.

In the event of the covered member's death, monthly survivor benefits may be paid to the qualified survivors of the deceased. Qualified survivors generally include minor children, a surviving spouse, dependent parents, or a cobeneficiary (for deceased members who were eligible for retirement at the time of death).

Monthly benefits are specified in statute and vary based upon the deceased's HAS, years of service credit, the qualified survivor to whom benefits are to be paid, and the number of qualified survivors receiving benefits.

If at the time of death, a member has less than one year of earned service credit or does not have any qualified survivors, the deceased's named beneficiary or the estate receives a lump-sum payment of the deceased member's account plus a 100% match on eligible amounts.

Survivor Benefits Program—DPS Benefit Structure

Active members who have at least five years of continuous service under the DPS benefit structure prior to the date of death and DPS disability retirements (prior to age 65) are covered by the survivor benefits program applicable to the DPS benefit structure.

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In the event of the covered member's death, the member's qualified survivors are eligible for survivor benefits as long as the named beneficiary(ies) waive their right to receive a refund of the member's contributions. Qualified survivors generally include minor children, a surviving spouse, or dependent parents.

Monthly benefits are specified in statute and vary based upon the deceased's HAS, years of service credit, the qualified survivor to whom benefits are to be paid, and the number of qualified survivors receiving benefits.

If at the time of death, a member has not met the eligibility requirements for the DPS benefit structure survivor benefits program that are specified in statute, the member's named beneficiary(ies) will receive a lump-sum payment of the deceased member's account without a match.

Annual Increases

On an annual basis, eligible benefit recipients receive post-retirement, cost-of-living adjustments called annual increases (AI). The AI eligibility and amounts are determined by the date the retiree or deceased member began membership in PERA.

The AI provisions are explained as follows:

- For benefit recipients of the PERA benefit structure who began membership before January 1, 2007, and whose benefit is paid based on a retirement date prior to January 1, 2011, and benefit recipients of the DPS benefit structure whose benefit is paid based on a retirement date prior to January 1, 2011:
  - ***Payment Month:*** The AI is paid in July.
  - ***Eligibility:*** The benefit recipient has been receiving benefits for at least seven months immediately preceding the July in which the AI is to be paid.
  - ***AI Amount:*** The AI for 2022 is 1.00%. Each year, the AI is equal to the maximum AI or "AI cap," currently 1.00% per year, unless it is adjusted by the automatic adjustment provision (AAP). The AAP may raise or lower the AI cap by up to 0.25% if the AAP ratio of the Division Trust Funds is outside the parameters specified in C.R.S. § 24-51-413. The amount of the first AI will be prorated from the month of retirement to the first AI payment date.
- For benefit recipients of the PERA benefit structure who began membership before January 1, 2007, and whose benefit is paid based on a retirement date on or after January 1, 2011, and benefit recipients of the DPS benefit structure whose benefit is paid based on a retirement date on or after January 1, 2011, the following eligibility criteria is required:
  - ***Payment Month:*** The AI is paid in July.
  - ***Eligibility:*** For full service retirees, disability retirees, and reduced service retirees who are eligible to receive a benefit on January 1, 2011, and survivor benefit recipients, who already received the first AI on or before May 1, 2018, the benefit recipient has received benefit payments for the 12 months prior to the July in which the AI is to be paid.

    For full service retirees, disability retirees, and reduced service retirees who are eligible to receive a benefit on January 1, 2011, and survivor benefit recipients, who had not yet received the first AI on or before May 1, 2018, the benefit recipient has received benefit payments for 36 months total, including for the 12 months prior to the July in which the AI is to be paid.

    For reduced service retirees who are not eligible to retire as of January 1, 2011, but who already received the first AI on or before May 1, 2018: A reduced service retiree is eligible to receive the AI in July of the year in which both of the following conditions are met: (1) the retiree has received benefit payments for 12 months immediately preceding the July in which the AI is to be paid and (2) as of January 1 of the year the AI is paid, the retiree has either reached age 60 or the age and service rule for unreduced service retirement applicable to the retiree's plan.

    For reduced service retirees who are not eligible to retire as of January 1, 2011, and who had not yet received the AI on or before May 1, 2018: A reduced service retiree is eligible to receive the AI in July of the year in which all of the following conditions are met: (1) the retiree has received benefit payments for 36 months total; (2) the retiree has received benefit payments for 12 months immediately preceding the July in which the AI is to be paid; and (3) as of January 1 of the year the AI is paid, the retiree has either reached age 60 or the age and service rule for unreduced service retirement applicable to the retiree's plan.
  - ***AI Amount:*** The AI for 2022 is 1.00%. Each year, the AI is equal to the AI cap, currently 1.00% per year, unless it is adjusted by the AAP. The AAP may raise or lower the AI cap by up to 0.25% if the AAP ratio of the Division Trust Funds is outside the parameters specified in C.R.S. § 24-51-413.
- For benefit recipients of the PERA benefit structure who began membership on and after January 1, 2007:
  - ***Payment Month:*** The AI is paid in July.
  - ***Eligibility:*** For full service retirees, disability retirees, and survivor benefit recipients who had already received an AI on or before May 1, 2018: The benefit recipient becomes eligible in July of the calendar year

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following the calendar year in which the benefit recipient has received 12 months of benefit payments. For full service retirees, disability retirees, and survivor benefit recipients who had not yet received an AI on or before May 1, 2018: The benefit recipient becomes eligible in July if the benefit recipient has received 36 months of benefit payments total including 12 months of benefit payments in the prior calendar year.

A reduced service retiree who had already received an AI on or before May 1, 2018, is eligible to receive the AI in July of the year in which both of the following conditions are met: (1) as of January 1 of the year the AI is to be paid, the retiree has received 12 months of benefit payments in the prior calendar year and (2) as of January 1 of the year the AI is paid, the retiree has either reached age 60 or the age and service rule for unreduced service retirement applicable to the retiree's plan.

A reduced service retiree who had not yet received an AI on or before May 1, 2018, is eligible to receive the AI in July of the year in which all of the following conditions are met: (1) as of January 1 of the year the AI is to be paid, the retiree has received 36 months of benefit payments total; (2) the retiree received 12 months of benefit payments in the prior calendar year; and (3) as of January 1 of the year the AI is paid, the retiree has either reached age 60 or the age and service rule for unreduced service retirement applicable to the retiree's plan.

- ***AI Amount:*** The AI for 2022 is 1.00%. Each year, the AI is the lesser of the AI cap, currently 1.00% (unless adjusted by the AAP), or the average of the monthly Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) amounts for the prior calendar year. In no case can the present value of the year's AIs paid to a division's benefit recipients exceed 10% of the division's Annual Increase Reserve (AIR).

Changes to the AI Cap: If PERA's overall funded status (actuarial value of assets/actuarial accrued liability) is at or above 103%, the AI cap will increase by 0.25%. This adjustment will occur separately from any impact of the AAP.

Automatic Adjustment Provision

Adjustments may be made to the AI cap, member and employer contribution rates, and, under certain circumstances, the direct distribution from the State.

Based on the results of the AAP assessment which utilized the December 31, 2021, actuarial valuation performed for funding purposes, effective July 1, 2023, no adjustment to the AI cap is required.

Based on the results of the AAP assessment which utilized the December 31, 2022, actuarial valuation performed for funding purposes, effective July 1, 2024, no adjustment to the AI cap is required.

A summary of AAP provisions is provided in Note 4.

Indexing of Benefits

Inactive members, who meet the following conditions, have their benefit amounts increased by the applicable AI granted by PERA from their date of membership termination to their effective date of retirement:

- Covered by the plan as of December 31, 2006;
- Eligible to retire as of January 1, 2011;
- Have 25 or more years of service credit; and
- Have not started receiving monthly benefits.

Suspending Benefits

If a retiree suspends retirement on or after January 1, 2011, returns to membership, and earns at least one year of service credit, a separate benefit will be earned. In this case, the retiree may opt to refund the contributions remitted with interest and an applicable match or receive a second, separate benefit. The original benefit will not be recalculated. Individuals who suspended retirement prior to January 1, 2011, are eligible to have their original benefit recalculated upon re-retirement.

If less than one year of service credit is earned during the return to membership, the retiree will be required to refund the contributions remitted with interest and an applicable match before the original benefit will resume.

Working After Retirement Without Suspending Benefits

- **Retiree Contributions:** With a few statutory exceptions, employers are required to remit employer contributions, Amortization Equalization Disbursement (AED), and Supplemental Amortization Equalization Disbursement (SAED) on salary earned by retirees who work for them, but do not suspend retirement and return to membership. Beginning January 1, 2011, working retirees are required to make contributions at a percentage equal to the member contribution rate. Under C.R.S. § 24-51-101(53), working retiree contributions are nonrefundable and are not deposited into member accounts. PERA deposits these contributions into the employer reserve.
- **Limits on Working After Retirement:** With a few statutory exceptions, outlined as follows, retirees may work up to 110 days/720 hours per calendar year for a PERA employer with no reduction in benefits. In addition, each employer assigned to the School Division, DPS Division, and each Higher Education Institution assigned to the State Division may designate on a

calendar year basis, up to 10 service retirees who may work up to 30 additional days for a total of 140 days/916 hours in a calendar year without exception under the working after retirement provisions:

- The employer is required to provide full payment of PERA employer contributions, AED, SAED, and working retiree contributions on all salary earned.
- The retiree cannot work for any PERA employer during the month of the effective date of retirement.
- The retiree does not resume PERA membership or build an additional benefit.

- **"Critical Shortage" Exceptions to the Limits on Working After Retirement:** Certain retirees who have applicable experience, skills, or qualifications that meet one or more areas of the critical shortage positions may receive salary without a reduction in retirement benefits from employers who have declared a critical shortage of certain positions.
  - **PERA Retirees Employed by Rural School Districts, Boards of Cooperative Services (BOCES) within Rural School Districts, or Charter Schools within Rural School Districts:** Pursuant to C.R.S. § 24-51-1101(1.9), enacted June 6, 2017, and further expanded by House Bill (HB) 22-1101, enacted March 17, 2022, this exception is applicable to retirees who work for a rural school district, BOCES within a rural school district, or a charter school within a rural school district that has determined it has a critical shortage of qualified teachers, school bus drivers, school food services cooks, school nurses, or paraprofessionals. Provisions specific to this exception include:
    - The retiree cannot work under these provisions for more than six consecutive years.
    - If the retiree is a teacher who retired prior to full service retirement eligibility, a two-year waiting period is required before reemployment by the school district from which the teacher retired.
    - The retiree will not receive a PERA health care premium subsidy during reemployment.
  - **PERA Retirees Employed by BOCES:** Pursuant to C.R.S. § 24-51-1101(5), enacted July 13, 2020, to be repealed effective July 1, 2025, this exception is applicable to retirees who work as a special service provider for a BOCES that serves rural school districts and has determined it has a critical shortage of qualified service providers. Provisions specific to this exception include:
    - The employer is required to provide an additional 2.00% of the retiree's salary paid while reemployed under these provisions.
    - The retiree provides services in two or more rural school districts served by the BOCES.
    - The retiree cannot work under these provisions for more than five consecutive years.
    - If the retiree retired prior to full service retirement eligibility, a two-year waiting period is required before reemployment by the BOCES from which the special service provider retired.
    - The total number of special service providers is not to exceed 40 retirees hired by all BOCES.
    - The retiree will not receive a PERA health care premium subsidy during reemployment.
  - **PERA Retirees Employed by School Districts or Charter Schools in the School or DPS Divisions:** Pursuant to HB 22-1057, enacted March 17, 2022, to be repealed effective July 1, 2025, this exception is applicable to retirees who hold a valid Colorado teaching license and work as substitute teachers for any school district or charter school that has determined it has a critical shortage of substitute teachers. Provisions specific to this exception include:
    - The retiree will not be subject to any restriction regarding length of assignment.
    - The retiree does not count against the additional 10 service retirees that an eligible employer may otherwise designate under typical working after retirement provisions.

Benefit Provisions—Voluntary Investment Program, Defined Contribution Retirement Plan, and Deferred Compensation Plan

See Note 8.

Benefit Provisions—Health Care Trust Funds

See Note 9.

Life Insurance Reserve

PERA offers an optional life insurance program where members can purchase varying amounts of coverage. The Life Insurance Reserve is an accumulation of dividends received in the past from the insurance company based upon plan experience. The investment income from the Life Insurance Reserve is used to pay the current administrative costs of the plan.

Termination of PERA

If PERA is partially or fully terminated for any reason, C.R.S. § 24-51-217 provides that the rights of all members and benefit recipients to all benefits on the date of termination, to the extent then funded, will become nonforfeitable.

NOTES TO THE FINANCIAL STATEMENTS
(Dollars in Thousands)

Note 2—Summary of Significant Accounting Policies

Reporting Entity

The Board oversees all funds included in the financial statements of PERA and has the ability to influence operations. The Board's responsibilities include designation of management, membership eligibility, investment of funds, and accountability for fiscal matters.

PERA is an instrumentality of the State; it is not an agency of State government. In addition, it is not subject to administrative direction by any department, commission, board, bureau, or agency of the State. Accordingly, PERA's financial statements are not included in the financial statements of any other organization.

Basis of Presentation

The accompanying financial statements are prepared in accordance with accounting principles generally accepted in the United States of America that apply to governmental accounting for fiduciary funds.

The financial statements include summarized prior-year comparative information. Such information does not include all of the information required to constitute a presentation in accordance with accounting principles generally accepted in the United States of America. Accordingly, such information should be read in conjunction with the financial statements for the year ended December 31, 2021, from which such summarized information was derived.

Due to the adoption of GASB Statement 87 *Leases*, a lease receivable and a deferred inflow of resources have been added to the December 31, 2021, combined amounts on the Statements of Fiduciary Net Position. The restatements do not affect the individual funds' fiduciary net position (FNP).

Basis of Accounting

The accompanying financial statements for the defined benefit and defined contribution pension trust funds, the HCTF, the DPS HCTF, and the private purpose trust fund are prepared using the economic resources measurement focus and the accrual basis of accounting. The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires PERA to use estimates and assumptions that affect the accompanying financial statements and disclosures. Actual results could differ from those estimates. Member and employer contributions are recognized as revenues in the period in which the compensation becomes payable to the member and the employer is statutorily committed to pay these contributions to the defined benefit and defined contribution pension trust funds, the HCTF, and the DPS HCTF. Benefits and refunds are recognized when due and payable.

Adoption of Accounting Standards

PERA implemented all applicable new GASB pronouncements in the year ended December 31, 2022. The pronouncements which have an impact on PERA's financial statements are summarized below.

PERA implemented GASB Statement No. 87 *Leases* and GASB Statement No. 97 C*ertain Component Unit Criteria, and Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans* for the year ending December 31, 2022.

Due to the adoption of GASB Statement 87, PERA is recognizing a lease receivable and a deferred inflow of resources. See Note 12 for disclosures related to GASB 87.

Due to the adoption of GASB Statement 97, PERA will treat the deferred compensation plan as a pension plan and modify disclosures in Note 8-Voluntary Investment Program, Defined Contribution Retirement Plan, and Deferred Compensation Plan.

Fund Accounting

The financial activities of the State Division Trust Fund, the School Division Trust Fund, the Local Government Division Trust Fund, the Judicial Division Trust Fund, the DPS Division Trust Fund, the Voluntary Investment Program, the Defined Contribution Retirement Plan, the Deferred Compensation Plan, the HCTF, the DPS HCTF, and the Life Insurance Reserve are recorded in separate funds. The State, School, Local Government, Judicial, and DPS Division Trust Funds maintain separate accounts, and all actuarial determinations are made using separate division-based information.

The Division Trust Funds, the Health Care Trust Funds, and the Life Insurance Reserve pool their investments into a combined investment fund (CIF). Investment value and earnings of the CIF are allocated among the funds based on each fund's percentage ownership. As of December 31, 2022, the ownership percentages of each fund are shown in the following table:

Trust Fund	Ownership Percentages
State Division	29.85%
School Division	52.58%
Local Government Division	8.75%
Judicial Division	0.73%
DPS Division	7.03%
HCTF	0.92%
DPS HCTF	0.09%
Life Insurance Reserve	0.05%
Total	**100.00%**

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The administrative activities and operating assets and liabilities are pooled and recorded in a Common Operating Fund (COF). Expenses incurred and net operating assets are allocated from the COF to the Division Trust Funds based on administrative staff workload devoted to these funds and the ratio of the number of active and retired members in each division to the total for all the Division Trust Funds. Expenses are allocated to the HCTF and DPS HCTF based on administrative staff workload devoted to these funds and member participation in health plans. Expenses are allocated to the Voluntary Investment Program, the Defined Contribution Retirement Plan, and the Deferred Compensation Plan based on administrative staff workload, internally managed investment fees earned for Investment division expenses, and the ratio of FNP of each program or plan to the total for the program and plans. Expenses are allocated to the Life Insurance Reserve based on administrative staff workload.

Fair Value of Investments

Plan investments are presented at fair value in the Statements of Fiduciary Net Position. See Note 5 for additional information.

NOTES TO THE FINANCIAL STATEMENTS
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Note 3—Interfund Transfers and Balances

Interfund transfers of assets take place on a regular basis between the Division Trust Funds. The transfers occur upon the initiation of a retirement or survivor benefit where the member earned or purchased service in another division in addition to the Fund that is paying the benefit.

Transfers also occur from the Division Trust Funds to the Health Care Trust Funds to allocate a portion of the amount paid by members to purchase service credit. The transfers for the year ended December 31, 2022, consisted of the following amounts:

INTERFUND TRANSFERS

	State Division Trust Fund	School Division Trust Fund	Local Government Division Trust Fund	Judicial Division Trust Fund	DPS Division Trust Fund	HCTF	DPS HCTF
Transfers in from other Funds for retirements[1]	$32,782	$44,873	$5,365	$5,295	$14,753	$—	$—
Transfers out to other Funds for retirements[1]	(38,440)	(39,879)	(10,165)	(774)	(13,810)	—	—
Transfers in from other Funds for survivor benefits[1]	30	395	162	—	24	—	—
Transfers out to other Funds for survivor benefits[1]	(28)	(217)	(231)	—	(135)	—	—
Transfers out to Health Care Trust Funds for purchased service credit[2]	(2,515)	(3,180)	(801)	(33)	(168)	—	—
Transfers in to Health Care Trust Funds for purchased service credit[3]	—	—	—	—	—	6,529	168

[1] The interfund transfers at retirement line on the Schedule of Other Additions and Schedule of Other Deductions in the Supplementary Schedules show where the total for each division is included on the Statements of Changes in Fiduciary Net Position.

[2] Included in other deductions on the Statements of Changes in Fiduciary Net Position as shown on the Schedule of Other Deductions in the Supplementary Schedules.

[3] Included in other additions on the Statements of Changes in Fiduciary Net Position as shown on the Schedule of Other Additions in the Supplementary Schedules.

As of December 31, 2022, interfund balances existed between funds due to unreimbursed internal operating expenses. The interfund balances consisted of the following amounts:

INTERFUND BALANCES

Trust Fund	Amount
State Division	$118
School Division	208
Local Government Division	35
Judicial Division	3
DPS Division	28
Voluntary Investment Program	(250)
Defined Contribution Retirement Plan	(76)
Deferred Compensation Plan	(70)
HCTF	4
Total	**$—**

NOTES TO THE FINANCIAL STATEMENTS
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Note 4—Contributions

Division Trust Funds—Defined Benefit Pension Plans

Members and employers are required to contribute to PERA at a rate set by Colorado statute. The contribution requirements of plan members and affiliated employers are established under C.R.S. § 24-51-401 *et seq.* Colorado State law provisions may be amended from time to time by the Colorado General Assembly.

Members are required to contribute a percentage of their PERA-includable salary as shown in the contribution rates table on page 62. PERA records these contributions in individual member accounts. Member contributions are tax-deferred for federal and Colorado income tax purposes, effective July 1, 1984, (January 1, 1986, for members of the DPS benefit structure) and January 1, 1987, respectively. Prior to those dates, contributions were on an after-tax basis. PERA-affiliated employers contribute a percentage of active member covered payrolls depending on division as shown in the following contribution rates table.

Employers that rehire a PERA retiree as an employee or under any other work arrangement (working retiree) are required to report and pay employer contributions, including an additional 2.00% for retirees rehired pursuant to C.R.S. § 24-51-1101(5), on the amounts paid to the working retiree. In addition, effective January 1, 2011, working retirees are required to make contributions at a percentage of salary equal to the member contribution rate. However, under C.R.S. § 24-51-101(53), these contributions are not member contributions, are not deposited into a member account, and, therefore, are nonrefundable to the working retiree.

For purposes of deferring federal income tax imposed on salary, member contributions and working retiree contributions shall be treated as employer contributions pursuant to the provisions of 26 U.S.C. § 414 (h)(2), as amended. For all other purposes, these contributions shall be treated as member contributions and working retiree contributions as previously described.

Beginning January 1, 2006, employers are required to pay the AED, and beginning January 1, 2008, employers are required to pay the SAED. The employers pay these amounts on the PERA-includable salary for all employees working for the employer who are members of PERA, or who are eligible to elect to become members of PERA on or after January 1, 2006, including any amounts paid in connection with the employment of a retiree by an employer. PERA uses these payments to help amortize the unfunded actuarial accrued liability (UAAL). The AED and SAED are set to increase in 2023 for the Judicial Division Trust Fund, as described in the table on page 63.

C.R.S. § 24-51-411 provides for adjustment of the AED and SAED based on the year end funded status within a particular Division Trust Fund. If a particular Division Trust Fund reaches a funded status of 103%, a decrease in the AED and SAED is mandated and if it subsequently falls below a funded status of 90%, an increase in the AED and SAED is mandated. For the Local Government and Judicial Divisions, if the funded ratio reaches 90% and subsequently falls below 90%, an increase in the AED and SAED is mandated. AED and SAED rates cannot exceed the maximums listed in the table on page 63.

Effective January 1, 2021, and every year thereafter, C.R.S. § 24-51-415 adjusts employer contribution rates for the State and Local Government Divisions to include a defined contribution (DC) supplement. The DC supplement for these two divisions will be determined based on the employer contribution amounts paid on behalf of eligible employees who commence employment on or after January 1, 2019, to DC plan participant accounts that would have otherwise gone to the defined benefit trusts to pay down the unfunded liability. This calculation includes defined benefit investment earnings thereon, and is expressed as a percentage of salary on which employer contributions are made.

C.R.S. § 24-51-412 permits a pension certificates of participation (PCOP) offset to the DPS Division employer contribution rate. The offset, expressed as a percentage of covered payroll, is equal to the annual assumed payment obligations for PCOPs issued in 1997 and 2008, including subsequent refinancing, by the DPS at a fixed effective annual interest rate of 8.50%. At a minimum, the DPS Division employer rate, after applying the PCOP offset, must be sufficient to fund the DPS HCTF and the AIR contribution rates applicable to the DPS Division. The staff of Denver Public Schools provided the PCOP offset rate of 11.47% for 2022, which is reviewed and analyzed by PERA staff.

C.R.S. § 24-51-401(1.7)(e) requires a periodic "true-up" calculation to be performed beginning in 2015 and every five years following, with the purpose of determining the total DPS Division employer contribution rate that would result in the equalization of the ratio of UAAL over payroll between the DPS and School Divisions at the end of the 30-year period beginning January 1, 2010. The 2020 calculation indicated that a reduction to the total DPS Division employer rate would be needed to equalize the defined ratio. As of December 31, 2022, the ratio of UAAL over payroll is 281.0% for the School Division and 57.4% for the DPS Division. It should be noted that a reduction in an employer contribution rate for any one Division Trust Fund could potentially influence the outcome of the assessment of contributions (actual versus actuarially determined) considering all five Division Trust Funds,

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annually performed under the AAP, enacted through C.R.S. § 24-51-413, and described in greater detail on pages 63-64.

PERA-affiliated employers forward the contributions to PERA for deposit. PERA transfers a portion of these contributions, equal to 1.02% of the reported salaries, into the HCTF or DPS HCTF for health care benefits. Beginning in 2007, the AIR, under C.R.S. § 24-51-1009, was created within each division for the purpose of funding future benefit increases. Funding for this reserve comes from the employer contributions and is calculated at 1.00% of the salary reported for members in the PERA benefit structure hired on or after January 1, 2007. In 2022, post-retirement benefit increases for these members are limited to a maximum of 1.00% (unless further adjusted by the AAP) compounded annually, subject to the availability of assets in the AIR for each division. As of December 31, 2022, the value of the AIR was $254,110 in the State Division, $356,270 in the School Division, $67,229 in the Local Government Division, $3,288 in the Judicial Division, and $61,913 in the DPS Division. The remainder of the contributions is transferred into a trust fund established for each division for the purpose of meeting current benefit accruals and future benefit payments.

The DC supplement provisions increased employer contribution rates, effective January 1, 2022, by 0.05% and 0.01% for all employers in the State and Local Government Divisions, respectively.

Pursuant to C.R.S. § 24-51-401(1.7)(g), effective for the State's 2020-21 and 2021-22 fiscal years, the employer contribution rate for the Judicial Division decreased by 5.00% and the member contribution rate for the Judicial Division increased by 5.00%. This contribution rate exchange does not apply to the employer or member contribution rates for judges employed by the Denver County Court.

Effective July 1, 2022, the member and employer contribution rates increased 0.50% for all divisions.

The combined employer contribution rates for retirement and health care benefits along with the member contribution rates for 2022 are shown as follows:

CONTRIBUTION RATES

Trust Fund[1]	Employer Contribution Rate	AED	SAED	DC Supplement	PCOP Offset	Total Contribution Rate Paid by Employer	Member Contribution Rate
January 1, 2022 - June 30, 2022							
State Division (members other than State Troopers)	10.90%	5.00%	5.00%	0.10%	—%	21.00%	10.50%
State Division (State Troopers)	13.60%	5.00%	5.00%	0.10%	—%	23.70%	12.50%
School Division	10.90%	4.50%	5.50%	—%	—%	20.90%	10.50%
Local Government Division (members other than State Troopers)	10.50%	2.20%	1.50%	0.03%	—%	14.23%	8.50%
Local Government Division (State Troopers)	13.60%	2.20%	1.50%	0.03%	—%	17.33%	12.50%
Judicial Division (members other than Denver County Court Judges)	9.41%	4.60%	4.60%	—%	—%	18.61%	15.50%
Judicial Division (Denver County Court Judges)	14.41%	4.60%	4.60%	—%	—%	23.61%	10.50%
DPS Division	10.90%	4.50%	5.50%	—%	(11.22%)[2]	9.68%	10.50%
July 1, 2022 - December 31, 2022							
State Division (members other than State Troopers)	11.40%	5.00%	5.00%	0.10%	—%	21.50%	11.00%
State Division (State Troopers)	14.10%	5.00%	5.00%	0.10%	—%	24.20%	13.00%
School Division	11.40%	4.50%	5.50%	—%	—%	21.40%	11.00%
Local Government Division (members other than State Troopers)	11.00%	2.20%	1.50%	0.03%	—%	14.73%	9.00%
Local Government Division (State Troopers)	14.10%	2.20%	1.50%	0.03%	—%	17.83%	13.00%
Judicial Division	14.91%	4.60%	4.60%	—%	—%	24.11%	11.00%
DPS Division	11.40%	4.50%	5.50%	—%	(11.72%)[2]	9.68%	11.00%

[1] See Note 1 for the definition of "State Troopers".

[2] To conform with this presentation of contribution rates, the annual PCOP offset of 11.47% percent for 2022 has been adjusted based on the portion of the PCOP offset used to satisfy employer contribution requirements.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

FUTURE AED AND SAED RATES

	2023 Rates		Future Annual Increases in Rates Prescribed by Colorado Revised Statutes		Maximum Allowable Limitations	
Trust Fund	AED	SAED	AED	SAED	AED	SAED
State Division	5.00%	5.00%	N/A	N/A	5.00%	5.00%
School Division	4.50%	5.50%	N/A	N/A	4.50%	5.50%
Local Government Division	2.20%	1.50%	No	No	5.00%	5.00%
Judicial Division	5.00%	5.00%	N/A[1]	N/A[2]	5.00%	5.00%
DPS Division[3]	4.50%	5.50%	N/A	N/A	4.50%	5.50%

[1] C.R.S. § 24-51-411(4.5) increased the AED payment to 4.60% of PERA-includable salary for 2022 and requires the AED payment to increase by 0.40% at the start of 2023 at which time the AED payment will be 5.00% of PERA-includable salary.

[2] C.R.S. § 24-51-411(7.5) increased the SAED payment to 4.60% of PERA-includable salary for 2022 and requires the SAED payment to increase by 0.40% at the start 2023 at which time the SAED payment will be 5.00% of PERA-includable salary.

[3] DPS Division employers are permitted to reduce the AED and SAED by the PCOP offset, as specified in C.R.S. § 24-51-412 *et seq.*

Funding of the plan assumes statutory contributions will be made on a timely basis. Any significant reduction in contributions would have an impact on the ability of the plan to make benefit payments in the future.

Direct Distribution

Pursuant to C.R.S. § 24-51-414, PERA is to receive an annual direct distribution from the State, as a nonemployer contributing entity, in the amount of $225 million (actual dollars). Beginning in 2018, the distribution will occur each July 1 until there are no unfunded actuarial accrued liabilities in the trust fund of any division that receives such distribution. PERA shall allocate the distribution to the trust funds as it would an employer contribution in a manner that is proportionate to the annual payroll of each division except there shall be no allocation to the Local Government Division.

HB 22-1029, enacted June 7, 2022, required a restorative payment for the suspended 2020 direct distribution due to HB 20-1379. Upon enactment of HB 22-1029, the State treasurer issued a warrant to PERA in the amount of $380 million (actual dollars) with reductions, as applicable, to future direct distributions scheduled to occur July 1, 2023, and July 1, 2024.

The allocation for 2022 was as follows:

Trust Fund	Direct Distribution
State Division	$198,247
School Division	350,393
Judicial Division	3,576
DPS Division	52,784
Total	**$605,000**

Pursuant to HB 22-1029, and the known total fund investment return for 2021 of 16.1%, the July 1, 2023, direct distribution will be reduced by $190 million (actual dollars), resulting in a payment of $35 million (actual dollars). Due to the negative investment return experienced by the total fund in 2022, no reduction to the July 1, 2024, $225 million (actual dollars) direct distribution is required. The $35 million (actual dollars) direct distribution scheduled to occur July 1, 2023, was considered in the 2021 AAP assessment.

Senate Bill (SB) 23-056, enacted June 2, 2023, requires an additional restorative payment of approximately $14.5 million (actual dollars). This payment is intended to recompense PERA for the cancellation of a previously scheduled July 1, 2020, direct distribution of $225 million (actual dollars), in addition to the compensatory payment provided in previous legislation.

Automatic Adjustment Provision

The primary intent of the AAP is to gauge the adequacy of the contributions coming into the pension trust fund against the amount required, and if determined necessary, to initiate automatic changes to member and employer contribution rates, the AI cap, and, under certain circumstances, the direct distribution from the State. This assessment commenced with the December 31, 2018, actuarial funding valuation and is performed annually thereafter.

Pursuant to C.R.S. § 24-51-413, the AAP assessment involves the comparison of two blended rates, weighted across all five Division Trust Funds, determining a resulting ratio as follows:

+ employer contribution rates
+ member contribution rate
+ direct distribution as a rate of pay

= **Blended Total Contribution Amount**

divided by = **AAP Resulting Ratio**

+ actuarially determined contribution (ADC) rate
+ member contribution rate

= **Blended Total Required Contribution**

NOTES TO THE FINANCIAL STATEMENTS

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If the resulting ratio falls within an acceptable corridor (98% to 119%), no adjustments are made. If the resulting ratio does not achieve a minimum benchmark (less than 98%), adjustments are applied in an equitable manner of impact resulting in increases in contributions and a decrease in the AI cap. If the resulting ratio exceeds the acceptable corridor (120% or greater), adjustments are applied in an equitable manner of impact resulting in decreases in contributions and an increase in the AI cap.

Per statute, the first adjustment required as a result of the AAP did not occur until July 1, 2020. The AAP defines the limited amounts of total adjustment available in each category, and also the increments of adjustments that can occur in any one year. Adjustments over multiple years arising from a single AAP are permitted, although they cannot exceed the ultimate limits as set forth in statute. An adjustment (increase or decrease) to each of the employer contribution rates and the member contribution rates cannot exceed 0.50% in any one year, and in total, cannot exceed 2.00% above the rates defined in C.R.S. § 24-51-401(1.7)(a)(IV) or fall below the rates defined in C.R.S. § 24-51-401(1.7)(a)(I). An adjustment to the direct distribution cannot exceed $20 million (actual dollars) in any one year, and cannot exceed the initially legislated annual $225 million (actual dollars) amount, but can be reduced to $0.

Further, adjustments that are required because funding is below the 98% AAP ratio threshold will be made to an extent that will bring the revised AAP ratio to 103% following the corrective efforts, but in no event can the adjustments in one year be greater than the limits as previously described. Similarly, adjustments that are required because funding has reached the 120% AAP ratio threshold must not cause the AAP ratio to fall below 103%.

Based on the results of the AAP assessment which utilized the December 31, 2021, actuarial valuation performed for funding purposes, effective July 1, 2023, no adjustments to member and employer contribution rates are required, with no adjustment to the $225 million (actual dollars) direct distribution.

Based on the results of the AAP assessment which utilized the December 31, 2022, actuarial valuation performed for funding purposes, effective July 1, 2024, no adjustments to member and employer contribution rates are required, with no adjustment to the $225 million (actual dollars) direct distribution.

Replacement Benefit Arrangements

IRC § 415 limits the amount of the benefit payable to a retiree or survivor in a defined benefit plan. In some cases, the IRC limit is lower than the benefit calculated under the plan provisions. For 2022, this limit is set at $245,000 (actual dollars) for retirees who are age 62 or older. This dollar amount is actuarially decreased for retirees younger than 62. IRC § 415(m) allows a government plan to set up a "qualified governmental excess benefit arrangement" to pay the difference to those retirees. To accomplish this, PERA has entered into agreements with the employers who last employed the affected retirees. Under the agreement, the employer pays the benefit difference to the retiree from a portion of the current employer contributions. In 2022, employers under these agreements used current employer contributions to pay retirees $3,188 in the State Division; $832 in the School Division; $1,458 in the Local Government Division; $1 in the Judicial Division; and $55 in the DPS Division. As of December 31, 2022, payroll, there were 143 accounts receiving a replacement benefit.

Contributions—Voluntary Investment Program, Defined Contribution Retirement Plan, and Deferred Compensation Plan

See Note 8.

Contributions—Health Care Trust Funds

See Note 9.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Note 5—Investments

Investment Authority

Under C.R.S. § 24-51-206, the Board has complete responsibility for the investment of PERA's funds, with the following investment limitations:

- The aggregate amount of moneys invested in corporate stocks or corporate bonds, notes, or debentures that are convertible into corporate stock or in investment trust shares cannot exceed 65% of the then book value of the fund.
- No investment of the fund in common or preferred stock (or both) of any single corporation can exceed 5% of the then book value of the fund.
- The fund cannot acquire more than 12% of the outstanding stock or bonds of any single corporation.
- The origination of mortgages or deeds of trust on real residential property is prohibited.

Additionally, C.R.S. § 24-54.8-201 *et seq.* imposes targeted divestment from companies that have economic prohibitions against Israel.

PERA Board's Statutory Fiduciary Responsibility

By State law, the management of PERA's retirement fund is vested in the Board who is held to the standard of conduct of fiduciaries in discharging their responsibilities. According to C.R.S. § 24-51-207(2), the Board, as fiduciaries, must carry out their functions solely in the interest of PERA members and benefit recipients and for the exclusive purpose of providing benefits.

Investment Committee

The Investment Committee is responsible for assisting the Board in overseeing the PERA investment program. Specific responsibilities include:

- Recommend *Statements of Investment Policy and Philosophy* and review the statements at least biennially.
- Recommend the strategic asset allocation and associated benchmarks.
- Review, at least annually, PERA's compliance with the *Statement of Investment Policy*.
- Review costs of the investment program.
- Review total fund, asset class, and investment manager performance and risk.
- Advise on any other investment matters and make recommendations for action when necessary.

Overview of Investment Policy

PERA's investment policy is established and may be amended by a majority vote of the Board. The policy outlines the investment philosophy and guidelines within which the fund's investments will be managed, and includes the following:

- Strategic asset allocation is the most significant factor influencing long-term investment performance and asset volatility.
- The fund's liabilities are long term and the investment strategy will therefore be long term in nature.
- The asset allocation policy will be periodically re-examined to ensure its appropriateness to the then prevailing liability considerations.
- As a long-term investor, PERA will invest across a wide spectrum of investments in a prudent manner.
- Active management may be expected to add value over passive investment alternatives under appropriate conditions.

The Board determines the strategic asset allocation for the fund. This strategic asset allocation contains a long-term target allocation and specific ranges within which each asset class may operate. The yearly Policy Benchmark weight and long-term asset allocation target, as well as the specified ranges for each asset class are presented in the Investment Section on page 125.

The asset allocation policy is determined by an intensive asset/liability study which considers expected investment returns, risks, and correlations of returns. The characteristics of the fund's liabilities are analyzed in conjunction with expected investment risks and returns. The targeted strategic asset allocation is designed to provide appropriate diversification and to balance the expected returns, while ensuring an appropriate level of risk is incurred.

The asset allocation targets are adhered to through the implementation of a rebalancing policy. Investments are managed and monitored in a manner which seeks to balance return and risk within the asset/liability framework. The Chief Investment Officer is authorized to execute investment transactions on behalf of the Board. Assets are managed both internally and externally. In making investment decisions, the Board and staff utilize external experts in various fields including risk and performance analysis and other important investment functions and issues.

See information on the most recent asset/liability study in the Investment Section on page 125.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Investment Performance

For the year ended December 31, 2022, the net-of-fees, money-weighted rate of return on the pooled investment assets was negative 13.5%.

A money-weighted rate of return considers the effect of timing of transactions that increase the amount of pension plan investments (such as contributions) and those that decrease the amount of pension plan investments (such as benefit payments). Additionally, the money-weighted rate of return provides information that is comparable with the long-term assumed rate of return on the pooled investment assets.

Fair Value

Investments are measured at fair value in accordance with GASB Statement No. 72. Fair value is defined as the amount for which an investment could be sold in an orderly transaction between market participants at the measurement date in the principal or most advantageous market of the investment. This Statement establishes a three-tier, hierarchical disclosure framework which prioritizes and ranks the level of market price observability used in measuring fair value. The hierarchy is based on the valuation inputs used to measure the fair value of the investment and gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). Inputs refer broadly to the assumptions that market participants would use in pricing the asset or liability, including assumptions about risk, for example, the risk inherent in a particular valuation technique used to measure fair value (such as a pricing model) and/or the risk inherent in the inputs to the valuation technique. The categorization of investments within the hierarchy is based upon the pricing transparency of the instrument and should not be perceived as the particular investment's risk. The three-tier framework is summarized as follows:

- **Level 1—**Unadjusted quoted prices for identical instruments in active markets.
- **Level 2—**Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable.
- **Level 3—**Valuations derived from valuation techniques in which significant inputs are unobservable.

Investments in certain entities that calculate a net asset value (NAV) per share (or its equivalent) sometimes do not have a readily determinable fair value. For these investments, governmental accounting standards permit establishment of fair value using a practical expedient based on the NAV per share (or its equivalent).

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

The following table presents PERA's investments within the hierarchical framework, as well as investments where fair value is determined using the practical expedient, as of December 31, 2022:

INVESTMENTS MEASURED AT FAIR VALUE

		Fair Value Measurements Using:		
	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Global Equity				
Public market investments[1]				
Information technology	$5,996,938	$5,937,237	$59,701	$—
Financials	5,026,890	4,950,956	75,817	117
Health care	4,299,451	4,257,956	41,201	294
Industrials	3,776,801	3,712,676	62,734	1,391
Consumer discretionary	3,448,807	3,407,783	40,962	62
Consumer staples	2,099,348	2,061,100	38,248	—
Energy	1,623,066	1,582,444	39,653	969
Communication services	1,616,732	1,590,561	25,375	796
Materials	1,526,560	1,511,779	14,258	523
Real Estate	789,506	781,103	8,307	96
Utilities	668,215	654,394	13,821	—
Non-public market investments and other	1,989	—	—	1,989
Equity mutual fund	524	524	—	—
Total global equity investments	**30,874,827**	**30,448,513**	**420,077**	**6,237**
Fixed Income				
U.S. government MBS	4,054,636	1,003,427	3,051,209	—
U.S. Treasuries	2,976,741	2,974,478	2,263	—
U.S. corporate bonds	2,392,746	7,958	2,384,788	—
Non-U.S. government/agency bonds	469,316	—	469,316	—
Non-U.S. corporate bonds	417,790	—	417,314	476
Non-agency MBS/CMBS	195,296	—	195,296	—
U.S. government agencies	193,039	—	193,039	—
U.S. municipal bonds	120,045	—	120,045	—
Total fixed income investments	**10,819,609**	**3,985,863**	**6,833,270**	**476**
Real estate	1,484,258	—	—	1,484,258
Self-directed brokerage	61,990	61,733	257	—
Total investments by fair value level	**43,240,684**	**$34,496,109**	**$7,253,604**	**$1,490,971**
Investments Measured at the NAV				
Global equity	1,125,202			
Fixed income	223,057			
Private equity	5,159,499			
Real estate	5,169,331			
Alternatives	3,508,950			
Multi-asset class funds	1,439,252			
Total investments measured at the NAV	**16,625,291**			
Total investments measured at fair value	**$59,865,975**			

[1] Public market investments of $382,884 are classified in Level 2 due to the election of fair value pricing for international equity portfolios. This election employs the use of intra-day movements of the Russell 1000 index as a factor in pricing individual equity investments to ensure equitability between participants in the PERAdvantage International Stock Fund.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

RECONCILIATION OF INVESTMENT LEVELING DISCLOSURE TO THE STATEMENTS OF FIDUCIARY NET POSITION

	Investments by Fair Value Level	Investments Measured at the NAV	Stable Value Fund[1]	Fixed Income Classified as Short-Term Investments	Statements of Fiduciary Net Position Combined Total
Global equity	$30,874,827	$1,125,202	$—	$—	$32,000,029
Fixed income	10,819,609	223,057	492,944	(71,583)	11,464,027
Private equity	—	5,159,499	—	—	5,159,499
Real estate	1,484,258	5,169,331	—	—	6,653,589
Alternatives	—	3,508,950	—	—	3,508,950
Multi-asset class funds	—	1,439,252	—	—	1,439,252
Self-directed brokerage	61,990	—	—	—	61,990
Total	**$43,240,684**	**$16,625,291**	**$492,944**	**($71,583)**	**$60,287,336**

[1] The Stable Value Fund is the underlying investment in the PERAdvantage Capital Preservation Fund which is available to participants in the three defined contribution plans. The value of the investment is based on the contract value, which approximates fair value. Contract value represents what is owed to the plan participants and at what price the shares of the stable value fund are being bought and sold.

Global equity investments classified in Level 1 of the hierarchical framework include securities which trade on a national or international exchange. These investments are primarily valued at the official closing price or last reported sales price of the instrument according to the rules of the exchange. Mutual funds classified in Level 1 of the hierarchical framework include instruments which trade on a national exchange and the fund's NAV is the basis for the fund's transactions. Fixed income securities classified as Level 1 include U.S. Treasuries and U.S. mortgage-backed securities (MBS) purchased in the to-be-announced forward market. These securities are valued using the bid price, which is the price prospective buyer(s) are prepared to pay to purchase the security. Self-directed brokerage is an investment vehicle available to participants in the three defined contribution plans. Equity investments contained in the self-directed brokerage accounts trade on an exchange, and therefore are classified in Level 1 of the hierarchical framework.

Global equity investments classified in Level 2 of the hierarchical framework include securities valued using a theoretical price which utilizes a standardized formula to derive a price from a related security or from the intra-day movement of a market index. Fixed income investments classified as Level 2 typically do not trade on a national or international exchange and their fair value is based on equivalent values of the same or comparable securities with similar yield and risk, otherwise known as matrix pricing. Fixed income investments contained in the self-directed brokerage are typically valued using a matrix pricing approach, and therefore are classified in Level 2 of the hierarchical framework.

Global equity public market investments classified in Level 3 of the hierarchical framework are valued using one or more unobservable inputs. This includes instruments that have been delisted from an exchange, instruments where trading has been suspended, and instruments that lack recent transaction information. Fixed income securities classified in Level 3 of the hierarchical framework include instruments that are in default and instruments whose values are estimated, out of necessity, using unobservable inputs due to lack of comparable securities in the market place. Real estate investments classified in Level 3 of the hierarchical framework were valued by an independent appraiser.

Typically, pricing information for public market investments is made available to PERA by independent, third-party pricing services and other third-party vendors.

The following table presents PERA's unfunded commitments, the investment redemption frequency and redemption notice period as of December 31, 2022, for PERA investments measured at the NAV.

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INVESTMENTS MEASURED AT THE NET ASSET VALUE

	Investments Measured at the NAV	Unfunded Commitments[1]	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Global equity commingled funds	$1,125,202	$—	Daily	1 - 3 days
Fixed income commingled funds	223,057	—	Daily	1 - 3 days
Private equity partnerships	5,159,499	2,766,707	N/A	N/A
Private real estate				
Directly held joint ventures	1,705,737	—	N/A	N/A
Real estate partnerships	1,544,165	346,194	Quarterly	90 days
Commingled open-end funds	1,919,429	—	Daily, Quarterly	30 - 90 days
Alternatives				
Alternatives partnerships	1,932,477	1,628,747	Monthly, Quarterly, Annual, Biennial, Quinquennial	90 - 180 days
Commingled open-end funds	1,576,473	287,558	Daily, Monthly, Quarterly, Biennial	0 - 180 days
Multi-asset class commingled funds	1,439,252	—	Daily	1 - 3 days
Total	**$16,625,291**	**$5,029,206**		

[1] Corresponding Note 7 includes unfunded commitments to assets valued at Level 3 within the hierarchical framework or with no market value as of December 31, 2022.

The fair value of the investments in global equity, fixed income, and multi-asset class commingled funds has been determined using NAV of the units held at December 31, 2022. Commingled funds are only offered to a limited group of investors, and the most significant element of the NAV is the fair value of the underlying investment holdings of the fund. Unit values are determined by dividing each fund's net assets by the number of units outstanding on the valuation date. Global equity commingled funds include seven funds which primarily consist of investments whose objective is to produce returns that either match or exceed the total rate of return of a particular benchmark. Fixed income commingled funds include three funds that seek results which correspond generally to the price and yield performance of a particular index or to produce returns in excess of the total rate of return of a particular benchmark. Multi-asset class commingled funds include 10 target date retirement funds which are broadly diversified across global asset classes, where asset allocations become more conservative over time with the objective of providing for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase. Additionally, this asset class also includes one fund whose objective is to produce returns that exceed inflation.

Private equity partnerships include 161 private equity limited partnership funds with various strategies including: buyout, venture capital, generalist debt, mezzanine debt, distressed debt, secondary funds, fund-of-funds, and energy-related strategies. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of PERA's ownership interest in partners' capital. The most significant element of NAV is the fair value of the investment holdings. The valuation techniques vary based on investment type and involve a certain degree of expert judgment. These holdings are valued by the general partners in conjunction with management, investment advisers, and valuation specialists and are generally audited annually. These investments cannot be redeemed during the term of the partnership. Typically, private equity partnerships have an approximate life of 10 years, with the first four to six years deemed as the investment period when capital is deployed. The remaining years are typically the harvest period in which distributions are received through the liquidation of the underlying assets of the fund. The fair value for these investments could differ significantly if a ready market for these assets existed.

Private real estate includes 67 funds that invest primarily in U.S. institutional quality commercial real estate across a broad range of real estate asset types and locations. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of PERA's ownership interest in partners' capital. The most significant element of NAV is the fair value of the investment holdings. The valuation techniques vary based on investment type and involve a certain degree of expert judgment. These holdings are valued by the general partners in conjunction with management, investment advisers, and valuation specialists and are generally audited annually. There are 41 real estate closed-end limited partnership funds, which are considered illiquid as these investments cannot typically be redeemed during the term of the partnership. Distributions can be made periodically based on the sole discretion of the general partner. There are eight majority-owned joint venture investments which consist of industrial and multifamily assets in various locations throughout the U.S. and Mexico. These investments are considered illiquid. There are 18 real estate commingled open-ended funds which are considered liquid real estate funds by nature of the open-ended structure of the fund. Open-end funds generally offer periodic distributions of net cash flow, which investors may elect to reinvest. Additionally, open-end funds generally offer quarterly redemption windows for requesting portions, or all, of PERA's investments. The fair value for these investments could differ significantly if a ready market for these assets existed.

(Dollars in Thousands)

Alternatives include 59 funds that invest in timber, real assets, tactical, credit, global macro, multi-strategy, and other opportunistic strategies. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of PERA's ownership interest in partners' capital. The most significant element of NAV is the fair value of the investment holdings. The valuation techniques vary based on investment type and involve a certain degree of expert judgment. These holdings are valued by the general partners in conjunction with management, investment advisers, and valuation specialists and are generally audited annually. There are 41 partnerships within Alternatives that are considered illiquid as the investments cannot be redeemed during the term of the partnership. Two open-end funds are also considered illiquid due to redemption restrictions. Illiquid funds represent approximately 39.9% of the value of alternatives. Four partnerships have redemption periods ranging from monthly to every five years. There are 10 investments within alternatives that are considered liquid by nature of the open-end structure of the fund. Open-end funds generally offer periodic distributions of net cash flow, which investors may elect to reinvest. Additionally, open-end funds generally offer daily and monthly redemption windows for requesting portions, or all, of PERA's investments. Distributions from each fund will be received as the underlying investments of the funds are liquidated. It is expected that the underlying assets of the funds may be liquidated over the next two to 10 years. The fair value for these investments could differ significantly if a ready market for these assets existed.

Cash and Short-Term Investments

Cash balances represent both operating cash accounts and investment cash on deposit held by banks. To maximize investment income, the float caused by outstanding checks is invested, thus causing a possible negative book balance. Negative book balances are reflected in the liabilities section on the Statements of Fiduciary Net Position.

The carrying value of cash and short-term investments as of December 31, 2022, in the Statements of Fiduciary Net Position includes short-term fixed income securities of $71,583, pending foreign exchange contracts of $2, and deposit and short-term investment funds of $1,481,446 for a total of $1,553,031. PERA considers fixed income securities with a remaining maturity of 12 months or less to be short-term investments.

The following table presents the PERA combined total deposits and short-term investment funds as of December 31, 2022:

	Carrying Value
Deposits held at banks (fully insured or collateralized)	$36,786
Deposits held at banks (uninsured or uncollateralized)	32,675
Short-term investment funds held at bank (shares in commingled funds, held by PERA's agent in PERA's name)	1,411,985
Total deposits and short-term investment funds	**$1,481,446**

Securities Lending Transactions

C.R.S. § 24-51-206 and Board policies permit PERA to lend its securities to broker-dealers and other entities with a simultaneous agreement to return the collateral for the same securities in the future. PERA utilized two lending agents in 2022: its custodian, The Northern Trust Company (Northern Trust) and Deutsche Bank AG, New York Branch (Deutsche Bank).

Northern Trust primarily lends international equity and fixed income securities for cash collateral. U.S. securities are loaned versus collateral valued at 102% of the fair value of the securities plus any accrued interest. Non-U.S. securities are loaned versus collateral valued at 105% of the fair value of the securities plus any accrued interest. Collateral is marked-to-market daily. PERA cannot pledge or sell the collateral securities unless the borrower defaults.

Northern Trust invests the cash collateral related to PERA's loaned securities in a separate account according to guidelines stipulated by PERA. Northern Trust's Senior Credit Committee sets borrower credit limits. As of December 31, 2022, the total fair value of securities on loan with Northern Trust cannot exceed $600,000.

Deutsche Bank lends domestic and international equities for cash collateral. U.S. securities are loaned versus collateral valued at a minimum of 102% of the fair value of the securities. International securities are loaned versus collateral valued at a minimum of 105% of the fair value of the securities. Collateral is marked-to-market daily. PERA cannot pledge or sell the collateral securities unless the borrower defaults.

Deutsche Bank invests the cash collateral related to PERA's loaned securities in a separate account according to guidelines stipulated by PERA. Deutsche Bank's Global Credit Risk Department sets borrower credit limits. As of December 31, 2022, the total fair value of securities on loan with Deutsche Bank cannot exceed $1,500,000.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

The following table details the balances relating to the securities lending transactions at December 31, 2022:

Securities Lent for Cash Collateral	Fair Value of Underlying Securities	Cash Collateral Received	Cash Collateral Investment Value
Cash and cash equivalents	$—	$—	$1,481,217
Global equity	1,436,004	1,470,345	—
Fixed income	111,591	114,125	107,907
Total	**$1,547,595**	**$1,584,470**	**$1,589,124**

PERA's income, including realized and unrealized gain/(loss), net of rebates and fees from securities lending, was $12,151 for the year ended December 31, 2022. Included in net securities lending income for the year ended December 31, 2022, was $175 from commingled funds.

As of December 31, 2022, PERA had no credit risk exposure to borrowers because the associated value of the collateral held exceeded the value of the securities loaned. The contracts with PERA's lending agents provide that the lending agents will indemnify PERA if loaned securities are not returned and PERA suffers direct losses due to a borrower's default and the lending agent's noncompliance with the contract. PERA had no losses on securities lending transactions resulting from the default of a borrower or the lending agent for the year ended December 31, 2022. PERA has limited the total fair value of securities outstanding to one borrower to 25% of the total fair value of all borrowed securities in the Deutsche Bank lending program and $50,000 per borrower in the Northern Trust lending program.

PERA or the borrower may terminate any security loan on demand. Though every loaned security may be sold and reclaimed at any time from the borrower, the weighted average loan life of overall loans outstanding at Northern Trust and Deutsche Bank was approximately 45 days and 116 days, respectively, as of December 31, 2022. At Northern Trust and Deutsche Bank, all loans were made on an overnight (one day) basis throughout 2022. The approximate weighted average maturity (to the next reset date) at Northern Trust was four days and at Deutsche Bank was six days as of December 31, 2022. Since all securities loans are made on an overnight basis, there is usually a difference between the weighted average maturity of the investments made with the cash collateral provided by the borrower and the maturities of the securities loans.

As of December 31, 2022, reinvested securities lending collateral of $1,589,124 primarily consisted of investments totaling $1,481,217 valued at par, and accordingly are not classified within the fair value hierarchical framework. At December 31, 2022, $107,907 of the $1,589,124 in reinvested securities lending collateral consisted of fixed income investments and were considered to be Level 2 investments in the fair value hierarchical framework.

Fixed income investments classified as Level 2 typically do not trade on a national or international exchange and their fair value is based on equivalent values of the same or comparable securities with similar yield and risk, otherwise known as matrix pricing.

Custodial Credit Risk

Governmental accounting standards limit the disclosure of custodial credit risk to investment securities that are uninsured, held in physical or book entry form, are not registered in PERA's name, and are held by either the counterparty or the counterparty's trust department or agent but not in PERA's name. Disclosure of custodial credit risk is also required when deposits are not covered by depository insurance and are uncollateralized, collateralized with securities held by the pledging financial institution, or collateralized with securities held by the pledging financial institution's trust department or agent but not in PERA's name.

To mitigate custodial credit risk, PERA's custodial credit risk policy has requirements governing how securities are held by the master custodian and for the effective management of cash balances. To further minimize custodial credit risk, periodic reviews are required to be completed on the master custodian's credit quality and capital levels. Additionally, assessments of counterparty risk are completed periodically using internal analysis and information obtained from third-party research and rating agency reports.

Northern Trust is the master custodian for the majority of PERA's securities. At December 31, 2022, there were no investments or collateral securities subject to custodial credit risk. At December 31, 2022, there were $15,900 of foreign currency deposits, $62,474 of margin, $16,775 cash, and $7,422 cash collateral pledged outside of Northern Trust which were uninsured and uncollateralized and, therefore, exposed to custodial credit risk.

Concentration of Credit Risk

Concentration of credit risk is the risk of loss that may be attributed to the magnitude of PERA's investment in a single issuer. C.R.S. § 24-51-206(3) requires that no investment of the fund in common or preferred stock, or both, of any single corporation shall be of an amount which exceeds 5% of the then book value of the fund, nor shall the fund acquire more than 12% of the outstanding stock or bonds of any single corporation. The 12% requirement does not apply to governmental securities (U.S. Treasuries, sovereigns, etc.), Government-sponsored enterprise securities (agencies including FNMA, FHLMC, etc.), agency or non-agency MBS, commercial mortgage-backed securities (CMBS), asset-backed securities, or municipal securities. There is no single issuer exposure that comprises 5% of the then book value of the fund and no holdings greater than 12% of the outstanding stock or bonds of any single corporation at December 31, 2022.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

RECONCILIATION OF CREDIT AND INTEREST RATE RISK DISCLOSURES TO FINANCIAL STATEMENTS

	As of December 31, 2022
Fixed income	$11,464,027
Fixed income securities classified as short term	71,583
Total fixed income securities	**$11,535,610**

Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation. As of December 31, 2022, PERA held investments across the credit ratings spectrum, with the majority invested in investment grade issuers defined as having a minimum rating of Baa3 issued by Moody's (or the equivalent by another nationally recognized statistical rating organization (NRSRO) which PERA does not have a license to publish).

PERA's fixed income credit risk provisions primarily include limitations on the fixed income portfolio, however, the policy also governs limitations on the total fund. For the unitized PERA Fixed Income Pool, the amount of below investment grade securities is limited to 3%, the exposure of a single company's securities is limited to 5%, and there are limits pertaining to holdings within the spectrum of credit rating categories. Additional individual manager mandates in the defined contribution plan have limits pertaining to holdings within the spectrum of credit rating categories to limit below investment grade securities.

The following table provides Moody's credit quality ratings for PERA's fixed income holdings as of December 31, 2022:

CREDIT QUALITY RATING DISPERSION SCHEDULE

Quality Rating	Total	U.S. Govt MBS	U.S. Corporate Bonds	Stable Value Fund	Non-U.S. Govt/ Agency Bonds	Non-U.S. Corporate Bonds	Non-Agency MBS/CMBS	U.S. Govt Agencies[1]	U.S. Municipal Bonds
Aaa	$628,368	$61,196	$88,572	$—	$197,698	$—	$73,582	$191,294	$16,026
Aa1	50,418	—	8,516	—	23,818	—	2,289	—	15,795
Aa2	111,423	—	28,424	—	36,670	15,447	2,501	—	28,381
Aa3	138,240	—	73,965	—	25,144	5,115	8,006	—	26,010
A1	544,145	—	398,047	—	56,194	78,394	1,799	—	9,711
A2	360,806	—	319,964	—	21,404	15,467	1,703	—	2,268
A3	355,715	—	280,746	—	—	72,767	915	—	1,287
Baa1	303,207	—	187,370	—	10,403	98,160	—	—	7,274
Baa2	498,274	—	351,396	—	72,166	65,960	8,752	—	—
Baa3	520,954	—	468,301	—	4,891	46,899	—	—	863
Ba1	115,221	—	115,221	—	—	—	—	—	—
Ba2	4,598	—	4,598	—	—	—	—	—	—
B2	8,975	—	8,975	—	—	—	—	—	—
Not rated[2]	4,232,233	3,530,205	58,651	492,944	20,928	19,581	95,749	1,745	12,430
Subtotal	7,872,577	$3,591,401	$2,392,746	$492,944	$469,316	$417,790	$195,296	$193,039	$120,045
U.S. Treasuries	2,976,741								
Explicit U.S. govt agencies[3]	463,235								
Fixed income commingled funds[2,4]	207,587								
Fixed income mutual funds[2]	15,470								
Total	**$11,535,610**								

1 Includes bonds issued by Federal Home Loan Bank, Federal Home Loan Mortgage Corporation, Federal National Mortgage Association, and other Government-sponsored enterprises.

2 Not rated.

3 Bonds issued by the Government National Mortgage Association.

4 The fair value and average fund-level credit quality ratings as reported by the commingled fund managers are: $16,989—Aaa; $190,598—Aa2.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. PERA's policy is to manage its exposure to fair value losses arising from changes in interest rates by requiring that the duration of individual portfolios stays within defined bands of the duration of each portfolio's benchmark. PERA utilizes effective duration as the primary measure of interest rate risk within its fixed income investments. Duration estimates the sensitivity of a bond's price to interest rate changes. Effective duration makes assumptions regarding the most likely timing and amounts of variable cash flows arising from such investments as callable bonds, MBS, and variable-rate debt.

Effective duration for PERA's fixed income holdings as of December 31, 2022, is shown in the following table:

INTEREST RATE RISK—EFFECTIVE DURATION

	Fair Value	Effective Weighted Duration in Years
U.S. government MBS	$4,054,636	7.53
U.S. Treasuries	2,976,741	6.47
U.S. corporate bonds	2,392,746	7.20
Stable value fund	492,944	3.50
Non-U.S. government/agency bonds	469,316	4.93
Non-U.S. corporate bonds	417,790	6.19
Fixed income commingled funds	207,587	6.05
Non-agency MBS/CMBS	195,296	5.42
U.S. government agencies	193,039	3.99
U.S. municipal bonds	120,045	9.45
Fixed income mutual funds	15,470	6.16
Total	**$11,535,610**	**6.76**

Mortgage-Backed Securities

PERA invests in residential MBS and CMBS which are reported at fair value in the Statements of Fiduciary Net Position under Investments at fair value, fixed income. PERA invests in MBS for diversification and to enhance fixed income returns.

A residential MBS depends on the underlying pool of single-family mortgage loans to provide the cash flow to make principal and interest payments on the security. MBS are subject to credit risk, the risk that the borrower will be unable to meet its obligations. In many cases, the payment of principal and interest is guaranteed by an agency of the U.S. Government, or a Government-sponsored enterprise. While these guarantees reduce credit risk, residential MBS are also subject to prepayment risk as the timing of principal and interest payments remains uncertain. A decline in interest rates can result in call risk as prepayments accelerate, which reduces the weighted average life of the security. Alternatively, an increase in interest rates can result in extension risk as prepayment rates decline, which may cause the weighted average life of a mortgage investment to be longer than anticipated.

CMBS depend on underlying pools of commercial real estate loans to provide the cash flow to make principal and interest payments on the security. CMBS are subject to credit risk, the risk that the borrower will be unable to meet its obligations. These loans are typically for a fixed term, cannot be repaid early by the borrower without penalty and, accordingly, have lower prepayment risk than residential MBS.

To reduce PERA's counterparty credit risk while trading residential MBS, PERA has entered into Master Securities Forward Transaction Agreements with a number of counterparties which require margin collateral to be pledged or received when the change in net value of unsettled trades exceeds an agreed-upon threshold. As of December 31, 2022, there was $7,422 in pledged collateral to counterparties and $2,521 in counterparty pledged collateral held by PERA.

As of December 31, 2022, the fair value of residential MBS and CMBS was $3,800,945 and $448,987, respectively, which excludes the fair value of those securities held in commingled funds.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of an investment or a deposit. PERA's currency risk exposure resides primarily within the Global Equity asset class. In accordance with governmental accounting standards, this disclosure is limited to investments denominated in non-U.S. dollars. There may be additional foreign currency risk in investments that contain underlying securities or business operations exposed to a foreign currency. PERA's formal policy regarding foreign currency risk is to incorporate the risk as part of the fund's periodic asset/liability study and to consider it in determining the total fund asset allocation.

At December 31, 2022, PERA did not have a currency hedging program at the total fund level. However, at the manager level, hedging currency risk may be permitted which allows the manager to actively manage currency exposure at their discretion in accordance with their individual investment guidelines. PERA monitors currency risk at the total fund, asset class, and portfolio levels. PERA's exposure to foreign currency risk as of December 31, 2022, is shown in the following table:

FOREIGN CURRENCY RISK

Currency	Total	Global Equity	Fixed Income	Private Equity	Real Estate	Alternatives	Cash and Short-Term Investments	Income Receivable	Pending Trades	Pending Foreign Exchange Trades
Euro	$2,877,791	$2,435,900	$—	$260,921	$96,341	$45,957	$1,047	$38,123	$—	($498)
Japanese yen	1,549,853	1,547,348	—	—	—	—	150	2,355	—	—
British pound sterling	1,344,608	1,340,521	1	464	—	—	1,024	2,660	373	(435)
Hong Kong dollar	769,997	767,152	—	—	—	—	2,820	25	—	—
Swiss franc	687,216	674,087	—	—	—	—	2	13,127	—	—
Canadian dollar	687,136	684,799	—	—	—	—	1,130	1,207	—	—
Australian dollar	539,870	539,042	—	—	—	—	306	522	97	(97)
Swedish krona	392,587	390,713	—	—	—	—	15	1,859	—	—
Indian rupee	277,234	276,799	—	—	—	—	434	1	—	—
Danish krone	264,228	258,074	—	—	—	—	93	6,061	—	—
New Taiwan dollar	246,735	246,006	—	—	—	—	103	626	—	—
South Korean won	209,491	206,626	—	—	—	—	318	2,657	(110)	—
Singapore dollar	167,925	167,881	—	—	—	—	44	—	—	—
Brazilian real	150,571	144,737	368	—	—	—	3,326	2,126	17	(3)
Chinese yuan renminbi (offshore)	124,928	124,330	—	—	—	—	598	—	—	—
Norwegian krone	92,810	92,759	—	—	—	—	51	—	—	—
Indonesian rupiah	82,751	82,064	—	—	—	—	687	—	—	—
Saudi riyal	77,008	75,551	—	—	—	—	1,457	—	—	—
Russian ruble	44,230	43,846	—	—	—	—	209	175	—	—
Thai baht	42,101	42,100	—	—	—	—	1	—	—	—
Israeli shekel	38,543	38,520	—	—	—	—	16	7	—	—
South African rand	35,175	34,454	—	—	—	—	679	42	—	—
Mexican peso	30,759	30,342	—	—	—	—	416	1	—	—
United Arab Emirates dirham	26,636	26,607	—	—	—	—	29	—	—	—
Polish zloty	19,538	19,408	—	—	—	—	78	53	—	(1)
New Zealand dollar	17,475	17,251	—	—	—	—	224	—	—	—
Qatari riyal	14,196	14,178	—	—	—	—	18	—	—	—
Malaysian ringgit	8,221	7,790	—	—	—	—	431	—	—	—
kuwaiti dinar	5,355	5,297	—	—	—	—	58	—	—	—
Turkish lira	4,364	4,364	—	—	—	—	—	—	—	—
Hungarian forint	4,212	4,100	—	—	—	—	112	—	—	—
Chilean peso	1,398	1,398	—	—	—	—	—	—	—	—
Philippine peso	1,374	1,357	—	—	—	—	17	—	—	—
Czech koruna	137	—	—	—	—	—	—	137	—	—
Colombian peso	128	127	—	—	—	—	1	—	—	—
Peruvian sol	6	—	—	—	—	—	6	—	—	—
Total	**$10,836,587**	**$10,345,528**	**$369**	**$261,385**	**$96,341**	**$45,957**	**$15,900**	**$71,764**	**$377**	**($1,034)**

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Note 6—Derivative Instruments

PERA reports derivative instruments at fair value. These derivative instruments involve, to varying degrees, elements of market risk to the extent of future market movements in excess of amounts recognized in the Statements of Fiduciary Net Position. For accounting purposes, derivative instruments are considered to be investments and not hedges.

The following table summarizes the derivative instruments outstanding as of December 31, 2022, that have been deemed significant by management. These instruments are recorded in investment receivables in the Statements of Fiduciary Net Position and the changes in fair value are included in investment income in the Statements of Changes in Fiduciary Net Position. Investments in limited partnerships and commingled funds include derivative instruments that are not reported in the following disclosure.

DERIVATIVE INSTRUMENTS—DEFINED BENEFIT PLANS

	Changes in Fair Value	
Investment Derivatives	Classification	Amount
Equity futures	Investment loss	($51,104)
Fixed income futures	Investment loss	(17,629)
Total		**($68,733)**

Fair Value at December 31, 2022	
Classification	Amount
Investment receivables	$62,474
Total	**$62,474**

DERIVATIVE INSTRUMENTS—DEFINED CONTRIBUTION PLANS

	Changes in Fair Value	
Investment Derivatives	Classification	Amount
Fixed income futures	Investment income	$3,741
Total		**$3,741**

Equity/Fixed Income Futures

Equity and fixed income futures represent contracts between two parties to purchase or sell securities or cash at a future date for a specified price. Futures contracts trade on organized exchanges. Recognition of investment income, with a corresponding change to the amount of investment receivables or liabilities, occurs on a daily basis according to the fluctuation of value of the futures contract. Payments are received or made to settle the fluctuation of the contract's value on a periodic basis.

Upon entering into a futures contract, PERA is required to pledge an amount of cash or securities (known as an initial margin deposit) equal to a percentage of the contract amount.

Investment in futures contracts exposes PERA to credit risk. No losses related to counterparty nonperformance occurred in 2022. Credit risk is minimized by central counterparty clearing, margin deposits, and periodic settlement payments. Investments in fixed income futures exposes PERA to interest rate risk.

At December 31, 2022, PERA's defined benefit plans had 3,243 outstanding futures contracts with a total notional market exposure of $369,086 and total investment receivables of $62,474 reflecting counterparty margin deposits and fluctuation of the contract value since the last periodic settlement payment.

FUTURES CONTRACTS OUTSTANDING—DEFINED BENEFIT PLANS

As of December 31, 2022

Contract Type	Year of Maturity	Notional Amount (Market Exposure)
Equity	2023	$281,934
Fixed income	2023	87,152
Total		**$369,086**

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Note 7—Commitments and Contingencies

As of December 31, 2022, PERA had commitments for future investments in Private Equity of $2,766,707, Real Estate of $705,400, and Alternatives of $2,041,305.

Lawsuit Regarding Tri-County Health Department

Effective December 31, 2022, Tri-County Health Department (Tri-County Health) terminated its affiliation with PERA. Tri-County Health's termination results from Douglas, Adams, and Arapahoe counties (the counties) withdrawing from Tri-County Health. PERA and Tri-County Health agree that the termination of affiliation provisions of PERA's governing statutes, specifically C.R.S. §§ 24-51-313–319, apply. Therefore, it is PERA's position that Tri-County Health (and the counties if Tri-County Health lacks sufficient funds) is obligated to pay its share of the current unfunded liability in PERA's Local Government Division and PERA's HCTF (the withdrawal liability). Prior to the disaffiliation, PERA communicated with Tri-County Health and the counties but did not receive assurances that they would pay the withdrawal liability; therefore, PERA filed a lawsuit on February 1, 2022, against Tri-County Health and the counties to enforce payment of the withdrawal liability effective December 31, 2022. In a separate court proceeding, a Receiver has been appointed to conclude Tri-County Health's business affairs. PERA remains engaged in this action seeking payment of Tri-County Health's withdrawal liability from Tri-County Health and the counties once the final amount is determined.

Other Pending or Threatened Litigation

PERA is involved in various lawsuits or threatened legal proceedings arising in the normal course of business. In the opinion of management, the ultimate resolution of these other matters will not have a material effect on the financial condition of PERA.

Contribution Settlements

In the normal course of business, administrative errors can occur resulting in corrections to prior employer and member contribution remissions.

(Dollars in Thousands)

Note 8—Voluntary Investment Program, Defined Contribution Retirement Plan, and Deferred Compensation Plan

PERA administers three defined contribution plans: the Voluntary Investment Program (PERAPlus 401(k) Plan), the Defined Contribution Retirement Plan (DC Plan), and the Deferred Compensation Plan (PERAPlus 457 Plan), collectively known as the Capital Accumulation Plans (CAPs). The Board has the authority to establish and administer the CAPs pursuant to C.R.S. § 24-51-1401, C.R.S. § 24-51-1501, and C.R.S. § 24-51-1601, respectively. The provisions of the PERAPlus 401(k) Plan and the DC Plan are found in the law at C.R.S. § 24-51-1401 *et seq.*, C.R.S. § 24-51-1501, *et seq.*, PERA Rules, 8 CCR 1502-1, and *PERA's 401(k) and Defined Contribution Plan and Trust* document. The provisions of the PERAPlus 457 Plan are found in the law at C.R.S. § 24-51-1601 et. seq, PERA Rules, 8 CCR 1502-1, and *The PERA Deferred Compensation Plan* document.

All Plans

The following investment, distribution, and fee provisions are the same under all three CAPs:

- Participants have the choice of contributing to 18 different investment options. In addition, participants may also make transfers, at any time, among the following listed investment options:
  - PERAdvantage Capital Preservation Fund
  - PERAdvantage Fixed Income Fund
  - PERAdvantage Real Return Fund
  - PERAdvantage Socially Responsible Investment (SRI) Fund
  - PERAdvantage U.S. Large Cap Stock Fund
  - PERAdvantage U.S. Small and Mid-Cap Stock Fund
  - PERAdvantage International Stock Fund
  - PERAdvantage Income Fund
  - PERAdvantage 2025 Fund
  - PERAdvantage 2030 Fund
  - PERAdvantage 2035 Fund
  - PERAdvantage 2040 Fund
  - PERAdvantage 2045 Fund
  - PERAdvantage 2050 Fund
  - PERAdvantage 2055 Fund
  - PERAdvantage 2060 Fund
  - PERAdvantage 2065 Fund
  - TD Ameritrade Self-Directed Brokerage Account
- The participant's account balances become available for distribution upon termination from all PERA-affiliated employers. All distributions are in accordance with the Plan documents and IRC requirements.
- Empower administers the recordkeeping for all participant transactions. Northern Trust provides an array of financial services in support of day to day operations of the CAPs, including custodial services.
- Cash balances represent both operating cash accounts and investment cash on deposit held by the custodians.
- Participants pay plan administration fees and investment management fees. Plan administrative fees cover fees for services such as recordkeeping, accounting, and plan maintenance. Investment management fees are charged by the fund managers for the CAPs' investment options to cover the costs of managing their respective funds.

This table presents the number of employers eligible to participate in the three defined contribution plans as of December 31, 2022.

Defined Contribution Plan	Employers[1]
PERAPlus 401(k) Plan	410
DC Plan	164
PERAPlus 457 Plan	112

[1] This employer count is presented for purposes of complying with GASB 67 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA (see Note 1).

PERAPlus 401(k) Plan

The PERAPlus 401(k) Plan was established January 1, 1985, and is an IRC § 401(k) plan that allows for voluntary participation to provide additional benefits at retirement for PERA members. All employees working for a PERA-affiliated employer may contribute to the PERAPlus 401(k) Plan.

In 2022, participants could contribute the lesser of $20,500 (actual dollars) or 100% of compensation less PERA member contributions. Catch-up contributions up to $6,500 (actual dollars) in 2022 were allowed for participants who had attained age 50 before the close of the plan year, subject to the limitations of IRC § 414(v). Employer matching and discretionary contributions are allowable with total participant and employer contributions limited to $61,000 (actual dollars) per participant in 2022 (plus catch-up contributions, if applicable).

Provisions of the PERAPlus 401(k) Plan permit in-service withdrawals by participants while employed with a PERA-affiliated employer through loans, hardship withdrawals, or by a trustee-to-trustee transfer to the PERA defined benefit plan to purchase service credit. The balance of outstanding loans as of December 31, 2022, was $48,794 and was recorded as a benefit receivable on the Statements of Fiduciary Net Position. There were 67,040 participants with balances as of December 31, 2022. During 2022, the PERAPlus 401(k) Plan had a total of 3,605 terminated participants take full distributions of their accounts.

(Dollars in Thousands)

DC Plan

The DC Plan was established January 1, 2006, and is an IRC § 401(a) governmental profit-sharing plan. Its purpose is to offer a defined contribution alternative to the PERA defined benefit plan. Participation is available to certain employees of the State or Local Government Divisions, classified employees at State colleges and universities, most community colleges, as well as the District Attorney within each Judicial District, and if authorized by the county and the District Attorney, the attorneys within that Judicial District (see Note 1 for additional details). The eligible employees have the option to choose the PERA defined benefit plan or the DC Plan.

Between the second and fifth year of participation in the DC Plan, eligible participants may elect to terminate membership in the DC Plan and become a member of the PERA defined benefit plan. Similarly, an eligible employee of the PERA defined benefit plan may elect, between the second and fifth year of membership, to terminate membership in the PERA defined benefit plan and become a participant of the DC Plan. Either election is irrevocable.

2022 rates for employer and member contributions deposited to DC Plan participant accounts are shown in the following table:

Trust Fund	Employer Contribution Rate[1,2]	Member Contribution Rate
January 1, 2022 - June 30, 2022		
State Division (members other than State Troopers)[3]	10.15%	10.50%
State Division (State Troopers)[3]	12.85%	12.50%
Local Government Division (members other than State Troopers)	10.00%	8.50%
Local Government Division (State Troopers)[3]	12.85%	12.50%
July 1, 2022 - December 31, 2022		
State Division (members other than State Troopers)[3]	10.15%	11.00%
State Division (State Troopers)[3]	12.85%	13.00%
Local Government Division (members other than State Troopers)	10.00%	9.00%
Local Government Division (State Troopers)[3]	12.85%	13.00%

[1] Employers also contribute the AED and SAED to the respective Division Trust Fund. See Note 4 for additional details on AED and SAED.

[2] Additional employer DC supplement contributions and employer AAP contributions are deposited in the respective Division Trust Fund. See Note 4 for additional information on the DC supplement and AAP.

[3] Additional 0.25% in statutory employer contribution increases are deposited in the respective Division Trust Fund.

Note: See Note 1 for the definition of “State Troopers”.

DC Plan participants immediately vest in 50% of their employer contributions, together with accumulated investment earnings on the vested portion. For each full year of participation, vesting increases by 10%. Contribution requirements are established under C.R.S. § 24-51-1505.

Provisions of the DC Plan allow for the transfer of DC funds to the PERAPlus 401(k) Plan if a participant is still a PERA member but not active in the DC Plan. Additionally, the election to purchase service credit is available to those who are eligible and who are members of the PERA defined benefit plan with an existing DC Plan account. As of December 31, 2022, the DC Plan had 7,846 participants with balances. During the year, 608 participants took full distributions of their accounts.

PERAPlus 457 Plan

On July 1, 2009, PERA assumed the administrative and fiduciary responsibilities for the State of Colorado Deferred Compensation Plan previously administered under C.R.S. Part 1 of Article 52 of Title 24, as said part existed prior to its repeal in 2009.

The PERAPlus 457 Plan is an IRC § 457 plan that allows for voluntary participation to provide additional benefits at retirement. All employees working for a PERA employer affiliated with the PERAPlus 457 Plan may contribute to the PERAPlus 457 Plan. All employers that were affiliated with the State 457 Plan prior to July 1, 2009, including those that are not PERA-affiliated employers, remained affiliated with the PERAPlus 457 Plan and their employees remained eligible to contribute.

In 2022, participants could defer the lesser of $20,500 (actual dollars) or 100% of compensation less PERA member contributions. Catch-up deferrals, up to the greater of $6,500 (actual dollars) for participants who had attained age 50 before the close of the plan year or the limits of the special section 457 plan catch-up, were allowed in 2022, subject to the limitations of IRC § 414(v) and § 457(b).

Provisions of the PERAPlus 457 Plan permit in-service withdrawals by participants while employed with a PERA-affiliated employer through loans, unforeseen emergency withdrawals, de minimis distributions, or by a trustee-to-trustee transfer to the PERA defined benefit plan to purchase service credit. The balance of outstanding loans as of December 31, 2022, was $10,602 and was recorded as a benefit receivable on the Statements of Fiduciary Net Position. There were 20,063 participants with balances as of December 31, 2022. During the year, the PERAPlus 457 Plan had a total of 1,117 terminated participants take full distributions of their accounts.

Note 9—Health Care Trust Funds—Defined Benefit Health Care Plans

PERA offers two defined benefit other postemployment benefit (OPEB) health care plans to benefit recipients and retirees. The HCTF and the DPS HCTF were created under C.R.S. § 24-51-1201(1) and (2), respectively. The HCTF is a cost-sharing multiple-employer plan and the DPS HCTF is a single-employer plan. These funds provide a health care premium subsidy to eligible participating PERA benefit recipients and retirees who choose to enroll in one of the PERA health care plans; however, the subsidy is not available if only enrolled in the dental and/or vision plan(s). The health care premium subsidy is based upon the benefit structure under which the member retires and the member's years of service credit. For members who retire having service credit with employers in the DPS Division and one or more of the other four divisions, the premium subsidy is allocated between the two Health Care Trust Funds. The basis for the amount of the premium subsidy funded by each trust fund is the percentage of the member contribution account balance from each division as it relates to the total member contribution account balance from which the retirement benefit is paid.

PERA Board Authority

Title 24, Article 51, Part 12 of the C.R.S., as amended, sets forth a framework that grants authority to the Board to contract, self-insure, and authorize disbursements necessary in order to carry out the purposes of the PERACare health benefits program, including the administration of the premium subsidies. PERA contracts with health insurance companies to provide fully insured health care plans as well as to administer medical, pharmacy, dental, and vision claims for the self-insured plans.

Plan Description and Benefit Provisions

C.R.S. § 24-51-1202 *et seq.* specifies the eligibility for enrollment in the health care plans offered by PERA and the amount of the premium subsidy. The law governing a benefit recipient's eligibility for the subsidy and the amount of the subsidy differs slightly depending under which benefit structure the benefits are calculated. All benefit recipients under the PERA benefit structure and all retirees under the DPS benefit structure are eligible for a premium subsidy if enrolled in a health care plan under PERACare. Upon the death of a DPS benefit structure retiree, no further subsidy is paid.

Membership Eligibility

Enrollment in the PERACare health benefits program is voluntary and available to the following eligible individuals:

- Benefit recipients and their dependents.
- Guardians of children receiving PERA survivor benefits if the children are enrolled in the health care program.
- Surviving spouses of deceased retirees who chose single-life annuity options, if the surviving spouse was enrolled in the program when the retiree's death occurred.
- Divorced spouses of retirees who are not receiving PERA benefits, but were enrolled in the program when the divorce occurred.
- Members while receiving short-term disability program payments.
- Members whose employers have elected to provide coverage through the health care program and such members' dependents.

Available Health Care Premium Subsidy

PERA Benefit Structure

The maximum service-based premium subsidy is $230 (actual dollars) per month for benefit recipients who are under 65 years of age and who are not entitled to Medicare; the maximum service-based subsidy is $115 (actual dollars) per month for benefit recipients who are 65 years of age or older or who are under 65 years of age and entitled to Medicare. The maximum service-based subsidy, in each case, is for benefit recipients with retirement benefits based on 20 or more years of service credit. There is a 5% reduction in the subsidy for each year less than 20. The benefit recipient pays the remaining portion of the premium to the extent the subsidy does not cover the entire amount.

For benefit recipients who have not participated in Social Security and who are not otherwise eligible for premium-free Medicare Part A for hospital-related services, C.R.S. § 24-51-1206(4) provides an additional subsidy. According to the statute, PERA cannot charge premiums to benefit recipients without Medicare Part A that are greater than premiums charged to benefit recipients with Part A for the same plan option, coverage level, and service credit. Currently, for each individual PERACare enrollee, the total premium for Medicare coverage is determined assuming plan participants have both Medicare Part A and Part B and the difference in premium cost is paid by the HCTF or the DPS HCTF on behalf of benefit recipients not covered by Medicare Part A.

DPS Benefit Structure

The maximum service-based premium subsidy is $230 (actual dollars) per month for retirees who are under 65 years of age and who are not entitled to Medicare; the maximum service-based subsidy is $115 (actual dollars) per month for retirees who are 65 years of age or older or who are under 65 years of age and entitled to Medicare. The maximum subsidy, in each case, is for retirees with retirement benefits based on 20 or more years of service credit. There is a 5% reduction in the subsidy for each year less than 20. The retiree pays the remaining portion of the premium to the extent the subsidy does not cover the entire amount.

(Dollars in Thousands)

For retirees who have not participated in Social Security and who are not otherwise eligible for premium-free Medicare Part A for hospital-related services, the HCTF or the DPS HCTF pays an alternate service-based premium subsidy. Each individual retiree meeting these conditions receives the maximum $230 (actual dollars) per month subsidy reduced appropriately for service less than 20 years, as previously described. Retirees who do not have Medicare Part A pay the difference between the total premium and the monthly subsidy.

Contributions

Contribution requirements are established by statute under C.R.S. § 24-51-208. Colorado State law provisions may be amended from time to time by the Colorado General Assembly. PERA-affiliated employers must submit contributions for all PERA members equal to 1.02% of covered salaries. PERA-affiliated employers of the State Division, School Division, Local Government Division, and Judicial Division contribute to the HCTF. Affiliated employers of the DPS Division contribute to the DPS HCTF.

This table is the number of active participating employers for the two Health Care Trust Funds. Guidance under GASB 74 classifies a primary government and its component units as one employer.

Trust Fund	As of December 31, 2022[1]
HCTF	409
DPS HCTF	1
Total employers	**410**

[1] This employer count is presented for purposes of complying with GASB 74 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA.

Employer contributions and investment earnings on the assets primarily pay for the cost of the premium subsidies and the administrative costs incurred by the funds.

Plan Data

Benefit recipients and members of PERA consisted of the following as of December 31, 2022:

MEMBERSHIP—HEALTH CARE TRUST FUNDS[1]

	HCTF	DPS HCTF	2022
Retirees and beneficiaries[2]	128,229	7,256	**135,485**
Inactive members eligible but not yet receiving benefits[3]	36,759	3,165	**39,924**
Active members[3]	191,392	15,254	**206,646**
Total	**356,380**	**25,675**	**382,055**

[1] PERA's inactive members not eligible for benefits are not included in this membership count for Health Care Trust Funds.

[2] Currently receiving or eligible for OPEB benefits.

[3] May be eligible for future OPEB benefits.

PARTICIPATION IN PERACARE HEALTH PLANS FOR ELIGIBLE RETIREES AND BENEFICIARIES

	HCTF	DPS HCTF	Total
Enrolled in PERACare			
Under age 65	7,903	312	8,215
Age 65 and older	48,555	3,008	51,563
	56,458	3,320	59,778
Not enrolled in PERACare			
Under age 65	16,080	628	16,708
Age 65 and older	55,691	3,308	58,999
	71,771	3,936	75,707
Total eligible retirees and beneficiaries	**128,229**	**7,256**	**135,485**

Summary of HCTF and DPS HCTF

PERA offers two general types of health plans: fully insured plans offered through health care organizations and self-insured plans administered by third-party vendors. The plans offered include HMO, PPO, and Medicare Advantage plans.

Premiums collected and payments made are reported in two ways, depending on whether or not the funds bear any level of risk with regard to the health coverage. When there is no transfer of risk to the funds, the premiums collected are reported as a liability and the liability is relieved when the premiums are paid to the health insurance company that provides the fully insured health plan. When there is no health coverage risk, the only benefit payment reported is the subsidy benefit which is equal to the difference between the premiums collected from the enrollees and the full premium due to the health insurance company.

(Dollars in Thousands)

When the health care plan bears risk, all claims paid are reported as benefit payments and premiums collected are reported as a reduction to benefit payments. The health care plan that involves risk to the funds is the self-insured plan administered by UMR, a UnitedHealthcare company. For this plan, the commercial medical and prescription claims are self-insured, while the UnitedHealthcare Medicare Advantage medical and prescription plans are fully insured. Due to PERA's premium structure, the Medicare premiums paid to United are reported as an expense within the plan and included in benefit payments. PERA uses an outside consultant to determine the premiums required to cover anticipated health claims. The cost to the enrollee is reduced by the amount of the enrollee's calculated subsidy, if applicable. Implicit in this process is the risk that actual claims experience could be different from the consultant's determination resulting in either a gain or loss to the funds. In addition, other estimates and assumptions are made for these funds. It is possible that actual results could significantly differ from these estimates.

Dental and Vision Plans

Dental and vision plans are also available to benefit recipients. PERA offers fully insured and self-insured dental plans and self-insured vision plans. The funds provide no subsidy and the participants pay the full premiums for dental and vision coverage. For the fully insured dental plan, premiums collected are reported as a liability and the liability is relieved when the premiums are paid to the insurance company who provides the coverage. For this plan, the risk is borne by the insurance company contracted to provide the coverage. The claims paid for the self-insured dental and vision plans are recorded as benefit payments and the premiums collected are recorded as a reduction to benefit payments. PERA uses an outside consultant to determine the premiums required to cover anticipated claims. The risk to these plans is that actual claims experience could be different from the estimates resulting in either a gain or loss to the funds. As of December 31, 2022, there were 68,816 participants enrolled in the dental plans and 55,916 participants enrolled in the vision plans in both the HCTF and the DPS HCTF.

PERA-Affiliated Employer Program Participation

In addition, fully insured pre-Medicare health plans offered through Kaiser Permanente are available to any PERA-affiliated employer who voluntarily elects to provide health care coverage through the health care plan for its employees who are PERA members. The program acts as a purchaser of private insurance to obtain economies of scale for the employers that elect to join in the joint purchasing arrangement. As of December 31, 2022, there were 14 employers in the program with 165 active members enrolled.

Fully insured dental and vision plans are also available to eligible employees of employers who have elected to provide health care coverage through PERA. As of December 31, 2022, there were 253 participants enrolled in the dental plans and 289 participants enrolled in the vision plans.

The insurance companies, who provide coverage through the program, set the rates for each employer group. There is no transfer of risk to the funds, PERA, or between the participating employers. The funds provide no subsidy and the insurance companies providing the benefits bear the risk for the plans. The participants and/or employers pay the full premiums for the coverage. PERA collects the premiums and remits them to the insurance companies who provide the coverage.

It is under this fully-insured set of plans that PERA offers coverage to members who are receiving short-term disability program payments.

Note 10—Net Pension Liability of the Division Trust Funds

The components of the net pension liability (NPL) for participating employers for each Division Trust Fund as of December 31, 2022, are as follows:

	State Division	School Division	Local Government Division	Judicial Division	DPS Division
Total pension liability	$27,616,860	$47,655,096	$5,895,159	$503,883	$4,803,157
Plan fiduciary net position	16,744,284	29,445,631	4,892,596	409,670	3,935,428
Net pension liability	**$10,872,576**	**$18,209,465**	**$1,002,563**	**$94,213**	**$867,729**
Plan fiduciary net position as a percentage of the total pension liability	60.63%	61.79%	82.99%	81.30%	81.93%

(Dollars in Thousands)

Actuarial Methods and Assumptions

Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future. Actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future. A Schedule of Changes in Net Pension Liability and Related Ratios is included in the RSI, which follows the Notes to the Financial Statements. It presents multi-year trend information about whether the FNP is increasing or decreasing over time relative to the total pension liability (TPL) for each division. Calculations are based on the benefits provided under the terms of the substantive plan in effect at the time of each pension actuarial valuation and on the pattern of sharing of costs between employers of each Division Trust Fund and/or plan members to that point. Actuarial calculations reflect a long-term perspective.

The TPL for the Division Trust Funds was determined by actuarial valuations as of December 31, 2021, and generally accepted actuarial techniques were applied to roll forward the TPL to December 31, 2022 (measurement date). The December 31, 2021, actuarial valuations used the following actuarial cost method and key actuarial assumptions and other inputs:

	State Division	School Division	Local Government Division	Judicial Division	DPS Division
Actuarial cost method	Entry age	Entry age	Entry age	Entry age	Entry age
Price inflation	2.30%	2.30%	2.30%	2.30%	2.30%
Real wage growth	0.70%	0.70%	0.70%	0.70%	0.70%
Wage inflation	3.00%	3.00%	3.00%	3.00%	3.00%
Salary increases, including wage inflation:					
Members other than State Troopers[1]	3.30%-10.90%	3.40%-11.00%	3.20%-11.30%	2.80%-5.30%	3.80%-11.50%
State Troopers[1]	3.20%-12.40%	N/A	3.20%-12.40%	N/A	N/A
Long-term investment rate of return, net of pension plan investment expenses, including price inflation	7.25%	7.25%	7.25%	7.25%	7.25%
Discount rate	7.25%	7.25%	7.25%	7.25%	7.25%
Post-retirement benefit increases:					
PERA benefit structure hired prior to 1/1/07 and DPS benefit structure (compounded annually)	1.00%	1.00%	1.00%	1.00%	1.00%
PERA benefit structure hired after 12/31/06[2]	Financed by the AIR	Financed by the AIR	Financed by the AIR	Financed by the AIR	Financed by the AIR

1 See Note 1 for the definition of "State Troopers".

2 Post-retirement benefit increases are provided by the AIR, accounted separately within each Division Trust Fund, and subject to moneys being available; therefore, liabilities related to increases for members of these benefit tiers can never exceed available assets.

The TPL for the Local Government Division, as of the December 31, 2022, measurement date, was adjusted to reflect the disaffiliation, as allowable under C.R.S. § 24-51-313, of Tri-County Health, effective December 31, 2022. As of the close of the 2022 fiscal year, no disaffiliation payment associated with Tri-County Health was received, and therefore no disaffiliation dollars were reflected in the FNP as of the December 31, 2022, measurement date.

The mortality tables are generational mortality tables developed on a benefit-weighted basis.

- Pre-retirement mortality assumptions for the State and Local Government Divisions (members other than State Troopers) were based upon the PubG-2010 Employee Table with generational projection using scale MP-2019.
- Pre-retirement mortality assumptions for State Troopers were based upon the PubS-2010 Employee Table with generational projection using scale MP-2019.
- Pre-retirement mortality assumptions for the School and DPS Divisions were based upon the PubT-2010 Employee Table with generational projection using scale MP-2019.
- Pre-retirement mortality assumptions for the Judicial Division were based upon the PubG-2010(A) Above-Median Employee Table with generational projection using scale MP-2019.

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- Post-retirement non-disabled mortality assumptions for the State and Local Government Divisions (members other than State Troopers) were based upon the PubG-2010 Healthy Retiree Table, adjusted as follows:
  - **Males:** 94% of the rates prior to age 80 and 90% of the rates for ages 80 and older, with generational projection using scale MP-2019.
  - **Females:** 87% of the rates prior to age 80 and 107% of the rates for ages 80 and older, with generational projection using scale MP-2019.
- Post-retirement non-disabled mortality assumptions for State Troopers were based upon the unadjusted PubS-2010 Healthy Retiree Table, with generational projection using scale MP-2019.
- Post-retirement non-disabled mortality assumptions for the School and DPS Divisions were based upon the PubT-2010 Healthy Retiree Table, adjusted as follows:
  - **Males:** 112% of the rates prior to age 80 and 94% of the rates for ages 80 and older, with generational projection using scale MP-2019.
  - **Females:** 83% of the rates prior to age 80 and 106% of the rates for ages 80 and older, with generational projection using scale MP-2019.
- Post-retirement non-disabled mortality assumptions for the Judicial Division were based upon the unadjusted PubG-2010(A) Above-Median Healthy Retiree Table with generational projection using scale MP-2019.
- Post-retirement non-disabled beneficiary mortality assumptions for the Division Trust Funds were based upon the Pub-2010 Contingent Survivor Table, adjusted as follows:
  - **Males:** 97% of the rates for all ages, with generational projection using scale MP-2019.
  - **Females:** 105% of the rates for all ages, with generational projection using scale MP-2019.
- Disabled mortality assumptions for the Division Trust Funds (members other than State Troopers) were based upon the PubNS-2010 Disabled Retiree Table using 99% of the rates for all ages with generational projection using scale MP-2019.
- Disabled mortality assumptions for State Troopers were based upon the unadjusted PubS-2010 Disabled Retiree Table with generational projection using scale MP-2019.

The actuarial assumptions used in the December 31, 2021, valuations were based on the 2020 experience analysis, dated October 28, 2020, for the period January 1, 2016, through December 31, 2019. Revised economic and demographic assumptions were adopted by the Board on November 20, 2020.

The long-term expected return on plan assets is reviewed as part of regularly scheduled experience studies performed at least every five years, and asset/liability studies, performed every three to five years for PERA. The most recent analyses were outlined in the Experience Study report dated October 28, 2020.

Several factors are considered in evaluating the long-term rate of return assumption, including long-term historical data, estimates inherent in current market data, and a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected return, net of investment expense and inflation) were developed for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentages and then adding expected inflation. The capital market assumptions may cover a shorter investment horizon and may not be useful in setting the long-term rate of return for funding pension plans, which covers a longer timeframe. The assumption is intended to be a long-term assumption and is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected future returns.

The Board first adopted the 7.25% long-term expected rate of return as of November 18, 2016. Following an asset/liability study, the Board reaffirmed the assumed rate of return at the Board's November 15, 2019, meeting, to be effective January 1, 2020. As of the most recent reaffirmation of the long-term rate of return, the target asset allocation and best estimates of geometric real rates of return for each major asset class are summarized in the table as follows:

Asset Class	Target Allocation	30-Year Expected Geometric Real Rate of Return
Global Equity	54.00%	5.60%
Fixed Income	23.00%	1.30%
Private Equity	8.50%	7.10%
Real Estate	8.50%	4.40%
Alternatives	6.00%	4.70%
Total	**100.00%**	

Note: In setting the long-term expected rate of return, projections employed to model future returns provide a range of expected long-term returns that, including expected inflation, ultimately support a long-term expected nominal rate of return assumption of 7.25%.

NOTES TO THE FINANCIAL STATEMENTS

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Discount Rate/Single Equivalent Interest Rate

The projection of cash flows used to determine the discount rate was performed in accordance with GASB 67. The basis for the projection of the liabilities and the FNP was an actuarial valuation performed as of December 31, 2021, and the financial status of the funds as of the prior measurement date (December 31, 2021). In addition to the actuarial cost method and assumptions presented earlier, the projection of cash flows applied the following methods and assumptions:

- Total covered payroll for the initial projection year consists of the covered payroll of the active membership present on the valuation date and the covered payroll of future plan members assumed to be hired during the year. In subsequent projection years, total covered payroll was assumed to increase annually at a rate of 3.00%.
- Employee contributions were assumed to be made at the member contribution rates in effect for each year, including the scheduled increases in SB 18-200 and required adjustments resulting from the 2018 and 2020 AAP assessments. Employee contributions for future plan members were used to reduce the estimated amount of total service costs for future plan members.
- Employer contributions were assumed to be made at rates equal to the fixed statutory rates specified in law for each year, including the scheduled increase in SB 18-200 and required adjustments resulting from the 2018 and 2020 AAP assessments. Employer contributions also include current and estimated future AED and SAED, until the actuarial value funding ratio reaches 103%, at which point the AED and SAED will each drop 0.50% every year until they are zero. Additionally, estimated employer contributions reflect reductions for the funding of the AIR and retiree health care benefits. For future plan members, employer contributions were further reduced by the estimated amount of total service costs for future plan members not financed by their member contributions.
- Employer contributions for the DPS Division Trust Fund are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.
- As specified in law, the State, as a nonemployer contributing entity, will provide an annual direct distribution of $225 million (actual dollars), commencing July 1, 2018, that is proportioned between the State, School, Judicial, and DPS Division Trust Funds based upon the covered payroll of each Division. The annual direct distribution ceases when all Division Trust Funds are fully funded.
- HB 22-1029, effective upon enactment in 2022, required the State treasurer to issue, in addition to the regularly scheduled $225 million (actual dollars) direct distribution, a warrant to PERA in the amount of $380 million (actual dollars) with reductions to future direct distributions. The July 1, 2023, direct distribution will be reduced by $190 million (actual dollars) to $35 million (actual dollars). The July 1, 2024, direct distribution will not be reduced from $225 million (actual dollars) due to a negative investment return in 2022.
- Employer contributions and the amount of total service costs for future plan members were based upon a process to estimate future ADCs assuming an analogous future plan member growth rate.
- The AIR balance was excluded from the initial FNP, as, per statute, AIR amounts cannot be used to pay benefits until transferred to either the retirement benefits reserve or the survivor benefits reserve, as appropriate. AIR transfers to the FNP position and the subsequent AIR benefit payments were estimated and included in the projections.
- As required by HB 20-1394, 5.00% of the Judicial Division base employer contribution rate is to be paid by the members of the Judicial Division effective for the 2020-21 and 2021-22 fiscal years. This contribution rate modification does not apply to judges employed by the Denver County Court.
- Benefit payments and contributions were assumed to be made at the middle of the year.

Based on those methods and assumptions and the GASB 67 projection test methodology, the FNP for all Division Trust Funds were projected to be available to make all projected future benefit payments of current plan members and were not projected to reach a depletion date. Therefore, the long-term expected rate of return on plan investments was applied to all periods of projected benefit payments to determine the TPL for each fund. The discount rate determination did not use a municipal bond index rate, and therefore, the discount rate used to measure the TPL for these funds as of the measurement date (December 31, 2022) was 7.25%.

The results of the GASB 67 projection test methodology and development of the discount rate for each fund do not necessarily indicate the fund's ability to make benefit payments in the future.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following tables present the NPL for participating employers for each fund using the current discount rate, as well the fund's NPL if calculated using a discount rate that is one percentage point lower or one percentage point higher than the current rate:

Trust Fund	1.0% Decrease in Discount Rate	Net Pension Liability
State Division	6.25%	$13,899,323
School Division	6.25%	23,829,927
Local Government Division	6.25%	1,683,051
Judicial Division	6.25%	145,548
DPS Division	6.25%	1,468,562

Trust Fund	Current Discount Rate	Net Pension Liability
State Division	**7.25%**	**$10,872,576**
School Division	**7.25%**	**18,209,465**
Local Government Division	**7.25%**	**1,002,563**
Judicial Division	**7.25%**	**94,213**
DPS Division	**7.25%**	**867,729**

Trust Fund	1.0% Increase in Discount Rate	Net Pension Liability
State Division	8.25%	$8,326,508
School Division	8.25%	13,515,805
Local Government Division	8.25%	432,882
Judicial Division	8.25%	50,248
DPS Division	8.25%	372,459

As shown, if there is a significant deviation, over a long period, in the actual rate of return compared to the assumed discount rate, the measurement of the NPL could be materially under- or over-reported as of December 31, 2022.

Note 11—Net OPEB Liability of the Health Care Trust Funds

The components of the net OPEB liability (NOL) for participating employers for each Health Care Trust Fund as of December 31, 2022, are as follows:

	HCTF	DPS HCTF
Total OPEB liability	$1,329,183	$61,024
Plan fiduciary net position	512,704	52,235
Net OPEB liability	**$816,479**	**$8,789**
Plan fiduciary net position as a percentage of the total OPEB liability	38.57%	85.60%

Actuarial Methods and Assumptions

Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future. Actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future. A Schedule of Changes in Net OPEB Liability and Related Ratios is included in the RSI, which follows the Notes to the Financial Statements. It presents multi-year trend information about whether the FNP is increasing or decreasing over time relative to the total OPEB liability (TOL) for each trust fund. Calculations are based on the benefits provided under the terms of the substantive plan in effect at the time of each actuarial valuation and on the pattern of sharing of costs between employers of each fund to that point. Actuarial calculations reflect a long-term perspective.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

The TOL for the Health Care Trust Funds was determined by actuarial valuations as of December 31, 2021, and generally accepted actuarial techniques were applied to roll forward the TOL to December 31, 2022 (measurement date). The December 31, 2021, actuarial valuations used the following actuarial cost method and key actuarial assumptions and other inputs:

	HCTF				DPS HCTF
	State Division	School Division	Local Government Division	Judicial Division	DPS Division
Actuarial cost method	Entry age				Entry age
Price inflation	2.30%				2.30%
Real wage growth	0.70%				0.70%
Wage inflation	3.00%				3.00%
Salary increases, including wage inflation:					
Members other than State Troopers[1]	3.30%-10.90%	3.40%-11.00%	3.20%-11.30%	2.80%-5.30%	3.80%-11.50%
State Troopers[1]	3.20%-12.40%	N/A	3.20%-12.40%	N/A	N/A
Long-term investment rate of return, net of OPEB plan investment expenses, including price inflation	7.25%				7.25%
Discount rate at measurement date	7.25%				7.25%
Health care cost trend rates					
PERA benefit structure:					
Service-based premium subsidy	0.00%				0.00%
PERACare Medicare plans	6.50% in 2022 gradually decreasing to 4.50% in 2030				6.50% in 2022 gradually decreasing to 4.50% in 2030
Medicare Part A premiums	3.75% in 2022, gradually increasing to 4.50% in 2029				3.75% in 2022, gradually increasing to 4.50% in 2029
DPS benefit structure:					
Service-based premium subsidy	0.00%				0.00%
PERACare Medicare plans	N/A				N/A
Medicare Part A premiums	N/A				N/A

[1] See Note 1 for the definition of "State Troopers".

The TOL for the HCTF, as of the December 31, 2022, measurement date, was adjusted to reflect the disaffiliation, allowable under C.R.S. § 24-51-313, of Tri-County Health, effective December 31, 2022. As of the close of the 2022 fiscal year, no disaffiliation payment associated with Tri-County Health was received, and therefore no disaffiliation dollars were reflected in the FNP as of the December 31, 2022, measurement date.

Beginning January 1, 2022, the per capita health care costs are developed by plan option; based on 2022 premium rates for the UnitedHealthcare Medicare Advantage Prescription Drug (MAPD) PPO plan #1, the UnitedHealthcare MAPD PPO plan #2, and the Kaiser Permanente MAPD HMO plan. Actuarial morbidity factors are then applied to estimate individual retiree and spouse costs by age, gender, and health care cost trend. This approach applies for all members and is adjusted accordingly for those not eligible for premium-free Medicare Part A for the PERA benefit structure.

AGE-RELATED MORBIDITY ASSUMPTIONS

Participant Age	Annual Increase (Male)	Annual Increase (Female)
65-69	3.0%	1.5%
70	2.9%	1.6%
71	1.6%	1.4%
72	1.4%	1.5%
73	1.5%	1.6%
74	1.5%	1.5%
75	1.5%	1.4%
76	1.5%	1.5%
77	1.5%	1.5%
78	1.5%	1.6%
79	1.5%	1.5%
80	1.4%	1.5%
81 and older	0.0%	0.0%

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

	MAPD PPO #1 with Medicare Part A		MAPD PPO #1 without Medicare Part A	
	Retiree/Spouse		Retiree/Spouse	
Sample Age	Male	Female	Male	Female
65	$1,704	$1,450	$6,514	$5,542
70	1,976	1,561	7,553	5,966
75	2,128	1,681	8,134	6,425

	MAPD PPO #2 with Medicare Part A		MAPD PPO #2 without Medicare Part A	
	Retiree/Spouse		Retiree/Spouse	
Sample Age	Male	Female	Male	Female
65	$583	$496	$4,227	$3,596
70	676	534	4,901	3,872
75	728	575	5,278	4,169

	MAPD HMO (Kaiser) with Medicare Part A		MAPD HMO (Kaiser) without Medicare Part A	
	Retiree/Spouse		Retiree/Spouse	
Sample Age	Male	Female	Male	Female
65	$1,923	$1,634	$6,752	$5,739
70	2,229	1,761	7,826	6,185
75	2,401	1,896	8,433	6,657

The 2022 Medicare Part A premium is $499 (actual dollars) per month.

All costs are subject to the health care cost trend rates, discussed as follows.

Health care cost trend rates reflect the change in per capita health costs over time due to factors such as medical inflation, utilization, plan design, and technology improvements. For the PERA benefit structure, health care cost trend rates are needed to project the future costs associated with providing benefits to those PERACare enrollees not eligible for premium-free Medicare Part A.

Health care cost trend rates for the PERA benefit structure are based on published annual health care inflation surveys in conjunction with actual plan experience (if credible), building block models, and industry methods developed by health plan actuaries and administrators. In addition, projected trends for the Federal Hospital Insurance Trust Fund (Medicare Part A premiums) provided by the Centers for Medicare & Medicaid Services are referenced in the development of these rates. Effective December 31, 2021, the health care cost trend rates for Medicare Part A premiums were revised to reflect the current expectation of future increases in rates of inflation applicable to Medicare Part A premiums.

The PERA benefit structure health care cost trend rates used to measure the TOL are summarized in the following table:

Year	PERACare Medicare Plans	Medicare Part A Premiums
2022	6.50%	3.75%
2023	6.25%	4.00%
2024	6.00%	4.00%
2025	5.75%	4.00%
2026	5.50%	4.25%
2027	5.25%	4.25%
2028	5.00%	4.25%
2029	4.75%	4.50%
2030+	4.50%	4.50%

Mortality assumptions used in the December 31, 2021, valuation for the Division Trust Funds are shown in Note 10 starting on page 82, and were applied, as applicable, in the December 31, 2021, valuation for the HCTF and DPS HCTF but developed using a headcount-weighted basis. Affiliated employers of the State, School, Local Government, and Judicial Divisions participate in the HCTF. Affiliated employers of the DPS Division participate in the DPS HCTF.

The following health care costs assumptions were updated and used in roll forward calculation for the HCTF and DPS HCTF:

- Per capita health care costs in effect as of the December 31, 2021, valuation date for those PERACare enrollees under the PERA benefit structure who are expected to be age 65 and older and are not eligible for premium-free Medicare Part A benefits have been updated to reflect costs for the 2022 plan year.
- The December 31, 2021, valuation utilizes premium information as of January 1, 2022, as the initial per capita health care cost. As of that date, PERACare health benefits administration is performed by UnitedHealthcare. In that transition, the costs for the Medicare Advantage Option #2 decreased to a level that is lower than the maximum possible service-related subsidy as described in the plan provisions.
- The health care cost trend rates applicable to health care premiums were revised to reflect the then-current expectation of future increases in those premiums. Medicare Part A premiums continued with the prior valuation trend pattern.

These actuarial assumptions pertaining to per capita health care costs and their related trend rates are analyzed and updated annually by the Board's actuary.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

Effective for the December 31, 2022, measurement date, the timing of the retirement decrement was adjusted to middle-of-year within the valuation programming used to determine the TOL, reflecting a recommendation from the 2022 actuarial audit report, dated October 14, 2022, summarizing the results of the actuarial audit performed on the December 31, 2021, actuarial valuation.

The actuarial assumptions used in the December 31, 2021, valuations were based on the 2020 experience analysis, dated October 28, 2020, and November 4, 2020, for the period January 1, 2016, through December 31, 2019. Revised economic and demographic assumptions were adopted by the Board on November 20, 2020.

The long-term expected return on plan assets is reviewed as part of regularly scheduled experience studies performed at least every five years, and asset/liability studies, performed every three to five years for PERA. The most recent analyses were outlined in the Experience Study report dated October 28, 2020.

Several factors are considered in evaluating the long-term rate of return assumption, including long-term historical data, estimates inherent in current market data, and a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected return, net of investment expense and inflation) were developed for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentages and then adding expected inflation. The capital market assumptions may cover a shorter investment horizon and may not be useful in setting the long-term rate of return for funding OPEB plans, which covers a longer timeframe. The assumption is intended to be a long-term assumption and is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected future returns.

The Board first adopted the 7.25% long-term expected rate of return as of November 18, 2016. Following an asset/liability study, the Board reaffirmed the assumed rate of return at the Board's November 15, 2019, meeting, to be effective January 1, 2020. As of the most recent reaffirmation of the long-term rate of return, the target asset allocation and best estimates of geometric real rates of return for each major asset class are summarized in the table in Note 10 on page 83.

Sensitivity of the Net OPEB Liability to Changes in the Health Care Cost Trend Rates

The following table presents the NOL using the current health care cost trend rates applicable to the PERA benefit structure, as well as the fund's NOL if calculated using health care cost trend rates that are one percentage point lower or one percentage point higher than the current rates:

	1.0% Decrease in Trend Rates	Current Trend Rates	1.0% Increase in Trend Rates
Initial PERACare Medicare trend rate[1]	5.25%	**6.25%**	7.25%
Ultimate PERACare Medicare trend rate	3.50%	**4.50%**	5.50%
Initial Medicare Part A trend rate[1]	3.00%	**4.00%**	5.00%
Ultimate Medicare Part A trend rate	3.50%	**4.50%**	5.50%
Net OPEB liability			
HCTF	$793,369	**$816,479**	$841,625
DPS HCTF	8,566	**8,789**	8,972

[1] For the January 1, 2023, plan year.

Discount Rate/Single Equivalent Interest Rate

The projection of cash flows used to determine the discount rate was performed in accordance with GASB 74. The basis for the projections of the liabilities and the FNP was an actuarial valuation performed as of December 31, 2021, and the financial status of the fund as of the prior measurement date (December 31, 2021). In addition to the actuarial cost method and assumptions presented earlier, the projection of cash flows applied the following methods and assumptions:

- Updated health care cost trend rates for Medicare Part A premiums as of the December 31, 2022, measurement date.
- Total covered payroll for the initial projection year consists of the covered payroll of the active membership present on the valuation date and the covered payroll of future plan members assumed to be hired during the year. In subsequent projection years, total covered payroll was assumed to increase annually at a rate of 3.00%.

NOTES TO THE FINANCIAL STATEMENTS

(Dollars in Thousands)

- Employer contributions were assumed to be made at rates equal to the fixed statutory rates specified in law and effective as of the measurement date.
- Employer contributions and the amount of total service costs for future plan members were based upon a process to estimate future ADCs assuming an analogous future plan member growth rate.
- Estimated transfers of dollars from the Division Trust Funds into the Health Care Trust Funds representing a portion of purchase service agreements intended to cover the costs associated with OPEB benefits.
- Benefit payments and contributions were assumed to be made at the middle of the year.

Based on those methods and assumptions and the GASB 74 projection test methodology, the FNP for the HCTF and DPS HCTF were projected to be available to make all projected future benefit payments of current plan members and were not projected to reach a depletion date. Therefore, the long-term expected rate of return on plan investments was applied to all periods of projected benefit payments to determine the TOL for each fund. The discount rate determination did not use a municipal bond index rate, and therefore, the discount rate used to measure the TOL for these funds as of the measurement date (December 31, 2022) was 7.25%.

The results of the GASB 74 projection test methodology and development of the discount rate for each fund do not necessarily indicate the fund's ability to make benefit payments in the future.

Sensitivity of the Net OPEB Liability to Changes in the Discount Rate

The following tables present the NOL for participating employers for each fund using the current discount rate, as well as the fund's NOL if calculated using a discount rate that is one percentage point lower or one percentage point higher than the current rate:

	1.0% Decrease in Discount Rate	Net OPEB Liability
HCTF	6.25%	$946,541
DPS HCTF	6.25%	14,874

	Current Discount Rate	Net OPEB Liability
HCTF	**7.25%**	**$816,479**
DPS HCTF	**7.25%**	**8,789**

	1.0% Increase in Discount Rate	Net OPEB Liability
HCTF	8.25%	$705,234
DPS HCTF	8.25%	3,605

As shown, if there is a significant deviation, over a long period, in the actual rate of return compared to the assumed discount rate, the measurement of the NOL could be materially under- or over-reported as of December 31, 2022.

Note 12—Leases

PERA, acting as lessor, leases office space at the Pointe Office in Westminster under long-term, non-cancelable lease payments. The agreements range from two years to six years with interest rates between 1.95% and 3.38% and provide for renewal options ranging from one year to five years. During the year ended December 31, 2022, PERA recognized $351 and $26 in lease revenue and interest revenue respectively.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—STATE DIVISION

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	**$401,939**	$413,596	$355,719	$344,666	$727,319
Interest	**1,945,315**	1,948,606	1,825,929	1,800,848	1,658,186
Changes of benefit terms	**—**	(547,823)	—	(501,768)	(1,967,940)
Difference between expected and actual experience	**(229,762)**	(16,478)	195,634	408,792	330,007
Changes of assumptions or other inputs	**—**	—	1,025,120	—	(8,968,282)
Benefit payments, refunds, and disability premiums	**(1,861,237)**	(1,802,036)	(1,734,329)	(1,700,965)	(1,675,880)
Net change in total pension liability	**256,255**	(4,135)	1,668,073	351,573	(9,896,590)
Total pension liability – beginning	**27,360,605**	27,364,740	25,696,667	25,345,094	35,241,684
Total pension liability – ending (a)	**$27,616,860**	**$27,360,605**	**$27,364,740**	**$25,696,667**	**$25,345,094**
Plan fiduciary net position					
Contributions – employer	**$704,797**	$664,304	$646,386	$612,282	$583,164
Contributions – nonemployer	**198,247**	76,706	—	77,088	78,489
Contributions – active member (includes purchased service)	**396,222**	369,166	326,786	287,297	261,540
Net investment income (loss)	**(2,657,031)**	2,806,442	2,652,870	2,764,719	(497,562)
Benefit payments, refunds, and disability premiums	**(1,861,237)**	(1,802,036)	(1,734,329)	(1,700,965)	(1,675,880)
Administrative expense	**(13,312)**	(12,051)	(11,385)	(11,294)	(11,903)
Other additions and deductions	**(8,968)**	3,088	6,756	(2,685)	4,871
Net change in plan fiduciary net position	**(3,241,282)**	2,105,619	1,887,084	2,026,442	(1,257,281)
Plan fiduciary net position – beginning	**19,985,566**	17,879,947	15,992,863	13,966,421	15,223,702
Plan fiduciary net position – ending (b)	**$16,744,284**	**$19,985,566**	**$17,879,947**	**$15,992,863**	**$13,966,421**
Net pension liability – ending (a)-(b)	**$10,872,576**	**$7,375,039**	**$9,484,793**	**$9,703,804**	**$11,378,673**
Plan fiduciary net position as a percentage of the total pension liability	**60.63%**	73.05%	65.34%	62.24%	55.11%
Covered payroll	**$3,183,955**	$3,092,509	$3,089,161	$2,995,453	$2,898,827
Net pension liability as a percentage of covered payroll	**341.48%**	238.48%	307.03%	323.95%	392.53%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—STATE DIVISION (CONTINUED)

For the Years Ended December 31

	2017	2016	2015	2014	2013[1]
Total pension liability					
Service cost	$518,360	$317,466	$309,351	$285,311	
Interest	1,640,426	1,741,390	1,700,903	1,663,542	
Changes of benefit terms	—	—	—	—	
Difference between expected and actual experience	416,731	176,889	237,147	(1,069)	
Changes of assumptions or other inputs	2,286,877	7,313,068	(192,776)	—	
Benefit payments, refunds, and disability premiums	(1,615,021)	(1,546,071)	(1,483,517)	(1,415,754)	
Net change in total pension liability	3,247,373	8,002,742	571,108	532,030	
Total pension liability – beginning	31,994,311	23,991,569	23,420,461	22,888,431	
Total pension liability – ending (a)	**$35,241,684**	**$31,994,311**	**$23,991,569**	**$23,420,461**	**$22,888,431**
Plan fiduciary net position					
Contributions – employer	$563,977	$521,804	$484,005	$444,372	
Contributions – nonemployer	—	—	—	—	
Contributions – active member (includes purchased service)	256,420	247,533	244,926	234,056	
Net investment income	2,391,683	947,981	210,337	780,762	
Benefit payments, refunds, and disability premiums	(1,615,021)	(1,546,071)	(1,483,517)	(1,415,754)	
Administrative expense	(11,745)	(11,271)	(10,779)	(10,067)	
Other additions and deductions	12,208	5,668	1,617	118	
Net change in plan fiduciary net position	1,597,522	165,644	(553,411)	33,487	
Plan fiduciary net position – beginning	13,626,180	13,460,536	14,013,947	13,980,460	
Plan fiduciary net position – ending (b)	**$15,223,702**	**$13,626,180**	**$13,460,536**	**$14,013,947**	**$13,980,460**
Net pension liability – ending (a)-(b)	**$20,017,982**	**$18,368,131**	**$10,531,033**	**$9,406,514**	**$8,907,971**
Plan fiduciary net position as a percentage of the total pension liability	43.20%	42.59%	56.11%	59.84%	61.08%
Covered payroll	$2,774,207	$2,710,651	$2,641,867	$2,564,670	$2,474,965
Net pension liability as a percentage of covered payroll	721.57%	677.63%	398.62%	366.77%	359.92%

[1] Amounts for changes in net pension liability shaded in gray are not available for 2013.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—SCHOOL DIVISION

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	**$815,689**	$783,583	$663,873	$618,937	$1,270,011
Interest	**3,313,326**	3,278,565	3,006,736	2,938,492	2,759,146
Changes of benefit terms	**—**	(964,344)	—	(856,299)	(3,247,230)
Difference between expected and actual experience	**47,448**	110,446	595,867	770,676	443,651
Changes of assumptions or other inputs	**—**	—	2,020,180	—	(15,247,222)
Benefit payments, refunds, and disability premiums	**(2,813,457)**	(2,708,328)	(2,605,668)	(2,545,230)	(2,492,928)
Net change in total pension liability	**1,363,006**	499,922	3,680,988	926,576	(16,514,572)
Total pension liability – beginning	**46,292,090**	45,792,168	42,111,180	41,184,604	57,699,176
Total pension liability – ending (a)	**$47,655,096**	**$46,292,090**	**$45,792,168**	**$42,111,180**	**$41,184,604**
Plan fiduciary net position					
Contributions – employer	**$1,201,265**	$1,113,636	$1,048,992	$1,002,760	$923,910
Contributions – nonemployer	**350,393**	127,781	—	127,367	126,505
Contributions – active member (includes purchased service)	**699,671**	630,849	536,847	462,891	414,336
Net investment income (loss)	**(4,623,013)**	4,847,781	4,556,622	4,676,607	(838,899)
Benefit payments, refunds, and disability premiums	**(2,813,457)**	(2,708,328)	(2,605,668)	(2,545,230)	(2,492,928)
Administrative expense	**(25,562)**	(22,608)	(22,779)	(22,619)	(23,560)
Other additions and deductions	**1,610**	(8,572)	(11,226)	(7,929)	5,456
Net change in plan fiduciary net position	**(5,209,093)**	3,980,539	3,502,788	3,693,847	(1,885,180)
Plan fiduciary net position – beginning	**34,654,724**	30,674,185	27,171,397	23,477,550	25,362,730
Plan fiduciary net position – ending (b)	**$29,445,631**	**$34,654,724**	**$30,674,185**	**$27,171,397**	**$23,477,550**
Net pension liability – ending (a)-(b)	**$18,209,465**	**$11,637,366**	**$15,117,983**	**$14,939,783**	**$17,707,054**
Plan fiduciary net position as a percentage of the total pension liability	**61.79%**	74.86%	66.99%	64.52%	57.01%
Covered payroll	**$5,670,280**	$5,465,866	$5,146,118	$5,104,431	$4,789,503
Net pension liability as a percentage of covered payroll	**321.14%**	212.91%	293.77%	292.68%	369.71%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—SCHOOL DIVISION (CONTINUED)

For the Years Ended December 31

	2017	2016	2015	2014	2013[1]
Total pension liability					
Service cost	$954,368	$567,247	$548,358	$511,059	
Interest	2,690,433	2,722,256	2,652,731	2,582,865	
Changes of benefit terms	—	—	—	—	
Difference between expected and actual experience	564,155	346,658	278,464	(1,387)	
Changes of assumptions or other inputs	3,547,294	13,572,334	(298,005)	—	
Benefit payments, refunds, and disability premiums	(2,411,987)	(2,300,644)	(2,208,452)	(2,113,547)	
Net change in total pension liability	5,344,263	14,907,851	973,096	978,990	
Total pension liability – beginning	52,354,913	37,447,062	36,473,966	35,494,976	
Total pension liability – ending (a)	**$57,699,176**	**$52,354,913**	**$37,447,062**	**$36,473,966**	**$35,494,976**
Plan fiduciary net position					
Contributions – employer	$857,740	$812,740	$754,182	$686,323	
Contributions – nonemployer	—	—	—	—	
Contributions – active member (includes purchased service)	399,053	386,481	372,378	356,520	
Net investment income	3,982,275	1,569,026	344,000	1,274,862	
Benefit payments, refunds, and disability premiums	(2,411,987)	(2,300,644)	(2,208,452)	(2,113,547)	
Administrative expense	(23,019)	(21,991)	(20,865)	(19,290)	
Other additions and deductions	(22,378)	(17,334)	(9,082)	(4,264)	
Net change in plan fiduciary net position	2,781,684	428,278	(767,839)	180,604	
Plan fiduciary net position – beginning	22,581,046	22,152,768	22,920,607	22,740,003	
Plan fiduciary net position – ending (b)	**$25,362,730**	**$22,581,046**	**$22,152,768**	**$22,920,607**	**$22,740,003**
Net pension liability – ending (a)-(b)	**$32,336,446**	**$29,773,867**	**$15,294,294**	**$13,553,359**	**$12,754,973**
Plan fiduciary net position as a percentage of the total pension liability	43.96%	43.13%	59.16%	62.84%	64.07%
Covered payroll	$4,471,357	$4,349,320	$4,235,290	$4,063,236	$3,938,650
Net pension liability as a percentage of covered payroll	723.19%	684.56%	361.12%	333.56%	323.84%

[1] Amounts for changes in net pension liability shaded in gray are not available for 2013.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—LOCAL GOVERNMENT DIVISION

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	**$93,983**	$93,133	$77,400	$75,305	$84,331
Interest	**411,598**	408,879	379,994	373,200	386,381
Changes of benefit terms	**(9,807)**	(118,435)	—	(105,812)	(412,930)
Difference between expected and actual experience	**(8,688)**	(2,587)	32,128	65,687	77,207
Changes of assumptions or other inputs	**—**	—	222,809	—	—
Benefit payments, refunds, and disability premiums	**(350,307)**	(338,375)	(320,919)	(312,629)	(302,903)
Net change in total pension liability	**136,779**	42,615	391,412	95,751	(167,914)
Total pension liability – beginning	**5,758,380**	5,715,765	5,324,353	5,228,602	5,396,516
Total pension liability – ending (a)	**$5,895,159**	**$5,758,380**	**$5,715,765**	**$5,324,353**	**$5,228,602**
Plan fiduciary net position					
Contributions – employer	**$108,748**	$96,481	$89,662	$85,597	$81,358
Contributions – active member (includes purchased service)	**80,759**	77,096	66,958	62,823	58,063
Net investment income (loss)	**(781,550)**	820,403	771,556	792,219	(142,476)
Benefit payments, refunds, and disability premiums	**(350,307)**	(338,375)	(320,919)	(312,629)	(302,903)
Administrative expense	**(3,450)**	(3,065)	(2,459)	(2,476)	(2,621)
Other additions and deductions	**(5,721)**	(3,061)	(3,122)	(3,961)	(3,118)
Net change in plan fiduciary net position	**(951,521)**	649,479	601,676	621,573	(311,697)
Plan fiduciary net position – beginning	**5,844,117**	5,194,638	4,592,962	3,971,389	4,283,086
Plan fiduciary net position – ending (b)	**$4,892,596**	**$5,844,117**	**$5,194,638**	**$4,592,962**	**$3,971,389**
Net pension liability (asset) – ending (a)-(b)	**$1,002,563**	**($85,737)**	**$521,127**	**$731,391**	**$1,257,213**
Plan fiduciary net position as a percentage of the total pension liability	**82.99%**	101.49%	90.88%	86.26%	75.96%
Covered payroll	**$760,262**	$723,744	$698,060	$681,093	$660,998
Net pension liability (asset) as a percentage of covered payroll	**131.87%**	(11.85%)	74.65%	107.38%	190.20%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—LOCAL GOVERNMENT DIVISION (CONTINUED)

For the Years Ended December 31

	2017	2016	2015	2014	2013[1]
Total pension liability					
Service cost	$75,417	$65,250	$63,005	$58,676	
Interest	360,995	346,944	338,616	329,156	
Changes of benefit terms	(110)	—	—	—	
Difference between expected and actual experience	125,585	42,105	14,930	(322)	
Changes of assumptions or other inputs	—	179,802	(36,449)	—	
Benefit payments, refunds, and disability premiums	(289,218)	(272,344)	(265,789)	(256,972)	
Net change in total pension liability	272,669	361,757	114,313	130,538	
Total pension liability – beginning	5,123,847	4,762,090	4,647,777	4,517,239	
Total pension liability – ending (a)	**$5,396,516**	**$5,123,847**	**$4,762,090**	**$4,647,777**	**$4,517,239**
Plan fiduciary net position					
Contributions – employer	$78,291	$75,132	$70,415	$68,719	
Contributions – employer disaffiliation	1,063	—	—	186,006	
Contributions – active member (includes purchased service)	56,797	52,451	51,986	49,290	
Net investment income	669,011	261,276	56,328	200,394	
Benefit payments, refunds, and disability premiums	(289,218)	(272,344)	(265,789)	(256,972)	
Administrative expense	(2,541)	(2,395)	(2,253)	(2,091)	
Other additions and deductions	(3,823)	(1,123)	(1,646)	(2,190)	
Net change in plan fiduciary net position	509,580	112,997	(90,959)	243,156	
Plan fiduciary net position – beginning	3,773,506	3,660,509	3,751,468	3,508,312	
Plan fiduciary net position – ending (b)	**$4,283,086**	**$3,773,506**	**$3,660,509**	**$3,751,468**	**$3,508,312**
Net pension liability – ending (a)-(b)	**$1,113,430**	**$1,350,341**	**$1,101,581**	**$896,309**	**$1,008,927**
Plan fiduciary net position as a percentage of the total pension liability	79.37%	73.65%	76.87%	80.72%	77.66%
Covered payroll	$632,768	$608,223	$561,518	$540,468	$529,003
Net pension liability as a percentage of covered payroll	175.96%	222.01%	196.18%	165.84%	190.72%

[1] Amounts for changes in net pension liability shaded in gray are not available for 2013.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—JUDICIAL DIVISION

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	**$9,790**	$9,791	$9,106	$8,774	$13,516
Interest	**34,772**	34,282	32,590	32,105	30,417
Changes of benefit terms	**—**	(9,135)	105	(8,459)	(33,997)
Difference between expected and actual experience	**5,974**	4,037	10,421	2,732	3,122
Changes of assumptions or other inputs	**—**	—	915	—	(100,437)
Benefit payments, refunds, and disability premiums	**(32,951)**	(31,488)	(29,485)	(28,097)	(26,463)
Net change in total pension liability	**17,585**	7,487	23,652	7,055	(113,842)
Total pension liability – beginning	**486,298**	478,811	455,159	448,104	561,946
Total pension liability – ending (a)	**$503,883**	**$486,298**	**$478,811**	**$455,159**	**$448,104**
Plan fiduciary net position					
Contributions – employer	**$12,318**	$9,787	$10,402	$10,649	$8,299
Contributions – nonemployer	**3,576**	1,360	—	1,344	1,385
Contributions – active member (includes purchased service)	**8,822**	9,389	7,697	5,187	4,700
Net investment income (loss)	**(63,501)**	66,030	61,634	61,719	(11,006)
Benefit payments, refunds, and disability premiums	**(32,951)**	(31,488)	(29,485)	(28,097)	(26,463)
Administrative expense	**(212)**	(186)	(87)	(84)	(86)
Other additions and deductions	**4,492**	5,383	2,456	6,670	155
Net change in plan fiduciary net position	**(67,456)**	60,275	52,617	57,388	(23,016)
Plan fiduciary net position – beginning	**477,126**	416,851	364,234	306,846	329,862
Plan fiduciary net position – ending (b)	**$409,670**	**$477,126**	**$416,851**	**$364,234**	**$306,846**
Net pension liability – ending (a)-(b)	**$94,213**	**$9,172**	**$61,960**	**$90,925**	**$141,258**
Plan fiduciary net position as a percentage of the total pension liability	**81.30%**	98.11%	87.06%	80.02%	68.48%
Covered payroll	**$56,565**	$55,780	$54,780	$53,427	$50,506
Net pension liability as a percentage of covered payroll	**166.56%**	16.44%	113.11%	170.19%	279.69%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—JUDICIAL DIVISION (CONTINUED)

For the Years Ended December 31

	2017	2016	2015	2014	2013[1]
Total pension liability					
Service cost	$14,364	$12,639	$10,813	$9,024	
Interest	27,480	25,774	25,005	24,820	
Changes of benefit terms	—	—	—	—	
Difference between expected and actual experience	16,644	22,804	7,289	(5)	
Changes of assumptions or other inputs	(14,394)	43,576	21,485	21,294	
Benefit payments, refunds, and disability premiums	(25,298)	(22,888)	(21,200)	(19,903)	
Net change in total pension liability	18,796	81,905	43,392	35,230	
Total pension liability – beginning	543,150	461,245	417,853	382,623	
Total pension liability – ending (a)	**$561,946**	**$543,150**	**$461,245**	**$417,853**	**$382,623**
Plan fiduciary net position					
Contributions – employer	$8,080	$8,024	$7,702	$7,070	
Contributions – nonemployer	—	—	—	—	
Contributions – active member (includes purchased service)	4,863	4,037	4,197	4,296	
Net investment income	51,173	19,783	4,149	15,299	
Benefit payments, refunds, and disability premiums	(25,298)	(22,888)	(21,200)	(19,903)	
Administrative expense	(86)	(81)	(77)	(72)	
Other additions and deductions	2,226	2,678	3,081	156	
Net change in plan fiduciary net position	40,958	11,553	(2,148)	6,846	
Plan fiduciary net position – beginning	288,904	277,351	279,499	272,653	
Plan fiduciary net position – ending (b)	**$329,862**	**$288,904**	**$277,351**	**$279,499**	**$272,653**
Net pension liability – ending (a)-(b)	**$232,084**	**$254,246**	**$183,894**	**$138,354**	**$109,970**
Plan fiduciary net position as a percentage of the total pension liability	58.70%	53.19%	60.13%	66.89%	71.26%
Covered payroll	$48,948	$48,700	$46,870	$42,977	$39,942
Net pension liability as a percentage of covered payroll	474.14%	522.07%	392.35%	321.93%	275.32%

[1] Amounts for changes in net pension liability shaded in gray are not available for 2013.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—DPS DIVISION

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	**$113,836**	$107,672	$93,058	$91,764	$90,657
Interest	**333,769**	326,361	309,174	301,210	313,294
Changes of benefit terms	**—**	(89,028)	—	(82,064)	(318,480)
Difference between expected and actual experience	**15,514**	46,732	(15,298)	86,001	35,147
Changes of assumptions or other inputs	**—**	—	125,275	—	—
Benefit payments, refunds, and disability premiums	**(299,660)**	(291,799)	(287,719)	(288,984)	(287,825)
Net change in total pension liability	**163,459**	99,938	224,490	107,927	(167,207)
Total pension liability – beginning	**4,639,698**	4,539,760	4,315,270	4,207,343	4,374,550
Total pension liability – ending (a)	**$4,803,157**	**$4,639,698**	**$4,539,760**	**$4,315,270**	**$4,207,343**
Plan fiduciary net position					
Contributions – employer	**$74,199**	$65,215	$56,245	$43,340	$35,994
Contributions – nonemployer	**52,784**	19,153	—	19,201	18,621
Contributions – active member (includes purchased service)	**96,124**	90,154	75,456	65,496	61,098
Net investment income (loss)	**(619,265)**	649,370	610,847	632,669	(114,070)
Benefit payments, refunds, and disability premiums	**(299,660)**	(291,799)	(287,719)	(288,984)	(287,825)
Administrative expense	**(3,133)**	(2,829)	(2,667)	(2,713)	(2,919)
Other additions and deductions	**652**	(3,115)	(1,010)	2,975	(4,497)
Net change in plan fiduciary net position	**(698,299)**	526,149	451,152	471,984	(293,598)
Plan fiduciary net position – beginning	**4,633,727**	4,107,578	3,656,426	3,184,442	3,478,040
Plan fiduciary net position – ending (b)	**$3,935,428**	**$4,633,727**	**$4,107,578**	**$3,656,426**	**$3,184,442**
Net pension liability – ending (a)-(b)	**$867,729**	**$5,971**	**$432,182**	**$658,844**	**$1,022,901**
Plan fiduciary net position as a percentage of the total pension liability	**81.93%**	99.87%	90.48%	84.73%	75.69%
Covered payroll	**$810,403**	$823,396	$771,347	$736,264	$722,040
Net pension liability as a percentage of covered payroll	**107.07%**	0.73%	56.03%	89.48%	141.67%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS—DPS DIVISION (CONTINUED)

For the Years Ended December 31

	2017	2016	2015	2014	2013[1]
Total pension liability					
Service cost	$91,986	$85,988	$82,079	$76,564	
Interest	295,838	283,862	281,752	274,862	
Changes of benefit terms	—	—	—	—	
Difference between expected and actual experience	47,121	(2,839)	45,767	(174)	
Changes of assumptions or other inputs	—	205,645	(113,772)	—	
Benefit payments, refunds, and disability premiums	(281,844)	(272,071)	(263,323)	(255,434)	
Net change in total pension liability	153,101	300,585	32,503	95,818	
Total pension liability – beginning	4,221,449	3,920,864	3,888,361	3,792,543	
Total pension liability – ending (a)	**$4,374,550**	**$4,221,449**	**$3,920,864**	**$3,888,361**	**$3,792,543**
Plan fiduciary net position					
Contributions – employer	$27,578	$17,071	$8,494	$18,478	
Contributions – nonemployer	—	—	—	—	
Contributions – active member (includes purchased service)	56,820	54,852	53,558	49,409	
Net investment income	548,585	218,415	49,172	182,823	
Benefit payments, refunds, and disability premiums	(281,844)	(272,071)	(263,323)	(255,434)	
Administrative expense	(2,857)	(2,754)	(2,599)	(2,377)	
Other additions and deductions	3,781	3,135	(1,764)	(1,547)	
Net change in plan fiduciary net position	352,063	18,648	(156,462)	(8,648)	
Plan fiduciary net position – beginning	3,125,977	3,107,329	3,263,791	3,272,439	
Plan fiduciary net position – ending (b)	**$3,478,040**	**$3,125,977**	**$3,107,329**	**$3,263,791**	**$3,272,439**
Net pension liability – ending (a)-(b)	**$896,510**	**$1,095,472**	**$813,535**	**$624,570**	**$520,104**
Plan fiduciary net position as a percentage of the total pension liability	79.51%	74.05%	79.25%	83.94%	86.29%
Covered payroll	$658,198	$642,177	$621,115	$584,319	$547,660
Net pension liability as a percentage of covered payroll	136.21%	170.59%	130.98%	106.89%	94.97%

[1] Amounts for changes in net pension liability shaded in gray are not available for 2013.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF EMPLOYER AND NONEMPLOYER CONTRIBUTIONS

For the Years Ended December 31

State Division	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**23.45%**	21.05%	23.69%	23.28%	26.30%
Covered payroll (b)	**$3,183,955**	$3,092,509	$3,089,161	$2,995,453	$2,898,827
Annual Increase Reserve contribution (c)	**22,441**	20,606	19,442	17,663	15,919
Actuarially determined contribution (a) x (b) + (c)	**769,078**	671,579	751,264	715,004	778,311
Contributions in relation to the actuarially determined contribution[1,2]	**903,044**	741,010	646,386	689,370	661,653
Annual contribution deficiency (excess)	**($133,966)**	**($69,431)**	**$104,878**	**$25,634**	**$116,658**
Actual contributions as a percentage of covered payroll	**28.36%**	23.96%	20.92%	23.01%	22.82%

	2017	2016	2015	2014	2013
Actuarially determined contribution rate (a)	22.71%	22.31%	22.35%	20.45%	20.01%
Covered payroll (b)	$2,774,207	$2,710,651	$2,641,867	$2,564,670	$2,474,965
Annual Increase Reserve contribution (c)	14,355	12,838	11,400	9,984	N/A
Actuarially determined contribution (a) x (b) + (c)	644,377	617,584	601,857	534,459	495,241
Contributions in relation to the actuarially determined contribution	563,977	521,804	484,005	444,372	393,218
Annual contribution deficiency	**$80,400**	**$95,780**	**$117,852**	**$90,087**	**$102,023**
Actual contributions as a percentage of covered payroll	20.33%	19.25%	18.32%	17.33%	15.89%

School Division	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**24.54%**	20.61%	23.37%	23.59%	26.80%
Covered payroll (b)	**$5,670,280**	$5,465,866	$5,146,118	$5,104,431	$4,789,503
Annual Increase Reserve contribution (c)	**35,114**	31,169	28,159	26,062	22,497
Actuarially determined contribution (a) x (b) + (c)	**1,426,601**	1,157,684	1,230,807	1,230,197	1,306,084
Contributions in relation to the actuarially determined contribution[1,2]	**1,551,658**	1,241,417	1,048,992	1,130,127	1,050,415
Annual contribution deficiency (excess)	**($125,057)**	**($83,733)**	**$181,815**	**$100,070**	**$255,669**
Actual contributions as a percentage of covered payroll	**27.36%**	22.71%	20.38%	22.14%	21.93%

	2017	2016	2015	2014	2013
Actuarially determined contribution rate (a)	22.54%	22.36%	21.94%	19.65%	19.79%
Covered payroll (b)	$4,471,357	$4,349,320	$4,235,290	$4,063,236	$3,938,650
Annual Increase Reserve contribution (c)	19,903	17,868	15,648	13,280	N/A
Actuarially determined contribution (a) x (b) + (c)	1,027,747	990,376	944,871	811,706	779,459
Contributions in relation to the actuarially determined contribution	857,740	812,740	754,182	686,323	613,738
Annual contribution deficiency	**$170,007**	**$177,636**	**$190,689**	**$125,383**	**$165,721**
Actual contributions as a percentage of covered payroll	19.18%	18.69%	17.81%	16.89%	15.58%

1 Includes an annual contribution from a nonemployer contributing entity required by C.R.S. § 24-51-414 *et seq.* starting on July 1, 2018.

2 House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF EMPLOYER AND NONEMPLOYER CONTRIBUTIONS (CONTINUED)

For the Years Ended December 31

Local Government Division	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**12.72%**	10.84%	13.01%	11.13%	14.27%
Covered payroll (b)	**$760,262**	$723,744	$698,060	$681,093	$660,998
Annual Increase Reserve contribution (c)	**5,739**	4,964	4,492	4,201	3,779
Actuarially determined contribution (a) x (b) + (c)	**102,444**	83,418	95,310	80,007	98,103
Contributions in relation to the actuarially determined contribution	**108,748**	96,481	89,662	85,597	81,358
Annual contribution deficiency (excess)	**($6,304)**	**($13,063)**	**$5,648**	**($5,590)**	**$16,745**
Actual contributions as a percentage of covered payroll	**14.30%**	13.33%	12.84%	12.57%	12.31%

	2017	2016	2015	2014	2013
Actuarially determined contribution rate (a)	11.92%	11.98%	13.62%	11.78%	10.62%
Covered payroll (b)	$632,768	$608,223	$561,518	$540,468	$529,003
Annual Increase Reserve contribution (c)	3,390	2,969	2,522	2,180	N/A
Actuarially determined contribution (a) x (b) + (c)	78,816	75,834	79,001	65,847	56,180
Contributions in relation to the actuarially determined contribution	78,291[1]	75,132	70,415	68,719[2]	65,329
Annual contribution deficiency (excess)	**$525**	**$702**	**$8,586**	**($2,872)**	**($9,149)**
Actual contributions as a percentage of covered payroll	12.37%	12.35%	12.54%	12.71%	12.35%

Judicial Division	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**15.56%**	14.13%	22.05%	21.90%	27.26%
Covered payroll (b)	**$56,565**	$55,780	$54,780	$53,427	$50,506
Annual Increase Reserve contribution (c)	**357**	314	289	251	207
Actuarially determined contribution (a) x (b) + (c)	**9,159**	8,196	12,368	11,952	13,975
Contributions in relation to the actuarially determined contribution[3,4]	**15,894**	11,147	10,402	11,993	9,684
Annual contribution deficiency (excess)	**($6,735)**	**($2,951)**	**$1,966**	**($41)**	**$4,291**
Actual contributions as a percentage of covered payroll	**28.10%**	19.98%	18.99%	22.45%	19.17%

	2017	2016	2015	2014	2013
Actuarially determined contribution rate (a)	22.54%	22.07%	21.45%	20.07%	21.53%
Covered payroll (b)	$48,948	$48,700	$46,870	$42,977	$39,942
Annual Increase Reserve contribution (c)	191	164	141	116	N/A
Actuarially determined contribution (a) x (b) + (c)	11,224	10,912	10,195	8,741	8,599
Contributions in relation to the actuarially determined contribution	8,080	8,024	7,702	7,070	6,494
Annual contribution deficiency	**$3,144**	**$2,888**	**$2,493**	**$1,671**	**$2,105**
Actual contributions as a percentage of covered payroll	16.51%	16.48%	16.43%	16.45%	16.26%

[1] Contributions do not include the disaffiliation payment of $1,063 for Cunningham Fire Protection District.

[2] Contributions do not include the disaffiliation payment of $186,006 for Memorial Health System.

[3] Includes an annual contribution from a nonemployer contributing entity required by C.R.S. § 24-51-414 *et seq.* starting on July 1, 2018.

[4] House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF EMPLOYER AND NONEMPLOYER CONTRIBUTIONS (CONTINUED)

For the Years Ended December 31

DPS Division	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**9.25%**	8.22%	10.42%	11.14%	13.50%
Covered payroll (b)	**$810,403**	$823,396	$771,347	$736,264	$722,040
Annual Increase Reserve contribution (c)	**6,160**	5,905	5,357	4,989	4,624
Actuarially determined contribution (a) x (b) + (c)	**81,122**	73,588	85,731	87,009	102,099
Contributions in relation to the actuarially determined contribution[1,2]	**126,983**	84,368	56,245	62,541	54,615
Annual contribution deficiency (excess)	**($45,861)**	**($10,780)**	**$29,486**	**$24,468**	**$47,484**
Actual contributions as a percentage of covered payroll	**15.67%**	10.25%	7.29%	8.49%	7.56%

	2017	2016	2015	2014	2013
Actuarially determined contribution rate (a)	10.28%	10.46%	11.06%	9.67%	11.53%
Covered payroll (b)	$658,198	$642,177	$621,115	$584,319	$547,660
Annual Increase Reserve contribution (c)	4,100	3,685	3,186	2,633	N/A
Actuarially determined contribution (a) x (b) + (c)	71,763	70,857	71,881	59,137	63,145
Contributions in relation to the actuarially determined contribution	27,578	17,071	8,494	18,478	23,104
Annual contribution deficiency	**$44,185**	**$53,786**	**$63,387**	**$40,659**	**$40,041**
Actual contributions as a percentage of covered payroll	4.19%	2.66%	1.37%	3.16%	4.22%

[1] Includes an annual contribution from a nonemployer contributing entity required by C.R.S. § 24-51-414 et seq. starting on July 1, 2018.

[2] House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

The accompanying notes are an integral part of the Required Supplementary Information.

SCHEDULE OF INVESTMENT RETURNS[1]

For the Years Ended December 31

	2022	2021	2020	2019	2018	2017	2016	2015	2014
Annual money-weighted rate of return, net of investment expenses	**(13.5%)**	16.1%	17.1%	20.4%	(3.3%)	18.1%	7.3%	1.6%	5.8%

[1] Information is not available prior to 2014. In future reports, additional years will be added until 10 years of historical data are presented.

The accompanying notes are an integral part of the Required Supplementary Information.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

Note 1—Significant Changes in Plan Provisions Affecting Trends in Actuarial Information

2022 Changes in Plan Provisions Since 2021

- House Bill (HB) 22-1029, effective upon enactment in 2022, required the State treasurer to issue, in addition to the regularly scheduled $225 million (actual dollars) direct distribution, a warrant to PERA in the amount of $380 million (actual dollars) with reductions to future direct distributions. The July 1, 2023, direct distribution will be reduced by $190 million (actual dollars) to $35 million (actual dollars). The July 1, 2024, direct distribution will not be reduced from $225 million (actual dollars) due to a negative investment return in 2022.
- The total pension liability for the Local Government Division, as of the December 31, 2022, measurement date, was adjusted to reflect the disaffiliation, as allowable under C.R.S. § 24-51-313, of Tri-County Health Department (Tri-County Health), effective December 31, 2022. As of the close of the 2022 fiscal year, no disaffiliation payment associated with Tri-County Health was received, and therefore no disaffiliation dollars were reflected in the fiduciary net position as of the December 31, 2022, measurement date.
- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the pension certificates of participation (PCOPs) issued in 1997 and 2008 and refinanced thereafter.

2021 Changes in Plan Provisions Since 2020

- The following changes reflect the anticipated adjustments resulting from the 2020 automatic adjustment provision (AAP) assessment, statutorily recognized July 1, 2021, and effective July 1, 2022:
  - Member contribution rates increase by 0.50%.
  - Employer contribution rates increase by 0.50%.
  - Annual Increase (AI) cap is lowered from 1.25% per year to 1.00% per year.
- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2020 Changes in Plan Provisions Since 2019

- HB 20-1379, enacted on June 29, 2020, suspended the $225 million (actual dollars) direct distribution payable on July 1, 2020 for the State's 2020-21 fiscal year.
- HB 20-1394, enacted on June 29, 2020, requires 5.0% of the Judicial Division base employer contributions rate to be paid by the members of the Judicial Division for the State's 2020-21 and 2021-22 fiscal years. This does not apply to the employer or member contribution rates for judges employed by the Denver County Court.
- Senate Bill (SB) 18-200 and SB 20-057, enacted in 2018 and 2020, respectively expanded the definition of "State Troopers" under Colorado law as follows:
  - Beginning July 1, 2020, new or existing employees of the Division of Fire Prevention and Control in the Department of Public Safety classified as firefighter I through firefighter VII;
  - New members hired on or after January 1, 2020, as a county sheriff, undersheriff, deputy sheriff, noncertified deputy sheriff, or detention officer by a Local Government Division employer; and
  - New members hired on or after January 1, 2020, as a corrections officer classified as I through IV by a State Division employer.
- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2019 Changes in Plan Provisions Since 2018

- SB 18-200 was enacted on June 4, 2018, which included the adoption of the AAP. The following changes reflect the anticipated adjustments resulting from the 2018 AAP assessment, statutorily recognized July 1, 2019, and effective July 1, 2020:
  - Member contribution rates increase by 0.50%.
  - Employer contribution rates increase by 0.50%.
  - AI cap is lowered from 1.50% per year to 1.25% per year.
- HB 19-1217, enacted May 20, 2019, repealed the member contribution increases scheduled for the Local Government Division pursuant to SB 18–200.
- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2018 Changes in Plan Provisions Since 2017

- The following changes were made to the plan provisions as part of SB 18-200:
  - Member contribution rates increase by 0.75% effective July 1, 2019, an additional 0.75% effective July 1, 2020, and an additional 0.50% effective July 1, 2021.
  - Employer contribution rates increase by 0.25% effective July 1, 2019 for State, School, Judicial, and DPS Divisions.
  - An annual direct distribution of $225 million (actual dollars) from the State of Colorado, recognized as a

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

nonemployer contributing entity, is distributed between the State, School, Judicial, and DPS Divisions proportionally based on payroll.

- AI cap is lowered from 2.00% per year to 1.50% per year.
- Initial AI waiting period is extended from one year after retirement to three years after retirement.
- AI payments are suspended for 2018 and 2019.
- The number of years used in the Highest Average Salary calculation for non-vested members as of January 1, 2020, increases from three to five years for the State, School, Local Government, and DPS Divisions and increases from one to three years for the Judicial Division.

- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2017 Changes in Plan Provisions Since 2016

- The Cunningham Fire Protection District (CFPD) disaffiliated from the Local Government Division on December 2, 2017. For the purpose of the December 31, 2017, measurement date, liabilities were determined assuming no additional benefit accruals for the disaffiliated membership of the CFPD that had not refunded their PERA member contribution accounts. The total disaffiliation payment of $1,159 was allocated to the Local Government Division Trust Fund and the Health Care Trust Fund (HCTF) in the amount of $1,063 and $96, respectively.
- Pursuant to HB 17-1265, the Amortization Equalization Disbursement (AED) and Supplemental Amortization Equalization Disbursement (SAED) contribution rates are adjusted for employers in the Judicial Division as follows:
  - For the calendar year beginning in 2019, C.R.S. § 24-51-411(4.5) increased the AED payment to 3.40% of PERA-includable salary and requires the AED payment to increase by 0.40% at the start of each of the following four calendar years through 2023 at which time the AED payment will be 5.00% of PERA-includable salary.
  - For the calendar year beginning in 2019, C.R.S. § 24-51-411(7.5) increased the SAED payment to 3.40% of PERA-includable salary and requires the SAED payment to increase by 0.40% at the start of each of the following four calendar years through 2023 at which time the SAED payment will be 5.00% of PERA-includable salary.
- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2016 Changes in Plan Provisions Since 2015

- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2015 Changes in Plan Provisions Since 2014

- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.
- As required under C.R.S. § 24-51-401(1.7)(e), PERA calculated and provided to the Colorado General Assembly an adjustment to the DPS Division's employer contribution rate to assure the equalization of the School Division's and the DPS Division's ratios of unfunded actuarial accrued liability (UAAL) to payroll as of December 31, 2039. Subsequently, the Colorado General Assembly passed HB 15-1391, reducing the employer contribution rate of the DPS Division from 13.75% to 10.15%, effective January 1, 2015.

2014 Changes in Plan Provisions Since 2013

- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

2013 Changes in Plan Provisions Since 2012

- Actual employer contributions to the DPS Division are reduced by an amount equal to the principal payments plus interest necessary each year to finance the PCOPs issued in 1997 and 2008 and refinanced thereafter.

Note 2—Significant Changes in Assumptions or Other Inputs Affecting Trends in Actuarial Information

2022 Changes in Assumptions or Other Inputs Since 2021

- There were no changes made to the actuarial methods or assumptions.

2021 Changes in Assumptions or Other Inputs Since 2020

- The assumption used to value the AI cap benefit provision was changed from 1.25% to 1.00%.

2020 Changes in Assumptions or Other Inputs Since 2019

- The price inflation assumption was lowered from 2.40% to 2.30%.
- The wage inflation assumption was lowered from 3.50% to 3.00%.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

- The real rate of investment return assumption was increased to 4.95% per year, net of investment expenses from 4.85% per year, net of investment expenses.
- Salary scale assumptions were revised to align with revised economic assumptions and to more closely reflect actual experience.
- Rates of termination/withdrawal, retirement, and disability were revised to more closely reflect actual experience.
- The pre-retirement mortality assumption for the State and Local Government Divisions (members other than State Troopers) was changed to the PubG-2010 Employee Table with generational projection using scale MP-2019.
- The pre-retirement mortality assumption for State Troopers was changed to the PubS-2010 Employee Table with generational projection using scale MP-2019.
- The pre-retirement mortality assumption for the School and DPS Divisions was changed to the PubT-2010 Employee Table with generational projection using scale MP-2019.
- The pre-retirement mortality assumption for the Judicial Division was changed to the PubG-2010(A) Above-Median Employee Table with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for the State and Local Government Divisions (members other than State Troopers) was changed to the PubG-2010 Healthy Retiree Table, adjusted as follows:
  - **Males:** 94% of the rates prior to age 80 and 90% of the rates for ages 80 and older, with generational projection using scale MP-2019.
  - **Females:** 87% of the rates prior to age 80 and 107% of the rates for ages 80 and older, with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for State Troopers was changed to the unadjusted PubS-2010 Healthy Retiree Table, with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for the School and DPS Divisions was changed to the PubT-2010 Healthy Retiree Table, adjusted as follows:
  - **Males:** 112% of the rates prior to age 80 and 94% of the rates for ages 80 and older, with generational projection using scale MP-2019.
  - **Females:** 83% of the rates prior to age 80 and 106% of the rates for ages 80 and older, with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for the Judicial Division was changed to the unadjusted PubG-2010(A) Above-Median Healthy Retiree Table with generational projection using scale MP-2019.The post-retirement non-disabled beneficiary mortality assumption for the Division Trust Funds was changed to the Pub-2010 Contingent Survivor Table, adjusted as follows:
  - **Males:** 97% of the rates for all ages, with generational projection using scale MP-2019.
  - **Females:** 105% of the rates for all ages, with generational projection using scale MP-2019.
- The disabled mortality assumption for the Division Trust Funds (members other than State Troopers) was changed to the PubNS-2010 Disabled Retiree Table using 99% of the rates for all ages with generational projection using scale MP-2019.
- The disabled mortality assumption for State Troopers was changed to the unadjusted PubS-2010 Disabled Retiree Table with generational projection using scale MP-2019.
- The mortality tables are generational mortality tables developed on a benefit-weighted basis.

2019 Changes in Assumptions or Other Inputs Since 2018

- The assumption used to value the AI cap benefit provision was changed from 1.50% to 1.25%.

2018 Changes in Assumptions or Other Inputs Since 2017

- The single equivalent interest rate (SEIR) for the State Division was increased from 4.72% to 7.25% to reflect the changes to the projection's valuation basis which no longer resulted in a projected year of depletion of the fiduciary net position (FNP), thereby eliminating the need to apply the municipal bond index rate.
- The SEIR for the School Division was increased from 4.78% to 7.25% to reflect the changes to the projection's valuation basis which no longer resulted in a projected year of depletion of the FNP, thereby eliminating the need to apply the municipal bond index rate.
- The SEIR for the Judicial Division was increased from 5.41% to 7.25% to reflect the changes to the projection's valuation basis which no longer resulted in a projected year of depletion of the FNP, thereby eliminating the need to apply the municipal bond index rate.

2017 Changes in Assumptions or Other Inputs Since 2016

- The SEIR for the State Division was lowered from 5.26% to 4.72% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)— DIVISION TRUST FUNDS

(Dollars in Thousands)

- The SEIR for the School Division was lowered from 5.26% to 4.78% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate.
- The SEIR for the Judicial Division was increased from 5.18% to 5.41% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate.
- The municipal bond index rate used in the determination of the SEIR for the State, School, and Judicial Divisions changed from 3.86% on the prior measurement date to 3.43% on the measurement date.

2016 Changes in Assumptions or Other Inputs Since 2015

- The investment return assumption was lowered from 7.50% to 7.25%.
- The price inflation assumption was lowered from 2.80% to 2.40%.
- The wage inflation assumption was lowered from 3.90% to 3.50%.
- The post-retirement mortality assumption for healthy lives for the State and Local Government Divisions was changed to the RP-2014 Healthy Annuitant Mortality Table with adjustments for credibility and gender adjustments of a 73% factor applied to ages below 80 and a 108% factor applied to age 80 and above, projected to 2018, for males, and a 78% factor applied to ages below 80 and a 109% factor applied to age 80 and above, projected to 2020, for females.
- The post-retirement mortality assumption for healthy lives for the School, Judicial, and DPS Divisions was changed to the RP-2014 White Collar Healthy Annuitant Mortality Table with adjustments for credibility and gender adjustments of a 93% factor applied to ages below 80 and a 113% factor applied to age 80 and above, projected to 2018, for males, and a 68% factor applied to ages below 80 and a 106% factor applied to age 80 and above, projected to 2020, for females.
- For disabled retirees, the mortality assumption was changed to reflect 90% of RP-2014 Disabled Retiree Mortality Table.
- The mortality assumption for active members was changed to RP-2014 White Collar Employee Mortality Table, a table specifically developed for actively working people. To allow for an appropriate margin of improved mortality prospectively, the mortality rates incorporate a 70% factor applied to male rates and a 55% factor applied to female rates.
- The rates of retirement, withdrawal, and disability were revised to reflect more closely actual experience.
- The estimated administrative expense as a percentage of covered payroll was increased from 0.35% to 0.40%.
- The SEIR for the State and School Divisions was lowered from 7.50% to 5.26% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate of 3.86% on the measurement date.
- The SEIR for the Local Government Division was lowered from 7.50% to 7.25%, reflecting the change in the long-term expected rate of return.
- The SEIR for the Judicial Division was lowered from 5.73% to 5.18% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate from 3.57% on the prior measurement date to 3.86% on the measurement date.
- The SEIR for the DPS Division was lowered from 7.50% to 7.25%, reflecting the change in the long-term expected rate of return.

2015 Changes in Assumptions or Other Inputs Since 2014

- The SEIR for the Judicial Division was lowered from 6.14% to 5.73% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate from 3.70% on the prior measurement date to 3.57% on the measurement date.
- The following programming changes were made:
  - Valuation of the full survivor benefit without any reduction for possible remarriage.
  - Reflection of the employer match on separation benefits for all eligible years.
  - Reflection of one year of service eligibility for survivor annuity benefit.
  - Refinement of the 18-month AI timing.
  - Refinements to directly value certain and life, modified cash refund and pop-up benefit forms.
- The following methodology changes were made:
  - Recognition of merit salary increases in the first projection year.
  - Elimination of the assumption that 35% of future disabled members elect to receive a refund.
  - Removal of the negative value adjustment for liabilities associated with refunds of future terminating members.
  - Adjustments to the timing of the normal cost and UAAL payment calculations to reflect contributions throughout the year.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—DIVISION TRUST FUNDS

(Dollars in Thousands)

2014 Changes in Assumptions or Other Inputs Since 2013

- The SEIR for the Judicial Division was lowered from 6.66% to 6.14% to reflect the changes to the projection's valuation basis, a projected year of depletion of the FNP, and the resulting application of the municipal bond index rate from 4.73% on the prior measurement date to 3.70% on the measurement date.
- In 2012, a lawsuit was initiated to determine the amount owed to PERA by Memorial and the City of Colorado Springs (City) for Memorial's departure from PERA. In September 2014, PERA and the City agreed to resolve the lawsuit. The agreement provided for the City to pay PERA $190,000 for the liabilities associated with the retirement and health care benefits already earned by 7,666 Memorial employees for the work that they performed before Memorial ceased to be a PERA employer. On October 3, 2014, PERA received a disaffiliation payment from the City, which was allocated to the Local Government Division Trust Fund and the HCTF in the amount of $186,006 and $3,994, respectively.

2013 Changes in Assumptions or Other Inputs Since 2012

- The investment return assumption was lowered from 8.00% to 7.50%.
- The price inflation assumption was lowered from 3.50% to 2.80%.
- The wage inflation assumption was lowered from 4.25% to 3.90%.

Note 3—Methods and Assumptions Used in Calculations of ADC

The ADC rates, as a percentage of covered payroll, used to determine the ADC amounts in the Schedule of Employer and Nonemployer Contributions are calculated as of December 31, two years prior to the end of the year in which ADC amounts are reported. The following actuarial methods and assumptions from the December 31, 2020, actuarial valuation were used to determine contribution rates reported in that schedule for the year ending December 31, 2022:

Actuarial cost method	Entry age
Amortization method	Level percentage of payroll
Amortization period	30 years, closed, layered[1]
Equivalent single amortization period	27 years (25 years for State Division Division)
Asset valuation method	4-year smoothed market
Price inflation	2.30%
Real wage growth	0.70%
Wage inflation	3.00%
Salary increases, including wage inflation	2.80% to 12.40%[2]
Long-term investment rate of return, net of pension plan investment expense, including price inflation	7.25%
Future post-retirement benefit increases	
PERA benefit structure hired prior to 1/1/07 and DPS benefit structure	1.25% compounded annually
PERA benefit structure hired after 12/31/06	0.00%, as financed by the AIR

[1] Effective with the December 31, 2014, actuarial valuation, gains and losses are to be amortized over a closed period.

[2] Salary increases range by age and Division Trust Fund.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET OPEB LIABILITY AND RELATED RATIOS—HEALTH CARE TRUST FUND[1]

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total OPEB liability					
Service cost	**$15,727**	$18,188	$18,074	$18,159	$19,328
Interest	**101,209**	101,172	106,997	117,840	112,849
Changes of benefit terms	**(43)**	—	—	—	—
Difference between expected and actual experience	**(59,877)**	(52,850)	(68,772)	(224,212)	(2,482)
Changes of assumptions or other inputs	**(65,295)**	15,483	(69,759)	2,006	11,438
Benefit payments and health care claims/ administrative processing fees	**(85,592)**	(72,465)	(61,522)	(65,019)	(77,221)
Net change in total OPEB liability	**(93,871)**	9,528	(74,982)	(151,226)	63,912
Total OPEB liability – beginning	**1,423,054**	1,413,526	1,488,508	1,639,734	1,575,822
Total OPEB liability – ending (a)	**$1,329,183**	**$1,423,054**	**$1,413,526**	**$1,488,508**	**$1,639,734**
Plan fiduciary net position					
Contributions – employer	**$103,818**	$97,974	$94,634	$92,011	$86,559
Other additions (includes purchased service transfers)	**9,004**	8,108	7,909	6,984	8,373
Net investment income (loss)	**(70,476)**	68,319	60,280	53,867	(9,678)
Benefit payments	**(83,145)**	(63,893)	(53,023)	(58,221)	(61,777)
Administrative expense	**(7,136)**	(12,976)	(10,977)	(9,290)	(20,401)
Other deductions	**(110)**	(84)	(32)	(33)	(106)
Net change in plan fiduciary net position	**(48,045)**	97,448	98,791	85,318	2,970
Plan fiduciary net position – beginning	**560,749**	463,301	364,510	279,192	276,222
Plan fiduciary net position – ending (b)	**$512,704**	**$560,749**	**$463,301**	**$364,510**	**$279,192**
Net OPEB liability – ending (a)-(b)	**$816,479**	**$862,305**	**$950,225**	**$1,123,998**	**$1,360,542**
Plan fiduciary net position as a percentage of the total OPEB liability	**38.57%**	39.40%	32.78%	24.49%	17.03%
Covered payroll	**$9,671,062**	$9,337,899	$8,988,119	$8,834,404	$8,399,835
Net OPEB liability as a percentage of covered payroll	**8.44%**	9.23%	10.57%	12.72%	16.20%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET OPEB LIABILITY AND RELATED RATIOS—HEALTH CARE TRUST FUND (CONTINUED)[1,2]

For the Years Ended December 31

	2017	2016
Total OPEB liability		
Service cost	$20,036	
Interest	108,625	
Changes of benefit terms	5	
Difference between expected and actual experience	7,354	
Changes of assumptions or other inputs	—	
Benefit payments and health care claims/ administrative processing fees	(116,960)	
Net change in total OPEB liability	19,060	
Total OPEB liability – beginning	1,556,762	
Total OPEB liability – ending (a)	**$1,575,822**	**$1,556,762**
Plan fiduciary net position		
Contributions – employer	$83,077	
Contributions – employer disaffiliation	96	
Other additions (includes purchased service transfers)	9,760	
Net investment income	44,990	
Benefit payments	(102,665)	
Administrative expense	(19,162)	
Other deductions	(102)	
Net change in plan fiduciary net position	15,994	
Plan fiduciary net position – beginning	260,228	
Plan fiduciary net position – ending (b)	**$276,222**	**$260,228**
Net OPEB liability – ending (a)-(b)	**$1,299,600**	**$1,296,534**
Plan fiduciary net position as a percentage of the total OPEB liability	17.53%	16.72%
Covered payroll	$7,927,280	$7,716,894
Net OPEB liability as a percentage of covered payroll	16.39%	16.80%

1 Information is not available prior to 2016. In future reports, additional years will be added until 10 years of historical data are presented.

2 Amounts for changes in net OPEB liability shaded in gray are not available for 2016.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET OPEB LIABILITY AND RELATED RATIOS—DPS HEALTH CARE TRUST FUND[1]

For the Years Ended December 31

	2022	2021	2020	2019	2018
Total OPEB liability					
Service cost	**$1,095**	$1,237	$1,291	$1,342	$1,420
Interest	**4,675**	4,750	5,005	4,970	5,245
Changes of benefit terms	**—**	—	—	—	—
Difference between expected and actual experience	**(2,353)**	(2,855)	(4,339)	(2,070)	(6,045)
Changes of assumptions or other inputs	**(3,703)**	—	(1,764)	—	5
Benefit payments and health care claims/ administrative processing fees	**(4,162)**	(3,873)	(3,453)	(3,968)	(4,693)
Net change in total OPEB liability	**(4,448)**	(741)	(3,260)	274	(4,068)
Total OPEB liability – beginning	**65,472**	66,213	69,473	69,199	73,267
Total OPEB liability – ending (a)	**$61,024**	**$65,472**	**$66,213**	**$69,473**	**$69,199**
Plan fiduciary net position					
Contributions – employer	**$8,744**	$8,622	$8,045	$7,649	$7,417
Other additions (includes purchased service transfers)	**306**	206	224	188	205
Net investment income (loss)	**(7,311)**	6,963	6,019	4,892	(894)
Benefit payments	**(4,022)**	(3,516)	(3,086)	(3,644)	(4,158)
Administrative expense	**(434)**	(639)	(516)	(477)	(845)
Other deductions	**(1)**	(4)	(1)	(1)	(4)
Net change in plan fiduciary net position	**(2,718)**	11,632	10,685	8,607	1,721
Plan fiduciary net position – beginning	**54,953**	43,321	32,636	24,029	22,308
Plan fiduciary net position – ending (b)	**$52,235**	**$54,953**	**$43,321**	**$32,636**	**$24,029**
Net OPEB liability – ending (a)-(b)	**$8,789**	**$10,519**	**$22,892**	**$36,837**	**$45,170**
Plan fiduciary net position as a percentage of the total OPEB liability	**85.60%**	83.93%	65.43%	46.98%	34.72%
Covered payroll	**$810,403**	$823,396	$771,347	$736,264	$722,040
Net OPEB liability as a percentage of covered payroll	**1.08%**	1.28%	2.97%	5.00%	6.26%

Please see next page for footnote references.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CHANGES IN NET OPEB LIABILITY AND RELATED RATIOS—DPS HEALTH CARE TRUST FUND (CONTINUED)[1,2]

For the Years Ended December 31

	2017	2016
Total OPEB liability		
Service cost	$1,591	
Interest	5,057	
Changes of benefit terms	—	
Difference between expected and actual experience	(35)	
Changes of assumptions or other inputs	—	
Benefit payments and health care claims/ administrative processing fees	(6,191)	
Net change in total OPEB liability	422	
Total OPEB liability – beginning	72,845	
Total OPEB liability – ending (a)	**$73,267**	**$72,845**
Plan fiduciary net position		
Contributions – employer	$6,930	
Other additions (includes purchased service transfers)	242	
Net investment income	3,305	
Benefit payments	(5,694)	
Administrative expense	(808)	
Other deductions	(4)	
Net change in plan fiduciary net position	3,971	
Plan fiduciary net position – beginning	18,337	
Plan fiduciary net position – ending (b)	**$22,308**	**$18,337**
Net OPEB liability – ending (a)-(b)	**$50,959**	**$54,508**
Plan fiduciary net position as a percentage of the total OPEB liability	30.45%	25.17%
Covered payroll	$658,198	$642,177
Net OPEB liability as a percentage of covered payroll	7.74%	8.49%

[1] Information is not available prior to 2016. In future reports, additional years will be added until 10 years of historical data are presented.

[2] Amounts for changes in net OPEB liability shaded in gray are not available for 2016.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CONTRIBUTIONS FROM EMPLOYERS AND OTHER CONTRIBUTING ENTITIES

For the Years Ended December 31

Health Care Trust Fund	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**0.84%**	0.89%	0.97%	1.11%	1.12%
Covered payroll (b)	**$9,671,062**	$9,337,899	$8,988,119	$8,834,404	$8,399,835
Actuarially determined contribution (a) x (b)	**81,237**	83,107	87,185	98,062	94,078
Contributions in relation to the actuarially determined contribution	**103,818**	97,974	94,634	92,011	86,559
Annual contribution deficiency (excess)	**($22,581)**	**($14,867)**	**($7,449)**	**$6,051**	**$7,519**
Actual contributions as a percentage of covered payroll	**1.07%**	1.05%	1.05%	1.04%	1.03%

	2017	2016	2015	2014	2013
Actuarially determined contribution rate (a)	1.08%	1.09%	1.15%	1.32%	1.24%
Covered payroll (b)	$7,927,280	$7,716,894	$7,485,545	$7,211,351	$6,982,560
Retiree drug subsidy (c)	—	—	—	—	15,731
Actuarially determined contribution (a) x (b) + (c)	85,615	84,114	86,084	95,190	102,315
Contributions in relation to the actuarially determined contribution	83,077[1]	80,825	78,463	75,631[2]	88,515
Annual contribution deficiency	**$2,538**	**$3,289**	**$7,621**	**$19,559**	**$13,800**
Actual contributions as a percentage of covered payroll	1.05%	1.05%	1.05%	1.05%	1.27%

[1] Contributions do not include the disaffiliation payment of $96 for Cunningham Fire Protection District.

[2] Contributions do not include the disaffiliation payment of $3,994 for Memorial Health System.

The accompanying notes are an integral part of the Required Supplementary Information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

SCHEDULE OF CONTRIBUTIONS FROM EMPLOYERS AND OTHER CONTRIBUTING ENTITIES (CONTINUED)

For the Years Ended December 31

DPS Health Care Trust Fund	2022	2021	2020	2019	2018
Actuarially determined contribution rate (a)	**0.35%**	0.44%	0.51%	0.60%	0.67%
Covered payroll (b)	**$810,403**	$823,396	$771,347	$736,264	$722,040
Actuarially determined contribution (a) x (b)	**2,836**	3,623	3,934	4,418	4,838
Contributions in relation to the actuarially determined contribution	**8,744**	8,622	8,045	7,649	7,417
Annual contribution excess	**($5,908)**	**($4,999)**	**($4,111)**	**($3,231)**	**($2,579)**
Actual contributions as a percentage of covered payroll	**1.08%**	1.05%	1.04%	1.04%	1.03%
	2017	**2016**	**2015**	**2014**	**2013**
Actuarially determined contribution rate (a)	0.68%	0.75%	0.81%	0.87%	0.86%
Covered payroll (b)	$658,198	$642,177	$621,115	$584,319	$547,660
Retiree drug subsidy (c)	—	—	—	—	563
Actuarially determined contribution (a) x (b) + (c)	4,476	4,816	5,031	5,084	5,273
Contributions in relation to the actuarially determined contribution	6,930	6,723	6,371	6,003	6,121
Annual contribution excess	**($2,454)**	**($1,907)**	**($1,340)**	**($919)**	**($848)**
Actual contributions as a percentage of covered payroll	1.05%	1.05%	1.03%	1.03%	1.12%

The accompanying notes are an integral part of the Required Supplementary Information.

SCHEDULE OF INVESTMENT RETURNS[1]

For the Years Ended December 31

	2022	2021	2020	2019	2018	2017	2016	2015	2014
Annual money-weighted rate of return, net of investment expenses	**(13.5%)**	16.1%	17.1%	20.4%	(3.3%)	18.1%	7.3%	1.6%	5.8%

[1] Information is not available prior to 2014. In future reports, additional years will be added until 10 years of historical data are presented.

The accompanying notes are an integral part of the Required Supplementary Information.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

Note 1—Significant Changes in Plan Provisions Affecting Trends in Actuarial Information

2022 Changes in Plan Provisions Since 2021

- The total OPEB liability for the Health Care Trust Fund (HCTF), as of the December 31, 2022, measurement date, was adjusted to reflect the disaffiliation, allowable under C.R.S. § 24-51-313, of Tri-County Health Department (Tri-County Health), effective December 31, 2022. As of the close of the 2022 fiscal year, no disaffiliation payment associated with Tri-County Health was received, and therefore no disaffiliation dollars were reflected in the fiduciary net position as of the December 31, 2022, measurement date.

2021 Changes in Plan Provisions Since 2020

- There were no changes made to plan provisions.

2020 Changes in Plan Provisions Since 2019

- There were no changes made to plan provisions.

2019 Changes in Plan Provisions Since 2018

- There were no changes made to plan provisions.

2018 Changes in Plan Provisions Since 2017

- There were no changes made to plan provisions.

2017 Changes in Plan Provisions Since 2016

- The Cunningham Fire Protection District (CFPD) disaffiliated from the Local Government Division, thereby ending participation in the HCTF on December 2, 2017. For the purpose of disclosure as of the December 31, 2017, measurement date, liabilities were determined assuming no additional service accruals impacting possible future premium subsidies for the disaffiliated membership of the CFPD that had not refunded their PERA member contribution accounts. The total disaffiliation payment of $1,159 was allocated to the Local Government Division Trust Fund and the HCTF in the amount of $1,063 and $96, respectively.

2016 Changes in Plan Provisions Since 2015

- There were no changes made to plan provisions.

2015 Changes in Plan Provisions Since 2014

- There were no changes made to plan provisions.

2014 Changes in Plan Provisions Since 2013

- There were no changes made to plan provisions.

2013 Changes in Plan Provisions Since 2012

- There were no changes made to plan provisions.

Note 2—Significant Changes in Assumptions or Other Inputs Affecting Trends in Actuarial Information

2022 Changes in Assumptions or Other Inputs Since 2021

- The timing of the retirement decrement was adjusted to middle-of-year.

2021 Changes in Assumptions or Other Inputs Since 2020

- There were no changes made to the actuarial methods or assumptions.

2020 Changes in Assumptions or Other Inputs Since 2019

- The price inflation assumption was lowered from 2.40% to 2.30%.
- The wage inflation assumption was lowered from 3.50% to 3.00%.
- The real rate of investment return assumption was increased to 4.95% per year, net of investment expenses from 4.85% per year, net of investment expenses.
- Rates of termination/withdrawal, retirement, and disability were revised to more closely reflect actual experience.
- The pre-retirement mortality assumption for the State and Local Government Divisions (members other than State Troopers) was changed to the PubG-2010 Employee Table with generational projection using scale MP-2019.
- The pre-retirement mortality assumption for State Troopers was changed to the PubS-2010 Employee Table with generational projection using scale MP-2019.
- The pre-retirement mortality assumption for the School and DPS Divisions was changed to the PubT-2010 Employee Table with generational projection using scale MP-2019.
- The pre-retirement mortality assumption for the Judicial Division was changed to the PubG-2010(A) Above-Median Employee Table with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for the State and Local Government Divisions (members other than State Troopers) was changed to the PubG-2010 Healthy Retiree Table, adjusted as follows:
  - **Males:** 94% of the rates prior to age 80 and 90% of the rates for ages 80 and older, with generational projection using scale MP-2019.
  - **Females:** 87% of the rates prior to age 80 and 107% of the rates for ages 80 and older, with generational projection using scale MP-2019.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

- The post-retirement non-disabled mortality assumption for State Troopers was changed to the unadjusted PubS-2010 Healthy Retiree Table, with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for the School and DPS Divisions was changed to the PubT-2010 Healthy Retiree Table, adjusted as follows:
  - **Males:** 112% of the rates prior to age 80 and 94% of the rates for ages 80 and older, with generational projection using scale MP-2019.
  - **Females:** 83% of the rates prior to age 80 and 106% of the rates for ages 80 and older, with generational projection using scale MP-2019.
- The post-retirement non-disabled mortality assumption for the Judicial Division was changed to the unadjusted PubG-2010(A) Above-Median Healthy Retiree Table with generational projection using scale MP-2019.
- The post-retirement non-disabled beneficiary mortality assumption for the Division Trust Funds was changed to the Pub-2010 Contingent Survivor Table, adjusted as follows:
  - **Males:** 97% of the rates for all ages, with generational projection using scale MP-2019.
  - **Females:** 105% of the rates for all ages, with generational projection using scale MP-2019.
- The disabled mortality assumption for the Division Trust Funds (members other than State Troopers) was changed to the PubNS-2010 Disabled Retiree Table using 99% of the rates for all ages with generational projection using scale MP-2019.
- The disabled mortality assumption for State Troopers was changed to the unadjusted PubS-2010 Disabled Retiree Table with generational projection using scale MP-2019.
- The mortality tables are generational mortality tables developed on a head-count weighted basis.

2019 Changes in Assumptions or Other Inputs Since 2018

- There were no changes made to the actuarial methods or assumptions.

2018 Changes in Assumptions or Other Inputs Since 2017

- There were no changes made to the actuarial methods or assumptions.

2017 Changes in Assumptions or Other Inputs Since 2016

- There were no changes made to the actuarial methods or assumptions.

2016 Changes in Assumptions or Other Inputs Since 2015

- The following methodology change was made:
  - The Entry Age Normal actuarial cost method allocation basis has been changed from a level dollar amount to a level percentage of pay.
- The following changes were made to the actuarial assumptions:
  - The investment rate of return assumption decreased from 7.50% to 7.25%.
  - The price inflation assumption decreased from 2.80% to 2.40%
  - The wage inflation assumption decreased from 3.90% to 3.50%.
  - The mortality assumption for active members was changed to RP-2014 White Collar Employee Mortality Table, a table specifically developed for actively working people. To allow for an appropriate margin of improved mortality prospectively, the mortality rates incorporate a 70% factor applied to male rates and a 55% factor applied to female rates.
  - The post-retirement mortality assumption for healthy lives for the State and Local Government Divisions was changed to the RP-2014 Healthy Annuitant Mortality Table with adjustments for credibility and gender adjustments of a 73% factor applied to ages below 80 and a 108% factor applied to age 80 and above, projected to 2018, for males, and a 78% factor applied to ages below 80 and a 109% factor applied to age 80 and above, projected to 2020, for females.
  - The post-retirement mortality assumption for healthy lives for the School, Judicial, and DPS Divisions was changed to the RP-2014 White Collar Healthy Annuitant Mortality Table with adjustments for credibility and gender adjustments of a 93% factor applied to ages below 80 and a 113% factor applied to age 80 and above, projected to 2018, for males, and a 68% factor applied to ages below 80 and a 106% factor applied to age 80 and above, projected to 2020, for females.
  - For disabled retirees, the mortality assumption was changed to reflect 90% of RP-2014 Disabled Retiree Mortality Table.
  - The assumed rates of withdrawal, retirement, and disability have been adjusted to more closely reflect experience.
  - The assumed rates of PERACare participation have been revised to reflect more closely actual experience.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)— HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

- Initial per capita health care costs for those PERACare enrollees under the PERA benefit structure who are expected to attain age 65 and older ages and are not eligible for premium-free Medicare Part A benefits have been updated to reflect the change in costs for the 2017 plan year.
- The percentage of PERACare enrollees who will attain age 65 and older ages and are assumed to not qualify for premium-free Medicare Part A coverage have been revised to reflect more closely actual experience.
- The percentage of disabled PERACare enrollees who are assumed to not qualify for premium-free Medicare Part A coverage has been revised to reflect more closely actual experience.
- The health care cost trend rates for Medicare Part A premiums have been revised to reflect the then-current expectation of future increases in rates of inflation applicable to Medicare Part A premiums.
- Assumed election rates for the PERACare coverage options that would be available to future PERACare enrollees who will qualify for the "No Part A Subsidy" when they retire have been revised to more closely reflect actual experience.
- Assumed election rates for the PERACare coverage options that will be available to those current PERACare enrollees, who qualify for the "No Part A Subsidy" but have not reached age 65, have been revised to more closely reflect actual experience.
- The rates of PERACare coverage election for spouses of eligible inactive members and future retirees was revised to reflect more closely actual experience.
- The assumed age differences between future retirees and their participating spouses have been revised to reflect more closely actual experience.

2015 Changes in Assumptions or Other Inputs Since 2014

- The following methodology changes were made:
  - Rates of morbidity to model the growth in assumed claims as a PERACare enrollee ages have been added to the process used to project per capita health care costs of those PERACare enrollees under the PERA benefit structure who have attained age 65 and older and are not eligible for premium-free Medicare Part A benefits.
  - Adjustments were made to the timing of the normal cost and unfunded actuarial accrued liability (UAAL) payment calculations to reflect contributions throughout the year.
- The following changes were made to the actuarial assumptions:
  - The percentage of PERACare enrollees who will attain age 65 and older ages and are assumed to not qualify for premium-free Medicare Part A coverage have been revised to more closely reflect actual experience.
  - Initial per capita health care costs for those PERACare enrollees under the PERA benefit structure who are expected to attain age 65 and older ages and are not eligible for premium-free Medicare Part A benefits have been updated to reflect the change in costs for the 2016 plan year.
  - The health care cost trend rates for Medicare Part A premiums have been revised to reflect the current expectation of future increases in rates of inflation applicable to Medicare Part A premiums.

2014 Changes in Assumptions or Other Inputs Since 2013

- The following change was made to the actuarial assumptions:
  - Initial per capita health care costs for those PERACare enrollees under the PERA benefit structure who are expected to attain age 65 and older ages and are not eligible for premium-free Medicare Part A benefits have been updated to reflect the change in costs for the 2015 plan year.
- The following other change was made:
  - In 2012, a lawsuit was initiated to determine the amount owed to PERA by Memorial and the City of Colorado Springs (City) for Memorial's disaffiliation from PERA. In September 2014, PERA and the City agreed to resolve the lawsuit. The agreement provided for the City to pay PERA $190,000 for the liabilities associated with the retirement and health care benefits already earned by 7,666 Memorial employees for the work that they performed before Memorial ceased to be a PERA employer. On October 3, 2014, PERA received a disaffiliation payment from the City, which was allocated to the Local Government Division Trust Fund and the HCTF in the amount of $186,006 and $3,994, respectively.

2013 Changes in Assumptions or Other Inputs Since 2012

- The following changes were made to the actuarial assumptions:
  - The investment rate of return assumption decreased from 8.00% to 7.50% per annum.
  - The price inflation assumption decreased from 3.50% to 2.80% per annum.

NOTES TO THE REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)—HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

- The wage inflation assumption decreased from 4.25% to 3.90% per annum.
- Effective January 1, 2014, PERACare no longer participates in the Centers for Medicare & Medicaid Services (CMS) Retiree Drug Subsidy (RDS) program. PERACare enrollees participating in the self-insured Medicare supplement plans and the Medicare HMO plan offered by Rocky Mountain Health Plans now receive their prescription drug benefits through a Medicare Prescription Drug Plan. The liability associated with the RDS has been eliminated.
- Initial per capita health care costs for those PERACare enrollees under the PERA benefit structure who are expected to attain age 65 and older ages and are not eligible for premium-free Medicare Part A benefits have been updated to reflect the change in costs for the 2014 plan year.
- The health care cost trend rates for Medicare Part A premiums have been revised to reflect the current expectation of future increases in rates of inflation applicable to Medicare Part A premiums.
- The utilization rates for the No Part A subsidy of both retirees and their spouses have been revised.

Note 3—Methods and Assumptions Used in Calculations of ADC

The ADC rates, as a percentage of covered payroll, used to determine the ADC amounts in the Schedule of Contributions from Employers and Other Contributing Entities are calculated as of December 31, two years prior to the end of the year in which ADC amounts are reported. The following actuarial methods and assumptions from the December 31, 2020, actuarial valuation were used to determine contribution rates reported in that schedule for the year ending December 31, 2022:

Actuarial cost method	Entry age
Amortization method	Level percentage of payroll
Amortization period	30 years, closed, layered[1]
Asset valuation method	4-year smoothed market
Price inflation	2.30%
Real wage growth	0.70%
Wage inflation	3.00%
Salary increases, including wage inflation	3.00% in aggregate
Long-term investment rate of return, net of OPEB plan investment expense, including price inflation	7.25%
Health care inflation factors	
PERA benefit structure:	
Service-based premium subsidy	0.00%
Medicare Part A premiums[2]	3.75% initial 4.50% ultimate
Carrier premiums[2]	4.50% initial 4.50% ultimate
DPS benefit structure:	
Service-based premium subsidy	0.00%
Medicare Part A premiums	N/A
Carrier premiums	N/A

[1] Effective with the December 31, 2017, actuarial valuation, gains and losses are to be amortized over a closed period.

[2] The Medicare Part A and carrier premiums only apply to calculation of the implicit subsidy applicable to the PERA benefit structure.

SUPPLEMENTARY SCHEDULES

(Dollars in Thousands)

SCHEDULE OF ADMINISTRATIVE EXPENSES

For the Year Ended December 31

	2022
Personnel Services	
Salaries	$45,901
Employee benefits	14,369
Total personnel services	**60,270**
Professional Services	
Actuarial contracts	742
Audits	258
Payroll services	88
Investment services	3,545
Legal and legislative counsel	3,554
Computer services and consulting	2,669
Management consulting	1,442
Health care consulting	410
Other	1,016
Total professional services	**13,724**
Miscellaneous	
Equipment rental and services	1,875
Memberships	250
Publications and subscriptions	86
Travel and local expense	440
Auto expense	16
Telephone	418
Postage	1,074
Insurance	393
Printing	379
Office supplies	512
Building rent, supplies, and utilities	1,014
Total miscellaneous	**6,457**
Direct Expense	
Health Care Trust Fund	2,457
DPS Health Care Trust Fund	141
Voluntary Investment Program	1,548
Defined Contribution Retirement Plan	168
Deferred Compensation Plan	457
Total direct expense	**4,771**
Depreciation expense	**397**
Tenant and other expense	**1,066**
Internal investment manager expense	**(29,983)**
Total administrative expenses	**$56,702**

SUPPLEMENTARY SCHEDULES

(Dollars in Thousands)

SCHEDULE OF ADMINISTRATIVE EXPENSES (CONTINUED)

For the Year Ended December 31

	2022
Allocation of Administrative Expenses	
State Division Trust Fund	$13,312
School Division Trust Fund	25,562
Local Government Division Trust Fund	3,450
Judicial Division Trust Fund	212
DPS Division Trust Fund	3,133
Voluntary Investment Program	1,961
Defined Contribution Retirement Plan	849
Deferred Compensation Plan	574
Health Care Trust Fund	7,136
DPS Health Care Trust Fund	434
Life Insurance Reserve	79
Total administrative expenses	**$56,702**

Note: The 2022 ratio of administrative expenses to fiduciary net position is eight basis points (0.08%) for the Division Trust Funds and is nine basis points (0.09%) for all funds.

See accompanying Independent Auditors' Report.

SUPPLEMENTARY SCHEDULES

(Dollars in Thousands)

SCHEDULE OF OTHER ADDITIONS
For the Year Ended December 31

	State Division Trust Fund	School Division Trust Fund	Local Government Division Trust Fund	Judicial Division Trust Fund	DPS Division Trust Fund	Voluntary Investment Program	Defined Contribution Retirement Plan	Deferred Compensation Plan	HCTF	DPS HCTF	Life Insurance Reserve	TOTAL 2022
Administrative fee income	$—	$—	$—	$—	$—	$70	$3	$27	$2,451	$138	$—	**$2,689**
Participant loan interest	—	—	—	—	—	2,142	—	480	—	—	—	**2,622**
Net interfund transfers at retirement	—	5,172	—	4,521	832	—	—	—	—	—	—	**10,525**
Purchase service transfer to health care	—	—	—	—	—	—	—	—	6,529	168	—	**6,697**
Settlement income	149	260	44	4	35	—	—	—	4	—	—	**496**
Miscellaneous	22	113	29	—	8	72	1,453	(11)	20	—	—	**1,706**
Total other additions	**$171**	**$5,545**	**$73**	**$4,525**	**$875**	**$2,284**	**$1,456**	**$496**	**$9,004**	**$306**	**$—**	**$24,735**

SCHEDULE OF OTHER DEDUCTIONS
For the Year Ended December 31

	State Division Trust Fund	School Division Trust Fund	Local Government Division Trust Fund	Judicial Division Trust Fund	DPS Division Trust Fund	Voluntary Investment Program	Defined Contribution Retirement Plan	Deferred Compensation Plan	HCTF	DPS HCTF	Life Insurance Reserve	TOTAL 2022
Net interfund transfers at retirement	$5,656	$—	$4,869	$—	$—	$—	$—	$—	$—	$—	$—	**$10,525**
Purchase service transfer to health care	2,515	3,180	801	33	168	—	—	—	—	—	—	**6,697**
Miscellaneous	968	755	124	—	55	1,275	118	532	110	1	—	**3,938**
Total other deductions	**$9,139**	**$3,935**	**$5,794**	**$33**	**$223**	**$1,275**	**$118**	**$532**	**$110**	**$1**	**$—**	**$21,160**

See accompanying Independent Auditors' Report.

SUPPLEMENTARY SCHEDULES

(Dollars in Thousands)

SCHEDULE OF INVESTMENT EXPENSES
For the Year Ended December 31

	2022
Division Trust Funds, Health Care Trust Funds, and Life Insurance Reserve	
External manager expenses	
Global equity	$24,907
Fixed income	—
Private equity	62,582
Real estate	37,998
Alternatives	52,364
Cash and short-term investments	373
Total external manager expenses	**178,224**
Internal manager expenses	**28,697**
Other investment expenses and custody fees	**5,203**
Defined Contribution Plans	
Internal manager expenses	1,286
Other investment expenses	2,983
Total investment expenses	**$216,393**

SCHEDULE OF PAYMENTS TO CONSULTANTS
For the Year Ended December 31

	2022
Professional Services	
Actuarial	$742
Audits	258
Payroll services	88
Legal and legislative counsel	3,554
Computer services and consulting	2,669
Management consulting	1,442
Health care consulting	410
Other	1,016
Total payments to consultants[1]	**$10,179**

[1] Excludes investment advisers.

The Schedule of Commissions and other information related to investment expenses can be found in the Investment Section on pages 127-129.

See accompanying Independent Auditors' Report.

COLORADO PERA®

Investment Section

COLORADO PERA®

DEFINED BENEFIT PLANS

INTRODUCTION

The Division Trust Funds, the Health Care Trust Funds, and the Life Insurance Reserve are included in the information discussed in this subsection on Colorado PERA's defined benefit plans.

REPORT ON INVESTMENT ACTIVITY

State Law

State law gives complete responsibility for the investment of PERA's funds to the PERA Board of Trustees (Board), with some stipulations including:

- The aggregate amount of moneys invested in corporate stocks or corporate bonds, notes, or debentures, which are convertible into corporate stock or in investment trust shares cannot exceed 65% of the then book value of the fund.
- No investment of the fund in common or preferred stock, or both, of any single corporation can exceed 5% of the then book value of the fund.
- The fund cannot acquire more than 12% of the outstanding stock or bonds of any single corporation.
- The origination of mortgages or deeds of trust on real residential property is prohibited.

Additionally, Colorado Revised Statutes (C.R.S.) § 24-54.8-201 *et seq.* imposes targeted divestment from companies that have economic prohibitions against Israel.

PERA Board's Statutory Fiduciary Responsibility

By State law, the management of PERA's retirement fund is vested in the Board who is held to the standard of conduct of fiduciaries in discharging their responsibilities. According to C.R.S. § 24-51-207(2), the Board, as fiduciaries, must carry out their functions solely in the interest of PERA members and benefit recipients and for the exclusive purpose of providing benefits.

Goal

The function of PERA is to provide present and future retirement or survivor benefits for its members. The investment function is managed in a manner to promote long-term financial security for our membership while maintaining the stability of the fund.

Overview of Investment Policy

PERA's investment policy outlines the investment philosophy and guidelines within which the fund's investments will be managed, and includes the following:

- Strategic asset allocation is the most significant factor influencing long-term investment performance and asset volatility.
- The fund's liabilities are long term and the investment strategy will therefore be long term in nature.
- The asset allocation policy will be periodically re-examined to ensure its appropriateness to the then-prevailing liability considerations.
- As a long-term investor, PERA will invest across a wide spectrum of investments in a prudent manner.
- Active management may be expected to add value over passive investment alternatives under appropriate conditions.

The Board determines the strategic asset allocation for the fund. This strategic asset allocation contains a long-term target allocation and specific ranges within which each asset class may operate. Because the long-term target allocation will be achieved over time, a yearly Policy Benchmark weight is also specified. The asset allocation targets and ranges in effect for 2022 are listed as follows:

ASSET ALLOCATION TARGETS AND RANGES[1]

	2022 Policy Benchmark Weight	Long-Term Asset Allocation Target	Target Range
Global Equity	55.0%	54.0%	49.0% – 61.0%
Fixed Income	23.5%	23.0%	18.5% – 28.5%
Private Equity	8.5%	8.5%	4.0% – 13.0%
Real Estate	8.5%	8.5%	4.0% – 13.0%
Alternatives	4.5%	6.0%[2]	0.0% – 12.0%
Cash and Short-Term Investments	0.0%	0.0%	0.0% – 3.0%

[1] See Note 5 of the Notes to the Financial Statements in the Financial Section for detailed disclosures about each asset class.

[2] Maximum allocation to Alternatives.The Policy Benchmark weight will be set yearly based on final 12/31 weights, rounded to the nearest 0.5%. Any uninvested allocation will be re-allocated to the Public Markets Benchmark.

The asset allocation policy is determined by an intensive asset/liability study which considers expected investment returns, risks, and correlations of returns. The characteristics of the fund's liabilities are analyzed in conjunction with expected investment risks and returns. The targeted strategic asset allocation is designed to provide appropriate diversification and to balance the expected total rate of return with the volatility of expected returns, while ensuring an appropriate level of risk is incurred. The Board commissioned an asset/liability study during 2019, which was prepared by Aon Investment USA Inc. (Aon). The objective of the study was to determine the optimal strategic asset allocation that will ultimately allow PERA to meet its financial obligations, while also ensuring that PERA incurs appropriate levels of risk and liquidity. As a result of this study, the Board slightly modified the asset allocation ranges and targets effective January 1, 2020, while reaffirming the investment return assumption of 7.25%.

DEFINED BENEFIT PLANS

The asset allocation targets are adhered to through the implementation of portfolio rebalancing. Investments are managed and monitored in a manner which seeks to balance return and risk within the asset/liability framework. The Chief Investment Officer is authorized to execute investment transactions on behalf of the Board. Assets are managed both internally and externally. In making investment decisions, the Board and staff utilize external experts in various fields including risk and performance analysis, and other important investment functions and issues.

Basis of Presentation

Aon, the Board's Investment Performance consultant, provides the investment returns for the fund based on data made available by the fund's custodian, The Northern Trust Company (Northern Trust). Performance calculations were prepared using time-weighted rates of return and are net-of-fees unless otherwise indicated. Returns for periods longer than one year are annualized.

Investment Stewardship

It is the fiduciary duty of the Board and Investment staff to manage plan assets with prudence and care in pursuit of long-term financial sustainability for the benefit of members and plan participants. PERA staff demonstrate stewardship of plan assets by: protecting members' interests through cost-conscious investments; integrating financially material factors into investment decisions; advocating for robust market practices that support long-term value; and evaluating portfolio exposures and performance on an ongoing basis.

Investment staff initiatives and philosophy supporting the pursuit of financial sustainability through stewardship are discussed in greater detail in PERA's *Investment Stewardship Report*. The *Investment Stewardship Report* is updated annually, and can be found on PERA's website at copera.org.

Proxy Voting

As part of investment stewardship, PERA promotes corporate governance and other business practices that are expected to contribute to financial sustainability through proxy voting. The Board views the right to vote as an asset of the plans to be managed under fiduciary duty, and has charged the Investment Committee with oversight in fulfilling that responsibility.

The Board and the Investment Committee have delegated to Investment Stewardship Division staff the authority to review and vote on proxy proposals in compliance with PERA's *Proxy Voting Policy (Policy)*. Accordingly, staff vote proxies for domestic and international equity shares held in public market portfolios.

The *Policy* sets forth guidance on a broad range of issues that may present risks and opportunities for the public companies in which PERA invests. The Board regularly updates the *Policy* in seeking alignment of corporate management interests with the interests of long-term shareholders, as relevant to PERA's investment thesis. The *Policy* and a link to disclosure of votes cast can be viewed on PERA's website at copera.org.

(The Report on Investment Activity was prepared by internal staff.)

DEFINED BENEFIT PLANS

(Dollars in Thousands)

INVESTMENT BROKERS/ADVISERS (INTERNALLY MANAGED ASSETS)

Amherst Pierpont Securities LLC
Baird (Robert W.) & Co, Incorporated
Barclays Capital Inc.
BMO Capital Markets Corp.
BNP Paribas Securities Corp.
BofA Securities, Inc.
Cantor Fitzgerald & Co.
Citadel Securities LLC
Citigroup Global Markets Inc.
Credit Agricole (USA) Inc.
Credit Suisse Securities (USA) LLC
DASH Financial Technologies LLC
Deutsche Bank Securities Inc.
Federal National Mortgage Association (Fannie Mae)
Fifth Third Securities, Inc.
Goldman Sachs & Co. LLC
HSBC Securities (USA) Inc.
J.P. Morgan Securities, Inc.
Jefferies Group LLC
Jones Trading Institutional Services LLC
KeyBanc Capital Markets Inc.
Liquidnet, Inc.
MarketAxess Corp.
Mizuho Securities USA LLC
Morgan Stanley & Co. LLC
MUFG Securities Americas Inc.
NatWest Markets Securities Inc.
Nomura Securities International, Inc.
PNC Capital Market LLC
RBC Capital Markets, LLC
SG Securities Americas, LLC
State Street Global Markets LLC
Stifel, Nicolaus & Company Incorporated
Sumitomo Mitsui Banking Corp.
TD Securities (USA) LLC
The Bank of New York Mellon Corp.
The Northern Trust Company
Themis Trading LLC
Tradeweb Markets LLC
Truist Securities, Inc.
U.S. Bancorp
UBS Securities, LLC
Wells Fargo Securities, LLC

Note: A list of investment managers is available upon request.

SCHEDULE OF COMMISSIONS[1]

As of December 31, 2022

	Internally Managed Investments		Externally Managed Investments		
Asset Class	**Commissions**	**Percentage of Asset Class**	**Commissions**	**Percentage of Asset Class**	**Total Commissions**
Global Equity[2]	$947	75.0%	$927	25.0%	**$1,874**
Fixed Income[3]	4,928	100.0%	—	—	**4,928**
Total commissions	**$5,875**		**$927**		**$6,802**

1 Does not include commissions from futures trading, Private Equity, Real Estate, or Alternatives.

2 Does not include commissions from commingled funds.

3 Fixed Income commissions are estimated, with the exception of commissions on exchange-traded funds.

DEFINED BENEFIT PLANS

(Dollars in Thousands)

(In actual dollars for this paragraph only)
Total investment expenses for internal and external asset management of PERA's $55.9 billion investment portfolio were $212.1 million representing about 38.0 basis points (bps). PERA strives to manage the investment assets in a cost efficient manner. The driving factor in the low overall cost is PERA's use of internal management. PERA staff manages 59.0% of total fund assets in-house at a calculated cost for internal asset management of $18.9 million (5.7 bps); outsourcing such management would cost an estimated $87.3 million (26.5 bps). The remaining portion of the $28.7 million internal manager expenses shown in the following table is for PERA staff oversight of externally-managed assets.

SCHEDULE OF INVESTMENT EXPENSES[1]

As of December 31, 2022

	Investment Expense
Global Equity	$24,907
Fixed Income	—
Private Equity	62,582
Real Estate	37,998
Alternatives	52,364
Cash and Short-Term Investments	373
Total external manager expenses	**178,224**
Internal manager expenses	**28,697**
Other investment expenses and custody fees	**5,203**
Total investment expenses	**$212,124**

[1] See the Investment Summary on page 130 for information about fair value of investments.

The following table breaks out both the dollar amount and percentage of each asset class managed internally. It is important to note that all accounts, both internal and external, are held to the same high performance standards.

SCHEDULE OF INTERNAL AND EXTERNAL ASSET MANAGEMENT

As of December 31, 2022

	Internal		External		
Asset Class	**Amount**	**Percent**	**Amount**	**Percent**	**Total Amount**
Global Equity	$22,135,056	75.0%	$7,382,047	25.0%	**$29,517,103**
Fixed Income	10,822,329	100.0%	—	—	**10,822,329**
Private Equity	—	—	5,161,194	100.0%	**5,161,194**
Real Estate	—	—	6,652,817	100.0%	**6,652,817**
Alternatives	—	—	3,513,781	100.0%	**3,513,781**
Cash and Short-Term Investments	—	—	194,238	100.0%	**194,238**
Total	**$32,957,385**	**59.0%**	**$22,904,077**	**41.0%**	**$55,861,462**

DEFINED BENEFIT PLANS

(Dollars in Thousands)

SCHEDULE OF INVESTMENT INCOME AND EXPENSE BY ASSET CLASS

As of December 31, 2022

Asset Class	Net Appreciation/ (Depreciation) in Fair Value[1]	Interest and Dividends	Net Operating Income[2]	Investment Expenses[3]	Net Securities Lending Income	Net Investment Income/(Loss)
Global Equity	($8,342,728)	$613,078	$—	($43,199)	$10,911	($7,761,938)
Fixed Income	(1,918,056)	296,879	—	(6,480)	366	(1,627,291)
Private Equity	(336,221)	14	11,697	(66,768)	—	(391,278)
Real Estate	644,454	—	173,885	(40,554)	—	777,785
Alternatives	182,053	39	113,243	(54,722)	—	240,613
Cash and Short-Term Investments	(70,143)	6,579	—	(401)	—	(63,965)
Total	**($9,840,641)**	**$916,589**	**$298,825**	**($212,124)**	**$11,277**	**($8,826,074)**

1 Global Equity and Fixed Income include realized gain/(loss) recognized on securities sold during 2022, current year unrealized gain/(loss) and unrealized translation gain/(loss), and class action revenue. Private Equity, Real Estate, and Alternatives include current year realized and unrealized gain/(loss), paid carried interest, and adjustments to accrued carried interest as reported by the General Partner.

2 Private Equity, Real Estate, and Alternatives include investment income and expenses as reported by the General Partner.

3 Includes external and internal investment management, custody, and other investment expenses.

SCHEDULE OF PRIVATE MARKET INVESTMENT CONTRIBUTIONS, DISTRIBUTIONS, AND PAID CARRIED INTEREST

As of December 31, 2022

Asset Class	Contributions[1]	Distributions[2]	Paid Carried Interest[3]
Private Equity	$596,976	$1,098,857[4]	$73,209
Real Estate	601,382	565,170	15,377
Alternatives	779,238	638,033	28,501
Total	**$1,977,596**	**$2,302,060**	**$117,087**

1 Represents money sent to external entities for the purpose of funding private market investments and/or fees during the current fiscal year.

2 Represents money or shares of companies received from external entities during the current fiscal year, generally due to PERA receiving its proportionate share of an investment's exited value.

3 Represents the share of profits paid to external entities due to investment returns surpassing agreed-upon thresholds. Amounts will vary, potentially significantly, from year to year depending on the timing of sales of the underlying investments and the magnitude of the gains. Amounts are based on best available information provided by external entities. Actual results could differ from those amounts.

4 Includes money received from the sale of PERA's partnership interests on the secondary market.

DEFINED BENEFIT PLANS

(Dollars in Thousands)

INVESTMENT SUMMARY

	Fair Value per Financial Statements December 31, 2022	Reallocation of Investment Amounts[1]	Non-Investment Amounts[2]	Fair Value per Investment Portfolio December 31, 2022	2022 Policy Benchmark Weight[3]	Actual Asset Allocation (% of Fair Value) 12/31/22	12/31/21	12/31/20
Global Equity	$29,294,587	$222,516	$—	$29,517,103	55.0%	**52.8%**	58.3%	58.0%
Fixed Income	10,562,480	259,849	—	10,822,329	23.5%	**19.4%**	18.4%	20.8%
Private Equity	5,159,499	1,695	—	5,161,194	8.5%	**9.2%**	9.2%	8.1%
Real Estate	6,653,589	(772)	—	6,652,817	8.5%	**11.9%**	8.8%	8.0%
Alternatives	3,508,950	4,831	—	3,513,781	4.5%	**6.3%**	4.7%	4.1%
Cash and Short-Term Investments								
Operating Cash	16,260	—	(16,260)	—				
Cash and Short-Term Investments	1,469,464	(1,275,226)	—	194,238	0.0%	**0.4%**	0.6%	1.0%
Net securities lending collateral and obligations	4,252	(4,252)	—	—				
Net investment settlements and income and other liabilities[4]	(895,652)	791,359	104,293	—				
Benefit, interfund, and lease receivables and capital assets[5]	243,926	—	(243,926)	—				
Deferred inflows of resources	(1,527)	—	1,527	—				
Total	**$56,015,828**	**$—**	**($154,366)**	**$55,861,462**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

[1] Investment receivables, payables, accruals, securities lending collateral, securities lending obligations, and cash and short-term investments are allocated back to the investment portfolios that hold them.

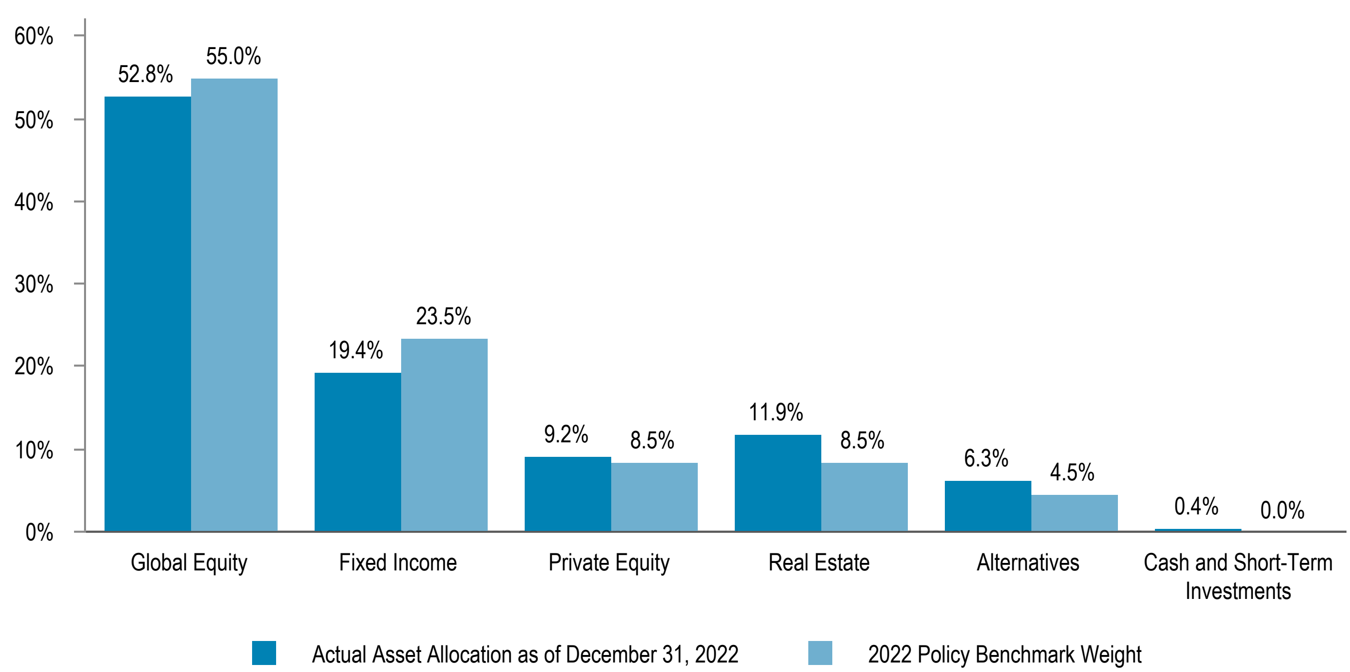
[2] Non-investment amounts are not included in the determination of actual investment asset allocation.

[3] See page 125 for more information about the strategic asset allocation of the fund.

[4] Includes non-investment payables of $104,293.

[5] Includes benefit receivables of $226,910, interfund receivables of $396, lease receivables of $1,563, and capital assets of $15,057.

Actual Asset Allocation versus Policy Benchmark Weight



DEFINED BENEFIT PLANS

Aon provides the investment returns for the fund based on data made available by Northern Trust. The annualized one-, three-, five-, and 10-year net-of-fees time-weighted rates of return for each asset class and their respective benchmarks are as follows:

SCHEDULE OF INVESTMENT RESULTS

As of December 31, 2022

	2022	3–Year	5–Year	10–Year
PERA Total Portfolio	**(13.4%)**	5.7%	6.5%	8.0%
Total Fund Policy Benchmark[1]	**(13.7%)**	3.8%	5.3%	7.1%
Median Plan (BNY Mellon Performance & Risk Analytics in conjunction with Investment Metrics Median Public Fund Universe)	**(11.1%)**	4.6%	5.3%	6.9%
Global Equity	**(20.6%)**	4.9%	6.3%	9.0%
Global Equity Custom Benchmark[2]	**(18.2%)**	4.2%	5.2%	8.1%
Fixed Income	**(12.8%)**	(2.4%)	0.3%	1.4%
Fixed Income Custom Benchmark[3]	**(13.0%)**	(2.7%)	0.0%	1.3%
Private Equity	**(6.7%)**	16.1%	13.9%	13.3%
Private Equity Custom Benchmark[4]	**(16.7%)**	5.7%	10.8%	13.5%
Real Estate	**13.4%**	14.2%	12.4%	12.6%
Real Estate Custom Benchmark[5]	**7.0%**	9.5%	8.2%	9.6%
Alternatives	**7.6%**	8.2%	7.3%	5.4%
Alternatives Custom Benchmark[6]	**(0.7%)**	6.4%	6.5%	5.5%
Cash and Short-Term Investments	**1.7%**	0.7%	1.3%	0.8%
ICE BofAML U.S. 3-Month Treasury Bill Index	**1.5%**	0.7%	1.3%	0.8%

Note: Performance calculations were prepared using net-of-fees time-weighted rates of return.

[1] The PERA Board adopted benchmarks beginning April 1, 2004, for each of the various asset classes. The adopted benchmarks have changed over time and, accordingly, the benchmark returns presented represent a blend, as follows:

- The Total Fund Policy Benchmark—A combination of 55.0% of the Global Equity Custom Benchmark, 23.5% of the Fixed Income Custom Benchmark, 8.5% of the Private Equity Custom Benchmark, 8.5% of the Real Estate Custom Benchmark, and 4.5% of the Alternatives Custom Benchmark. Prior to January 2022, 55.5% of the Global Equity Custom Benchmark, 23.5% of the Fixed Income Custom Benchmark, 8.5% of the Private Equity Custom Benchmark, 8.5% of the Real Estate Custom Benchmark, and 4.0% of the Alternatives Custom Benchmark. Prior to January 2021, 56.0% of the Global Equity Custom Benchmark, 23.5% of the Fixed Income Custom Benchmark, 8.5% of the Private Equity Custom Benchmark, 8.5% of the Real Estate Custom Benchmark, and 3.5% of the Alternatives Custom Benchmark. Prior to January 2020, 53.5% of the Global Equity Custom Benchmark, 23.5% of the Fixed Income Custom Benchmark, 8.5% of the Private Equity Custom Benchmark, 8.5% of the Real Estate Custom Benchmark, 5.0% of the Alternatives Custom Benchmark, and 1.0% of the ICE BofAML U.S. 3-Month Treasury Bill Index. Prior to July 2016, 55.0% of the Global Equity Custom Benchmark, 24.0% of the Fixed Income Custom Benchmark, 7.5% of the Real Estate Custom Benchmark, 7.5% of the Private Equity Custom Benchmark, 5.0% of the Alternatives Custom Benchmark, and 1.0% of the ICE BofAML U.S. 3-Month Treasury Bill Index. Prior to July 2015, 56.0% of the Global Equity Custom Benchmark, 25.0% of the Fixed Income Custom Benchmark, 7.0% of the Real Estate Custom Benchmark, 7.0% of the Private Equity Custom Benchmark, and 5.0% of the Alternatives Custom Benchmark.

[2] MSCI ACWI IMI (Net) with USA Gross. Prior to July 2018, MSCI ACWI IMI. Prior to February 2013, 52.0% DJ U.S. Total Stock Market Index and 48.0% MSCI ACWI ex-U.S. Index.

[3] Bloomberg U.S. Aggregate Bond Index. Prior to August 2018, Bloomberg U.S. Universal Bond Index. Prior to July 2015, 98.0% of the Bloomberg U.S. Universal Bond Index and 2.0% of the Bloomberg U.S. Long Government/Credit Index.

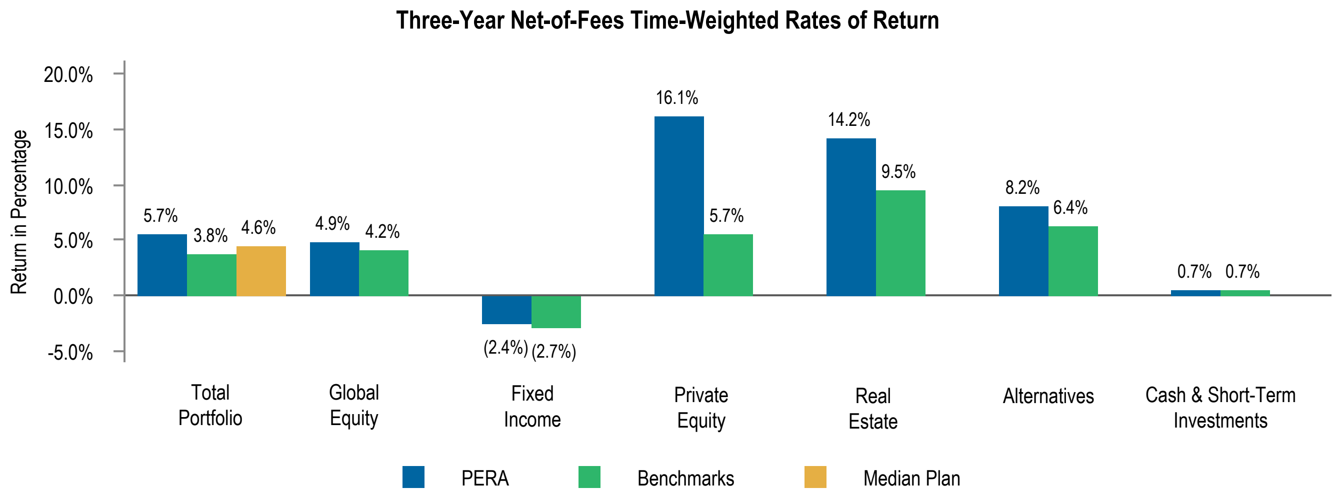
[4] MSCI ACWI IMI (Net) with USA Gross plus 150 basis points. Prior to January 2019, Burgiss Time Weighted Rate of Return Benchmark. Prior to January 2015, DJ U.S. Total Stock Market Index plus 250 basis points annually.

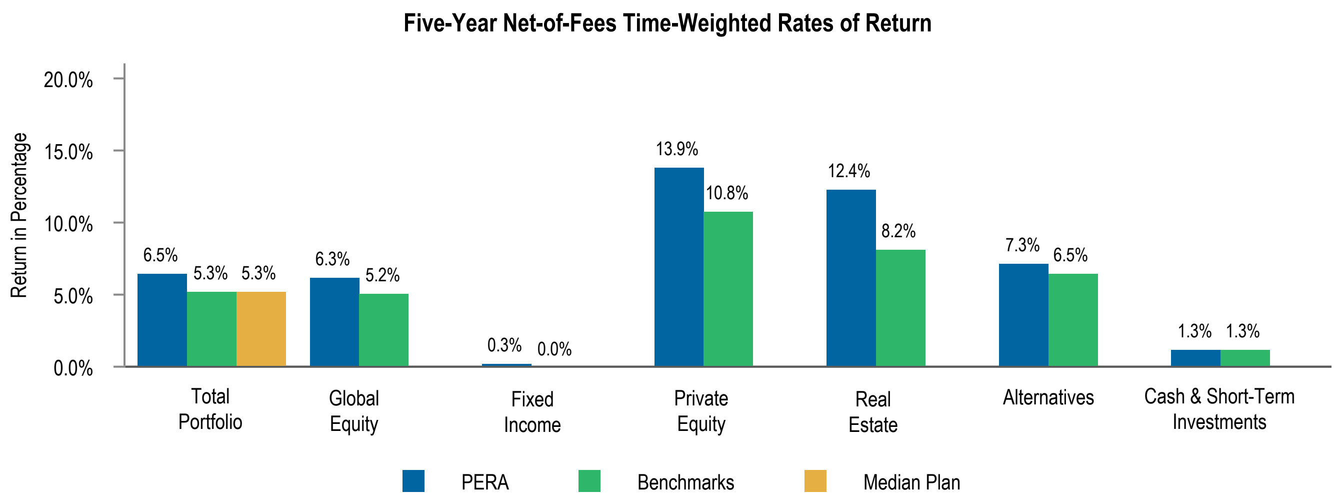
[5] NCREIF Open End Diversified Core Equity Index (NFI-ODCE) plus 50 basis points annually.

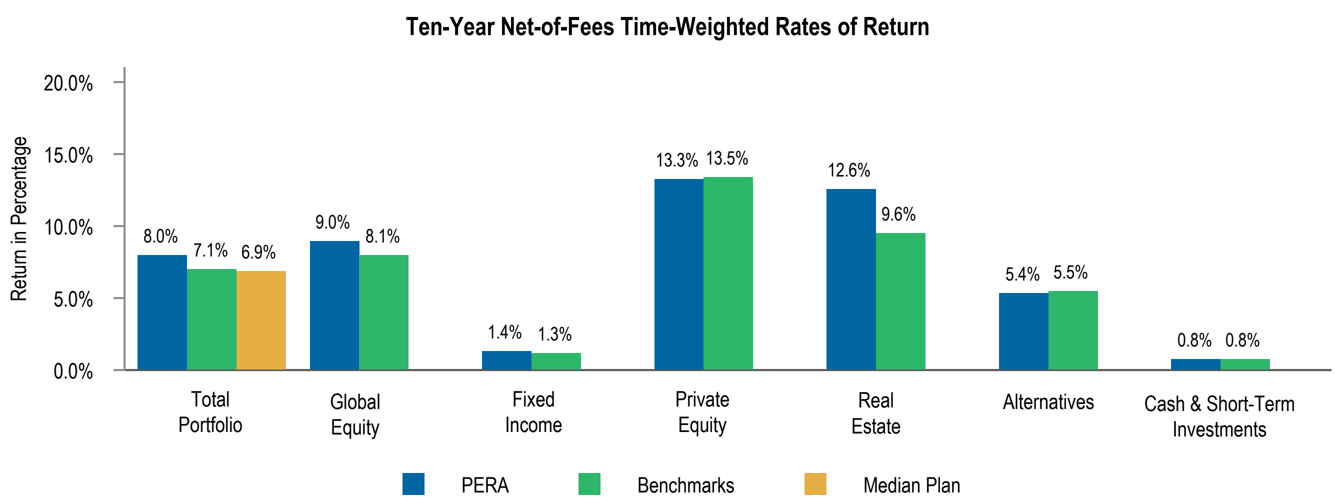
[6] Weighted average of each of the three objectives (Risk Mitigation: HFRI FOF Market Defensive Index, Real Assets: CPI plus 400 basis points, Opportunistic: PERA Public Markets plus 150 basis points). Prior to January 2019, weighted aggregate of the benchmarks of the individual strategies included in Alternatives.

DEFINED BENEFIT PLANS

The three-, five-, and 10-year net-of-fees time-weighted rates of return for the total fund and each asset class and their respective benchmarks are as follows:







DEFINED BENEFIT PLANS

FUND PERFORMANCE EVALUATION

(Returns are net-of-fees unless otherwise indicated)

Total Portfolio Performance

For the year ended December 31, 2022, PERA's total fund returned negative 13.4%, outperforming the policy benchmark's return of negative 13.7%. PERA's policy benchmark is a passive representation of the asset allocation policy adopted by the Board. The total fund has outperformed the policy benchmark over the one-, three-, five-, and 10-year periods. Total investment expenses for internal and external asset management of PERA's $55.9 billion investment portfolio were $212.1 million, representing about 38.0 basis points. The total fund return of negative 13.4% trailed the BNY Mellon Performance & Risk Analytics in conjunction with Investment Metrics Median Public Fund Universe return of negative 11.1%. As of December 31, 2022, this universe was comprised of 106 public pension funds with assets of approximately $2.6 trillion. The total fund has performed better than this universe over the three-, five-, and 10-year periods.

The total fund return of negative 13.4% outperformed a hypothetical portfolio consisting of 60% global equities, based on the MSCI ACWI IMI, and 40% fixed income, based on the Bloomberg U.S. Aggregate Bond Index, which collectively returned negative 15.9%. The total fund has performed better than this hypothetical portfolio over the one-, three-, five-, and 10-year periods (5.7% versus 1.8%, 6.5% versus 3.5%, and 8.0% versus 5.6%, for the three-, five-, and 10-year periods, respectively).

Asset Class Performance

PERA's Global Equity portfolio returned negative 20.6%, compared with its custom benchmark's return of negative 18.2%. The Global Equity portfolio has outperformed its custom benchmark over the three-, five-, and 10-year periods.

Most equity markets had their worst calendar year since the global financial crisis of 2008 as war in Ukraine, COVID lockdowns in China, supply chain bottlenecks, high inflation, and rising interest rates brought on by hawkish central banks threatened the global growth outlook. Surging inflation was an overarching concern this year, as U.S. headline Consumer Price Index (CPI) reached a 9.1% year-over-year pace in June (its highest level since 1981) before beginning to taper off. Inflation's impact was felt in the most speculative parts of markets (e.g., growth focused stocks). During 2022, companies had to cope with wage pressures, higher input pricing, and demand fluctuations. These factors fed into investor concerns that corporate earnings estimates were too high. Amid all of this, investor sentiment remained extremely depressed, while corporate executives slowed hiring, announced layoffs, and worked to cut costs.

PERA's Fixed Income portfolio returned negative 12.8%, outperforming its custom benchmark's return of negative 13.0%. The Fixed Income portfolio has outperformed its custom benchmark over the one-, three-, five-, and 10-year periods.

To slow decades-high inflation, the Federal Reserve (Fed) raised the Fed funds target rate at its fastest pace in history, leading bond yields to jump to their highest levels in years. The Fed raised its benchmark rate seven times through the course of the year, bringing the effective rate to a range of 4.25%-4.50%, up from zero in January. Treasury yields of all maturities surged in 2022, especially short-term yields, which are most directly affected by the Fed's moves. The 2-year Treasury yield rose to 4.3%, up from 0.8% in January, and 10-year yields rose to 3.8%, up from 1.5% at the start of the year. As a result, bonds had their worst year in modern history as the Bloomberg U.S. Aggregate Bond Index fell 13.0%. Prior calendar-year losses for the index had never exceeded 2%. The outlook improved in the fourth quarter as the market began recognizing that the Fed may be able to pause its rate hikes and "pivot" to lowering rates.

PERA's Private Equity portfolio returned negative 6.7%, compared with its custom benchmark's return of negative 16.7%. The Private Equity portfolio has outperformed its custom benchmark over the one-, three-, and five-year periods. The ultimate goal of private equity is to outperform public equities over the long term. Over the past 10 years, the Private Equity Portfolio has outperformed the Global Equity Custom Benchmark by 5.2%. The portfolio's since inception internal rate of return as of December 31, 2022, was 10.8% compared to its custom benchmark's since inception internal rate of return of 7.8%.

Fundraising in 2022 finished below 2021 levels both in terms of dollars and number of funds raised. While dollars raised remained strong compared to prior years, the number of private equity funds raised fell dramatically year-over-year to its lowest level since 2013, implying larger funds accounted for a disproportionate share of the capital raised. After a record 2021, investment deal activity in the U.S. by count and value declined by 2.4% and 19.5%, respectively, with a meaningful decline in the fourth quarter of 2022 as compared to the fourth quarter of 2021. Despite the declines compared to 2021, 2022 still posted one of the strongest years on record for deal activity. Public-to-private activity increased in 2022, with larger deal size occurring compared to prior years. U.S. private equity exit activity declined sharply both in terms of number and dollar value compared with 2021's record levels, dropping by 28.3% and 66.3%, respectively. Despite the decline in 2022 private equity exits, 2022 activity remained in-line with pre-2021 levels. After a strong start to 2022, venture-backed investment activity fell below the record levels posted in 2021 yet showed resilience and outstripped pre-2021 levels both in terms of dollars raised and number of deals.

DEFINED BENEFIT PLANS

PERA's Real Estate portfolio returned 13.4%, compared with its custom benchmark's return of 7.0%. The Real Estate portfolio has outperformed its custom benchmark over the one-, three-, five-, and 10-year periods.

2022 was a strong year for commercial real estate led by continued demand in multifamily and industrial which drove positive returns for the year in those sectors. Continued consumer preferences for online shopping drove industrial performance during the year while multifamily performance benefited from a rising interest rate environment which made single-family home ownership less affordable. Returns peaked early while tightening in financial conditions occurred during the 4th quarter which led to rising capitalization rates and asset depreciation. Office vacancy in nearly all major U.S. cities rose during 2022 as new supply entered the market and demand moderated. New investment activity appeared limited with asset pricing deteriorating as investors focused on flexibility to manage near term debt maturities.

PERA's Alternatives portfolio returned 7.6%, compared with its custom benchmark's return of negative 0.7%. The Alternatives portfolio has outperformed its custom benchmark over the one-, three-, and five-year periods.

Opportunistic fund managers faced challenging market conditions but capitalized on distressed and special situations to acquire private assets at attractive prices. Private credit funds benefitted from issuing floating-rate instruments, which resulted in higher interest income. Real asset strategies' primary drivers for the year's absolute return were timberland, which benefited from a strong valuation and exit environment as non-strategic buyers continued to bid up prices, and infrastructure, as these assets often benefit from contracted revenue streams with annual inflation adjustments. Excess return in the real asset's strategy was challenging to achieve, as the inflation-linked benchmark remained near its 40-year high. Risk mitigation outperformance was attributed to strong returns from global macro funds, which gained from trades tied to sharply rising rates and geopolitical events, such as Russia's invasion of Ukraine in February and the crash of the British pound in September.

DEFINED BENEFIT PLANS

(Dollars in Thousands)

PROFILE OF INVESTMENTS IN COLORADO

As of December 31, 2022

	Fair Value
Public Equity[1]	**$138,578**
Fixed Income[1]	**21,319**
Real Estate	
Portfolio investments[2]	137,182
Future commitments to Colorado-based general partnerships or funds	87,460
Total Real Estate	**224,642**
Private Equity	
Portfolio investments[2]	220,305
Future commitments to Colorado-based general partnerships or funds	50,660
Total Private Equity	**270,965**
Alternatives	
Portfolio investments[2]	140,066
Future commitments to Colorado-based general partnerships or funds	153,362
Total Alternatives	**293,428**
Total	**$948,932**

1 Companies headquartered in Colorado.

2 Portfolio investments domiciled in Colorado.

DEFINED BENEFIT PLANS

(Dollars in Thousands)

LARGEST EQUITY HOLDINGS BY FAIR VALUE[1]

As of December 31, 2022

	Shares	Fair Value
Apple Inc.	8,192,258	$1,064,420
Microsoft Corp.	3,801,592	911,698
Alphabet Inc.	5,682,000	501,323
Amazon.com, Inc.	5,677,035	476,871
UnitedHealth Group Inc.	749,089	397,152
Visa Inc.	1,376,432	285,968
Costco Wholesale Corp.	583,462	266,350
Merck & Co.	2,028,202	225,029
JPMorgan Chase & Co.	1,577,771	211,579
Nvidia Corp.	1,380,278	201,714

[1] Does not include commingled funds.

Note: A complete list of holdings is available on copera.org.

LARGEST FIXED INCOME HOLDINGS BY FAIR VALUE[1]

As of December 31, 2022

	Par Value	Income Rate	Maturity Date	Fair Value
FNMA TBA	$381,302	4.000%	6/25/52	$357,992
FNMA TBA	185,737	4.500%	7/25/52	178,917
FNMA TBA	176,893	5.000%	7/25/52	174,433
US Treasury Bonds	191,879	3.375%	8/15/42	172,661
US Treasury Bonds	159,203	2.500%	2/15/46	120,080
US Treasury Bonds	167,065	1.875%	2/15/41	118,943
US Treasury Notes	118,852	4.000%	12/15/25	118,202
GNMA Pool #MA7706	123,615	3.000%	11/20/51	110,711
US Treasury Notes	117,928	1.125%	1/15/25	110,424
US Treasury Notes	117,928	0.625%	11/15/24	110,134

[1] Based on the allocated portion of the unitized PERA Fixed Income Pool.

Note: A complete list of holdings is available on copera.org.

DEFINED CONTRIBUTION PLANS

INTRODUCTION

The Voluntary Investment Program, Defined Contribution Retirement Plan, and the Deferred Compensation Plan are included in the information discussed in this subsection on Colorado PERA's defined contribution plans.

These three Plans are known collectively as the Capital Accumulation Plans (CAPs). PERA publishes an Annual Report for the CAPs and distributes it to all plan participants.

REPORT ON INVESTMENT ACTIVITY

Overview

PERA established the Voluntary Investment Program (PERAPlus 401(k) Plan) on January 1, 1985, under Section 401(k) of the Internal Revenue Code (IRC). The PERAPlus 401(k) Plan includes voluntary contributions made by employees of PERA-affiliated employers in the State, School, Local Government, Judicial, and Denver Public Schools Division Trust Funds. These contributions are entirely separate from those that members make to the defined benefit plan each month.

The Defined Contribution Retirement Plan (DC Plan) was established on January 1, 2006, as an IRC § 401(a) governmental profit-sharing plan. The DC Plan offers a defined contribution alternative to the PERA defined benefit plan for certain employees of the State or Local Government Divisions, classified employees at State colleges and universities, most community colleges, as well as the District Attorney within each Judicial District, and if authorized by the county and the District Attorney, the attorneys within that Judicial District (see Note 1 of the Notes to the Financial Statements in the Financial Section for additional details).

On July 1, 2009, PERA assumed the administrative and fiduciary responsibility for the State of Colorado Deferred Compensation Plan, now known as the PERAPlus 457 Plan. The PERAPlus 457 Plan includes voluntary contributions made by employees working for a PERA-affiliated employer that have also affiliated with the PERAPlus 457 Plan. The employees of some employers that had affiliated with the State of Colorado Deferred Compensation Plan prior to July 1, 2009, and were not affiliated with PERA, remain eligible to contribute.

YEAR END STATISTICS

(Dollars in Thousands)

	Fiduciary Net Position			Number of Accounts		
	2022	**2021**	**% Chg**	**2022**	**2021**	**% Chg**
PERAPlus 401(k) Plan	**$3,786,273**	$4,713,012	(19.66%)	**67,040**	67,887	(1.25%)
DC Plan	**339,452**	387,278	(12.35%)	**7,846**	7,673	2.25%
PERAPlus 457 Plan	**1,106,210**	1,308,999	(15.49%)	**20,063**	20,022	0.20%

Outline of Investment Policies

Objectives

The Board is responsible for approving an appropriate range of investments that addresses the needs of the participants in the CAPs. The objectives of selecting the investment options under each CAP are to:

- Provide a wide range of investment opportunities in various asset classes so as to allow for diversification and to cover a wide risk/return spectrum.
- Achieve returns within reasonable and prudent levels of risk.
- Provide returns comparable to returns for similar investment options.
- Control administrative and investment management costs to the plan and participants.

Investment Stewardship

The CAPs adhere to the same principles of investment stewardship as the defined benefit plans. For more information, please refer to the Investment Stewardship section on page 126.

PERAdvantage Investment Options

The PERAdvantage funds provide diversification within each of the seven primary funds and 10 target retirement date funds. The white label structure of the PERAdvantage funds simplifies choices, increases diversification, and helps participants identify investments based on how the fund invests the money rather than name familiarity. In addition, the CAPs provide a self-directed brokerage account for participants to select their own investments.

DEFINED CONTRIBUTION PLANS

Participants invest assets in one or more of the following investments:

Primary Investment Options

PERAdvantage Capital Preservation Fund

The fund seeks to provide consistent investment income with a stable net asset value primarily by investing in a portfolio of high-quality, low volatility fixed income securities to produce the income. Since the underlying fixed income investments fluctuate in fair value with changes in the market, the portfolio is paired with an insurance contract to provide a more stable return and to offer participants the ability to withdraw or transfer their funds subject to plan rules without any fair value risk or other penalty for premature withdrawal. The fund is managed by Empower Capital Management (100%).

PERAdvantage Fixed Income Fund

The fund seeks to generate income, preserve capital, and provide long-term capital appreciation by investing in a diversified portfolio of fixed income instruments. This fund primarily invests in investment grade debt securities, but may invest a portion of its assets in high-yield securities. The fund may invest in derivative instruments or in mortgage- or asset-backed securities. The fund is managed by PERA (50% unitized Fixed Income) and BlackRock (50% Core Alpha).

PERAdvantage Real Return Fund

The fund seeks to provide broad exposure to real assets and U.S. inflation protected bonds and to produce a return over a full market cycle that exceeds the rate of inflation. This fund invests in U.S. inflation-linked bonds, real estate investment trusts (REITs), commodities, and global natural resources and infrastructure stocks. The fund is managed by State Street Global Advisors (70% Real Assets Strategy and 30% U.S. Inflation Protected Index).

PERAdvantage Socially Responsible Investment (SRI) Fund

The fund seeks to invest in a portfolio of developed and emerging market stocks screened on environmental, social, and governance (ESG) factors, and fixed income securities across the investment grade spectrum that demonstrate ESG leadership. The equity portion seeks to replicate the return of the MSCI ACWI ESG Focus Index. The fixed income portion invests in U.S. dollar denominated securities and may invest a significant portion of its assets in corporate bonds or mortgage-backed securities. The fund is managed by BlackRock (60% ACWI ESG Focus Index) and TIAA-CREF (40% Core Impact Bond).

PERAdvantage U.S. Large Cap Stock Fund

The fund seeks to provide long-term capital appreciation and dividend income primarily by investing in the common stock of companies located in the United States with large market capitalizations. This fund invests in a wide array of U.S. stocks with market capitalizations similar to those found in the MSCI USA Large Cap Index. The fund combines active and passive management and is managed by PERA (60% Large Cap Index and 40% Large Cap Core).

PERAdvantage U.S. Small and Mid Cap Stock Fund

The fund seeks to provide long-term capital appreciation and dividend income primarily by investing in the common stock of companies located in the United States with small and mid-market capitalizations. This fund invests in a wide array of U.S. stocks with market capitalizations similar to those found in the MSCI USA SMID Cap Index. The fund is managed by PERA (50% Small Cap Core) and Dimensional Fund Advisors (50% Mid Cap Core).

PERAdvantage International Stock Fund

The fund seeks to provide long-term capital appreciation and dividend income primarily by investing in the common stock of companies located outside the United States. This fund invests in a wide array of international stocks similar to those found in the MSCI All County World Index (ACWI) ex-USA Index. The fund is managed by Schroder Investment Management (60% International Alpha) and PERA (40% International Multi-Factor).

Additional Investment Options

PERAdvantage Target Retirement Date Funds

There are 10 funds with varying asset mixes and risk levels based on expected retirement date. Each fund is comprised of the corresponding BlackRock LifePath Index Target Retirement Date Fund. These funds seek a combination of capital appreciation and income and will automatically adjust the underlying asset allocation to become more conservative as they reach their target retirement date, at which time the fund will be blended into the PERAdvantage Income Fund. The funds are passively managed by BlackRock (100%).

TD Ameritrade Self-Directed Brokerage Account

This account allows selection from numerous mutual funds and other types of securities, such as stocks and bonds, for an additional fee. Investment in the self-directed brokerage account is offered through TD Ameritrade, a Division of TD Ameritrade, Inc.

DEFINED CONTRIBUTION PLANS

2022 Changes

Allspring, a manager in the PERAdvantage Fixed Income Fund, was terminated during 2022 and assets were transferred to the newly created internally managed unitized PERA Fixed Income Pool. The BlackRock Index allocation in the PERAdvantage Fixed Income Fund was transferred to the BlackRock Core Alpha Fund.

Loans

Participants in the PERAPlus 401(k) and PERAPlus 457 Plans may access their funds through loans as allowed under plan policy and the Internal Revenue Service. The DC Plan prohibits participant loans.

Administrative Fees

Plan administrative fees pay for recordkeeping, custodial services, consulting, and internal PERA administrative expenses.

The administrative fee for the PERAPlus 401(k) Plan and the DC Plan consists of a flat $1.00 per month per participant per plan and an asset-based fee of up to 0.03% on each underlying PERAdvantage fund. The PERAPlus 401(k) Plan asset-based fee was waived through 2022. The administrative fee for the PERAPlus 457 Plan consists of a flat $1.50 per month per participant per plan and an asset based fee of up to 0.03% on each underlying PERAdvantage fund.

(The Report on Investment Activity was prepared by internal staff.)

DEFINED CONTRIBUTION PLANS

Callan provides the investment returns for the CAPs based on data made available by Empower. The annualized one-, three-, five-, and 10-year net-of-fees time-weighted rates of return for each PERAdvantage fund and their respective benchmarks are as follows:

SCHEDULE OF INVESTMENT RESULTS

As of December 31, 2022

Fund/Benchmark	2022	3-Year	5-Year	10-Year
PERAdvantage Capital Preservation Fund	**1.5%**	1.8%	1.9%	1.9%
ICE BofAML U.S. 3-Month Treasury Bill Index[1]	**1.5%**	0.7%	1.4%	1.6%
PERAdvantage Fixed Income Fund	**(13.5%)**	(2.6%)	0.1%	1.0%
Bloomberg U.S. Aggregate Bond Index	**(13.0%)**	(2.7%)	0.0%	1.1%
PERAdvantage Real Return Fund	**(1.3%)**	6.8%	5.2%	2.6%
Real Return Custom Index[2]	**(1.4%)**	6.6%	5.2%	2.7%
PERAdvantage SRI Fund	**(17.1%)**	1.7%	3.9%	5.6%
SRI Custom Index[3]	**(16.8%)**	1.7%	3.9%	5.7%
PERAdvantage U.S. Large Cap Stock Fund	**(20.7%)**	7.0%	9.3%	12.4%
MSCI USA Large Cap Index[4]	**(20.0%)**	7.0%	8.8%	12.2%
PERAdvantage U.S. Small and Mid Cap Stock Fund	**(12.4%)**	7.4%	6.9%	10.2%
MSCI USA SMID Cap Index[5]	**(18.1%)**	6.1%	6.7%	10.5%
PERAdvantage International Stock Fund	**(17.0%)**	3.2%	2.8%	5.5%
MSCI ACWI ex USA Index	**(16.0%)**	0.1%	0.9%	3.8%
PERAdvantage Income Fund	**(14.6%)**	0.7%	2.6%	3.9%
BlackRock LifePath® Retirement Index	**(14.5%)**	0.8%	2.7%	4.0%
PERAdvantage 2025 Fund	**(15.2%)**	1.2%	3.2%	5.2%
BlackRock LifePath® 2025 Index	**(15.2%)**	1.2%	3.2%	5.3%
PERAdvantage 2030 Fund	**(16.0%)**	1.9%	3.8%	5.9%
BlackRock LifePath® 2030 Index	**(15.9%)**	1.9%	3.8%	6.0%
PERAdvantage 2035 Fund	**(16.7%)**	2.5%	4.3%	6.6%
BlackRock LifePath® 2035 Index	**(16.7%)**	2.5%	4.3%	6.6%
PERAdvantage 2040 Fund	**(17.4%)**	3.0%	4.8%	7.1%
BlackRock LifePath® 2040 Index	**(17.4%)**	3.0%	4.8%	7.2%
PERAdvantage 2045 Fund	**(17.9%)**	3.5%	5.2%	7.6%
BlackRock LifePath® 2045 Index	**(18.0%)**	3.5%	5.1%	7.6%
PERAdvantage 2050 Fund	**(18.2%)**	3.8%	5.4%	7.9%
BlackRock LifePath® 2050 Index	**(18.3%)**	3.7%	5.3%	7.9%
PERAdvantage 2055 Fund	**(18.3%)**	3.8%	5.4%	8.0%
BlackRock LifePath® 2055 Index	**(18.4%)**	3.8%	5.3%	8.0%
PERAdvantage 2060 Fund	**(18.3%)**	3.8%	5.4%	N/A
BlackRock LifePath® 2060 Index	**(18.4%)**	3.8%	5.3%	N/A
PERAdvantage 2065 Fund	**(18.3%)**	N/A	N/A	N/A
BlackRock LifePath® 2065 Index	**(18.4%)**	N/A	N/A	N/A

Note: Performance is net of investment management fees (and net of administrative fees prior to 12/03/2021) and calculated using time-weighted net asset values. Returns for periods greater than one year are annualized.

1 ICE BofAML U.S. 3-Month Treasury Bill Index represents the Hueler Index through December 2019 and the ICE BofAML U.S. 3-Month Treasury Bill Index from January 2020 forward.

2 70% State Street Real Asset Strategy DC Index/30% Bloomberg U.S. TIPS Index.

3 60% MSCI World ESG Leaders/40% Bloomberg U.S. Gov't Bond through September 2019, 60% MSCI ACWI ESG Focus/40% Bloomberg U.S. Gov't Bond through December 2019, 60% MSCI ACWI ESG Focus/40% Bloomberg U.S. Aggregate thereafter.

4 MSCI USA Large Cap Index represents the Russell 1000 Index through December 2018 and the MSCI USA Large Cap Index from January 2019 forward.

5 MSCI USA SMID Cap Index represents the Russell 2500 Index through December 2018 and the MSCI USA SMID Cap Index from January 2019 forward.

DEFINED CONTRIBUTION PLANS

(Dollars in Thousands)

INVESTMENT SUMMARY

	Fair Value as of December 31, 2022		
Fund	Voluntary Investment Program	Defined Contribution Retirement Plan	Deferred Compensation Plan
PERAdvantage Capital Preservation Fund[1]	$317,908	$16,053	$158,960
PERAdvantage Fixed Income Fund	284,209	14,613	81,803
Fixed Income Funds	**602,117**	**30,666**	**240,763**
PERAdvantage Real Return Fund	38,512	3,059	16,104
PERAdvantage SRI Fund	24,624	2,658	11,007
Multi-Asset Funds	**63,136**	**5,717**	**27,111**
PERAdvantage U.S. Large Cap Stock Fund	1,545,170	58,691	282,141
PERAdvantage U.S. Small and Mid Cap Stock Fund	213,370	28,672	131,912
PERAdvantage International Stock Fund	305,790	27,453	108,417
Equity Funds	**2,064,330**	**114,816**	**522,470**
PERAdvantage Income Fund	204,066	11,924	48,275
PERAdvantage 2025 Fund	151,597	12,100	38,499
PERAdvantage 2030 Fund	152,268	15,625	39,794
PERAdvantage 2035 Fund	142,613	17,335	42,267
PERAdvantage 2040 Fund	109,144	20,732	37,225
PERAdvantage 2045 Fund	81,314	33,304	25,520
PERAdvantage 2050 Fund	60,055	28,683	18,101
PERAdvantage 2055 Fund	36,233	23,484	9,638
PERAdvantage 2060 Fund	15,791	8,317	7,056
PERAdvantage 2065 Fund	3,956	1,270	2,171
Target Retirement Date Funds	**957,037**	**172,774**	**268,546**
TD Ameritrade Insured Deposit Account	6,224	1,719	6,893
Short-Term Funds	**6,224**	**1,719**	**6,893**
TD Ameritrade Self-Directed Brokerage Account	31,585	5,976	24,429
Self-Directed Brokerage	**31,585**	**5,976**	**24,429**
Total Investment Portfolio[2]	**$3,724,429**	**$331,668**	**$1,090,212**
Reconciliation to fair value per financial statements[3]			
Adjustments:			
Cash and short term-investments	(31,455)	(3,355)	(14,751)
Net securities lending collateral and obligations	(271)	(25)	(106)
Net investment settlements and income and other liabilities	9,035	378	2,472
Fair value per financial statements	**$3,701,738**	**$328,666**	**$1,077,827**

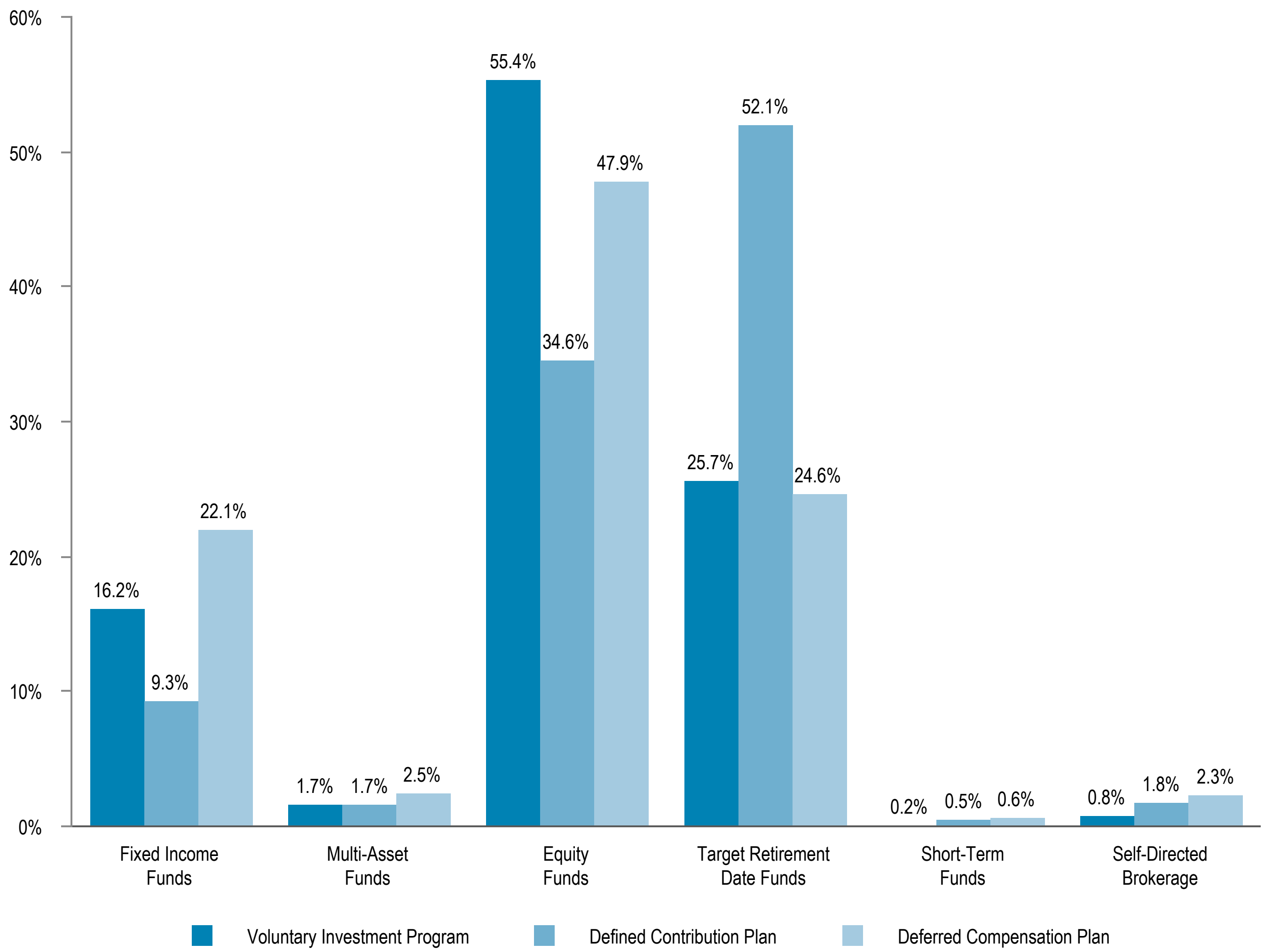
[1] The Stable Value Fund in the PERAdvantage Capital Preservation Fund is reported at contract value.

[2] The total investment portfolio managed by PERA for the defined contribution plans is $5,146,309.

[3] Investment receivables, payables, accruals, securities lending collateral, securities lending obligations, and cash and short-term investments are excluded from investments in the financial statements.

DEFINED CONTRIBUTION PLANS

Asset Breakdown
As of December 31, 2022



Actuarial Section

COLORADO PERA®

ACTUARY'S CERTIFICATION LETTER

Segal

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June 6, 2023

Board of Trustees
Public Employees' Retirement Association of Colorado
1301 Pennsylvania Street
Denver, CO 80203-2386

Re: Actuarial Certification of PERA Division and Health Care Trust Funds

Dear Members of the Board:

Per the "Colorado PERA Defined Benefit Pension Plan Funding Policy", adopted by the Board of Trustees on March 20, 2015, and most recently revised on November 16, 2018, and the "Colorado PERA Defined Benefit OPEB Plan Funding Policy", adopted by the Board of Trustees on January 19, 2018, the main funding objectives of the Public Employees' Retirement Association of Colorado (Colorado PERA) are:

- Preservation of the defined benefit plan structure;
- Demonstration of transparency and accountability;
- Achievement of a funded ratio greater than or equal to 110%;
- Balance of contribution rate stability and intergenerational equity;
- Reduction of Unfunded Actuarial Accrued Liabilities; and
- Recognition of beneficial elements of pooled risk.

With these goals in mind, an annual actuarial valuation is performed as a measure of the progress towards meeting them. The most recent valuations are based on the plan provisions and actuarial assumptions and methods in effect on December 31, 2022. In completing the valuation of the five defined benefit pension plans, referred to as the Division Trust Funds, and the two defined benefit Other Post-employment Benefit (OPEB) plans, referred to as the Health Care Trust Funds (HCTFs), Segal relied on membership and financial data provided by Colorado PERA. We have reviewed the membership data for reasonableness and consistency. We have not audited the membership data, but we have reconciled the membership data to the data used in the prior year's valuation.

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Board of Trustees
June 6, 2023
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This actuarial valuation reflects the following changes from the prior valuation including:

The following legislation, enacted in 2022 and 2023 was reflected, to the extent possible, in this actuarial valuation:

- HB 22-1029, effective upon enactment in 2022, requires the State Treasurer to (in addition to the regularly scheduled $225 million direct distribution) issue a warrant to PERA in the amount of $380 million, upon enactment, with potential reductions to future direct distributions scheduled to occur July 1, 2023, and July 1, 2024, based upon the actual investment returns reported by PERA for 2021 and 2022, respectively. The payment scheduled for July 1, 2023, is to be reduced by $190 million, from $225 million to $35 million, based on the total fund investment return in 2021 of 16.1%. No reduction is required for the payment scheduled to occur July 1, 2024, due to a negative investment return in 2022.
- HB 22-1057 and HB 22-1101, enacted and effective as of March 17, 2022, broadens the Critical Shortage programs that remove limitations regarding the number of days that service retirees can work without any reduction in their retirement benefits. These bills (respectively) are applicable to substitute teachers and members working for any rural school district, Board of Cooperative Services (BOCES), or charter school subject to critical shortage of certain positions.
- HB 22-1087, enacted and effective as of March 24, 2022, excludes district directors who begin service on or after July 1, 2022, from membership in PERA.
- SB 23-056, enacted and effective June 2, 2023, is intended to recompense PERA for the remaining portion of the $225 million direct distribution originally scheduled for receipt July 1, 2020, suspended due to the enactment of HB 20-1379, but not fully repaid through the provisions within HB 22-1029. Pursuant to SB 23-056, the State Treasurer is to issue a warrant to PERA consisting of the balance of the PERA Payment Cash Fund, created in §24-51-416, plus $10 million from the General Fund, totaling approximately $14.5 million.
- SB 23-163, enacted and effective June 6, 2023, states that beginning July 1, 2023, a wildlife officer and a parks and recreation officer (officer), employed by the division of parks and wildlife in the department of natural resources, is classified as a state trooper for the purpose of determining the officer's service retirement eligibility and benefit under PERA.

Note that all 2022 and 2023 PERA-related legislation listed above had minimal impact on the results of the funding actuarial valuation as of December 31, 2022, however, HB 22-1029 directly impacted the market and actuarial value of assets as of the December 31, 2022, valuation date for all divisions except the Local Government Division.

Other changes, include:

- The December 31, 2022, actuarial valuation recognizes the change in the default method applied for granting service accruals for certain members, from a "12-pay" method to a "non-12-pay" method. The default service accrual method for positions with an employment pattern of at least eight months but fewer than 12 months (including, but not limited to positions in the School and DPS Divisions) receive a higher ratio of service credit for each month worked, up to a maximum of 12 months of service credit per year.

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Segal

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Board of Trustees
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- As allowed by C.R.S. § 24-51-313, also reflected in the December 31, 2022, funding valuation results is the disaffiliation of Tri-County Health Department (TCHD) as a PERA-affiliated employer of the Local Government Division (and HCTF), effective December 31, 2022, due to the withdrawal of Douglas, Adams, and Arapahoe Counties from the Tri-County Health Department. As of the publication of the pension funding valuation report (June 6, 2023), no disaffiliation payment associated with Tri-County Health Department has been received by PERA, and therefore no disaffiliation dollars are reflected in the market or actuarial value of assets of the Local Government Division Trust Fund (nor HCTF) as of the December 31, 2022, valuation date. Pursuant to C.R.S. §§ 24-51-313-319, a final disaffiliation cost will be assessed and provided to the court-appointed Receiver for TCHD, following the release of PERA's 2022 Annual Comprehensive Financial Report.

- The December 31, 2022, Division and HCTFs actuarial valuation reports reflect modifications to the valuation programming made in response to the actuarial audit report, dated October 14, 2022, summarizing the results of the actuarial audit performed on the December 31, 2021, actuarial valuation.

- Annual assumption changes for the HCTFs were recognized, resulting from updates to retiree health care cost and health care cost trend assumptions based upon a review of historical experience, Medicare plan option elections, health care cost trend survey data, and available retiree premium increases for 2023. Other assumption changes for the HCTFs resulted from adjusting the timing of the retirement decrement to middle-of-year and updating the morbidity rates used to estimate individual retiree and spouse costs by age and by gender.

  - These changes reduced the total actuarial accrued liability for the HCTFs by $36.0 million and decreased the total normal cost by $1.2 million.

In our opinion, the assumptions are individually reasonable, taking into account the experience of the Division Trust Funds and the HCTFs and reasonable expectations, are internally consistent, and, in combination, offer our best estimate of anticipated experience affecting the Division Trust Funds and the HCTFs.

Future actuarial results may differ significantly from the current results 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.

Additionally, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations may lead to significant changes in actuarial measurements. 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.

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Segal

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Board of Trustees
June 6, 2023
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Segal provided the following information and/or schedules for the December 31, 2022, Annual Report:

Financial Section

- Prepared for the Division Trust Funds and HCTFs
  - Yearly Contribution Deficiency
  - Required Discount Rate Sensitivity Information providing the Net Pension Liability and the Net OPEB Liability at a discount rate that is one percentage point lower and one percentage point higher than the discount rate at Measurement Date
  - Membership Data
  - Notes to Required Supplementary Information
- Prepared for the Division Trust Funds Only
  - Average Monthly Benefit By Division for 2022, considering entire retired population and those retiring in 2022
  - Required Supplementary Information
    - Schedule of Changes in Net Pension Liability
    - Schedule of the Net Pension Liability
    - Schedule of Employer Contributions
- Prepared for the HCTFs Only
  - Required Health Care Cost Trend Rate Sensitivity Information at health care cost trend rates that are one percentage point lower and one percentage point higher than the health care cost trend rates applied at Measurement Date
  - Participation Data
  - Required Supplementary Information
    - Schedule of Changes in Net OPEB Liability
    - Schedule of the Net OPEB Liability
    - Schedule of Employer Contributions

Actuarial Section

- Prepared for the Division Trust Funds and HCTFs
  - Schedule of Retirees and Beneficiaries Added to and Removed from the Benefit Payroll
  - Schedule of Funded Liabilities by Type (formerly known as the Solvency Test)
  - Schedule of Funding Progress
  - Analysis of Financial Experience
  - Schedule of Gains and Losses in Accrued Liabilities and Reconciliation of Unfunded Actuarial Accrued Liabilities
  - Schedule of Computed Employer Contribution Rates for the 2024 Fiscal Year
  - Actuarial Statistics
  - Actuarially Determined Contributions (ADCs)
  - Alternative ADCs using 25-year, 20-year and 15-year amortization periods
  - Funded Ratios
  - Funded Ratio, Unfunded Actuarial Accrued Liability and Actuarially Determined Contributions using 6.25%, 7.25% and 8.25% investment return assumptions
  - Schedule of Active Member Actuarial Valuation Data

- Prepared for the Division Trust Funds Only
  - Member – Retiree Comparison

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Statistical Section

- Prepared for the Division Trust Funds and HCTFs
  - Schedule of Average Benefit Payments
- Prepared for the Division Trust Funds Only
  - Member and Benefit Recipient Statistics
  - Breakdown of Membership by Tiers
  - PERA Benefit Payments
    - Benefit Payments by Benefit Range
    - Benefit Payments by Benefit Range including RBA amounts
    - Benefit Payments by Decile
  - Schedule of Average Retirement Benefits Payable by Year of Retirement
    - For all retirees
    - For members who retired during the year
  - Schedule of Retirees and Survivors by Types of Benefits

In aggregate, the Division Trust Funds have a funded ratio of 69.9% based on the Actuarial Value of Assets and 62.7% based on the Fair Value of Assets. For the HCTFs combined, the funded ratios are 45.7% on an Actuarial Value of Assets basis and 41.0% on a Fair Value of Assets basis.

The results indicate that for all Division Trust Funds, the combined employer and member contribution rates, including the direct distribution from the State, as appropriate, are sufficient to fund the normal cost for all members and each division's UAAL, with consideration of the amounts allocated to finance the Annual Increase Reserve (AIR) Funds, and provide additional contributions to help finance both Health Care Trust Funds. In addition, the employer contribution rate with anticipated service purchase transfers is sufficient to eventually finance benefits for the HCTFs.

Shown in the following tables are the resulting amortization periods for each division trust fund as of December 31, 2022, recognizing all current sources of income from employer contributions, member contributions, the direct distribution (as applicable), and any future increases to the base employer contributions, member contributions, Amortization Equalization Disbursement (AED), and Supplemental Amortization Equalization Disbursement (SAED):

Trust Fund	Amortization Period[1]
State Division	20 years
School Division	24 years
Local Government Division	9 years
Judicial Division	6 years
Denver Public Schools (DPS) Division	7 years
HCTF	11 years
DPS HCTF	0 years

[1] Calculations completed on an actuarial valuation basis with a closed population (i.e., based upon the membership, normal cost rate and UAAL as of December 31, 2022). For the DPS Division, the resulting amortization period assumes a declining Pension Certificates of Participation (PCOP) offset rate as described in statute.

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Segal

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At the direction of PERA, Segal has prepared deterministic financial projections for all Division Trust Funds with the lower cost benefit structure for new members and using the following assumptions:

- All actuarial assumptions, including assuming 7.25% investment returns are realized each year
- Performed on an open-group basis with assumed active membership growth, as follows:
  - For School, Local Government and Denver Public Schools – 1.00% per year
  - For State and Judicial – 0.25% each year

These projections[2] indicate that fully funding the actuarial accrued liability under the PERA revised benefit structure created by SB 18-200 is achievable within a projection period of 34 years and includes the impact of AAP adjustments effective July 1, 2022, and the impact of legislative changes pursuant to HB 22-1029 and SB 23-056. The projected number of years[2] until each trust fund is expected to be 100% funded is shown in the table below:

Trust Fund	Projected Years[2] Until 100% Funded
State Division	32 years
School Division	34 years
Local Government Division	23 years
Judicial Division	12 years
DPS Division	13 years
HCTF	12 years
DPS HCTF	2 years

[2] Calculations completed on a projected basis with an open, increasing population (i.e., active members expected to retire, terminate, or die are replaced by new members who will accrue pension benefits under a lower cost basis).

The AAP assessment, performed as of December 31, 2022, resulted in a ratio of 105.69%. Since this ratio falls between 98% and 120%, no additional modifications to contribution rates, the AI cap, or the direct distribution payments are required as of July 1, 2024.

Actuarial computations presented in the December 31, 2022, actuarial valuation reports are for purposes of determining the actuarially determined contribution rates and evaluating the funding of the Division Trust Funds and HCTFs. Determinations for purposes other than meeting these requirements may be significantly different from the results shown in the December 31, 2022, actuarial valuation reports.

We also prepared actuarial computations as of December 31, 2022, for purposes of fulfilling financial accounting requirements for PERA under Governmental Accounting Standards Board (GASB) Statement No. 67 and Statement No. 74. The actuarial assumptions used in the funding valuations were also used for GASB 67 and GASB 74 reporting except GASB 74 reporting reflects health care cost and trend assumptions effective as of December 31, 2021. In addition, the entry age actuarial cost method, which is required to be used under GASB 67 and GASB 74, is also

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ACTUARY'S CERTIFICATION LETTER

Board of Trustees
June 6, 2023
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used for purposes of the funding valuations. The actuarial assumptions used in the funding and the GASB 67 and GASB 74 accounting valuations, as detailed in Segal's reports, meet the parameters set by the Actuarial Standards of Practice (ASOPs), as issued by the Actuarial Standards Board, and generally accepted accounting principles (GAAP) applicable in the United States of America as promulgated by the Governmental Accounting Standards Board.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this information is complete and accurate and that the valuation was performed in accordance with standards of practice and by qualified actuaries as prescribed by the American Academy of Actuaries and the Actuarial Standards Board. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. All of the consultants listed below have experience in performing valuations for large statewide public retirement systems.

Sincerely yours,

Matthew Strom, FSA, MAAA, EA
Senior Vice President and Actuary

Brad Ramirez, FSA, MAAA, EA
Vice President and Actuary

Tanya Dybal, FSA, MAAA, EA
Vice President and Actuary

Melissa A. Krumholz, FSA, MAAA
Vice President and Actuary

Yori Rubinson, FSA, MAAA
Vice President and Retiree Health Actuary

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DIVISION TRUST FUNDS—PENSION

Actuarial Topics

The standard promulgated by the Governmental Accounting Standards Board (GASB) Statement No. 67, results in the preparation of two actuarial valuations—one for funding purposes and one for accounting and financial reporting purposes. Unless otherwise noted, this Division Trust Funds subsection reports on the actuarial valuation performed for funding purposes, but also includes information on specific differences between the two actuarial valuations.

The plan provisions in effect on December 31, 2022, are summarized in Note 1 of the Notes to the Financial Statements in the Financial Section. Changes to plan provisions enacted into law after December 31, 2022, and included in the actuarial valuation are summarized under "Changes Since Last Actuarial Valuation" on page 159.

PERA BOARD GOVERNANCE - FIVE DEFINED BENEFIT PENSION PLANS	
PERA Defined Benefit Pension Plans	The five defined benefit pension plans of the Public Employees' Retirement Association of Colorado (PERA), include the State Division, School Division, Local Government Division, Judicial Division, and Denver Public Schools (DPS) Division Trust Funds. All but the DPS Division Trust Fund are cost-sharing multiple-employer plans and the DPS Division Trust Fund is a single-employer plan.
PERA Board Pension Funding Policy	The PERA Board of Trustees (Board) is responsible for maintaining a pension funding policy applicable to these plans. The current pension funding policy initially was adopted by the Board on March 20, 2015, effective for the December 31, 2014, funding actuarial valuation and last amended on November 16, 2018. The pension funding policy requires the calculation of an actuarially determined contribution (ADC) for each of the five Division Trust Funds for the purpose of assessing the adequacy of the statutory contribution rates of each division. The ADC is determined in accordance with the pension plan provisions in effect as of the date of the actuary's Letter of Certification and is expressed as a level percentage of assumed future covered payroll.
Actuarial Service Provider	The Board retains an external actuary, and effective November 1, 2018, Segal was retained to perform annual actuarial valuations and sustainability projections as well as periodic experience studies to review the actuarial assumptions versus actual plan experience.
Actuarial Service Provider Funding Method Statement	Per their actuarial valuation report, "Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and a portion of the principal balance. The pension funding policy adopted by PERA...meets this standard."

ACTUARIAL METHODS	
Actuarial Methods	The Board is responsible for the actuarial methods and assumptions used in the actuarial valuations in accordance with Colorado Revised Statutes (C.R.S.) § 24-51-204(5). Through formal action, the Board updates, replaces, or adopts new actuarial methods and assumptions as deemed necessary.

Actuarial Methods	Type	Description / Source / Basis	Adoption / Effective Date
Asset Valuation Method	Smoothed Actuarial Value of Assets	In 1992, the Board adopted a method for valuing assets that determines a smoothed market value of assets to help mitigate volatile investment market experience. Note, the term "market value" used in the Board's pension funding policy regarding the description of the determination of the asset valuation method applied for funding purposes, is synonymous with the term "fair value" used consistently throughout the Actuarial Section and all other sections of this *Annual Comprehensive Financial Report (ACFR).* The smoothed fair value of assets recognizes the differences between actual and expected investment experience for each year in equal amounts over a four-year period. The smoothed fair value of assets excludes the Annual Increase Reserve (AIR).	Initially Adopted: 1992; Effective: Dec 31, 1992; Reinitialized to Fair Value as of: Dec 31, 2004; Effective: Dec 31, 2005

DIVISION TRUST FUNDS—PENSION

Actuarial Methods	Type	Description / Source / Basis	Adoption / Effective Date
Actuarial Cost Method	Entry Age Actuarial Cost Method (EA)	The EA funding or cost method is designed to keep annual costs level as a percent of covered payroll and for this reason, was selected by the Board to be used in the actuarial valuations. Under the EA cost method, early and service retirement, termination (including the possibility of refunds), disability, and death benefits are projected for all active members. Cost factors, which are developed to produce level annual costs in each year from the age at hire (entry age) to the assumed retirement age, are applied to the projected benefits to determine the normal cost. The normal cost is the portion of the total plan cost allocated to the current year. Normal cost is determined only for active members currently accruing benefits. The actuarial accrued liability (AAL) for active members is the portion of the total plan cost allocated to prior years. The total AAL for the plan includes the AAL for active members and the present value of the expected benefit payments to members currently receiving benefits and inactive members entitled to future benefits. The excess of the total AAL over the actuarial value of plan assets is the unfunded actuarial accrued liability (UAAL). The effect of differences between the actuarial assumptions and the actual experience of the plan is determined within each annual actuarial valuation. These differences produce actuarial gains or losses that result in an adjustment of the UAAL.	State, School, and Local Government (Municipal) Divisions - Effective: Jun 30, 1968; Judicial Division - Effective: Dec 31, 1980 DPS Division - Initially Adopted: Jun 30, 1950; Last Revised: Merger, Jan 1, 2010
Amortization Method	Defined, Closed, and Layered Periods	The ADC is determined by adding the normal cost and the cost to amortize, over defined, closed periods, any existing UAAL or new UAAL, including the impact of any experience actuarial gains and losses, actuarial assumption changes, and changes in plan provisions. Each amortized item is tracked over the closed period defined for that category. The 30-year period used to amortize the legacy UAAL was initialized as of December 31, 2017. All gains, losses, and changes in actuarial methods and assumptions on and after January 1, 2018, are recognized each year and amortized separately over closed 30-year periods. The impact of any changes in plan provisions will be recognized over a closed period relating to the demographics of the group affected and/or the duration of the enhancement provided, not to exceed 25 years. If any future actuarial valuation indicates a division has a negative UAAL, the ADC shall be set equal to the normal cost until such time as the funded ratio equals or exceeds 120%. At that time, the ADC shall be equal to the normal cost less an amount equal to 15-year amortization of the portion of the negative UAAL above the 120% funded ratio.	Initially Adopted: Mar 20, 2015; Last Amended: Nov 16, 2018; Effective: Dec 31, 2018

DIVISION TRUST FUNDS—PENSION

ACTUARIAL ASSUMPTIONS		
Actuarial Assumptions[1]	Unless otherwise noted, it can be assumed that the economic and demographic actuarial assumptions applied to the actuarial valuation for funding purposes also were applied to the actuarial valuation for accounting and financial reporting purposes. Periodically, the Board participates in discussions related to actuarial assumptions to ensure understanding and to provide for the retention or adoption of all economic and non-economic assumptions under the guidance provided by Actuarial Standards of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations,* and ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations,* as prescribed by the Actuarial Standards Board. The discussions typically occur during Asset Liability or Experience Analysis studies and include participation of the Board's actuarial service provider, their investment consultant, and other actuarial and investment experts who also may provide their market outlook.	
	Basis for Actuarial Assumptions Used	Unless otherwise noted, the basis of all selected economic and non-economic actuarial assumptions resulted from the 2020 experience analysis and related discussions that took place during the November 20, 2020, Board meeting. As a result of the 2019 Asset Liability Study, concluded at the November 15, 2019, Board meeting, the Board reaffirmed the 7.25% assumed long-term rate of investment return effective as of January 1, 2020, which was supported by the analysis provided by Segal in the 2020 Experience Analysis report.

[1] See Exhibits A through G for detailed assumption information.

Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Rate of Investment Return	7.25%	Long-term assumed rate of investment return represented as a percent per year, compounded annually, net of investment expenses.	Assumed rate of investment return - Last Revised: Nov 18, 2016; Effective: Dec 31, 2016 All actuarial assumptions - Last Revised/Reaffirmed: Nov 20, 2020; Effective: Dec 31, 2020
Real Rate of Investment Return	4.95%	Long-term assumed rate of real investment return (net of price inflation) represented as a percent per year, compounded annually, net of investment expenses.	
Price Inflation	2.30%	Long-term assumed rate of price inflation represented as a percent per year, compounded annually.	
Wage Inflation	3.00%	Long-term assumed rate of wage inflation composed of the plan's assumed price inflation and the assumed real wage growth, represented as a percent per year, compounded annually.	
Pay Increases	Exhibit A	Sample pay increase assumptions for individual members as developed and recommended by the Board's retained actuary.	
Board Crediting Interest Rate	3.00%	Annually, the Board reviews the rate at which interest is credited to member accounts. On November 18, 2022, the Board voted to continue the annual interest rate at 3.00% for interest earned during 2023. Basis: Board Crediting Interest Rate Policy and Board annual discussion at the November 18, 2022, Board meeting.	Annual Review Policy initiated in 2006, slight revisions since. Last Adopted: Nov 18, 2022; Effective: Jan 1, 2023

DIVISION TRUST FUNDS—PENSION

Non-Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Rates of Withdrawal	Select and Ultimate Withdrawal Rates - Exhibit B	Beginning in 1986, PERA uses a select and ultimate approach for all members (except members of the Judicial Division and those classified under the State Troopers and DPS benefit structures) in applying rates of withdrawal or termination when estimating the number of members who will leave service prior to retirement. The 2020 experience analysis indicated, in the aggregate, fewer active member terminations prior to retirement than expected, resulting in a reduction in withdrawal rates across all divisions except for members under the PERA benefit structure within the DPS Division.	Separation from active service assumptions—Last Revised: Nov 20, 2020; Effective: Dec 31, 2020
Rates of Disability	Exhibit C	The 2020 experience analysis indicated, in the aggregate, fewer active members retired with disability benefits than expected. This resulted in a 19% uniform reduction of disability rates across all divisions with no rate changes for members under the State Troopers benefit structure.	
Rates of Retirement	Reduced Early Retirement Rates - Exhibit E	The 2020 experience analysis indicated, in the aggregate, slightly more reduced early retirements than expected with certain groups experiencing fewer reduced early retirements than expected. Retirement experience was analyzed on a benefit-weighted basis separately for males and females, resulting in modifications to reduced early retirement rates at several ages across most divisions.	
	Unreduced Retirement Rates - Exhibit F	The 2020 experience analysis indicated, in the aggregate, fewer unreduced retirements than expected with certain groups experiencing more unreduced retirements than expected. Retirement experience was analyzed on a benefit-weighted basis separately for males and females, resulting in modifications to unreduced retirement rates at several ages across most divisions.	

DIVISION TRUST FUNDS—PENSION

Non-Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Rates of Mortality	Healthy Pre-Retirement Mortality - Exhibit D	Healthy pre-retirement mortality is based on the Pub-2010 mortality tables, by category, as associated with each group with generational projection applied using scale MP-2019: --State and Local Government Divisions (other than State Troopers): PubG-2010 Employee Table; --State and Local Government Divisions (State Troopers): PubS-2010 Employee Table; --School and DPS Divisions: PubT-2010 Employee Table; and --Judicial Division: PubG-2010(A) Above-Median Employee Table. The tables are benefit-weighted.	First implemented use of separate mortality tables for different groups / divisions Effective: Dec 31, 2016; Mortality—Last Revised: Nov 20, 2020; Effective: Dec 31, 2020 First implemented generational mortality and use of a separate mortality table for beneficiaries Effective: Dec 31, 2020
	Healthy Post-Retirement Mortality - Exhibit G	The 2020 experience analysis employed a benefit-weighted approach and indicated, in the aggregate, generally fewer deaths than expected for all groups of retirees, with the exception of females age 80 and older. As a result, updated base tables to appropriate Pub-2010 mortality tables, with adjustments based on PERA-specific experience where credible data exists. To reflect future improvements in mortality, application of the MP-2019 mortality projection scale was recommended. Healthy post-retirement non-disability retiree mortality is based on the Pub-2010 mortality tables, by category, as associated with each group with generational projection applied using scale MP-2019: --State and Local Government Divisions (other than State Troopers): PubG-2010 Healthy Retiree Table with credibility adjustments by gender and age. For males, the adjustments are 94% of the rates prior to age 80 and 90% of the rates for ages 80 and older; for females, the adjustments are 87% of the rates prior to age 80 and 107% of the rates for ages 80 and older; --State and Local Government Divisions (State Troopers): Unadjusted PubS-2010 Healthy Retiree Table for males and females; --School and DPS Divisions: PubT-2010 Healthy Retiree Table with credibility adjustments by gender and age. For males, the adjustments are 112% of the rates prior to age 80 and 94% of the rates for ages 80 and older; for females, the adjustments are 83% of the rates prior to age 80 and 106% of the rates for ages 80 and older; and --Judicial Division: Unadjusted PubG-2010(A) Above-Median Healthy Retiree Table for males and females. The tables are benefit-weighted.	
	Beneficiary Post-Retirement Mortality - Exhibit G	The 2020 experience analysis indicated more deaths than expected for beneficiaries. As a result, post-retirement non-disabled beneficiary mortality was updated to the Pub-2010 Contingent Survivor Table (benefit weighted) adjusted for credibility and gender with generational projection applied using scale MP-2019. For males, the adjustments are 97% of the rates for all ages; for females, the adjustments are 105% of the rates for all ages.	
	Disabled Post-Retirement Mortality	The 2020 experience analysis indicated disabled retiree deaths generally consistent with expectations. Disabled post-retirement mortality is based on the Pub-2010 mortality tables with generational projection applied using scale MP-2019: --All Divisions (other than State Troopers): PubNS-2010 Disabled Retiree Table using 99% of the rates for all ages; and --State and Local Government Divisions (State Troopers): Unadjusted PubS-2010 Disabled Retiree Table for males and females. The tables are benefit-weighted.	

DIVISION TRUST FUNDS—PENSION

Non-Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Rate of Vested Terminated Members to Refund Member Account	Non-Judicial - 35%	The 2020 experience analysis confirmed the current assumption that 35% of the vested members who terminate will elect to withdraw their accounts while the remaining 65% will elect to leave their accounts in the plan to be eligible for a benefit at retirement date.	Last Revised: 2009; Effective: Dec 31, 2009
	Judicial - 0%	The 2020 experience analysis confirmed the current assumption that none of the vested members who terminate will elect to withdraw their accounts while 100% will elect to leave their accounts in the plan to be eligible for a benefit at retirement date.	
Rate of Non-Vested Terminated Members to Refund Member Account	100%	The 2020 experience analysis confirmed the current assumption that 100% of the non-vested members who terminate will elect to withdraw their accounts.	Since inception of termination benefits, first mentioned in Dec 31, 2011 actuarial valuation report
Administrative Expense Load	0.40%	The element of the normal cost for each division, referred to as the administrative expense load, was first adopted by the Board as of November 5, 2012, effective for the December 31, 2012, actuarial valuation. The 2020 experience analysis confirmed that the current 0.40% administrative expense load continues to be appropriate for this purpose.	Initially adopted: Nov 5, 2012; Effective: Dec 31, 2012; Last Revised: Nov 18, 2016; Effective: Dec 31, 2016

Annual Increase (AI) Assumptions	Value(s)	Description / Source / Basis	Adoption / Effective Date
AI Rate Cap (Membership Prior to Jan 1, 2007 under the PERA Benefit Structure & Members under the DPS Benefit Structure)	1.00%	The AI cap that may be awarded by the Board in 2022 and thereafter is assumed to be 1.00% per year after payments begin and eligibility requirements for payment of the AI have been met. Basis: Adjusted pursuant to C.R.S. § 24-51-413, based on results of the 2018 and 2020 AAP assessments.	Effective: Dec 31, 2021
AI Rate Cap (Membership After Dec 31, 2006 under the PERA Benefit Structure)	0.00%	An AIR was established for each Division Trust Fund to provide AIs, to the extent affordable, once benefits become payable for these members. Therefore, the AI actuarial assumption applied to these members is 0.00%, since members in this category receive AIs through the affiliated AIR only to the extent affordable in accordance with C.R.S. § 24-51-1009. Basis: AI provisions Pursuant to Senate Bill (SB) 06-235, enacted May 25, 2006.	Enacted: May 25, 2006; Effective: Dec 31, 2006
AI Waiting Period	36 months	The waiting period to meet the eligibility for AI payments was extended from 12 months to 36 months. Basis: Pursuant to SB 18-200, enacted June 4, 2018	Enacted: Jun 4, 2018; Effective: Dec 31, 2017

DIVISION TRUST FUNDS—PENSION

ACTUARIAL STUDIES

Governance Studies	Following their adopted governance procedures and practices, the Board performs periodic asset/liability modeling studies, actuarial audits, and actuarial experience analyses approximately every three to five years.

Actuarial Studies	Description / Result	Last Conducted By	Completed	Next Scheduled
Asset Liability Modeling (ALM) Study	The Board commissioned an asset/liability study during 2019, which was prepared by Aon. The objective of the study was to determine the optimal strategic asset allocation that will ultimately allow PERA to meet its financial obligations, while also ensuring that PERA incurs appropriate levels of risk and cash liquidity. As a result of this study, the Board slightly modified the asset allocation ranges and targets effective January 1, 2020, while reaffirming the investment return assumption of 7.25%.	Aon	Nov 15, 2019	2023 - 2024
Actuarial Audit	The primary focus of an actuarial audit is to ensure independence, accuracy, and conformity with the accepted ASOPs with regard to results of the annual actuarial valuation and the appropriateness of the actuarial assumptions used to calculate those results. The most recent actuarial audit was conducted in 2022 by Buck, an independent actuarial consulting firm with significant experience performing actuarial services within the public plan sector. Buck's October 14, 2022, actuarial audit report states: "Based on our review of the census data, experience study documents, liability replication, review of individual sample life calculations, and the actuarial valuation reports, we believe the December 31, 2021, actuarial valuations for Division Trust Funds and Health Care Trust Funds are reasonable, based on appropriate assumptions and methods, and the reports generally comply with the Actuarial Standards of Practice (ASOPs)", and, additionally, "Our review has indicated that the actuarial process followed by Colorado PERA is thorough, complete, and complies with applicable Actuarial Standards of Practice (ASOPs) and U.S. Qualification Standards (USQ) of the American Academy of Actuaries (AAA)."	Buck	Oct 14, 2022	2027
Experience Analysis	In October of 2020, Segal completed an experience analysis covering plan experience for the four-year period from 2016 through 2019, to provide the Board an updated view of all economic and demographic assumptions. In addition to the recommendations regarding revised assumptions, the Board's 2019 decision to reaffirm the assumed long-term rate of investment return of 7.25% was supported by the analysis provided in the 2020 report. Based on the results of the experience analysis, the presentation by Segal, and related discussion, the Board adopted the recommended revised economic and demographic assumptions, as proposed, during the November 20, 2020, Board meeting effective for the December 31, 2020, actuarial valuation.	Segal	Reports Delivered: Oct 28, 2020 & Nov 4, 2020; Revised Assumptions Adopted: Nov 20, 2020 Effective: Dec 31, 2020	2024

CHANGES SINCE LAST ACTUARIAL VALUATION

Changes in Actuarial Methods	There are no changes in actuarial methods incorporated in the December 31, 2022, actuarial valuation, since the last actuarial valuation as of December 31, 2021.
Changes in Actuarial Assumptions	There are no changes in economic and demographic actuarial assumptions incorporated in the December 31, 2022, actuarial valuation, since the last actuarial valuation as of December 31, 2021
Changes in Plan Provisions	There are no changes to contribution and plan provisions incorporated in the December 31, 2022, actuarial valuation since the last actuarial valuation of December 31, 2021. The following legislation, enacted in 2023, is reflected to the extent possible in the actuarial valuation as of December 31, 2022: • SB 23-056, enacted and effective June 2, 2023, is intended to recompense PERA for the remaining portion of the $225 million direct distribution originally scheduled for receipt July 1, 2020, suspended due to the enactment of House Bill (HB) 20-1379, but not fully repaid through the provisions within HB 22-1029. Pursuant to SB 23-056, the State treasurer is to issue a warrant to PERA consisting of the balance of the PERA Payment Cash Fund, created in C.R.S. § 24-51-416, plus $10 million from the General Fund, totaling approximately $14.5 million. • SB 23-163, enacted and effective June 6, 2023, states that beginning July 1, 2023, a wildlife officer and a parks and recreation officer (officer), employed by the division of parks and wildlife in the department of natural resources, is classified as a State Trooper for the purpose of determining the officer's service retirement eligibility and benefit under PERA.

DIVISION TRUST FUNDS—PENSION

SIGNIFICANT EVENTS

There were no significant events during 2022.

DIFFERENCES IN ACTUARIAL VALUATION METHODS AND ASSUMPTIONS

- The actuarial valuation for funding purposes was performed as of December 31, 2022. The actuarial valuation for accounting and financial reporting purposes was performed as of December 31, 2021, and the total pension liability (TPL) was rolled forward to the measurement date as of December 31, 2022.
- Census data used for the actuarial valuation for funding purposes reflects membership data as of December 31, 2022, and the census data used for the actuarial valuation for accounting and financial reporting purposes reflects membership data as of December 31, 2021. Therefore, all summaries and schedules, regarding actuarial valuation results for funding purposes, shown in the Actuarial Section, reflect census data as of December 31, 2022.
- The actuarial valuation for funding purposes applies an asset valuation method that recognizes a four-year smoothed fair value of assets for purposes of determining the UAAL. The actuarial valuation for accounting and financial reporting purposes applies the fair value of assets to determine the net pension liability.
- The actuarial valuation for funding purposes does not apply an AI assumption for members under the PERA benefit structure hired on or after January 1, 2007, in the determination of the AAL. Therefore, the ADC established by the funding valuation does not consider future increases for this member group and the assets attributable to the AIR are not included in the actuarial value of assets. A separate annual actuarial valuation is performed on the AIR to determine the applicable AI payable to eligible members after benefit commencement. AIR plan provisions are deemed substantively automatic, ad hoc cost-of-living adjustments. Liabilities associated with the AIR statutorily can never exceed available assets. As a result, the actuarial valuation for accounting and financial reporting purposes includes the balance of the AIR both in the plan assets, at fair value, and in the TPL of the applicable division.

DIVISION TRUST FUNDS—PENSION

Actuarial Assumptions: Exhibits A–G

Exhibit A: Individual Pay Increase Assumptions—All Divisions and Benefit Structures

AGE-BASED PAY INCREASE ASSUMPTIONS FOR AN INDIVIDUAL MEMBER—STATE DIVISION, SCHOOL DIVISION, LOCAL GOVERNMENT DIVISION, STATE TROOPERS, AND DPS DIVISION

	Merit and Seniority					Inflation and Productivity	Total Increase (Next Year)				
Sample Ages	State[1]	School[2]	Local Government[1]	State Troopers[3]	DPS[2]	All Divisions / Groups	State[1]	School[2]	Local Government[1]	State Troopers[3]	DPS[2]
20	7.90%	8.00%	8.30%	9.40%	8.50%	3.00%	10.90%	11.00%	11.30%	12.40%	11.50%
25	5.50%	5.60%	5.70%	5.90%	6.40%	3.00%	8.50%	8.60%	8.70%	8.90%	9.40%
30	3.80%	4.00%	3.80%	3.80%	4.80%	3.00%	6.80%	7.00%	6.80%	6.80%	7.80%
35	2.90%	3.30%	2.80%	2.90%	3.90%	3.00%	5.90%	6.30%	5.80%	5.90%	6.90%
40	2.20%	2.70%	2.20%	2.20%	3.20%	3.00%	5.20%	5.70%	5.20%	5.20%	6.20%
45	1.60%	2.10%	1.80%	1.70%	2.50%	3.00%	4.60%	5.10%	4.80%	4.70%	5.50%
50	1.10%	1.60%	1.50%	1.30%	2.00%	3.00%	4.10%	4.60%	4.50%	4.30%	5.00%
55	0.70%	1.20%	1.20%	0.90%	1.60%	3.00%	3.70%	4.20%	4.20%	3.90%	4.60%
60	0.50%	0.80%	0.90%	0.60%	1.30%	3.00%	3.50%	3.80%	3.90%	3.60%	4.30%
65	0.30%	0.50%	0.40%	0.30%	0.90%	3.00%	3.30%	3.50%	3.40%	3.30%	3.90%
70	0.30%	0.40%	0.20%	0.20%	0.80%	3.00%	3.30%	3.40%	3.20%	3.20%	3.80%

1 Not applicable to members under the State Troopers benefit structure.

2 Rates shown apply to the division indicated regardless of benefit structure.

3 Rates shown are for members under the State Troopers benefit structure in the State or Local Government Divisions.

SERVICE-BASED PAY INCREASE ASSUMPTIONS FOR AN INDIVIDUAL MEMBER—JUDICIAL DIVISION

Sample Years of Service	Merit and Seniority	Inflation and Productivity	Total Increase (Next Year)
0	2.30%	3.00%	5.30%
5	2.00%	3.00%	5.00%
10	1.50%	3.00%	4.50%
15	1.20%	3.00%	4.20%
20	0.90%	3.00%	3.90%
25	0.70%	3.00%	3.70%
30	0.40%	3.00%	3.40%
35	0.20%	3.00%	3.20%
40	0.00%	2.80%	2.80%

DIVISION TRUST FUNDS—PENSION

Exhibit B: Withdrawal Assumptions—All Divisions and Benefit Structures

SELECT RATES OF WITHDRAWAL—PERCENT OF MEMBERS WITH LESS THAN FIVE YEARS OF SERVICE WITHDRAWING FROM EMPLOYMENT WITHIN THE NEXT YEAR

Completed Years of Service	State Division[1]		School Division[2]		Local Government Division[1]		DPS Division[3]	
	Male	Female	Male	Female	Male	Female	Male	Female
0	34.00%	34.00%	30.00%	30.00%	34.00%	34.00%	26.00%	26.00%
1	21.00%	21.00%	18.00%	18.00%	21.00%	21.00%	19.00%	19.00%
2	16.00%	16.00%	14.00%	14.00%	16.00%	16.00%	14.00%	14.00%
3	12.00%	12.00%	11.00%	11.00%	12.00%	12.00%	12.00%	12.00%
4	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%

ULTIMATE RATES OF WITHDRAWAL—PERCENT OF MEMBERS WITH FIVE OR MORE YEARS OF SERVICE WITHDRAWING FROM EMPLOYMENT WITHIN THE NEXT YEAR

Sample Ages	State Division[1]		School Division[2]		Local Government Division[1]		State Troopers[4]
	Male	Female	Male	Female	Male	Female	Unisex
20	30.00%	16.45%	20.00%	17.00%	30.00%	16.45%	7.30%
25	13.60%	12.30%	11.26%	11.56%	13.60%	12.30%	5.15%
30	7.10%	9.50%	6.54%	7.34%	7.10%	9.50%	3.65%
35	5.90%	7.30%	4.60%	5.51%	5.90%	7.30%	2.98%
40	4.75%	5.75%	3.64%	4.34%	4.75%	5.75%	2.62%
45	3.95%	4.95%	3.34%	4.00%	3.95%	4.95%	2.50%
50	3.66%	4.60%	3.24%	4.00%	3.66%	4.60%	2.50%
55	3.54%	4.50%	3.20%	4.00%	3.54%	4.50%	2.50%
60	3.50%	4.50%	3.20%	4.00%	3.50%	4.50%	2.50%
65	3.50%	4.50%	3.20%	4.00%	3.50%	4.50%	2.50%
70	3.50%	4.50%	3.20%	4.00%	3.50%	4.50%	2.50%

Sample Ages	Judicial Division	DPS Division[3]		DPS Benefit Structure[5]	
	Unisex	Male	Female	Male	Female
20	1.50%	19.20%	12.80%	8.00%	10.00%
25	1.50%	11.20%	10.80%	7.40%	8.80%
30	1.50%	7.70%	9.40%	6.85%	7.70%
35	1.50%	6.60%	7.80%	6.60%	7.20%
40	1.50%	6.00%	6.40%	5.45%	5.95%
45	1.50%	6.00%	6.00%	4.69%	4.41%
50	1.50%	6.00%	5.40%	4.50%	3.85%
55	1.50%	6.00%	5.00%	4.31%	3.85%
60	1.50%	6.00%	5.00%	4.25%	3.85%
65	1.50%	6.00%	5.00%	4.25%	3.85%
70	1.50%	6.00%	5.00%	4.25%	3.85%

[1] Not applicable to members under the State Troopers benefit structure.

[2] Rates shown are for PERA benefit structure members in the School Division.

[3] Rates shown are for PERA benefit structure members in the DPS Division.

[4] Rates shown are for members under the State Troopers benefit structure in the State or Local Government Divisions.

[5] Rates shown are for DPS benefit structure members in any division.

DIVISION TRUST FUNDS—PENSION

Exhibit C: Disability Assumptions—All Divisions and Benefit Structures

RATES OF DISABILITY—PERCENT OF MEMBERS DISABLING FROM EMPLOYMENT WITHIN THE NEXT YEAR

	State Division[1]	School and DPS Divisions[2]	Local Government[1]	State Troopers[3]	Judicial Division	DPS Benefit Structure[4]
Sample Ages	Unisex	Unisex	Unisex	Unisex	Unisex	Unisex
20	0.008%	0.008%	0.008%	0.010%	0.008%	0.008%
25	0.008%	0.008%	0.008%	0.020%	0.008%	0.008%
30	0.008%	0.008%	0.008%	0.040%	0.008%	0.008%
35	0.024%	0.016%	0.024%	0.060%	0.016%	0.016%
40	0.039%	0.033%	0.039%	0.100%	0.033%	0.033%
45	0.076%	0.050%	0.076%	0.250%	0.050%	0.050%
50	0.156%	0.078%	0.156%	0.300%	0.078%	0.078%
55	0.203%	0.126%	0.203%	0.300%	0.126%	0.126%
60	0.236%	0.180%	0.236%	0.300%	0.180%	0.180%
65	0.236%	0.180%	0.236%	0.300%	0.180%	0.180%
70	0.236%	0.180%	0.236%	0.300%	0.180%	0.180%

1 Not applicable to members under the State Troopers benefit structure.

2 Rates shown are for PERA benefit structure members in the School or DPS Divisions.

3 Rates shown are for members under the State Troopers benefit structure in the State or Local Government Divisions.

4 Rates shown are for DPS benefit structure members in any division.

Exhibit D: Pre-Retirement Mortality Assumptions—All Divisions and Benefit Structures

2022 RATES OF PRE-RETIREMENT MORTALITY[1]—PERCENT OF ACTIVE MEMBERS DECEASING WITHIN THE NEXT YEAR

	State and Local Government Divisions[2]		School and DPS Divisions[3]		State Troopers[4]		Judicial Division	
Sample Ages	Male	Female	Male	Female	Male	Female	Male	Female
20	0.039%	0.015%	0.036%	0.015%	0.044%	0.018%	0.038%	0.013%
25	0.034%	0.011%	0.019%	0.011%	0.045%	0.025%	0.029%	0.010%
30	0.051%	0.021%	0.031%	0.019%	0.058%	0.037%	0.044%	0.018%
35	0.070%	0.032%	0.045%	0.028%	0.070%	0.050%	0.061%	0.029%
40	0.086%	0.043%	0.055%	0.037%	0.077%	0.058%	0.074%	0.039%
45	0.102%	0.056%	0.070%	0.048%	0.085%	0.067%	0.089%	0.051%
50	0.139%	0.079%	0.104%	0.070%	0.112%	0.087%	0.121%	0.073%
55	0.212%	0.128%	0.166%	0.111%	0.169%	0.128%	0.184%	0.116%
60	0.330%	0.198%	0.273%	0.171%	0.273%	0.179%	0.285%	0.180%
65	0.471%	0.286%	0.438%	0.261%	0.413%	0.220%	0.408%	0.261%
70	0.654%	0.438%	0.660%	0.435%	0.713%	0.407%	0.567%	0.399%

1 Assumptions shown are used for pension plans, developed on a benefit-weighted basis, whereas those used for OPEB plans are headcount-weighted, using the same underlying mortality tables. For more detail, please see the mortality descriptions in the Pension and OPEB introduction subsections.

2 Not applicable to members under the State Troopers benefit structure.

3 Rates shown are for all members in the School and DPS Divisions, regardless of benefit structure.

4 Rates shown are for members under the State Troopers benefit structure in the State or Local Government Divisions.

DIVISION TRUST FUNDS—PENSION

Exhibit E: Reduced Retirement Assumptions—All Divisions and Benefit Structures

RATES OF REDUCED RETIREMENT—PERCENT OF MEMBERS ELIGIBLE FOR REDUCED RETIREMENT BENEFITS RETIRING WITHIN THE NEXT YEAR

Retirement Ages	State Division[1]		School and DPS Divisions[2]		Local Government Division[1]		State Troopers[3]	Judicial Division	DPS Benefit Structure[4]	
	Male	Female	Male	Female	Male	Female	Unisex	Unisex	Male	Female
50	9.5%	9.0%	8.0%	7.0%	9.5%	9.0%	10.0%	6.0%	8.0%	5.0%
51	11.0%	8.0%	8.0%	7.0%	11.0%	8.0%	10.0%	6.0%	8.0%	7.0%
52	11.0%	8.0%	9.0%	8.0%	11.0%	8.0%	10.0%	6.0%	8.0%	10.0%
53	12.0%	9.0%	9.0%	10.0%	12.0%	9.0%	10.0%	6.0%	10.0%	10.0%
54	12.0%	12.0%	12.0%	14.0%	12.0%	12.0%	10.0%	10.0%	10.0%	10.0%
55	12.0%	15.0%	9.0%	12.0%	12.0%	15.0%	5.0%	10.0%	10.0%	10.0%
56	9.5%	11.0%	9.0%	12.0%	9.5%	11.0%	5.0%	10.0%	10.0%	10.0%
57	15.0%	12.0%	9.0%	12.0%	15.0%	12.0%	5.0%	10.0%	10.0%	10.0%
58	15.0%	15.0%	12.0%	16.0%	15.0%	15.0%	5.0%	8.0%	10.0%	10.0%
59	35.0%	35.0%	24.0%	34.0%	35.0%	35.0%	5.0%	8.0%	15.0%	14.0%
60	7.5%	8.0%	8.0%	9.0%	7.5%	8.0%	10.0%	10.0%	15.0%	17.0%
61	7.5%	8.0%	9.0%	9.0%	7.5%	8.0%	10.0%	10.0%	16.0%	17.0%
62	7.5%	9.0%	10.0%	10.0%	7.5%	9.0%	10.0%	10.0%	16.0%	17.0%
63	7.5%	9.0%	10.0%	10.0%	7.5%	9.0%	10.0%	10.0%	16.0%	17.0%
64	7.5%	9.0%	10.0%	10.0%	7.5%	9.0%	10.0%	8.0%	16.0%	17.0%
65 and over	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1] Not applicable to members under the State Troopers benefit structure.

[2] Rates shown are for PERA benefit structure members in the School or DPS Divisions.

[3] Rates shown are for members under the State Troopers benefit structure in the State or Local Government Divisions.

[4] Rates shown are for DPS benefit structure members in any division.

DIVISION TRUST FUNDS—PENSION

Exhibit F: Unreduced Retirement Assumptions—All Divisions and Benefit Structures

ADDITIONAL INCREASE IN RATES DURING THE FIRST FIVE YEARS OF UNREDUCED RETIREMENT ELIGIBILITY FOR AGES 55 THROUGH 64

First Five Years of Unreduced Retirement Eligibility	State Division[1]		School and DPS Divisions[2]		Local Government Division[1]		State Troopers[3]
	Male	Female	Male	Female	Male	Female	Unisex
1	30%	20%	28%	28%	30%	20%	20%
2	13%	9%	4%	10%	13%	9%	0%
3	13%	9%	4%	10%	13%	9%	0%
4	13%	9%	4%	10%	13%	9%	0%
5	13%	9%	4%	10%	13%	9%	0%

RATES OF UNREDUCED RETIREMENT—PERCENT OF MEMBERS ELIGIBLE FOR UNREDUCED RETIREMENT BENEFITS RETIRING WITHIN THE NEXT YEAR

Retirement Ages	State Division[1]		School and DPS Divisions[2]		Local Government Division[1]		State Troopers[3]	Judicial Division	DPS Benefit Structure[4]	
	Male	Female	Male	Female	Male	Female	Unisex	Unisex	Male	Female
50	56%	48%	52%	55%	56%	48%	40%	6%	35%	40%
51	43%	35%	43%	45%	43%	35%	28%	6%	35%	40%
52	38%	34%	41%	41%	38%	34%	28%	6%	30%	30%
53	34%	28%	39%	37%	34%	28%	28%	6%	30%	30%
54	33%	30%	37%	34%	33%	30%	28%	10%	25%	30%
55	26%	25%	27%	28%	26%	25%	28%	10%	30%	34%
56	19%	20%	22%	24%	19%	20%	28%	10%	20%	24%
57	18%	19%	21%	23%	18%	19%	28%	10%	26%	25%
58	17%	18%	19%	22%	17%	18%	28%	8%	22%	20%
59	20%	18%	21%	22%	20%	18%	28%	8%	26%	28%
60	20%	21%	25%	24%	20%	21%	28%	10%	26%	25%
61	19%	18%	24%	23%	19%	18%	28%	10%	18%	28%
62	23%	20%	22%	26%	23%	20%	28%	10%	27%	30%
63	20%	18%	22%	24%	20%	18%	28%	10%	40%	31%
64	22%	21%	26%	24%	22%	21%	28%	8%	24%	42%
65	27%	27%	28%	31%	27%	27%	100%	20%	38%	38%
66	29%	27%	31%	29%	29%	27%	100%	20%	30%	35%
67	28%	25%	25%	26%	28%	25%	100%	20%	30%	32%
68	24%	24%	26%	25%	24%	24%	100%	20%	30%	27%
69	24%	24%	26%	25%	24%	24%	100%	20%	30%	29%
70	24%	24%	24%	28%	24%	24%	100%	40%	30%	28%
71	24%	24%	24%	23%	24%	24%	100%	40%	30%	30%
72	24%	24%	24%	23%	24%	24%	100%	40%	30%	30%
73	24%	24%	24%	23%	24%	24%	100%	40%	30%	30%
74	24%	24%	24%	23%	24%	24%	100%	40%	30%	30%
75 and over	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1] Not applicable to members under the State Troopers benefit structure.

[2] Rates shown are for PERA benefit structure members in the School or DPS Divisions.

[3] Rates shown are for members under the State Troopers benefit structure in the State or Local Government Divisions.

[4] Rates shown are for DPS benefit structure members in any division.

DIVISION TRUST FUNDS—PENSION

Exhibit G: Post-Retirement Mortality Assumptions and Single Life Retirement Values—All Divisions and Benefit Structures

2022 RATES OF POST-RETIREMENT MORTALITY[1,2] AND SINGLE LIFE RETIREMENT VALUES

(In Actual Dollars)

Sample Attained Ages	Percent of Retirees Deceasing Within the Next Year		Present Value of $1 Monthly for Life		Present Value of $1 Monthly Increasing 1.00% Annually		Future Life Expectancy in Years	
	Male	Female	Male	Female	Male	Female	Male	Female
State and Local Government Divisions								
50	0.262%	0.184%	$151.80	$155.62	$169.50	$174.37	36.59	38.88
55	0.391%	0.258%	145.31	150.09	160.99	166.89	31.66	33.86
60	0.597%	0.355%	137.08	142.73	150.53	157.30	26.90	28.93
65	0.864%	0.516%	126.81	132.97	137.88	145.07	22.35	24.12
70	1.334%	0.829%	114.01	120.27	122.63	129.74	18.03	19.46
75	2.258%	1.471%	98.77	104.27	105.04	111.11	14.03	15.05
80	3.887%	3.333%	81.95	84.95	86.16	89.43	10.51	10.99
85	7.114%	6.283%	64.57	66.54	67.16	69.24	7.55	7.80
State Troopers								
45	0.127%	0.087%	$157.28	$158.98	$176.65	$179.01	40.96	43.04
50	0.180%	0.142%	151.94	154.01	169.43	172.24	35.80	37.81
55	0.296%	0.268%	144.74	147.43	160.05	163.60	30.73	32.69
60	0.525%	0.474%	135.47	139.17	148.40	153.06	25.83	27.77
65	0.887%	0.745%	124.08	128.97	134.52	140.46	21.21	23.11
70	1.459%	1.192%	110.33	116.36	118.29	125.37	16.90	18.70
75	2.541%	2.061%	94.21	101.24	99.84	107.85	12.96	14.61
80	4.617%	3.673%	76.56	84.41	80.21	88.90	9.51	10.98
85	8.405%	6.475%	59.18	67.28	61.34	70.09	6.71	7.96
School and DPS Divisions								
55	0.241%	0.166%	$148.23	$152.93	$164.54	$170.48	32.91	35.46
60	0.413%	0.253%	140.00	146.08	154.02	161.42	27.95	30.42
65	0.668%	0.358%	129.61	136.91	141.17	149.77	23.20	25.49
70	1.115%	0.573%	116.69	124.59	125.72	134.76	18.71	20.66
75	2.045%	1.089%	101.42	108.65	108.03	116.08	14.59	16.03
80	3.271%	2.769%	85.15	89.12	89.64	94.03	11.02	11.75
85	6.258%	5.403%	66.61	70.29	69.31	73.27	7.81	8.36
Judicial Division								
50	0.250%	0.203%	$152.07	$155.19	$169.80	$173.89	36.55	38.97
55	0.374%	0.286%	145.59	149.63	161.29	166.41	31.61	33.97
60	0.570%	0.394%	137.34	142.30	150.79	156.89	26.83	29.07
65	0.826%	0.575%	126.97	132.70	138.00	144.87	22.25	24.31
70	1.285%	0.925%	113.95	120.40	122.50	130.02	17.89	19.73
75	2.191%	1.641%	98.33	105.27	104.48	112.36	13.85	15.43
80	3.973%	3.022%	80.80	87.85	84.86	92.65	10.25	11.56
85	7.328%	5.696%	63.13	69.49	65.58	72.44	7.29	8.27

Please see next page for footnote references.

DIVISION TRUST FUNDS—PENSION

2022 RATES OF POST-RETIREMENT MORTALITY[1,2] AND SINGLE LIFE RETIREMENT VALUES (CONTINUED)

(In Actual Dollars)

Sample Attained Ages	Percent of Retirees Deceasing Within the Next Year		Present Value of $1 Monthly for Life		Present Value of $1 Monthly Increasing 1.00% Annually		Future Life Expectancy in Years	
	Male	Female	Male	Female	Male	Female	Male	Female
Beneficiaries (All Divisions)								
40	0.692%	0.328%	$152.72	$158.91	$171.83	$179.65	42.16	46.52
45	0.555%	0.274%	150.03	155.91	167.89	175.31	37.97	41.73
50	0.636%	0.321%	145.23	151.25	161.46	168.98	33.51	36.83
55	0.772%	0.486%	138.87	145.11	153.23	160.92	29.09	32.02
60	1.014%	0.694%	130.72	137.65	143.02	151.36	24.77	27.43
65	1.352%	0.913%	120.69	128.41	130.79	139.86	20.65	23.02
70	1.921%	1.274%	108.48	116.60	116.36	125.66	16.74	18.76
75	2.950%	2.028%	94.25	101.94	100.01	108.62	13.13	14.71
80	4.704%	3.478%	78.51	85.03	82.41	89.55	9.92	11.04
85	7.803%	6.276%	62.31	67.22	64.72	69.99	7.19	7.92

[1] Rates are shown for healthy benefit recipients. Separate disability mortality tables are used for disabled retirees.

[2] Assumptions shown are used for pension plans, developed on a benefit-weighted basis, whereas those used for OPEB plans are headcount-weighted, using the same underlying mortality tables. For more detail, please see the mortality descriptions in the Pension and OPEB introduction subsections.

Summary of Funding Progress

The PERA funding objective is to pay long-term benefit promises through contributions that remain approximately level from year to year as a percent of covered payroll earned by PERA members. The following schedules presented in this section provide an overview of funding progress:

- The schedule of funded liabilities by type shows the degree to which existing liabilities are funded, including prior history.
- The schedule of funding progress shows the UAAL as a percentage of annual covered payroll, including prior history.
- Schedules detailing actuarial gains and losses, by source, including prior history and a reconciliation of UAAL considering the total of all five Division Trust Funds, over the past five years.
- The scheduled contribution requirements based on the December 31, 2022, actuarial valuation for the period ending December 31, 2024.

Schedule of Funded Liabilities by Type

The schedule of funded liabilities by type, formerly known as the "solvency test," compares the plan's actuarial value of assets with: (A) member contributions (with interest) on deposit, (B) the liabilities for future benefits to persons who have retired, died or become disabled, and to those who have terminated service with the right to a future benefit, and (C) the liabilities for service already rendered by active members.

The actuarial valuation of December 31, 2022, shows that plan assets fully cover liability A. In addition, the remainder of plan assets covers 100% of the liabilities for future benefits to persons who have retired or terminated service with the right to a future benefit (liability B) regarding the Local Government, Judicial, and DPS Division Trust Funds and a significant portion of these liabilities for the State and School Division Trust Funds. Generally, if the system follows the discipline of level contribution rate financing, the funded portion of liability B and C is expected to increase over time.

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF FUNDED LIABILITIES BY TYPE

(Dollars in Thousands)

	Aggregate Accrued Liabilities				Portion of Actuarial Accrued Liabilities Covered by Valuation Assets		
Valuation Date	Active Member Contributions (A)[1]	Retirees, Beneficiaries, and Inactive Members (B)	Employer-Financed Portion of Active Members (C)	Actuarial Value of Plan Assets	Liability (A)	Liability (B)	Liability (C)
State Division							
12/31/2013	$2,675,469	$15,296,368	$4,871,888	$13,129,460	100.0%	68.3%	0.0%
12/31/2014	2,688,514	15,846,200	4,873,607	13,523,488	100.0%	68.4%	0.0%
12/31/2015	2,685,014	16,470,370	4,930,287	13,882,820	100.0%	68.0%	0.0%
12/31/2016	2,678,312	17,933,227	5,058,377	14,026,332	100.0%	63.3%	0.0%
12/31/2017	2,668,406	17,395,423	4,718,256	14,256,410	100.0%	66.6%	0.0%
12/31/2018	2,682,956	18,095,951	4,730,945	14,303,726	100.0%	64.2%	0.0%
12/31/2019	2,737,022	18,157,929	4,822,697	14,922,050	100.0%	67.1%	0.0%
12/31/2020	2,820,780	18,876,016	5,420,009	16,039,287	100.0%	70.0%	0.0%
12/31/2021	2,881,533	19,079,270	5,199,043	17,379,516	100.0%	76.0%	0.0%
12/31/2022	**2,909,654**	**19,514,493**	**5,223,224**	**18,371,697**	**100.0%**	**79.2%**	**0.0%**
School Division							
12/31/2013	$3,881,145	$23,301,641	$8,254,526	$21,369,380	100.0%	75.1%	0.0%
12/31/2014	3,915,705	24,247,868	8,222,959	22,143,356	100.0%	75.2%	0.0%
12/31/2015	4,003,251	25,133,168	8,540,734	22,871,661	100.0%	75.1%	0.0%
12/31/2016	4,108,961	27,922,423	9,321,584	23,263,344	100.0%	68.6%	0.0%
12/31/2017	4,212,088	26,937,539	8,896,588	23,780,045	100.0%	72.6%	0.0%
12/31/2018	4,344,574	27,922,414	9,331,412	24,094,442	100.0%	70.7%	0.0%
12/31/2019	4,551,132	28,014,055	9,859,874	25,412,014	100.0%	74.5%	0.0%
12/31/2020	4,748,885	29,376,412	11,406,778	27,581,088	100.0%	77.7%	0.0%
12/31/2021	5,019,414	29,763,775	11,553,599	30,253,176	100.0%	84.8%	0.0%
12/31/2022	**5,273,925**	**30,576,351**	**12,476,471**	**32,393,722**	**100.0%**	**88.7%**	**0.0%**
Local Government Division							
12/31/2013	$533,003	$2,991,177	$978,102	$3,291,298	100.0%	92.2%	0.0%
12/31/2014	534,695	3,114,436	961,836	3,629,400	100.0%	99.4%	0.0%
12/31/2015	533,262	3,275,093	972,343	3,777,161	100.0%	99.0%	0.0%
12/31/2016	545,507	3,573,344	1,094,201	3,879,197	100.0%	93.3%	0.0%
12/31/2017	544,525	3,482,526	1,018,881	4,009,413	100.0%	99.5%	0.0%
12/31/2018	549,499	3,679,915	1,011,471	4,070,679	100.0%	95.7%	0.0%
12/31/2019	565,273	3,713,892	1,037,268	4,288,325	100.0%	100.0%	0.9%
12/31/2020	579,211	3,895,852	1,183,840	4,663,031	100.0%	100.0%	15.9%
12/31/2021	597,770	3,978,148	1,169,092	5,090,566	100.0%	100.0%	44.0%
12/31/2022	**591,991**	**4,112,331**	**1,209,122**	**5,379,487**	**100.0%**	**100.0%**	**55.8%**

Please see next page for footnote references.

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF FUNDED LIABILITIES BY TYPE (CONTINUED)

(Dollars in Thousands)

	Aggregate Accrued Liabilities				Portion of Actuarial Accrued Liabilities Covered by Valuation Assets		
Valuation Date	Active Member Contributions (A)[1]	Retirees, Beneficiaries, and Inactive Members (B)	Employer-Financed Portion of Active Members (C)	Actuarial Value of Plan Assets	Liability (A)	Liability (B)	Liability (C)
Judicial Division							
12/31/2013	$59,348	$208,236	$84,014	$256,800	100.0%	94.8%	0.0%
12/31/2014	60,973	214,541	95,739	270,866	100.0%	97.8%	0.0%
12/31/2015	60,118	232,303	109,545	286,891	100.0%	97.6%	0.0%
12/31/2016	58,119	273,416	115,582	297,888	100.0%	87.7%	0.0%
12/31/2017	54,973	277,542	95,593	310,085	100.0%	91.9%	0.0%
12/31/2018	57,922	286,045	103,790	315,970	100.0%	90.2%	0.0%
12/31/2019	57,145	304,173	100,720	342,071	100.0%	93.7%	0.0%
12/31/2020	58,779	318,647	100,779	376,437	100.0%	99.7%	0.0%
12/31/2021	61,353	331,715	94,970	419,256	100.0%	100.0%	27.6%
12/31/2022	**61,421**	**360,922**	**88,859**	**452,509**	**100.0%**	**100.0%**	**33.9%**
DPS Division							
12/31/2013	$364,126	$2,672,260	$749,486	$3,075,895	100.0%	100.0%	5.3%
12/31/2014	379,240	2,665,352	771,501	3,151,456	100.0%	100.0%	13.9%
12/31/2015	394,306	2,732,879	778,055	3,207,327	100.0%	100.0%	10.3%
12/31/2016	402,849	2,999,767	843,814	3,220,935	100.0%	93.9%	0.0%
12/31/2017	419,239	2,867,254	802,033	3,257,770	100.0%	99.0%	0.0%
12/31/2018	438,008	2,941,988	868,606	3,261,338	100.0%	96.0%	0.0%
12/31/2019	461,075	2,906,773	895,537	3,410,264	100.0%	100.0%	4.7%
12/31/2020	501,422	2,975,191	1,055,933	3,682,072	100.0%	100.0%	19.5%
12/31/2021	569,134	2,921,569	1,147,171	4,029,095	100.0%	100.0%	46.9%
12/31/2022	**586,071**	**2,991,715**	**1,200,823**	**4,313,602**	**100.0%**	**100.0%**	**61.3%**
All Division Trust Funds[2]							
12/31/2013	$7,513,091	$44,469,682	$14,938,016	$41,122,833	100.0%	75.6%	0.0%
12/31/2014	7,579,127	46,088,397	14,925,642	42,718,566	100.0%	76.2%	0.0%
12/31/2015	7,675,951	47,843,813	15,330,964	44,025,860	100.0%	76.0%	0.0%
12/31/2016	7,793,748	52,702,177	16,433,558	44,687,696	100.0%	70.0%	0.0%
12/31/2017	7,899,231	50,960,284	15,531,351	45,613,723	100.0%	74.0%	0.0%
12/31/2018	8,072,959	52,926,313	16,046,224	46,046,155	100.0%	71.7%	0.0%
12/31/2019	8,371,647	53,096,822	16,716,096	48,374,724	100.0%	75.3%	0.0%
12/31/2020	8,709,077	55,442,118	19,167,339	52,341,915	100.0%	78.7%	0.0%
12/31/2021	9,129,204	56,074,477	19,163,875	57,171,609	100.0%	85.7%	0.0%
12/31/2022	**9,423,062**	**57,555,812**	**20,198,499**	**60,911,017**	**100.0%**	**89.5%**	**0.0%**

[1] Includes accrued interest on member contributions.

[2] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

DIVISION TRUST FUNDS—PENSION

Unfunded Actuarial Accrued Liability

UAAL is the difference between actuarially calculated liability for service already rendered and the valuation assets of the retirement fund.

In 2021, the ratio of PERA's valuation assets to accrued liabilities was 67.8% and increased to 69.9% by the end of 2022.

Following are the most impactful factors resulting in higher liabilities (or losses) to PERA during 2022:

- Member pay increases were greater than expected.
- New PERA members had some service resulting in accrued liabilities.
- Recognition of a change in the default service accrual method from "12-pay" to "non-12-pay," predominantly for members of the School and DPS Divisions.

Following are the most impactful factors resulting in lower liabilities (or gains) during 2022:

- Higher than assumed investment return (based on the smoothed actuarial value of assets) for 2019, 2020, 2021, and 2022.
- Actual payroll contributions were greater than the determined ADC.
- Retirees experienced shorter lifespans than expected.
- Of the members who terminated PERA-covered employment, more withdrew their accounts than expected.

Between 2013 and 2016, PERA's funded status was negatively affected primarily by the recognition of adverse economic experience and by the adoption of more conservative economic and demographic assumptions to better reflect anticipated future behaviors, longevity, and economic conditions.

In 2017, PERA's funded status improved due to a decrease in plan liabilities reflecting the adoption of SB 18-200 pension reforms along with better than expected investment performance.

PERA's funded status was, again, negatively impacted in 2018, reflecting unfavorable demographic experience and lower than assumed investment performance.

In 2019, PERA's funded status was positively impacted by better than expected investment performance and the reduced AI cap from 1.50% to 1.25%, and negatively impacted by demographic losses and, to a lesser extent, the enactment of HB 20-1394 modifying the Judicial Division's employer and member contribution rates for the State's 2020-21 and 2021-22 fiscal years.

In 2020, PERA's funded status was positively impacted by better than expected investment performance and a small mortality gain and negatively impacted by the adoption of generally more conservative actuarial assumptions. The revised actuarial assumptions include the application of generational mortality.

In 2021, PERA's funded status was positively impacted by better than expected investment performance and recognition of the reduction in the AI cap from 1.25% to 1.00% per annum.

In 2022, PERA's funded status increased. The funded status is determined based on an actuarial or "smoothed" value of assets, recognizing only a portion of each year's investment gain or loss over a four-year period. Therefore, even though the 2022 investment return was lower than the 7.25% expected rate of investment return, the favorable investment performance for 2019, 2020, and 2021 helped mitigate the adverse effect of the 2022 investment performance as well as other demographic actuarial losses.

Since inflation decreases the dollar's value, it is important to examine more than basic actuarial metrics and data when assessing the plan's financial status. The ratio of UAAL dollars divided by member covered payroll, as shown in the following table, can provide a meaningful index. Opposite of the funded status ratio, the lower the ratio, the greater the strength of the system.

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF FUNDING PROGRESS

(Dollars in Thousands)

(A) Valuation Date	(B) Actuarial Value of Plan Assets	(C) Actuarial Accrued Liabilities	(D) Unfunded Actuarial Accrued Liabilities (UAAL) (C) – (B)	(E) Funded Ratio (B)/(C)	(F) Annual Covered Payroll	(G) UAAL As a Percentage of Covered Payroll (D)/(F)
State Division						
12/31/2013	$13,129,460	$22,843,725	$9,714,265	57.5%	$2,474,965	392.5%
12/31/2014	13,523,488	23,408,321	9,884,833	57.8%	2,564,670	385.4%
12/31/2015	13,882,820	24,085,671	10,202,851	57.6%	2,641,867	386.2%
12/31/2016	14,026,332	25,669,916	11,643,584	54.6%	2,710,651	429.5%
12/31/2017	14,256,410	24,782,085	10,525,675	57.5%	2,774,207	379.4%
12/31/2018	14,303,726	25,509,852	11,206,126	56.1%	2,898,827	386.6%
12/31/2019	14,922,050	25,717,648	10,795,598	58.0%	2,995,453	360.4%
12/31/2020	16,039,287	27,116,805	11,077,518	59.1%	3,089,161	358.6%
12/31/2021	17,379,516	27,159,846	9,780,330	64.0%	3,092,509	316.3%
12/31/2022	**18,371,697**	**27,647,371**	**9,275,674**	**66.5%**	**3,183,955**	**291.3%**
School Division						
12/31/2013	$21,369,380	$35,437,312	$14,067,932	60.3%	$3,938,650	357.2%
12/31/2014	22,143,356	36,386,532	14,243,176	60.9%	4,063,236	350.5%
12/31/2015	22,871,661	37,677,153	14,805,492	60.7%	4,235,290	349.6%
12/31/2016	23,263,344	41,352,968	18,089,624	56.3%	4,349,320	415.9%
12/31/2017	23,780,045	40,046,215	16,266,170	59.4%	4,471,357	363.8%
12/31/2018	24,094,442	41,598,400	17,503,958	57.9%	4,789,503	365.5%
12/31/2019	25,412,014	42,425,061	17,013,047	59.9%	5,104,431	333.3%
12/31/2020	27,581,088	45,532,075	17,950,987	60.6%	5,146,118	348.8%
12/31/2021	30,253,176	46,336,788	16,083,612	65.3%	5,465,866	294.3%
12/31/2022	**32,393,722**	**48,326,747**	**15,933,025**	**67.0%**	**5,670,280**	**281.0%**
Local Government Division						
12/31/2013	$3,291,298	$4,502,282	$1,210,984	73.1%	$529,003	228.9%
12/31/2014	3,629,400	4,610,967	981,567	78.7%	540,468	181.6%
12/31/2015	3,777,161	4,780,698	1,003,537	79.0%	561,518	178.7%
12/31/2016	3,879,197	5,213,052	1,333,855	74.4%	608,223	219.3%
12/31/2017	4,009,413	5,045,932	1,036,519	79.5%	632,768	163.8%
12/31/2018	4,070,679	5,240,885	1,170,206	77.7%	660,998	177.0%
12/31/2019	4,288,325	5,316,433	1,028,108	80.7%	681,093	150.9%
12/31/2020	4,663,031	5,658,903	995,872	82.4%	698,060	142.7%
12/31/2021	5,090,566	5,745,010	654,444	88.6%	723,744	90.4%
12/31/2022	**5,379,487**	**5,913,444**	**533,957**	**91.0%**	**760,262**	**70.2%**
Judicial Division						
12/31/2013	$256,800	$351,598	$94,798	73.0%	$39,942	237.3%
12/31/2014	270,866	371,253	100,387	73.0%	42,977	233.6%
12/31/2015	286,891	401,966	115,075	71.4%	46,870	245.5%
12/31/2016	297,888	447,117	149,229	66.6%	48,700	306.4%
12/31/2017	310,085	428,108	118,023	72.4%	48,948	241.1%
12/31/2018	315,970	447,757	131,787	70.6%	50,506	260.9%
12/31/2019	342,071	462,038	119,967	74.0%	53,427	224.5%
12/31/2020	376,437	478,205	101,768	78.7%	54,780	185.8%
12/31/2021	419,256	488,038	68,782	85.9%	55,780	123.3%
12/31/2022	**452,509**	**511,202**	**58,693**	**88.5%**	**56,565**	**103.8%**

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF FUNDING PROGRESS (CONTINUED)

(Dollars in Thousands)

(A) Valuation Date	(B) Actuarial Value of Plan Assets	(C) Actuarial Accrued Liabilities	(D) Unfunded Actuarial Accrued Liabilities (UAAL) (C) – (B)	(E) Funded Ratio (B)/(C)	(F) Annual Covered Payroll	(G) UAAL As a Percentage of Covered Payroll (D)/(F)
DPS Division						
12/31/2013	$3,075,895	$3,785,872	$709,977	81.2%	$547,660	129.6%
12/31/2014	3,151,456	3,816,093	664,637	82.6%	584,319	113.7%
12/31/2015	3,207,327	3,905,240	697,913	82.1%	621,115	112.4%
12/31/2016	3,220,935	4,246,430	1,025,495	75.9%	642,177	159.7%
12/31/2017	3,257,770	4,088,526	830,756	79.7%	658,198	126.2%
12/31/2018	3,261,338	4,248,602	987,264	76.8%	722,040	136.7%
12/31/2019	3,410,264	4,263,385	853,121	80.0%	736,264	115.9%
12/31/2020	3,682,072	4,532,546	850,474	81.2%	771,347	110.3%
12/31/2021	4,029,095	4,637,874	608,779	86.9%	823,396	73.9%
12/31/2022	**4,313,602**	**4,778,609**	**465,007**	**90.3%**	**810,403**	**57.4%**
All Division Trust Funds[1]						
12/31/2013	$41,122,833	$66,920,789	$25,797,956	61.5%	$7,530,220	342.6%
12/31/2014	42,718,566	68,593,166	25,874,600	62.3%	7,795,670	331.9%
12/31/2015	44,025,860	70,850,728	26,824,868	62.1%	8,106,660	330.9%
12/31/2016	44,687,696	76,929,483	32,241,787	58.1%	8,359,071	385.7%
12/31/2017	45,613,723	74,390,866	28,777,143	61.3%	8,585,478	335.2%
12/31/2018	46,046,155	77,045,496	30,999,341	59.8%	9,121,874	339.8%
12/31/2019	48,374,724	78,184,565	29,809,841	61.9%	9,570,668	311.5%
12/31/2020	52,341,915	83,318,534	30,976,619	62.8%	9,759,466	317.4%
12/31/2021	57,171,609	84,367,556	27,195,947	67.8%	10,161,295	267.6%
12/31/2022	**60,911,017**	**87,177,373**	**26,266,356**	**69.9%**	**10,481,465**	**250.6%**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Note: A history of contributions by Division Trust Fund, the ADC compared to the actual contributions paid, including the deficiency or (excess), for each of the last 10 years, is shown in the Schedule of Employer and Nonemployer Contributions, found on pages 100-102 in the Required Supplementary Information (RSI) in the Financial Section.

DIVISION TRUST FUNDS—PENSION

Actuarial Gains and Losses

ANALYSIS OF FINANCIAL EXPERIENCE

(Dollars in Millions)

	State Division	School Division	Local Government Division	Judicial Division	DPS Division
Amounts					
From differences between assumed and actual experience on liabilities					
Age and service retirements[1]	$5.6	$44.1	$3.1	$2.6	$1.2
Disability retirements[2]	3.3	2.0	—	(0.1)	0.4
Deaths[3]	(115.3)	(123.7)	(21.3)	0.5	3.2
Withdrawals[4]	(43.7)	49.3	(23.3)	0.8	(57.3)
New members[5]	143.6	170.6	31.1	7.0	47.8
Pay increases[6]	154.0	222.1	67.7	(0.1)	10.7
Administrative expenses and other[7]	(105.8)	343.0	(33.0)	1.1	(8.3)
Subtotal	41.7	707.4	24.3	11.8	(2.3)
From differences between assumed and actual experience on assets	(359.7)	(590.1)	(101.6)	(7.3)	(80.6)
From changes in plan assumptions and methods	—	—	—	—	—
From changes in plan provisions	—	—	—	—	—
Total actuarial (gains)/losses on 2022 activities	**($318.0)**	**$117.3**	**($77.3)**	**$4.5**	**($82.9)**
Total actuarial (gains)/losses on 2021 activities	**($1,398.8)**	**($2,084.9)**	**($336.4)**	**($24.1)**	**($241.2)**

1 *Age and service retirements*: If members retire at older ages than assumed, there is a gain. If members retire at younger ages than assumed, there is a loss.

2 *Disability retirements*: If disability claims are lower than assumed, there is a gain. If disability claims are higher than assumed, there is a loss.

3 *Deaths*: If survivor claims are lower than assumed, there is a gain. If survivor claims are higher than assumed, there is a loss. If retirees die sooner than assumed, there is a gain. If retirees live longer than assumed, there is a loss.

4 *Withdrawal from employment*: If more members terminate and more liabilities are released by withdrawals than assumed, there is a gain. If fewer liabilities are released by terminations than assumed, there is a loss.

5 *New members*: If new members entering the plan have prior service, there is a loss.

6 *Pay increases*: If there are smaller salary increases than assumed, there is a gain. If greater salary increases occur than assumed, there is a loss.

7 *Administrative expenses and other:* Includes miscellaneous gains and losses resulting from valuation software updates and refinements, data adjustments, timing of financial transactions, etc.

DIVISION TRUST FUNDS—PENSION

The following table identifies the components that contributed to the change in the underfunded status of the Division Trust Funds for the period 2018 to 2022:

SCHEDULE OF GAINS AND LOSSES IN ACCRUED LIABILITIES AND RECONCILIATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITIES

(Dollars in Millions)

	(Gain) or Loss for Years Ended December 31					
Type of Activity	**2018**	**2019**	**2020**	**2021**	**2022**	**2018 - 2022**
UAAL beginning of year	$28,777.1	$30,999.3	$29,809.8	$30,976.6	**$27,195.9**	$28,777.1
Experience (gains) and losses						
Age and service retirements	177.5	95.4	91.0	44.9	**56.6**	465.4
Disability retirements	13.3	9.5	4.2	6.6	**5.6**	39.2
Deaths	118.0	4.7	(164.3)	(159.4)	**(256.6)**	(457.6)
Withdrawal from employment	(5.2)	150.1	296.5	114.1	**(74.2)**	481.3
New members	231.4	213.4	176.5	266.2	**400.1**	1,287.6
Pay increases	162.0	391.6	(24.8)	207.2	**454.4**	1,190.4
Investment (income) loss	580.4	(1,176.7)	(2,754.3)	(3,033.7)	**(1,139.3)**	(7,523.6)[1]
Other	511.0[2]	47.5	(78.7)	47.7	**197.0**	724.5
Experience (gain) loss during year	1,788.4	(264.5)	(2,453.9)	(2,506.4)	**(356.4)**	(3,792.8)
Non-recurring items						
Change in plan assumptions and methods	—	—	3,107.9[3]	—	**—**	3,107.9
Change in plan provisions	(5.6)	(1,494.3)[4]	—	(1,579.0)[5]	**—**	(3,078.9)
Non-recurring items	(5.6)	(1,494.3)	3,107.9	(1,579.0)	**—**	29.0
Contribution deficiency	450.0	132.9	280.2	(216.6)	**(417.4)**	229.1[6]
Expected change in UAAL	(10.6)	436.4	232.6	521.3	**(155.7)**	1,024.0[7]
Total (gain)/loss for year	**2,222.2**	**(1,189.5)**	**1,166.8**	**(3,780.7)**	**(929.5)**	**(2,510.7)**
UAAL end of year	**$30,999.3**	**$29,809.8**	**$30,976.6**	**$27,195.9**	**$26,266.4**	**$26,266.4**

This schedule shows where gains and losses occurred over the five-year period compared to what was expected or assumed. These include the following significant gains and losses:

1 $7.5 billion cumulative gain resulting from favorable investment experience for 2019, 2020, 2021, and 2022.

2 $0.5 billion loss in 2018, primarily due to the change in actuarial service provider and actuarial valuation software. Although the total present value of benefits matched closely as determined by the prior and current actuarial service provider, the loss shown represents the different methods of attribution applied to allocate costs between future normal costs and AAL for earned service.

3 $3.1 billion loss in 2020, due to the recognition of revised actuarial assumptions, including the implementation of generational mortality, adopted November 20, 2020, effective December 31, 2020.

4 $1.5 billion gain in 2019, due to the reduction in the AI cap from 1.50% to 1.25%, effective July 1, 2020, as required by the 2018 AAP assessment.

5 $1.6 billion gain in 2021, due to the reduction in the AI cap from 1.25% to 1.00%, effective July 1, 2022, as required by the 2020 AAP assessment.

6 $0.2 billion cumulative loss resulting from contribution deficiencies; occurring when actual contributions flowing into the plans are less than the determined ADC.

7 $1.0 billion cumulative loss indicating the five-year difference between each prior year's UAAL and the expected current year UAAL considering the normal cost earned, less the required employer contributions all of which is adjusted for interest.

DIVISION TRUST FUNDS—PENSION

Actuarial Valuation Results

Contribution rates for the year ending December 31, 2024, are derived from the results of the December 31, 2022, annual actuarial valuation and are determined in advance for purposes of budgeting, completing the required assessments related to the automatic adjustment provision (AAP) and consideration of any necessary legislative action.

SCHEDULE OF COMPUTED EMPLOYER CONTRIBUTION AND DIRECT DISTRIBUTION RATES FOR THE 2024 FISCAL YEAR

	Expressed as a Percentage of Covered Payroll				
	State Division	School Division	Local Government Division	Judicial Division	DPS Division
Contributions					
Service retirement benefits	8.20%	10.14%	8.34%	14.75%	8.81%
Disability retirement benefits	0.33%	0.21%	0.31%	0.39%	0.21%
Survivor benefits	0.25%	0.20%	0.28%	0.47%	0.19%
Termination withdrawals	2.84%	2.83%	2.66%	1.01%	3.40%
Refunds	0.84%	0.65%	0.83%	0.07%[1]	0.41%
Administrative expense load	0.40%	0.40%	0.40%	0.40%	0.40%
Total normal cost	12.86%	14.43%	12.82%	17.09%	13.42%
Less member contributions	(11.10%)[2]	(11.00%)	(9.01%)[2]	(11.00%)	(11.00%)
Employer normal cost	**1.76%**	**3.43%**	**3.81%**	**6.09%**	**2.42%**
Percentage available to amortize unfunded actuarial accrued liabilities	18.07%	16.34%	9.16%	17.17%	6.46%
Amortization period[3]	20 Years	24 Years	9 Years	6 Years	7 Years
Total employer contribution rate for actuarially funded benefits	11.54%[2]	11.40%	11.01%[2]	14.91%	11.40%
Amortization Equalization Disbursement	5.00%	4.50%	2.20%	5.00%	4.50%
Supplemental Amortization Equalization Disbursement	5.00%	5.50%	1.50%	5.00%	5.50%
Less Health Care Trust Fund	(1.02%)	(1.02%)	(1.02%)	(1.02%)	(1.02%)
Less Annual Increase Reserve	(0.69%)	(0.61%)	(0.72%)	(0.63%)	(0.73%)
Less PCOP credit	N/A	N/A	N/A	N/A	(10.77%)[4]
Employer contribution rate for defined benefit plan	**19.83%**	**19.77%**	**12.97%**	**23.26%**	**8.88%**
Direct distribution[5]	**2.18%**	**2.18%**	N/A	**2.18%**	**2.18%**
DC supplement rates[6]	**0.21%**	**N/A**	**0.08%**	**N/A**	**N/A**

1 Assumes no judge will elect a refund of contributions made for the 17th through the 20th year of service.

2 Weighted average of more than one statutory rate.

3 The amortization periods shown consider ongoing employer, member, AED, and SAED contributions including any future increases, and the direct distribution, where and when applicable.

4 An offset to the DPS Division rate is provided for under C.R.S. § 24-51-412. See Note 4 of the Notes to the Financial Statements in the Financial Section.

5 Rates for the direct distribution have been estimated and are shown as a percentage of 2024 projected covered payroll.

6 The DC supplement will be paid to the State and Local Government Divisions on behalf of all employees of these divisions, calculated pursuant to employees hired on or after January 1, 2019, who chose to participate in the PERAChoice DC Plan in lieu of participating in PERA's DB Plan. Designed to compensate for the employer contributions paid to the DC Plan participant accounts that otherwise would have been payment toward the UAAL, this supplement is determined separately for the State and Local Government Divisions as a rate of pay and is payable as of January 1, 2024, by all employers of the two divisions.

Note: The underlying calculations involve more precision than what is presented in the schedule and the rounded numbers shown may not add as a result.

DIVISION TRUST FUNDS—PENSION

The AED and SAED are set to increase in future years for the Judicial Division, shown as follows. With the passage of SB 10-001, the AED and the SAED can be adjusted based on the year-end funded status within a particular Division Trust Fund. If a particular Division Trust Fund reaches a funded status of 103%, a decrease in the AED and SAED is mandated and if it subsequently falls below a funded status of 90%, an increase is mandated. For the Local Government and Judicial Divisions, if the funded ratio reaches 90% and subsequently falls below 90%, an increase in the AED and SAED is mandated. Increases cannot exceed the following maximum allowable limitations.

FUTURE AED AND SAED RATES

	2023 Rates		Future Annual Increases in Rates Prescribed by Colorado Revised Statutes		Maximum Allowable Limitations	
Trust Fund	AED	SAED	AED	SAED	AED	SAED
State Division	5.00%	5.00%	N/A	N/A	5.00%	5.00%
School Division	4.50%	5.50%	N/A	N/A	4.50%	5.50%
Local Government Division	2.20%	1.50%	No	No	5.00%	5.00%
Judicial Division	5.00%	5.00%	N/A[1]	N/A[2]	5.00%	5.00%
DPS Division[3]	4.50%	5.50%	N/A	N/A	4.50%	5.50%

[1] C.R.S. § 24-51-411(4.5) increased the AED payment to 4.60% of PERA-includable salary for 2022 and requires the AED payment to increase by 0.40% at the start of 2023 at which time the AED payment will be 5.00% of PERA-includable salary.

[2] C.R.S. § 24-51-411(7.5) increased the SAED payment to 4.60% of PERA-includable salary for 2022 and requires the SAED payment to increase by 0.40% at the start 2023 at which time the SAED payment will be 5.00% of PERA-includable salary.

[3] DPS Division employers are permitted to reduce the AED and SAED by the PCOP offset, as specified in C.R.S. § 24-51-412 *et seq.*

Note: A history of contributions by Division Trust Fund, the ADC compared to the actual contributions paid, including the deficiency or (excess), for each of the last 10 years, is shown in the Schedule of Employer and Nonemployer Contributions, found on pages 100-102 in the RSI in the Financial Section.

DIVISION TRUST FUNDS—PENSION

Annual Actuarial Valuation Statistics

As of December 31, 2022, the Funded Ratio, the UAAL, the ADC for 2024 as a percentage of covered payroll, and the amortization period considering current funding and future increases prescribed by Colorado statute, for each Division Trust Fund, are shown in the following table. The results in this table are based on the actuarial valuation for funding purposes, which does not consider the impact of reduced benefits for those hired in the future as provided for in Colorado law.

ACTUARIAL STATISTICS

(Dollars in Thousands)

Trust Fund	Funded Ratio	UAAL	ADC[1]	Amortization Period[2]
State Division	66.5%	$9,275,674	19.77%	20 Years
School Division	67.0%	15,933,025	20.58%	24 Years
Local Government Division	91.0%	533,957	8.28%	9 Years
Judicial Division	88.5%	58,693	12.78%	6 Years
DPS Division	90.3%	465,007	6.04%	7 Years
All Division Trust Funds[3]		**$26,266,356**		

1 Determined considering the 30-year target amortization period defined in the pension funding policy for purposes of funding benchmarks and RSI reporting as shown in the Financial Section.

2 The determination of each amortization period considers future statutory increases in base employer and member contribution rates, increases in AED and SAED, and inclusion of the direct distribution, as applicable.

3 The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Pursuant to the pension funding policy, for reporting purposes, alternative ADCs also are determined by applying the layered amortization methodology as previously described. Under the target and alternative calculations, the legacy UAAL as of December 31, 2017, was amortized using a 30-year period, but the alternative ADCs use a 25-year closed period, a 20-year closed period, and a 15-year closed period, in lieu of the 30-year period, for amortization of any "new" UAAL recognized on and after January 1, 2018. The 2024 target and alternative ADCs, by division, are displayed as follows:

	Target ADC	Alternative ADCs		
Trust Fund	30-Year[1]	25-Year[2]	20-Year[2]	15-Year[2]
State Division	19.77%	19.62%	19.39%	19.02%
School Division	20.58%	20.63%	20.72%	20.90%
Local Government Division	8.28%	8.02%	7.62%	6.94%
Judicial Division	12.78%	12.29%	11.51%	10.14%
DPS Division	6.04%	5.82%	5.48%	4.90%

1 Refers to the amortization period used to amortize the legacy UAAL as of December 31, 2017, and any "new" UAAL recognized on and after January 1, 2018.

2 Refers to the amortization period used to amortize any "new" UAAL recognized on and after January 1, 2018.

DIVISION TRUST FUNDS—PENSION

Automatic Adjustment Provision

The primary intent of the AAP is to gauge the adequacy of the contributions coming into the pension trust fund against the amount required, and if determined necessary, to initiate automatic changes to member and employer contribution rates, the AI cap, and, under certain circumstances, the direct distribution from the State of Colorado, to better insure achievement of the targeted 30-year funding goal, as delineated in SB 18-200. Pursuant to C.R.S. § 24-51-413, this assessment commenced with the December 31, 2018, actuarial valuation and is performed annually thereafter.

The AAP assessment compares two blended rates, weighted across all five Division Trust Funds, defined as: the "Blended Total Contribution Amount" (employer contribution rate + member contribution rate + direct distribution as a rate of pay) divided by the "Blended Total Required Contribution" (ADC Rate + member contribution rate), determining a resulting ratio. If the resulting ratio falls within an acceptable corridor (98% to 119%), no adjustments are made. If the resulting ratio does not achieve a minimum benchmark (is less than 98%) or exceeds a maximum benchmark (is 120% or greater), adjustments are applied in an equitable manner of impact.

The following table shows the results of the AAP assessment which was conducted to determine if adjustments are necessary as of July 1, 2024:

Elements of Test Ratio (Shown as a percentage of pay)	2024 Input Percentages	Resulting Ratio	Adjustments, if Necessary (Effective July 1, 2024)	Revised Resulting Ratio
2024 Blended Total Contribution Amount[1,2] *(Divided by):* 2024 Blended Total Required Contribution[1]	32.51% *(Divided by):* 30.76%	(Equals) 105.69%	N/A	N/A

[1] The blended rates are based on the 2024 contribution rates shown on pages 175-176, weighted based on the UAAL of each Division Trust Fund and are not appropriate for any other use.

[2] Pursuant to SB 23-056, enacted June 2, 2023, the State treasurer is to issue a warrant to PERA in the approximate amount of $14.5 million, upon enactment.

A summary of the AAP guidelines, found in C.R.S. § 24-51-413, is as follows:

An automatic adjustment will occur under the following conditions:

- If the resulting ratio is less than 98%, there will be adjustments of equitable impact, increasing each of the employer and member contribution rates, decreasing the AI cap, and increasing the direct distribution (if permitted).
- If the resulting ratio is greater than or equal to 120%, there will be adjustments of equitable impact, decreasing each of the employer and member contribution rates, increasing the AI cap, and decreasing the direct distribution.

The AAP defines the limited amounts of total adjustment available in each category, and also the increments of adjustments that can occur in any one year. Multiple steps over multiple years are allowed for a required adjustment as necessary, but cannot exceed the ultimate limits as set forth in statute, detailed as follows:

- Adjustment (increase or decrease) to each of the employer and member contribution rates cannot exceed 0.50% in any one year, and
  - Cannot exceed 2.00% above the contribution rates reflecting SB 18-200 statutory reforms.
  - Cannot fall below the contribution rates in effect immediately prior to the passage of SB 18-200.
- Adjustment (increase or decrease) to the AI rate cannot exceed 0.25% in any one year, and
  - Cannot exceed a 2.00% AI cap maximum.
  - Cannot fall below a 0.50% AI cap minimum.
- Adjustment to the direct distribution cannot exceed $20 million in any one year, and
  - Cannot exceed the initial $225 million amount.
  - Can be reduced to $0.
- Adjustments that are required because:
  - Funding is below the 98% threshold, will be made to an extent that will bring the revised ratio to 103% following the corrective efforts but in no event can the adjustments in one year be greater than the limit described above.
  - Funding has reached the 120% threshold, must not cause the ratio to fall below 103%.

DIVISION TRUST FUNDS—PENSION

AAP ASSESSMENT HISTORY

Assessment	Information Based on Valuation Date	Compare Contribution Rates for Plan Year	Triggered Adjustments?	Adjustments to be Made	Effective Date for Adjustments
2018	December 31, 2018	2020	Yes	0.50% increase to member rate 0.50% increase to employer rate 0.25% decrease to AI cap No change to $225M direct distribution[1]	July 1, 2020
2019	December 31, 2019	2021	No	N/A	N/A
2020	December 31, 2020	2022	Yes	0.50% increase to member rate 0.50% increase to employer rate 0.25% decrease to AI cap No change to $225M direct distribution	July 1, 2022
2021	December 31, 2021	2023	No	N/A	N/A
2022	December 31, 2022	2024	No	N/A	N/A

[1] Pursuant to HB 20-1379, the direct distribution, payable July 1, 2020, was suspended.

Funded Ratio

(Dollars in Thousands)

The funded ratio for the plan is determined by dividing the actuarial value of assets by the AAL. The actuarial value of assets is not the current fair value but a market-related value, which recognizes the differences between actual and expected investment experience for each year in equal amounts over a four-year period. The actuarial value of the assets as of December 31, 2022, was $60,911,017 compared to a fair value of assets of $54,684,799, and to the AAL of $87,177,373. The funded ratio for each of the funds, based on the actuarial value of assets, at December 31 for each of the last five years is as follows:

Trust Fund	2018	2019	2020	2021	2022
State Division	56.1%	58.0%	59.1%	64.0%	**66.5%**
School Division	57.9%	59.9%	60.6%	65.3%	**67.0%**
Local Government Division	77.7%	80.7%	82.4%	88.6%	**91.0%**
Judicial Division	70.6%	74.0%	78.7%	85.9%	**88.5%**
DPS Division	76.8%	80.0%	81.2%	86.9%	**90.3%**
All Division Trust Funds[1]	**59.8%**	**61.9%**	**62.8%**	**67.8%**	**69.9%**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

The Board's pension funding policy states that the targeted actuarial funded ratio is greater than or equal to 110% on a combined Division Trust Fund basis. The funded ratios listed give an indication of progress made toward achieving the stated objective. A larger funded ratio indicates that a plan is better funded. As an example, for every $1.00 of the actuarially determined benefits earned for the School Division Trust Fund as of December 31, 2022, approximately $0.67 of assets are available for payment based on the actuarial value of assets. These benefits earned will be payable over the life span of members after their retirement and therefore, it is not imperative that the AAL equal the actuarial value of assets at any given moment in time.

DIVISION TRUST FUNDS—PENSION

At December 31, 2021, and December 31, 2022, PERA had the following funded status for the Division Trust Funds:

FUNDED STATUS FOR THE DIVISION TRUST FUNDS

(Dollars in Thousands)

	Fair Value of Assets		Actuarial Value of Assets[1]	
	12/31/2021	12/31/2022	12/31/2021	12/31/2022
State Division Trust Fund				
Actuarial accrued liability[2]	$27,159,846	**$27,647,371**	$27,159,846	**$27,647,371**
Assets held to pay those liabilities	19,710,492	**16,490,174**	17,379,516	**18,371,697**
Unfunded actuarial accrued liability	**$7,449,354**	**$11,157,197**	**$9,780,330**	**$9,275,674**
Funded ratio	72.6%	**59.6%**	64.0%	**66.5%**
School Division Trust Fund				
Actuarial accrued liability[2]	$46,336,788	**$48,326,747**	$46,336,788	**$48,326,747**
Assets held to pay those liabilities	34,273,949	**29,089,361**	30,253,176	**32,393,722**
Unfunded actuarial accrued liability	**$12,062,839**	**$19,237,386**	**$16,083,612**	**$15,933,025**
Funded ratio	74.0%	**60.2%**	65.3%	**67.0%**
Local Government Division Trust Fund				
Actuarial accrued liability[2]	$5,745,010	**$5,913,444**	$5,745,010	**$5,913,444**
Assets held to pay those liabilities	5,771,080	**4,825,367**	5,090,566	**5,379,487**
Unfunded actuarial accrued liability	**($26,070)**	**$1,088,077**	**$654,444**	**$533,957**
Funded ratio	100.5%	**81.6%**	88.6%	**91.0%**
Judicial Division Trust Fund				
Actuarial accrued liability[2]	$488,038	**$511,202**	$488,038	**$511,202**
Assets held to pay those liabilities	473,629	**406,382**	419,256	**452,509**
Unfunded actuarial accrued liability	**$14,409**	**$104,820**	**$68,782**	**$58,693**
Funded ratio	97.0%	**79.5%**	85.9%	**88.5%**
DPS Division Trust Fund				
Actuarial accrued liability[2]	$4,637,874	**$4,778,609**	$4,637,874	**$4,778,609**
Assets held to pay those liabilities	4,567,640	**3,873,515**	4,029,095	**4,313,602**
Unfunded actuarial accrued liability	**$70,234**	**$905,094**	**$608,779**	**$465,007**
Funded ratio	98.5%	**81.1%**	86.9%	**90.3%**
All Division Trust Funds[3]				
Actuarial accrued liability[2]	$84,367,556	**$87,177,373**	$84,367,556	**$87,177,373**
Assets held to pay those liabilities[4]	64,796,790	**54,684,799**	57,171,609	**60,911,017**
Unfunded actuarial accrued liability	**$19,570,766**	**$32,492,574**	**$27,195,947**	**$26,266,356**
Funded ratio	76.8%	**62.7%**	67.8%	**69.9%**

[1] The actuarial value of assets is calculated by spreading any market gains or losses above or below the assumed rate of return over four years.

[2] Based upon an assumed rate of return on investments of 7.25% and an assumed rate of 7.25% to discount the liabilities to be paid in the future to a value as of December 31, 2021, and December 31, 2022.

[3] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

[4] In aggregate, the fair value of the assets as of December 31, 2022, is $6,226,218 less than the actuarial value of assets calculated by the actuaries, as they are recognizing the gains and losses in value over four years, rather than only in the year they occurred. The remaining gains and (losses) to be smoothed for 2020 are $1,233,526, for 2021 are $2,488,982, and for 2022 are ($9,948,726).

DIVISION TRUST FUNDS—PENSION

Sensitivity of Actuarial Valuation to Changes in Assumed Investment Rate of Return and Discount Rate

The most important long-term driver of a pension plan is investment income. The investment return assumption and the discount rate for liabilities should be based on an estimated long-term investment yield for the plan, considering the nature and mix of current and expected plan investments and the basis used to determine the actuarial value of assets.

To understand the importance of the investment rate of return assumption, which is used to discount the actuarial liabilities of PERA, a 1% fluctuation in the assumed investment rate of return and discount rate would change the funded ratio, UAAL, and ADC (for contributions for the fiscal year ended December 31, 2024) as shown in the following tables:

INVESTMENT RETURN ASSUMPTION (DISCOUNT RATE) EQUAL TO 6.25%

(Dollars in Thousands)

	Actuarial Value of Assets			Fair Value of Assets
Trust Fund	Funded Ratio	UAAL	ADC	UAAL
State Division	60.0%	$12,271,679	26.02%	$14,153,202
School Division	60.0%	21,623,398	29.39%	24,927,760
Local Government Division	81.6%	1,209,030	15.54%	1,763,151
Judicial Division	80.4%	110,494	20.53%	156,621
DPS Division	80.4%	1,049,903	12.83%	1,489,990
All Division Trust Funds[1]		**$36,264,504**		**$42,490,724**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

CURRENT INVESTMENT RETURN ASSUMPTION (DISCOUNT RATE) EQUAL TO 7.25%

(Dollars in Thousands)

	Actuarial Value of Assets			Fair Value of Assets
Trust Fund	Funded Ratio	UAAL	ADC	UAAL
State Division	**66.5%**	**$9,275,674**	**19.77%**	**$11,157,197**
School Division	**67.0%**	**15,933,025**	**20.58%**	**19,237,386**
Local Government Division	**91.0%**	**533,957**	**8.28%**	**1,088,077**
Judicial Division	**88.5%**	**58,693**	**12.78%**	**104,820**
DPS Division	**90.3%**	**465,007**	**6.04%**	**905,094**
All Division Trust Funds[1]		**$26,266,356**		**$32,492,574**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

INVESTMENT RETURN ASSUMPTION (DISCOUNT RATE) EQUAL TO 8.25%

(Dollars in Thousands)

	Actuarial Value of Assets			Fair Value of Assets
Trust Fund	Funded Ratio	UAAL	ADC	UAAL
State Division	73.1%	$6,748,942	14.12%	$8,630,465
School Division	74.4%	11,173,332	14.16%	14,477,694
Local Government Division	100.6%	(33,003)	1.60%	521,118
Judicial Division	96.9%	14,337	5.50%	60,464
DPS Division	100.4%	(19,176)	0.03%	420,910
All Division Trust Funds[1]		**$17,884,432**		**$24,110,651**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Note: The time-weighted, net-of-fees annualized rate of return for the pooled investment assets was 6.5% for the past five years and 8.0% for the past 10 years. The 30-year annualized gross-of-fees rate of return for the pooled investment assets was 8.3%.

DIVISION TRUST FUNDS—PENSION

Plan Data

SCHEDULE OF RETIREES, BENEFICIARIES, AND SURVIVORS ADDED TO AND REMOVED FROM THE BENEFIT PAYROLL

(In Actual Dollars)

	Added to Payroll		Removed from Payroll		Payroll—End of Year			
Valuation Date	No.[1]	Annual Benefits	No.[1]	Annual Benefits	No.[1]	Annual Benefits	Average Annual Benefits	Increase (Decrease) in Average Benefits
State Division[2]								
12/31/2013					34,846	$1,316,530,332	$37,781	—
12/31/2014	1,688	$70,625,718	728	$17,912,280	35,806	1,369,243,770	38,241	1.2%
12/31/2015	1,862	92,808,306	803	20,891,508	36,865	1,441,160,568	39,093	2.2%
12/31/2016	1,953	90,963,480	805	22,828,296	38,013	1,509,295,752	39,705	1.6%
12/31/2017	2,029	96,524,376	810	23,794,584	39,232	1,582,025,544	40,325	1.6%
12/31/2018	1,948	64,439,160	865	29,030,196	40,315	1,617,434,508	40,120	(0.5%)
12/31/2019	1,805	60,004,122	939	33,418,682	41,181	1,644,019,948	39,922	(0.5%)
12/31/2020	1,939	63,669,828	1,252	20,885,946	41,868	1,686,803,830	40,289	0.9%
12/31/2021	2,049	74,357,738	980	16,651,788	42,937	1,744,509,780	40,630	0.8%
12/31/2022	**2,098**	**73,553,004**	**1,281**	**28,133,745**	**43,754**	**1,789,929,039**	**40,909**	**0.7%**
School Division[2]								
12/31/2013					55,808	$1,974,615,348	$35,382	—
12/31/2014	3,016	$111,392,724	843	$19,419,540	57,981	2,066,588,532	35,643	0.7%
12/31/2015	2,990	130,162,524	1,027	23,409,984	59,944	2,173,341,072	36,256	1.7%
12/31/2016	3,023	123,292,224	1,027	25,461,636	61,940	2,271,171,660	36,667	1.1%
12/31/2017	3,249	130,564,260	1,026	26,635,332	64,163	2,375,100,588	37,017	1.0%
12/31/2018	3,319	90,191,556	1,106	32,160,792	66,376	2,433,131,352	36,657	(1.0%)
12/31/2019	3,149	84,865,404	1,163	39,402,271	68,362	2,478,594,485	36,257	(1.1%)
12/31/2020	3,506	98,641,497	1,629	15,175,838	70,239	2,562,060,144	36,476	0.6%
12/31/2021	3,834	115,785,385	1,383	16,732,525	72,690	2,661,113,004	36,609	0.4%
12/31/2022	**3,954**	**123,361,006**	**1,705**	**26,877,020**	**74,939**	**2,757,596,990**	**36,798**	**0.5%**
Local Government Division[2]								
12/31/2013					6,147	$221,838,300	$36,089	—
12/31/2014	392	$13,412,585	93	$2,018,928	6,446	233,231,957	36,182	0.3%
12/31/2015	408	18,760,927	97	2,215,488	6,757	249,777,396	36,966	2.2%
12/31/2016	388	15,843,636	100	2,491,764	7,045	263,129,268	37,350	1.0%
12/31/2017	420	18,329,400	114	2,916,156	7,351	278,542,512	37,892	1.5%
12/31/2018	421	14,336,628	128	3,227,280	7,644	289,651,860	37,893	0.0%
12/31/2019	426	13,283,210	137	4,898,210	7,933	298,036,860	37,569	(0.9%)
12/31/2020	418	13,867,438	171	544,659	8,180	311,359,639	38,064	1.3%
12/31/2021	500	16,208,420	110	(64,326)	8,570	327,632,385	38,230	0.4%
12/31/2022	**445**	**14,515,357**	**207**	**2,779,130**	**8,808**	**339,368,612**	**38,530**	**0.8%**

Please see next page for footnote references.

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF RETIREES, BENEFICIARIES, AND SURVIVORS ADDED TO AND REMOVED FROM THE BENEFIT PAYROLL (CONTINUED)

(In Actual Dollars)

	Added to Payroll		Removed from Payroll		Payroll—End of Year			
Valuation Date	No.[1]	Annual Benefits	No.[1]	Annual Benefits	No.[1]	Annual Benefits	Average Annual Benefits	Increase (Decrease) in Average Benefits
Judicial Division[2]								
12/31/2013					322	$19,219,128	$59,687	—
12/31/2014	16	$1,068,823	8	$368,520	330	19,919,431	60,362	1.1%
12/31/2015	20	2,111,405	6	323,940	344	21,706,896	63,101	4.5%
12/31/2016	28	2,406,072	12	287,580	360	23,825,388	66,182	4.9%
12/31/2017	24	2,554,728	9	398,184	375	25,981,932	69,285	4.7%
12/31/2018	8	696,864	3	129,084	380	26,549,712	69,868	0.8%
12/31/2019	27	2,115,235	8	400,305	399	28,264,642	70,839	1.4%
12/31/2020	25	2,141,893	10	387,294	414	30,019,241	72,510	2.4%
12/31/2021	28	2,213,671	10	298,792	432	31,934,120	73,922	1.9%
12/31/2022	**24**	**2,168,626**	**12**	**201,176**	**444**	**33,901,570**	**76,355**	**3.3%**
DPS Division[2]								
12/31/2013					6,551	$242,733,072	$37,053	—
12/31/2014	306	$12,537,532	171	$5,065,860	6,686	250,204,744	37,422	1.0%
12/31/2015	295	14,799,992	178	5,884,980	6,803	259,119,756	38,089	1.8%
12/31/2016	322	14,412,348	190	5,854,992	6,935	267,677,112	38,598	1.3%
12/31/2017	283	13,847,400	181	6,388,008	7,037	275,136,504	39,099	1.3%
12/31/2018	297	9,717,816	184	6,345,060	7,150	278,509,260	38,952	(0.4%)
12/31/2019	234	6,854,297	241	9,248,121	7,143	276,115,436	38,655	(0.8%)
12/31/2020	256	7,957,106	271	5,910,106	7,128	278,162,436	39,024	1.0%
12/31/2021	281	8,318,920	230	5,665,898	7,179	280,815,458	39,116	0.2%
12/31/2022	**314**	**10,103,383**	**245**	**6,432,639**	**7,248**	**284,486,202**	**39,250**	**0.3%**
All Division Trust Funds[2]								
12/31/2013					103,674	$3,774,936,180	$36,412	—
12/31/2014	5,418	$209,037,382	1,843	$44,785,128	107,249	3,939,188,434	36,729	0.9%
12/31/2015	5,575	258,643,154	2,111	52,725,900	110,713	4,145,105,688	37,440	1.9%
12/31/2016	5,714	246,917,760	2,134	56,924,268	114,293	4,335,099,180	37,930	1.3%
12/31/2017	6,005	261,820,164	2,140	60,132,264	118,158	4,536,787,080	38,396	1.2%
12/31/2018	5,993	179,382,024	2,286	70,892,412	121,865	4,645,276,692	38,118	(0.7%)
12/31/2019	5,641	167,122,268	2,488	87,367,589	125,018	4,725,031,371	37,795	(0.8%)
12/31/2020	6,144	186,277,762	3,333	42,903,843	127,829	4,868,405,290	38,085	0.8%
12/31/2021	6,692	216,884,134	2,713	39,284,677	131,808	5,046,004,747	38,283	0.5%
12/31/2022	**6,835**	**223,701,376**	**3,450**	**64,423,710**	**135,193**	**5,205,282,413**	**38,503**	**0.6%**

[1] The number does not include deferred survivors.

[2] Amounts derived on an accrual basis.

DIVISION TRUST FUNDS—PENSION

The number of persons receiving monthly retirement benefits has grown steadily in relation to membership. As shown in the following table, this trend has substantially stabilized over the last few years as PERA has reached a mature plan status. The retirement benefit disbursements shown in the right-hand column include cost-of-living increases paid in years since 1970. Prior to 1981, figures are for years ended June 30.

MEMBER-RETIREE COMPARISON–ALL DIVISION TRUST FUNDS[1]

(In Actual Dollars)

Year	Number of Retiree Accounts on 12/31	Number of Member Accounts on 12/31[2]	Retiree Accounts as a Percentage of Members on 12/31	Total Benefits Paid–Year Ended 12/31
1940	93	3,715	2.5%	$72,588
1945	171	5,585	3.1%	137,442
1950	280	11,853	2.4%	237,866
1955	747	21,185	3.5%	745,679
1960	1,775	33,068	5.4%	2,055,139
1965	3,631	49,701	7.3%	5,486,225
1970	6,308	65,586	9.6%	13,115,234
1975	11,650	84,781	13.7%	32,820,433
1980	17,301	96,473	17.9%	71,289,456
1985	24,842	101,409	24.5%	192,456,029
1990	32,955	115,350	28.6%	350,398,094
1995	41,909	203,102	20.6%	639,501,796
2000	53,015	248,104	21.4%	1,093,779,068
2005	69,416	306,139	22.7%	1,973,240,491
2010	91,412	378,264	24.2%	3,161,773,781
2015	108,426	436,465	24.8%	4,073,789,897
2020	125,363	502,972	24.9%	4,825,842,185
2021	129,325	517,470	25.0%	4,984,778,874
2022	**132,676**	**536,426**	**24.7%**	**5,153,727,994**

1 Amounts derived on a cash basis. Data prior to 2010 does not include the DPS Division.

2 Includes inactive member accounts.

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF MEMBERS IN ACTUARIAL VALUATION

By Attained Age and Years of Service as of December 31, 2022

(In Actual Dollars)

State Division

For State Division members (excluding State Troopers) the average age was 45.5 years, the average service was 9.2 years, and the average expected remaining service life was 9.1 years. For State Troopers the average age was 36.3 years, the average service was 5.6 years, and the average expected remaining service life was 15.1 years.

	Years of Service to Valuation Date							Total	
Attained Age	0–4	5–9	10–14	15–19	20–24	25–29	30+	No.	Annual Valuation Payroll
Up to 20	239	—	—	—	—	—	—	239	$5,760,388
20-24	1,812	20	12	—	—	—	—	1,844	69,496,057
25-29	3,427	369	502	6	—	—	—	4,304	208,982,372
30-34	3,185	545	1,813	310	11	—	—	5,864	331,206,770
35-39	2,414	471	1,985	1,096	345	12	—	6,323	392,212,576
40-44	1,894	370	1,639	1,180	1,003	328	16	6,430	427,249,069
45-49	2,042	347	1,485	1,053	1,047	832	315	7,121	485,999,948
50-54	1,328	306	1,288	1,023	1,047	931	823	6,746	478,171,646
55-59	993	187	999	874	863	745	680	5,341	369,379,008
60	150	32	194	157	164	133	147	977	65,302,485
61	128	38	152	136	173	117	122	866	57,741,115
62	124	37	151	133	149	113	114	821	54,152,589
63	110	25	136	119	141	102	108	741	47,558,697
64	103	24	133	123	136	81	104	704	45,841,029
65+	465	85	474	432	436	320	359	2,571	144,901,455
Total	**18,414**	**2,856**	**10,963**	**6,642**	**5,515**	**3,714**	**2,788**	**50,892**	**$3,183,955,204**

School Division

For School Division members the average age was 44.5 years, the average service was 9.0 years, and the average expected remaining service life was 9.8 years.

	Years of Service to Valuation Date							Total	
Attained Age	0–4	5–9	10–14	15–19	20–24	25–29	30+	No.	Annual Valuation Payroll
Up to 20	1,523	1	—	—	—	—	—	1,524	$14,265,344
20-24	5,584	183	111	—	—	—	—	5,878	129,756,532
25-29	7,187	1,263	2,024	47	—	—	—	10,521	380,857,037
30-34	5,429	1,092	5,004	1,234	53	—	—	12,812	538,036,019
35-39	5,364	932	3,904	3,342	1,168	55	—	14,765	659,301,737
40-44	5,270	982	3,836	2,728	3,458	1,157	31	17,462	848,160,655
45-49	9,095	964	3,596	2,391	2,663	2,889	816	22,414	1,025,476,263
50-54	3,157	646	2,884	2,292	2,580	2,456	2,419	16,434	907,057,041
55-59	2,195	461	2,050	1,700	2,258	1,901	1,519	12,084	617,398,134
60	403	75	359	299	398	299	250	2,083	97,361,363
61	413	79	307	244	339	302	233	1,917	84,616,444
62	354	70	301	246	309	289	223	1,792	78,979,998
63	308	70	268	201	298	249	188	1,582	66,399,770
64	288	55	223	175	240	213	157	1,351	55,490,961
65+	1,754	293	1,114	665	642	503	467	5,438	167,122,546
Total	**48,324**	**7,166**	**25,981**	**15,564**	**14,406**	**10,313**	**6,303**	**128,057**	**$5,670,279,844**

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF MEMBERS IN ACTUARIAL VALUATION (CONTINUED)

By Attained Age and Years of Service as of December 31, 2022

(In Actual Dollars)

Local Government Division

For Local Government Division members (excluding State Troopers) the average age was 43.9 years, the average service was 7.8 years, and the average expected remaining service life was 9.0 years. For State Troopers the average age was 37.1 years, the average service was 2.1 years, and the average expected remaining service life was 15.8 years.

	Years of Service to Valuation Date							Total	
Attained Age	0–4	5–9	10–14	15–19	20–24	25–29	30+	No.	Annual Valuation Payroll
Up to 20	623	—	—	—	—	—	—	623	$5,660,079
20-24	566	13	11	—	—	—	—	590	16,788,045
25-29	720	78	144	1	—	—	—	943	47,641,976
30-34	680	128	376	78	8	—	—	1,270	78,657,924
35-39	592	121	395	172	90	12	—	1,382	93,131,890
40-44	454	80	390	201	177	63	9	1,374	101,981,413
45-49	560	68	336	197	237	131	76	1,605	115,808,307
50-54	357	62	285	176	281	172	131	1,464	115,301,404
55-59	300	51	220	172	210	140	131	1,224	90,578,964
60	45	12	33	51	56	35	22	254	17,596,383
61	49	11	33	21	46	26	11	197	13,382,351
62	42	7	41	32	28	27	31	208	14,181,354
63	37	12	41	25	28	18	23	184	11,658,001
64	39	8	34	19	29	19	16	164	11,098,068
65+	228	30	119	96	77	28	43	621	26,795,593
Total	**5,292**	**681**	**2,458**	**1,241**	**1,267**	**671**	**493**	**12,103**	**$760,261,752**

Judicial Division

For Judicial Division members the average age was 53.3 years, the average service was 11.9 years, and the average expected remaining service life was 11.6 years.

	Years of Service to Valuation Date							Total	
Attained Age	0–4	5–9	10–14	15–19	20–24	25–29	30+	No.	Annual Valuation Payroll
Up to 20	—	—	—	—	—	—	—	—	$—
20-24	—	—	—	—	—	—	—	—	—
25-29	—	—	—	—	—	—	—	—	—
30-34	2	—	1	—	—	—	—	3	324,812
35-39	10	—	2	5	—	—	—	17	2,175,198
40-44	17	4	11	8	4	—	—	44	6,922,999
45-49	13	6	21	8	8	4	1	61	10,353,564
50-54	16	4	11	13	16	3	—	63	10,686,237
55-59	8	2	14	13	15	9	9	70	11,885,400
60	2	—	2	3	2	1	3	13	2,140,496
61	3	—	2	2	4	1	1	13	2,314,947
62	—	—	2	3	1	1	2	9	1,621,700
63	—	—	3	4	—	3	1	11	1,962,086
64	—	1	1	—	3	1	1	7	1,247,856
65+	1	1	3	4	4	4	12	29	4,930,035
Total	**72**	**18**	**73**	**63**	**57**	**27**	**30**	**340**	**$56,565,330**

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF MEMBERS IN ACTUARIAL VALUATION (CONTINUED)

By Attained Age and Years of Service as of December 31, 2022

(In Actual Dollars)

DPS Division

For DPS Division members the average age was 41.1 years, the average service was 7.6 years, and the average expected remaining service life was 9.7 years.

	Years of Service to Valuation Date							Total	
Attained Age	0–4	5–9	10–14	15–19	20–24	25–29	30+	No.	Annual Valuation Payroll
Up to 20	152	—	—	—	—	—	—	152	$2,257,972
20-24	873	27	22	—	—	—	—	922	22,802,574
25-29	1,296	195	368	11	—	—	—	1,870	77,882,061
30-34	943	204	974	195	2	—	—	2,318	121,536,900
35-39	634	156	761	580	105	4	—	2,240	133,580,972
40-44	958	131	634	487	240	43	3	2,496	139,523,896
45-49	336	75	393	357	237	188	34	1,620	102,802,913
50-54	264	74	262	353	194	208	103	1,458	93,748,670
55-59	202	40	162	238	120	127	87	976	58,501,730
60	31	6	37	41	34	20	12	181	10,590,973
61	34	7	23	40	23	18	18	163	8,659,848
62	23	7	21	36	12	15	13	127	6,426,068
63	19	7	35	30	18	16	8	133	7,114,019
64	19	7	28	40	16	12	8	130	5,977,045
65+	127	26	81	133	33	40	28	468	18,997,002
Total	**5,911**	**962**	**3,801**	**2,541**	**1,034**	**691**	**314**	**15,254**	**$810,402,643**

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF ACTIVE MEMBER ACTUARIAL VALUATION DATA

As of December 31

(In Actual Dollars)

Year	Number of Participating Employers[1]	Number of Active Members	Annual Payroll for Active Members	Average Annual Pay for Active Members	Percentage Increase (Decrease) in Average Annual Pay
State Division					
2013	70	55,354	$2,474,965,482	$44,712	—
2014	32	55,300	2,564,669,718	46,377	3.72%
2015	32	55,291	2,641,866,650	47,781	3.03%
2016	32	55,725	2,710,650,565	48,643	1.80%
2017	32	55,686	2,774,207,203	49,819	2.42%
2018	32	55,511	2,898,827,271	52,221	4.82%
2019	32	55,252	2,995,452,821	54,214	3.82%
2020	32	53,643	3,089,161,069	57,587	6.22%
2021	32	53,477	3,092,509,212	57,829	0.42%
2022	**32**	**50,892**	**3,183,955,204**	**62,563**	**8.19%**
School Division					
2013	294[2]	117,727	$3,938,649,818	$33,456	—
2014	224	119,618	4,063,235,757	33,968	1.53%
2015	227	120,239	4,235,290,282	35,224	3.70%
2016	229	121,945	4,349,319,783	35,666	1.25%
2017	234	122,990	4,471,356,847	36,355	1.93%
2018	234	126,333	4,789,503,451	37,912	4.28%
2019	235	128,938	5,104,430,888	39,588	4.42%
2020	234	119,421	5,146,117,910	43,092	8.85%
2021	233	125,007	5,465,866,064	43,724	1.47%
2022	**234**	**128,057**	**5,670,279,844**	**44,279**	**1.27%**
Local Government Division					
2013	146	11,954	$529,003,436	$44,253	—
2014	141	12,084	540,468,037	44,726	1.07%
2015	140	12,176	561,518,205	46,117	3.11%
2016	141	12,736	608,222,609	47,756	3.55%
2017	140	12,770	632,768,337	49,551	3.76%
2018	141	13,260	660,998,127	49,849	0.60%
2019	141	13,086	681,093,520	52,047	4.41%
2020	141	12,757	698,059,659	54,720	5.14%
2021	141	12,745	723,744,103	56,787	3.78%
2022	**141**	**12,103**	**760,261,752**	**62,816**	**10.62%**
Judicial Division					
2013	6	332	$39,941,730	$120,306	—
2014	2	334	42,976,979	128,674	6.96%
2015	2	334	46,869,730	140,329	9.06%
2016	2	335	48,699,531	145,372	3.59%
2017	2	332	48,947,607	147,433	1.42%
2018	2	332	50,505,856	152,126	3.18%
2019	2	339	53,427,351	157,603	3.60%
2020	2	344	54,780,086	159,244	1.04%
2021	2	345	55,779,834	161,681	1.53%
2022	**2**	**340**	**56,565,330**	**166,369**	**2.90%**

Please see next page for footnote references.

DIVISION TRUST FUNDS—PENSION

SCHEDULE OF ACTIVE MEMBER ACTUARIAL VALUATION DATA (CONTINUED)

As of December 31

(In Actual Dollars)

Year	Number of Participating Employers[1]	Number of Active Members	Annual Payroll for Active Members	Average Annual Pay for Active Members	Percentage Increase (Decrease) in Average Annual Pay
DPS Division					
2013	31[2]	14,816	$547,659,912	$36,964	—
2014	1	15,414	584,319,269	37,908	2.55%
2015	1	15,929	621,114,573	38,993	2.86%
2016	1	15,950	642,177,158	40,262	3.25%
2017	1	15,991	658,198,306	41,161	2.23%
2018	1	16,148	722,040,073	44,714	8.63%
2019	1	15,679	736,263,798	46,959	5.02%
2020	1	14,693	771,347,604	52,498	11.80%
2021	1	15,695	823,395,477	52,462	(0.07%)
2022	**1**	**15,254**	**810,402,643**	**53,127**	**1.27%**
All Division Trust Funds					
2013	547[2]	200,183	$7,530,220,378	$37,617	—
2014	400	202,750	7,795,669,760	38,450	2.21%
2015	402	203,969	8,106,659,440	39,745	3.37%
2016	405	206,691	8,359,069,646	40,442	1.75%
2017	409	207,769	8,585,478,300	41,322	2.18%
2018	410	211,584	9,121,874,778	43,112	4.33%
2019	411	213,294	9,570,668,378	44,871	4.08%
2020	410	200,858	9,759,466,328	48,589	8.29%
2021	409	207,269	10,161,294,690	49,025	0.90%
2022	**410**	**206,646**	**10,481,464,773**	**50,722**	**3.46%**

[1] Prior to 2014, employer counts were based on separate units of government. Effective in 2014, GASB 67 classifies a primary government and its component units as one employer. Employer counts for the years 2014 and beyond are presented for purposes of complying with GASB 67 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA.

[2] Includes charter schools operating within the School and DPS Divisions.

HEALTH CARE TRUST FUNDS—OPEB

Actuarial Topics

The standard promulgated by the GASB Statement No. 74 results in the preparation of two actuarial valuations—one for funding purposes and one for accounting and financial reporting purposes. Unless otherwise noted, this Health Care Trust Funds subsection reports on the actuarial valuation performed for funding purposes, but also includes information on specific differences between the two actuarial valuations.

The other postemployment benefit (OPEB) plan provisions in effect on December 31, 2022, are summarized in Note 9 of the Notes to the Financial Statements in the Financial Section.

PERA BOARD GOVERNANCE - TWO DEFINED BENEFIT OPEB PLANS	
PERA Defined Benefit OPEB Plans	PERA's two defined benefit OPEB plans include the Health Care Trust Fund (HCTF), a cost-sharing multiple-employer plan, and the Denver Public Schools Health Care Trust Fund (DPS HCTF), a single-employer plan. The HCTF and the DPS HCTF provide a subsidy for PERACare, PERA's health benefits program. Participation in the HCTF and the DPS HCTF is voluntary pursuant to C.R.S. § 24-51-1201. Employer contributions and investment earnings on the assets of the plans primarily pay for the costs. The HCTF was established as of July 1, 1985, and the DPS HCTF was established January 1, 2010, with the asset transfer from the Denver Public Schools Retiree Health Benefit Trust held by the DPS Board of Education. The HCTF and the DPS HCTF provide a health care premium subsidy based upon the benefit structure under which a member retires and the member's years of service credit. There is an allocation of the premium subsidy between the trust funds for members who retire with service credit in the DPS Division and one or more of the other divisions, as set forth in C.R.S. § 24-51-1206.5. The basis for the allocation of the premium subsidy is the percentage of the member contribution balance from each division as it relates to the total member contribution account balance.
PERA Board OPEB Funding Policy	The PERA Board is responsible for maintaining an OPEB funding policy applicable to these plans. The current OPEB funding policy initially was adopted by the Board on January 19, 2018, effective for the December 31, 2017, funding actuarial valuation. The OPEB funding policy requires the calculation of an ADC for each of the two Health Care Trust Funds for the purpose of assessing the adequacy of the statutory contribution rate of each fund. The ADC is determined in accordance with the OPEB plan provisions in effect as of the date of the actuary's Letter of Certification and is expressed as a level percentage of assumed future covered payroll.
Actuarial Service Provider & Other Responsibilities	The Board retains an external actuary, and effective November 1, 2018, Segal was retained to perform annual actuarial valuations and sustainability projections as well as periodic experience studies to review the actuarial assumptions versus actual plan experience. In addition, the Board has the authority to contract, self-insure, and authorize disbursements necessary in order to carry out the purposes of the PERACare program including the administration of the health care subsidies.
Actuarial Service Provider Funding Method Statement	Per their actuarial valuation report, "Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and a portion of the principal balance. The OPEB funding policy adopted by PERA meets this standard."

ACTUARIAL METHODS	
Actuarial Methods	The Board is responsible for the actuarial methods and assumptions used in the actuarial valuations in accordance with C.R.S. § 24-51-204(5). Through formal action, the Board updates, replaces, or adopts new actuarial methods and assumptions as deemed necessary. Initial valuations were performed on an "open group" basis approximately once every two years. Annual valuations commenced with the December 31, 1998, actuarial valuation.

HEALTH CARE TRUST FUNDS—OPEB

Actuarial Methods	Type	Description / Source / Basis	Adoption / Effective Date
Asset Valuation Method	Smoothed Actuarial Value of Assets	In 1992, the Board adopted a method for valuing assets that determines a smoothed fair value (synonymous with the term "market value," as is used in the Board's OPEB funding policy) of assets to help mitigate volatile investment market experience. The smoothed fair value of assets recognizes the differences between actual and expected investment experience for each year in equal amounts over a four-year period.	Initially Adopted: 1992; Effective: Jan 1, 1993; Reinitialized to Fair Value as of: Dec 31, 2004; Effective: Dec 31, 2005
Actuarial Cost Method	Entry Age Actuarial Cost Method (EA)	The EA funding or cost method is designed to keep annual costs level as a percent of covered payroll and for this reason, was selected by the Board to be used in the actuarial valuations. The method to determine normal cost, original based on credited service, is determined based on compensation as of the December 31, 2016, actuarial valuation. The effect of differences between the actuarial assumptions and the actual experience of the plan is determined within each annual actuarial valuation. These differences produce actuarial gains or losses that result in an adjustment of the UAAL.	EA Effective: Jan 1, 1991; Normal Cost basis changed from service to compensation - Effective: Dec 31, 2016
Amortization Method	Defined, Closed, and Layered Periods	The ADC is determined by adding the normal cost and the cost to amortize, over defined, closed periods, any existing UAAL or new UAAL, including the impact of any experience actuarial gains and losses, actuarial assumption changes, and changes in plan provisions. Each amortized item is tracked over the closed period defined for that category. The 30-year period used to amortize the legacy UAAL was initialized as of December 31, 2017. All gains, losses, and changes in actuarial methods and assumptions on and after January 1, 2018, are recognized each year and amortized separately over closed 30-year periods. The impact of any changes in plan provisions will be recognized over a closed period relating to the demographics of the group affected and/or the duration of the enhancement provided, not to exceed 25 years. If any future actuarial valuation indicates a division has a negative UAAL, the ADC shall be set equal to the normal cost until such time as the funded ratio equals or exceeds 120%. At that time, the ADC shall be equal to the normal cost less an amount equal to 15-year amortization of the portion of the negative UAAL above the 120% funded ratio.	Initially Adopted: Jan 19, 2018; Effective: Dec 31, 2017

HEALTH CARE TRUST FUNDS—OPEB

ACTUARIAL ASSUMPTIONS

Actuarial Assumptions[1]	Unless otherwise noted, it can be assumed that the economic and demographic actuarial assumptions applied to the actuarial valuation for funding purposes also were applied to the actuarial valuation for accounting and financial reporting purposes. All actuarial methods and assumptions necessary to assess OPEB liabilities, in addition to those already previously, are described as follows. The actuary followed ASOP No. 6, *Measuring Retiree Group Benefit Obligations*, for purposes of recommending appropriate OPEB-specific assumptions.	
	Basis of Actuarial Assumptions Used	Unless otherwise noted, the basis of all selected economic and non-economic actuarial assumptions resulted from the 2020 experience analysis and related discussions that took place during the November 20, 2020, Board meeting. As a result of the 2019 Asset Liability Study, concluded at the November 15, 2019, Board meeting, the Board reaffirmed the 7.25% assumed long-term rate of investment return effective as of January 1, 2020, which was supported by the analysis provided by Segal in the 2020 Experience Analysis report.

[1] See Exhibits H through L for detailed assumption information.

Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Initial Per Capita Health Care Costs	Exhibit H	Exhibit H contains the assumptions used in determining the additional liability for PERACare enrollees under the PERA benefit structure (and in certain circumstances, the DPS benefit structure), who are age 65 or older and who are not eligible for premium-free Medicare Part A. Shown are the monthly costs/premiums assumed for 2023, which are subject to the morbidity rates and health care cost trend rates. Basis: Reviewed and updated annually	Updated Effective: Dec 31, 2022
Age-Related Morbidity Rates	Exhibit H	These rates assist in anticipating the pace at which a defined population ages through an eligibility period and for PERA, apply only to Medicare-eligible members who retire under the PERA benefit structure (and in certain circumstances, the DPS benefit structure) and do not qualify for premium-free Medicare Part A. Where the actual premiums for the selected plan are less than the service-based premium subsidy, age-related morbidity assumptions are applied accordingly; i.e. the 2023 Medicare Advantage #2 is lower than the service-based subsidy. Basis: Updated for the December 31, 2022, valuation, the revised morbidity rate factors are based on a review of historical claims experience by age, gender, and status (active vs. retired) from Segal's claims data warehouse, developed by Segal for use in client valuations—annually monitored and updated as appropriate.	Initially Effective: Dec 31, 2015; Last Updated Effective: Dec 31, 2022
Health Care Cost Trend Rates	Exhibit H	Health care cost trends reflect the change in per capita costs over time and include such factors as unit cost, utilization of health care services, plan design, and technological improvements. These factors impact overall cost (and thus retiree share after the fixed subsidy) as well as the costs for Medicare beneficiaries not eligible for premium-free Medicare Part A under the PERA benefit structure (and in certain circumstances, the DPS benefit structure.) Basis: Reviewed and updated annually	Updated Effective: Dec 31, 2022
Additional Premium Subsidy Assumptions - DPS Benefit Structure	Exhibit I	Plan defined dollar subsidy amounts used in determining the additional liability for PERACare enrollees under the DPS benefit structure who are age 65 or older and who are not eligible for premium-free Medicare Part A. Basis: Additional subsidy for DPS Benefit Structure in effect as of January 1, 2010	Subsidy amounts in effect as of Merger of the DPS Retirement System into PERA, Effective: Jan 1, 2010

HEALTH CARE TRUST FUNDS—OPEB

Non-Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Health Care Participation Rate Assumptions	Exhibit J	Current PERACare participants are assumed to maintain their current health care benefit elections in perpetuity. For active members retiring directly from covered employment, Exhibit J provides the assumed participation rates. The participation of current PERACare enrollees and members retiring directly from active service is adjusted to reflect the increasing rate of participation with age, as described in Exhibit J. The 2020 experience analysis supported a reduction in anticipated participation for retiring active members at certain ages for all divisions.	Last Revised: Nov 20, 2020; Effective: Dec 31, 2020
Survivors of Retirees Choosing Joint & Survivor Payment Options	Portion of Male Retirees with Surviving Spouse: 60%; Portion of Female Retirees with Surviving Spouse: 35%	Survivors of retirees under the PERA benefit structure electing health care coverage are eligible to receive the subsidy. To anticipate future liabilities driven by these survivors, it is assumed that a percent of the current members assumed to elect PERACare coverage will choose a joint and survivor optional payment and thus, their survivors will qualify for the subsidy. The 2020 experience analysis supported separate assumptions for male and female retirees.	Last Revised: Nov 20, 2020; Effective: Dec 31, 2020
Age Differences	Male Retiree: Three Years Older; Female Retiree: One Year Older	The assumed average number of years a covered male spouse is older than a covered female spouse is three years for a male retiree and one year for a female retiree. These assumptions initially were determined from actual census data and were revised from the previous non-gender specific assumptions used in prior actuarial valuations. The 2020 experience analysis confirmed the current assumptions.	Last Revised: Nov 18, 2016; Effective: Dec 31, 2016
Health Care Participation Election Assumption for Inactive Members	Inactive Members: 20%	It is assumed that a certain percent of eligible inactive members will elect health care coverage upon commencement of their monthly benefit. The 2020 experience analysis supported a reduction in anticipated participation for inactive members.	Last Revised: Nov 20, 2020; Effective: Dec 31, 2020
Health Care Participation Spousal Election Assumption	5%	It is assumed that a certain percent of participating members, regardless of prior status, retirement benefit payment selection, or eligibility for premium-free Medicare Part A, will elect coverage for their spouses. The 2020 experience analysis supported consolidation of spousal election assumptions and a reduction in the resulting spousal election assumption.	Last Revised: Nov 20, 2020; Effective: Dec 31, 2020
Commencement Age Assumed for Inactive Members	Ranging From Age 50 to Age 60, depending on Inactive Member Group	For eligible inactive members, an average age at which health benefits are to begin must be assumed. Here, the assumed age of initial benefit receipt is determined using the same approach used for terminating active members who are assumed to leave their contributions in the plan in order to be eligible for a pension benefit at their retirement date. This assumption varies depending on benefit structure and years of service. The 2020 experience analysis confirmed the assumed initial benefit age for all inactive member groups except those under the DPS benefit structure, for whom the assumption was lowered.	Last Confirmed/ Revised: Nov 20, 2020; Effective: Dec 31, 2020
Medicare Health Care Plan Election Rate Assumptions	Exhibit K	Exhibit K shows the assumed plan elections for current and future Medicare-eligible retirees who are not eligible for premium-free Medicare Part A. The 2020 experience analysis supported consolidation and revision of the pre- and post-Medicare health care plan election rate assumptions.	Last Revised: Nov 20, 2020; Effective: Dec 31, 2020

HEALTH CARE TRUST FUNDS—OPEB

Non-Economic Assumptions	Value(s) / Type	Description / Source / Basis	Adoption / Effective Date
Percent Qualifying for "No Part A" Subsidy Assumptions	Exhibit L	For those current PERACare enrollees who are age 65 and older, the premium-free Medicare Part A eligibility status is provided by PERA and is assumed to be maintained in perpetuity. For current PERACare enrollees not yet age 65, estimated to have been hired prior to April 1, 1986, and not assumed eligible for premium-free Medicare Part A coverage through their spouse, and for those active employees hired prior to April 1, 1986, Exhibit L lists the percentage, by estimated age at hire, of PERACare enrollees assumed to not qualify for premium-free Medicare Part A benefits, thus qualifying for the applicable "No Part A" subsidy. The 2020 experience analysis confirmed the current assumptions for healthy PERACare enrollees, but supported revised assumptions for certain groups, stated as follows: Of the PERACare enrollees under the PERA benefit structure assumed to qualify for the "No Part A" subsidy, 5% are assumed to cover a spouse. Of the disability retirees enrolled in PERACare 5% are assumed to qualify for the "No Part A" subsidy. Of the eligible inactive (or deferred vested) members enrolled in PERACare, 100% are assumed to obtain the 40 or more quarters of Medicare-covered employment required for premium-free Medicare Part A coverage as a result of their subsequent employment, therefore 0% are assumed to qualify for the "No Part A" subsidy.	Last Confirmed/Revised: Nov 20, 2020; Effective: Dec 31, 2020
Mortality	Exhibit D and Exhibit G	The revised pre- and post-retirement and disability retirement mortality assumptions described in the Division Trust Funds subsection of this Actuarial Section appropriately reflect PERA's recent and anticipated plan experience and are used to estimate the value of expected future subsidy payments. Exhibit D in the Division Trust Funds subsection of this Actuarial Section, lists the healthy pre-retirement mortality rates at sample ages and Exhibit G lists the healthy post-retirement mortality rates and values at sample ages. As a result of the 2020 experience analysis, a separate beneficiary mortality table was implemented to recognize differing mortality for beneficiaries versus retirees. All mortality tables for purpose of valuing the Health Care Trust Funds are headcount-weighted.	First implemented use of separate mortality tables for different groups / divisions Effective: Dec 31, 2016; Mortality—Last Revised: Nov 20, 2020; Effective: Dec 31, 2020 First implemented generational mortality and use of a separate mortality table for beneficiaries Effective: Dec 31, 2020
AI Rate	N/A	As the service-based premium subsidy does not increase over time, there is no need for an assumption regarding increasing benefit amounts. Basis: N/A	N/A

ACTUARIAL STUDIES

Governance Studies	All actuarial studies described in the Division Trust Funds subsection of this Actuarial Section titled, Actuarial Studies, incorporated a review and analysis of actuarial methods and assumptions pertaining to the HCTF and the DPS HCTF.

HEALTH CARE TRUST FUNDS—OPEB

CHANGES SINCE LAST ACTUARIAL VALUATION

Changes in Actuarial Methods	There are no changes in actuarial methods incorporated in the December 31, 2022, actuarial valuation, since the last actuarial valuation as of December 31, 2021.
Changes in Actuarial Assumptions	The actuarial assumption changes, specific to the HCTF and the DPS HCTF, incorporated into the December 31, 2022, actuarial valuation, since the last actuarial valuation as of December 31, 2021 are listed as follows: Revisions were made to the following assumptions based on annual analysis: • Per capita health care costs in effect as of the December 31, 2022, valuation date for those PERACare enrollees under the PERA benefit structure who are expected to be age 65 and older and are not eligible for premium-free Medicare Part A benefits have been updated to reflect the costs for the 2023 plan year. • The morbidity rates used to estimate individual retiree and spouse costs by age and by gender were updated effective for the December 31, 2022, actuarial valuation. The revised morbidity rate factors are based on a review of historical claims experience by age, gender, and status (active vs. retired) from Segal's claims data warehouse. • The health care cost trend rates applicable to health plan premiums were revised to reflect the current expectation of future increases in those premiums. • The timing of the retirement decrement was adjusted to middle-of-year, reflecting a recommendation from the 2022 actuarial audit.
Changes in Plan Provisions	There are no changes in OPEB plan provisions incorporated in the December 31, 2022, actuarial valuation since the last actuarial valuation as of December 31, 2021.

SIGNIFICANT EVENTS

There were no significant events during 2022.

DIFFERENCES IN ACTUARIAL VALUATION METHODS AND ASSUMPTIONS

- The actuarial valuation for funding purposes was performed as of December 31, 2022. The actuarial valuation for accounting and financial reporting purposes was performed as of December 31, 2021, and the total OPEB liability was rolled forward to the measurement date as of December 31, 2022.
- Census data used for the actuarial valuation for funding purposes reflects membership data as of December 31, 2022, and the census data used for the actuarial valuation for accounting and financial reporting purposes reflects membership data as of December 31, 2021. Therefore, all summaries and schedules, regarding actuarial valuation results for funding purposes, shown in the Actuarial Section, reflect census data as of December 31, 2022.
- The actuarial valuation for funding purposes applies an asset valuation method that recognizes a four-year smoothed fair value of assets for purposes of determining the UAAL. The actuarial valuation for accounting and financial reporting purposes applies the fair value of assets to determine the net OPEB liability.
- The actuarial valuation for funding purposes reflects updated initial per capita health care costs and health care trend rates to 2023. The actuarial valuation for accounting and financial reporting purposes reflects updated initial per capita health care costs and health care trend rates to 2022.

HEALTH CARE TRUST FUNDS—OPEB

Actuarial Assumptions: Exhibits H–L

The following exhibits (Exhibits H through L) show the actuarial assumptions employed to determine the actuarial valuation results. The basic economic and demographic actuarial assumptions as detailed in Exhibits A through G, in the Division Trust Funds subsection of the Actuarial Section, also were applied, as applicable, for purposes of determining OPEB liabilities.

Exhibit H: Initial Health Care Costs, Age-Related Morbidity, and Trend Rate Assumptions—PERA Benefit Structure

PER CAPITA HEALTH CARE COST DEVELOPMENT

Continuing from the prior year, the per capita health care costs are developed by plan option. This approach applies for all members and is adjusted accordingly for those not eligible for premium-free Medicare Part A.

MAPD PPO #1:
Based on January 1, 2023, premium rates for the UnitedHealthcare Medicare Advantage Prescription Drug (MAPD) PPO plan #1. Actuarial factors were then applied to estimate individual retiree and spouse costs by age and by gender and healthcare cost trend.

MAPD PPO #2:
Based on January 1, 2023, premium rates for the UnitedHealthcare Medicare Advantage Prescription Drug (MAPD) PPO plan #2. Actuarial factors were then applied to estimate individual retiree and spouse costs by age and by gender and healthcare cost trend.

MAPD HMO:
Based on January 1, 2023, premium rates for the Kaiser Permanente Medicare Advantage Prescription Drug (MAPD) HMO plan. Actuarial factors were then applied to estimate individual retiree and spouse costs by age and by gender and healthcare cost trend.

AGE-RELATED MORBIDITY ASSUMPTIONS

Participant Age	Annual Increase (Male)	Annual Increase (Female)
65-68	2.2%	2.3%
69	2.8%	2.2%
70	2.7%	1.6%
71	3.1%	0.5%
72	2.3%	0.7%
73	1.2%	0.8%
74	0.9%	1.5%
75-85	0.9%	1.3%
86 and older	0.0%	0.0%

HEALTH CARE TRUST FUNDS—OPEB

PER CAPITA HEALTH CARE COSTS BEGINNING JANUARY 1, 2023

(In Actual Dollars)

	MAPD PPO #1 with Medicare Part A		MAPD PPO #2 with Medicare Part A		MAPD HMO (Kaiser) with Medicare Part A	
Sample Age	Male	Female	Male	Female	Male	Female
65	$1,692	$1,406	$579	$481	$1,913	$1,589
70	1,901	1,573	650	538	2,149	1,778
75	2,100	1,653	718	566	2,374	1,869

	MAPD PPO #1 without Medicare Part A		MAPD PPO #2 without Medicare Part A		MAPD HMO (Kaiser) without Medicare Part A	
Sample Age	Male	Female	Male	Female	Male	Female
65	$6,469	$5,373	$4,198	$3,487	$6,719	$5,581
70	7,266	6,011	4,715	3,900	7,546	6,243
75	8,026	6,319	5,208	4,101	8,336	6,563

The 2023 Medicare Part A Premium is $506 per month.

HEALTH CARE COST TREND RATE ASSUMPTIONS[1]

Year	PERACare Medicare Plans[2]	Medicare Part A Premiums
2023	7.00%	3.50%
2024	6.75%	3.50%
2025	6.50%	3.75%
2026	6.25%	3.75%
2027	6.00%	4.00%
2028	5.75%	4.00%
2029	5.50%	4.00%
2030	5.25%	4.25%
2031	5.00%	4.25%
2032	4.75%	4.25%
2033	4.50%	4.25%
2034	4.50%	4.25%
2035+	4.50%	4.50%

[1] Applies only to PERACare enrollees who are age 65 or older and who are not eligible for premium-free Medicare Part A. Where the actual premiums for the selected plan are less than the service-based premium subsidy, trend rate assumptions are applied accordingly.

[2] 0% for UnitedHealthcare MAPD PPO plans in 2023.

Exhibit I: Additional Premium Subsidy Assumptions—DPS Benefit Structure[1]

Years of Service	Monthly Subsidy for Members without Medicare Part A	Years of Service	Monthly Subsidy for Members without Medicare Part A
20+	$115.00	10	$57.50
19	109.25	9	51.75
18	103.50	8	46.00
17	97.75	7	40.25
16	92.00	6	34.50
15	86.25	5	28.75
14	80.50	4	23.00
13	74.75	3	17.25
12	69.00	2	11.50
11	63.25	1	5.75

[1] Health care assumptions for future PERACare enrollees who are age 65 or older and who are assumed to not be eligible for premium-free Medicare Part A.

HEALTH CARE TRUST FUNDS—OPEB

Exhibit J: Health Care Participation Rate Assumptions

	Percent Electing Health Care Coverage			Percent Electing Health Care Coverage	
Attained Age(s)	Other Divisions	DPS Division	Attained Age(s)	Other Divisions	DPS Division
15 – 48	20%	20%	61	45%	60%
49	25%	25%	62	45%	60%
50	25%	25%	63	45%	60%
51	35%	35%	64	45%	60%
52	35%	35%	65	45%	55%
53	40%	40%	66	45%	55%
54	40%	50%	67	45%	55%
55	40%	50%	68	45%	55%
56	40%	50%	69	45%	55%
57	40%	50%	70	45%	55%
58	45%	50%	71	45%	55%
59	45%	50%	72+	55%	65%
60	45%	50%			

Exhibit K: Medicare Health Care Plan Election Rate Assumptions

	Percent of Future Medicare Benefit Recipients Electing Medicare Plan
Medicare Plans[1]	All Divisions
UnitedHealthcare MAPD PPO[2]	70%
Kaiser Permanente Medicare Advantage HMO	30%

[1] These assumptions are applicable to members under the PERA benefit structure only.

[2] Of the PERACare enrollees participating in the UnitedHealthcare MAPD PPO plans, it is assumed that 67% elect MA #1 and 33% elect MA #2.

Exhibit L: Percent Qualifying for “No Part A” Subsidy Assumptions

Hire Age	HCTF[1,2]	DPS HCTF[2]
15 – 24	17%	17%
25 – 29	11%	11%
30+	4%	4%

[1] Of the PERACare enrollees under the PERA benefit structure assumed to qualify for the “No Part A” subsidy, 5% are assumed to cover a spouse.

[2] Of the PERACare enrollees receiving health care benefits as a result of disability retirement, 5% are assumed to qualify for the “No Part A” subsidy. Of the eligible inactive (or deferred vested) members enrolled in PERACare, 100% are assumed to obtain the 40 or more quarters of Medicare-covered employment required for premium-free Medicare Part A coverage as a result of their subsequent employment.

HEALTH CARE TRUST FUNDS—OPEB

Summary of Funding Progress

The PERA funding objective is to pay long-term benefit promises through contributions that remain approximately level from year to year as a percent of covered payroll earned by PERA members. The following schedules presented in this section provide an overview of funding progress:

- The schedule of funded liabilities by type shows the degree to which existing liabilities are funded, including prior history.
- The schedule of funding progress shows the UAAL as a percentage of annual covered payroll, including prior history.
- A schedule detailing actuarial gains and losses, by source, for the current year.
- The scheduled contribution requirements based on the December 31, 2022, actuarial valuation for the period ending December 31, 2024.

Schedule of Funded Liabilities by Type

The schedule of funded liabilities by type, formerly known as the “solvency test,” compares the plan’s actuarial value of assets with: (A) member contributions (with interest) on deposit, (B) the liabilities for future benefits to persons who have retired, died or become disabled, and to those who have terminated service with the right to a future benefit, and (C) the liabilities for service already rendered by active members. Since the HCTF and the DPS HCTF are funded only through employer contributions, there are no member contribution accounts (liability A).

The following table shows the funded level of the liabilities for future benefits to current retirees (liability B) and the unfunded liabilities associated with service already rendered by active members (liability C):

SCHEDULE OF FUNDED LIABILITIES BY TYPE

(Dollars in Thousands)

	Aggregate Accrued Liabilities				Portion of Actuarial Accrued Liabilities Covered by Valuation Assets		
Valuation Date	Active Member Contributions (A)	Retirees, Beneficiaries, and Inactive Members (B)	Employer-Financed Portion of Active Members (C)	Actuarial Value of Plan Assets	Liability (A)	Liability (B)	Liability (C)
HCTF							
12/31/2013	N/A	$1,092,438	$464,968	$293,556	N/A	26.9%	0.0%
12/31/2014	N/A	1,085,995	448,466	297,377	N/A	27.4%	0.0%
12/31/2015	N/A	1,099,045	457,224	285,588	N/A	26.0%	0.0%
12/31/2016	N/A	1,153,015	403,747	270,150	N/A	23.4%	0.0%
12/31/2017	N/A	1,178,160	403,062	260,282	N/A	22.1%	0.0%
12/31/2018	N/A	1,084,313	393,801	288,323	N/A	26.6%	0.0%
12/31/2019	N/A	1,048,219	398,950	348,433	N/A	33.2%	0.0%
12/31/2020	N/A	1,041,551	376,340	430,256	N/A	41.3%	0.0%
12/31/2021	N/A	973,039	372,432	511,143	N/A	52.5%	0.0%
12/31/2022	**N/A**	**965,100**	**352,056**	**571,710**	**N/A**	**59.2%**	**0.0%**
DPS HCTF							
12/31/2013	N/A	$52,106	$24,530	$15,482	N/A	29.7%	0.0%
12/31/2014	N/A	50,998	25,028	16,502	N/A	32.4%	0.0%
12/31/2015	N/A	49,891	25,006	17,557	N/A	35.2%	0.0%
12/31/2016	N/A	51,357	21,488	18,945	N/A	36.9%	0.0%
12/31/2017	N/A	50,796	19,496	21,117	N/A	41.6%	0.0%
12/31/2018	N/A	48,268	21,184	25,018	N/A	51.8%	0.0%
12/31/2019	N/A	46,398	21,539	31,189	N/A	67.2%	0.0%
12/31/2020	N/A	45,306	20,252	39,853	N/A	88.0%	0.0%
12/31/2021	N/A	40,643	21,417	49,719	N/A	100.0%	42.4%
12/31/2022	**N/A**	**39,157**	**20,524**	**58,134**	**N/A**	**100.0%**	**92.5%**

HEALTH CARE TRUST FUNDS—OPEB

SCHEDULE OF FUNDED LIABILITIES BY TYPE (CONTINUED)

(Dollars in Thousands)

	Aggregate Accrued Liabilities				Portion of Actuarial Accrued Liabilities Covered by Valuation Assets		
Valuation Date	Active Member Contributions (A)	Retirees, Beneficiaries, and Inactive Members (B)	Employer-Financed Portion of Active Members (C)	Actuarial Value of Plan Assets	Liability (A)	Liability (B)	Liability (C)
Total of Health Care Trust Funds[1]							
12/31/2013	N/A	$1,144,544	$489,498	$309,038	N/A	27.0%	0.0%
12/31/2014	N/A	1,136,993	473,494	313,879	N/A	27.6%	0.0%
12/31/2015	N/A	1,148,936	482,230	303,145	N/A	26.4%	0.0%
12/31/2016	N/A	1,204,372	425,235	289,095	N/A	24.0%	0.0%
12/31/2017	N/A	1,228,956	422,558	281,399	N/A	22.9%	0.0%
12/31/2018	N/A	1,132,581	414,985	313,341	N/A	27.7%	0.0%
12/31/2019	N/A	1,094,617	420,489	379,622	N/A	34.7%	0.0%
12/31/2020	N/A	1,086,857	396,592	470,109	N/A	43.3%	0.0%
12/31/2021	N/A	1,013,682	393,849	560,862	N/A	55.3%	0.0%
12/31/2022	**N/A**	**1,004,257**	**372,580**	**629,844**	**N/A**	**62.7%**	**0.0%**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Unfunded Actuarial Accrued Liability

UAAL is the difference between actuarially calculated liability for service already rendered and the valuation assets of the fund.

The following factors resulted in higher liabilities (or losses) during 2022:

- Of the members who terminated PERA-covered employment fewer withdrew their accounts than expected.
- New PERA members had some service resulting in accrued liabilities.

The following factors resulted in lower liabilities (or gains) during 2022:

- Higher than assumed investment return (based on the smoothed actuarial value of assets) for 2019, 2020, 2021, and 2022.
- Favorable benefit utilization and claims experience after reflecting administrative expenses.
- Fewer members retired at earlier ages than expected.
- Fewer service and disability retirements were experienced than expected.
- Actual payroll contributions were greater than the determined ADC for the HCTF and the DPS HCTF.

HEALTH CARE TRUST FUNDS—OPEB

SCHEDULE OF FUNDING PROGRESS

(Dollars in Thousands)

(A) Valuation Date	(B) Actuarial Value of Plan Assets	(C) Actuarial Accrued Liabilities	(D) Unfunded Actuarial Accrued Liabilities (UAAL) (C)–(B)	(E) Funded Ratio (B)/(C)	(F) Annual Covered Payroll	(G) UAAL As a Percentage of Covered Payroll (D)/(F)
HCTF						
12/31/2013	$293,556	$1,557,406	$1,263,850	18.8%	$6,982,560	18.1%
12/31/2014	297,377	1,534,461	1,237,084	19.4%	7,211,351	17.2%
12/31/2015	285,588	1,556,269	1,270,681	18.4%	7,485,545	17.0%
12/31/2016	270,150	1,556,762	1,286,612	17.4%	7,716,894	16.7%
12/31/2017	260,282	1,581,222	1,320,940	16.5%	7,927,280	16.7%
12/31/2018	288,323	1,478,114	1,189,791	19.5%	8,399,835	14.2%
12/31/2019	348,433	1,447,169	1,098,736	24.1%	8,834,404	12.4%
12/31/2020	430,256	1,417,891	987,635	30.3%	8,988,119	11.0%
12/31/2021	511,143	1,345,471	834,328	38.0%	9,337,899	8.9%
12/31/2022	**571,710**	**1,317,156**	**745,446**	**43.4%**	**9,671,062**	**7.7%**
DPS HCTF						
12/31/2013	$15,482	$76,636	$61,154	20.2%	$547,660	11.2%
12/31/2014	16,502	76,026	59,524	21.7%	584,319	10.2%
12/31/2015	17,557	74,897	57,340	23.4%	621,115	9.2%
12/31/2016	18,945	72,845	53,900	26.0%	642,177	8.4%
12/31/2017	21,117	70,292	49,175	30.0%	658,198	7.5%
12/31/2018	25,018	69,452	44,434	36.0%	722,040	6.2%
12/31/2019	31,189	67,937	36,748	45.9%	736,264	5.0%
12/31/2020	39,853	65,558	25,705	60.8%	771,347	3.3%
12/31/2021	49,719	62,060	12,341	80.1%	823,396	1.5%
12/31/2022	**58,134**	**59,681**	**1,547**	**97.4%**	**810,403**	**0.2%**
Total of Health Care Trust Funds[1]						
12/31/2013	$309,038	$1,634,042	$1,325,004	18.9%	$7,530,220	17.6%
12/31/2014	313,879	1,610,487	1,296,608	19.5%	7,795,670	16.6%
12/31/2015	303,145	1,631,166	1,328,021	18.6%	8,106,660	16.4%
12/31/2016	289,095	1,629,607	1,340,512	17.7%	8,359,071	16.0%
12/31/2017	281,399	1,651,514	1,370,115	17.0%	8,585,478	16.0%
12/31/2018	313,341	1,547,566	1,234,225	20.2%	9,121,875	13.5%
12/31/2019	379,622	1,515,106	1,135,484	25.1%	9,570,668	11.9%
12/31/2020	470,109	1,483,449	1,013,340	31.7%	9,759,466	10.4%
12/31/2021	560,862	1,407,531	846,669	39.8%	10,161,295	8.3%
12/31/2022	**629,844**	**1,376,837**	**746,993**	**45.7%**	**10,481,465**	**7.1%**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Note: A history of contributions by Health Care Trust Fund, the ADC compared to the actual contributions paid, including the deficiency or (excess), for each of the last 10 years, is shown in the Schedule of Contributions from Employers and Other Contributing Entities, found on pages 112-113 in the RSI in the Financial Section.

HEALTH CARE TRUST FUNDS—OPEB

Actuarial Gains and Losses

ANALYSIS OF FINANCIAL EXPERIENCE

(Dollars in Millions)

	HCTF	DPS HCTF
Amounts		
From differences between assumed and actual experience on liabilities		
Age and service retirements[1]	($13.8)	($1.1)
Disability retirements[2]	(0.5)	—
Deaths[3]	1.7	(1.0)
Withdrawals[4]	5.1	0.4
New members[5]	5.9	0.3
Administrative expenses and other[6]	18.0	5.6
Subtotal	16.4	4.2
From differences between assumed and actual experience on assets	(0.3)	—
From change in plan assumptions	(34.6)	(1.4)
From change in actuarial methods	—	—
From change in plan provisions	—	—
Total actuarial (gains)/losses on 2022 activities	**($18.5)**	**$2.8**
Total actuarial (gains)/losses on 2021 activities	**($110.7)**	**($2.0)**

[1] *Age and service retirements*: If members retire at older ages than assumed, there is a gain. If members retire at younger ages than assumed, there is a loss.

[2] *Disability retirements*: If disability claims are lower than assumed, there is a gain. If disability claims are higher than assumed, there is a loss.

[3] *Deaths*: If survivor claims are lower than assumed, there is a gain. If survivor claims are higher than assumed, there is a loss. If retirees die sooner than assumed, there is a gain. If retirees live longer than assumed, there is a loss.

[4] *Withdrawal from employment*: If more members terminate and more liabilities are released by withdrawals than assumed, there is a gain. If fewer liabilities are released by terminations than assumed, there is a loss.

[5] *New members*: If new members entering the plan have prior service, there is a loss.

[6] *Administrative expenses and other:* Includes miscellaneous gains and losses resulting from purchased service transfers, claims experience, benefit utilization, software updates and refinements, data adjustments, timing of financial transactions, etc.

Actuarial Valuation Results

Contribution rates for the year ending December 31, 2024, are derived from the results of the December 31, 2022, annual actuarial valuation and are determined in advance for purposes of budgeting and consideration of any necessary legislative action.

SCHEDULE OF COMPUTED EMPLOYER CONTRIBUTION RATES FOR THE 2024 FISCAL YEAR

	Expressed as a Percentage of Member Payroll	
	HCTF	DPS HCTF
Contributions		
Service retirement benefits	0.14%	0.11%
Disability retirement benefits	0.00%	0.00%
Survivor benefits	0.00%	0.00%
Separation benefits	0.02%	0.02%
Total normal cost	0.16%	0.13%
Less member contributions	(0.00%)	(0.00%)
Employer normal cost	**0.16%**	**0.13%**
Percentage available to amortize unfunded actuarial accrued liabilities	0.86%	0.89%
Amortization period	11 Years	0 Years
Total employer contribution rate for actuarially funded benefits	**0.65%**	**0.16%**

HEALTH CARE TRUST FUNDS—OPEB

Annual Actuarial Valuation Statistics

As of December 31, 2022, the Funded Ratio, the UAAL, the ADC for 2024 as a percentage of covered payroll, and the amortization period are shown in the following table. The results in this table are based on the actuarial valuation for funding purposes.

ACTUARIAL STATISTICS
(Dollars in Thousands)

Trust Fund	Funded Ratio	UAAL	ADC[1]	Amortization Period
HCTF	43.4%	$745,446	0.65%	11 Years
DPS HCTF	97.4%	1,547	0.16%	0 Years
Total of Health Care Trust Funds[2]		**$746,993**		

[1] Determined considering the 30-year target amortization period defined in the OPEB funding policy for purposes of funding benchmarks and RSI reporting as shown in the Financial Section.

[2] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Pursuant to the OPEB funding policy, for reporting purposes, alternative ADCs also are determined by applying the layered amortization methodology as previously described. Under the target and alternative calculations, the legacy UAAL as of December 31, 2017, was amortized using a 30-year period, but the alternative ADCs use a 25-year closed period, a 20-year closed period, and a 15-year closed period, in lieu of the 30-year period, for amortization of any "new" UAAL recognized on and after January 1, 2018. The 2024 target and alternative ADCs, by division, are displayed as follows:

	Target ADC	Alternative ADCs		
Trust Fund	30-Year[1]	25-Year[2]	20-Year[2]	15-Year[2]
HCTF	0.65%	0.61%	0.54%	0.41%
DPS HCTF	0.16%	0.13%	0.10%	0.03%

[1] Refers to the amortization period used to amortize the legacy UAAL as of December 31, 2017, and any "new" UAAL recognized on and after January 1, 2018.

[2] Refers to the amortization period used to amortize any "new" UAAL recognized on and after January 1, 2018.

Funded Ratio

(Dollars in Thousands)

The funded ratio for the plan is determined by dividing the actuarial value of assets by the AAL. The actuarial value of assets is not the current fair value but a market-related value, which recognizes the differences between actual and expected investment experience for each year in equal amounts over a four-year period. The actuarial value of the assets as of December 31, 2022, was $629,844 compared to a fair value of assets of $564,939, and to the AAL of $1,376,837. The funded ratio for each of the funds, based on the actuarial value of assets, at December 31 for each of the last five years is as follows:

Trust Fund	2018	2019	2020	2021	2022
HCTF	19.5%	24.1%	30.3%	38.0%	**43.4%**
DPS HCTF	36.0%	45.9%	60.8%	80.1%	**97.4%**
Total of Health Care Trust Funds[1]	**20.2%**	**25.1%**	**31.7%**	**39.8%**	**45.7%**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

The Board's OPEB funding policy states that the targeted actuarial funded ratio is greater than or equal to 110% on a combined trust fund basis. The funded ratios listed give an indication of progress made toward achieving the stated objective. A larger funded ratio indicates that a plan is better funded. As an example, for every $1.00 of the actuarially determined benefits earned for the HCTF as of December 31, 2022, approximately $0.43 of assets are available for payment based on the actuarial value of assets. These benefits earned will be payable over a period dependent upon factors, such as, the life span of members after their retirement and participation in PERACare. Therefore, it is not imperative that the AAL equal the actuarial value of assets at any given moment in time.

HEALTH CARE TRUST FUNDS—OPEB

At December 31, 2021, and December 31, 2022, PERA had the following funded status for the Health Care Trust Funds:

FUNDED STATUS FOR THE HEALTH CARE TRUST FUNDS

(Dollars in Thousands)

	Fair Value of Assets		Actuarial Value of Assets[1]	
	12/31/2021	12/31/2022	12/31/2021	12/31/2022
Health Care Trust Fund				
Actuarial accrued liability[2]	$1,345,471	**$1,317,156**	$1,345,471	**$1,317,156**
Assets held to pay those liabilities	560,749	**512,704**	511,143	**571,710**
Unfunded actuarial accrued liability	**$784,722**	**$804,452**	**$834,328**	**$745,446**
Funded ratio	41.7%	**38.9%**	38.0%	**43.4%**
DPS Health Care Trust Fund				
Actuarial accrued liability[2]	$62,060	**$59,681**	$62,060	**$59,681**
Assets held to pay those liabilities	54,953	**52,235**	49,719	**58,134**
Unfunded actuarial accrued liability	**$7,107**	**$7,446**	**$12,341**	**$1,547**
Funded ratio	88.5%	**87.5%**	80.1%	**97.4%**
Total of Health Care Trust Funds[3]				
Actuarial accrued liability[2]	$1,407,531	**$1,376,837**	$1,407,531	**$1,376,837**
Assets held to pay those liabilities[4]	615,702	**564,939**	560,862	**629,844**
Unfunded actuarial accrued liability	**$791,829**	**$811,898**	**$846,669**	**$746,993**
Funded ratio	43.7%	**41.0%**	39.8%	**45.7%**

[1] The actuarial value of assets is calculated by spreading any market gains or losses above or below the assumed rate of return over four years.

[2] Based upon an assumed rate of return on investments of 7.25% and an assumed rate of 7.25% to discount the liabilities to be paid in the future to a value as of December 31, 2021, and December 31, 2022.

[3] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

[4] In aggregate, the fair value of the assets as of December 31, 2022, is $64,905 less than the actuarial value of assets calculated by the actuaries, as they are recognizing the gains and losses in value over four years, rather than only in the year they occurred. The remaining gains and (losses) to be smoothed for 2020 are $8,985, for 2021 are $18,663, and for 2022 are ($92,553).

HEALTH CARE TRUST FUNDS—OPEB

Sensitivity of Actuarial Valuation to Changes in Assumed Investment Rate of Return and Discount Rate

The most important long-term driver of an OPEB plan is investment income. The investment return assumption and the discount rate for liabilities should be based on an estimated long-term investment yield for the plan, considering the nature and mix of current and expected plan investments and the basis used to determine the actuarial value of assets.

To understand the importance of the investment rate of return, which is used to discount the actuarial liabilities, a 1% fluctuation in the investment rate of return and discount rate would change the funded ratio, UAAL, and ADC (for contributions for the fiscal year ended December 31, 2024) as shown in the following tables:

INVESTMENT RETURN ASSUMPTION (DISCOUNT RATE) EQUAL TO 6.25%

(Dollars in Thousands)

	Actuarial Value of Assets			Fair Value of Assets
Trust Fund	Funded Ratio	UAAL	ADC	UAAL
HCTF	39.5%	$875,209	0.72%	$934,215
DPS HCTF	88.4%	7,610	0.22%	13,509
Total of Health Care Trust Funds[1]		**$882,819**		**$947,724**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

CURRENT INVESTMENT RETURN ASSUMPTION (DISCOUNT RATE) EQUAL TO 7.25%

(Dollars in Thousands)

	Actuarial Value of Assets			Fair Value of Assets
Trust Fund	Funded Ratio	UAAL	ADC	UAAL
HCTF	**43.4%**	**$745,446**	**0.65%**	**$804,452**
DPS HCTF	**97.4%**	**1,547**	**0.16%**	**7,446**
Total of Health Care Trust Funds[1]		**$746,993**		**$811,898**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

INVESTMENT RETURN ASSUMPTION (DISCOUNT RATE) EQUAL TO 8.25%

(Dollars in Thousands)

	Actuarial Value of Assets			Fair Value of Assets
Trust Fund	Funded Ratio	UAAL	ADC	UAAL
HCTF	47.4%	$634,516	0.60%	$693,522
DPS HCTF	106.6%	(3,608)	0.10%	2,291
Total of Health Care Trust Funds[1]		**$630,908**		**$695,813**

[1] The data in this table is aggregated for informational purposes. The assets of each trust fund are for the sole purpose of its members and cannot be used by another fund.

Note: The time-weighted, net-of-fees annualized rate of return for the pooled investment assets was 6.5% for the past five years and 8.0% for the past 10 years. The 30-year annualized gross-of-fees rate of return for the pooled investment assets was 8.3%.

HEALTH CARE TRUST FUNDS—OPEB

Plan Data

Except for the "Inactive members not eligible for benefits," the PERA membership is potentially eligible for participation in OPEB benefits through receipt of a PERA-provided benefit and enrollment in PERACare. The following table represents all individuals included in the assessment of the AAL associated with the Health Care Trust Funds as of December 31, 2022:

MEMBERSHIP—HEALTH CARE TRUST FUNDS

As of December 31, 2022

	HCTF	DPS HCTF	Total
Retirees and beneficiaries[1]	128,229	7,256	**135,485**
Inactive members eligible but not yet receiving benefits[2]	36,759	3,165	**39,924**
Inactive members not eligible for benefits	N/A	N/A	**N/A**
Active members[2]	191,392	15,254	**206,646**
Total	**356,380**	**25,675**	**382,055**

[1] Currently receiving or eligible for OPEB benefits.

[2] May be eligible for future OPEB benefits.

PARTICIPATION IN PERACARE HEALTH PLANS FOR ELIGIBLE RETIREES AND BENEFICIARIES

As of December 31, 2022

	HCTF	DPS HCTF	Total
Enrolled in PERACare			
Under age 65	7,903	312	8,215
Age 65 and older	48,555	3,008	51,563
	56,458	3,320	59,778
Not enrolled in PERACare			
Under age 65	16,080	628	16,708
Age 65 and older	55,691	3,308	58,999
	71,771	3,936	75,707
Total eligible retirees and beneficiaries	**128,229**	**7,256**	**135,485**

HEALTH CARE TRUST FUNDS—OPEB

SCHEDULE OF RETIREES, BENEFICIARIES, AND SURVIVORS ADDED TO AND REMOVED FROM THE BENEFIT PAYROLL

(In Actual Dollars)

	Added to Payroll		Removed from Payroll		Payroll—End of Year			
Valuation Date	No.	Annual Benefits	No.	Annual Benefits	No.[1]	Annual Benefits	Average Annual Benefits	Increase (Decrease) in Average Benefits
HCTF[2]								
12/31/2013					53,041	$91,009,965	$1,716	—
12/31/2014	3,231	$6,954,234	2,196	$3,945,282	54,076	91,222,002	1,687	(1.7%)
12/31/2015	3,271	6,998,325	2,255	3,920,028	55,092	91,545,543	1,662	(1.5%)
12/31/2016	3,217	6,921,114	2,520	4,463,334	55,789	91,567,554	1,641	(1.3%)
12/31/2017	3,352	7,255,971	2,667	7,153,713	56,474	91,669,812	1,623	(1.1%)
12/31/2018	3,337	7,068,843	3,169	5,498,610	56,642	89,984,901	1,589	(2.1%)
12/31/2019	3,265	6,495,867	3,455	6,074,346	56,452	89,033,598	1,577	(0.8%)
12/31/2020	2,743	5,640,819	2,922	6,801,192	56,273	87,873,225	1,562	(1.0%)
12/31/2021	2,969	5,509,620	3,064	5,562,987	56,178	80,751,402	1,437	(8.0%)
12/31/2022	**2,985**	**5,212,041**	**2,705**	**4,463,307**	**56,458**	**79,917,060**	**1,416**	**(1.5%)**
DPS HCTF[2]								
12/31/2013					3,995	$6,098,082	$1,526	—
12/31/2014	184	$368,943	217	$346,587	3,962	5,961,324	1,505	(1.4%)
12/31/2015	174	360,111	206	330,648	3,930	5,829,741	1,483	(1.5%)
12/31/2016	156	322,230	201	302,220	3,885	5,703,954	1,468	(1.0%)
12/31/2017	149	325,128	218	445,188	3,816	5,583,894	1,463	(0.3%)
12/31/2018	160	346,794	351	550,827	3,625	5,905,296	1,629	11.3%
12/31/2019	276	468,441	281	492,591	3,620	5,805,591	1,604	(1.5%)
12/31/2020	112	218,592	213	424,626	3,519	5,599,557	1,591	(0.8%)
12/31/2021	109	188,670	240	420,486	3,388	4,851,156	1,432	(10.0%)
12/31/2022	**105**	**180,891**	**308**	**449,127**	**3,185**	**4,522,734**	**1,420**	**(0.8%)**
Total of Health Care Trust Funds[2]								
12/31/2013					57,036	$97,108,047	$1,703	—
12/31/2014	3,415	$7,323,177	2,413	$4,291,869	58,038	97,183,326	1,674	(1.7%)
12/31/2015	3,445	7,358,436	2,461	4,250,676	59,022	97,375,284	1,650	(1.4%)
12/31/2016	3,373	7,243,344	2,721	4,765,554	59,674	97,271,508	1,630	(1.2%)
12/31/2017	3,501	7,581,099	2,885	7,598,901	60,290	97,253,706	1,613	(1.0%)
12/31/2018	3,497	7,415,637	3,520	6,049,437	60,267	95,890,197	1,591	(1.4%)
12/31/2019	3,541	6,964,308	3,736	6,566,937	60,072	94,839,189	1,579	(0.8%)
12/31/2020	2,855	5,859,411	3,135	7,225,818	59,792[3]	93,472,782	1,563	(1.0%)
12/31/2021	3,078	5,698,290	3,304	5,983,473	59,566[3]	85,602,558	1,437	(8.1%)
12/31/2022	**3,090**	**5,392,932**	**3,013**	**4,912,434**	**59,643[4]**	**84,439,794**	**1,416**	**(1.5%)**

[1] Enrolled in PERACare.

[2] The annual benefit is based upon creditable service and varies by attained age.

[3] Excludes two beneficiaries enrolled in PERACare who are not receiving a subsidy.

[4] Excludes 135 beneficiaries enrolled in PERACare who are not receiving a subsidy.

HEALTH CARE TRUST FUNDS—OPEB

SCHEDULE OF ACTIVE MEMBER ACTUARIAL VALUATION DATA

As of December 31

(In Actual Dollars)

Year	Number of Participating Employers[1,2]	Total Number of Active Members	Medicare Eligible Active Members[3]	Annual Payroll for Active Members	Average Annual Pay for Active Members	% Increase (Decrease) in Average Annual Pay
HCTF						
2013	516	185,367		$6,982,560,466	$37,669	—
2014	531	187,336		7,211,350,491	38,494	2.19%
2015	534	188,040		7,485,544,867	39,808	3.41%
2016	542	190,741		7,716,892,488	40,457	1.63%
2017	408	191,778	8,284	7,927,279,994	41,336	2.17%
2018	409	195,436	8,826	8,399,834,705	42,980	3.98%
2019	410	197,615	9,035	8,834,404,580	44,705	4.01%
2020	409	186,165	7,881	8,988,118,724	48,280	8.00%
2021	408	191,574	8,595	9,337,899,213	48,743	0.96%
2022	**409**	**191,392**	**8,655**	**9,671,062,130**	**50,530**	**3.67%**
DPS HCTF						
2013	31	14,816		$547,659,912	$36,964	—
2014	34	15,414		584,319,269	37,908	2.55%
2015	38	15,929		621,114,573	38,993	2.86%
2016	42	15,950		642,177,158	40,262	3.25%
2017	1	15,991	498	658,198,306	41,161	2.23%
2018	1	16,148	510	722,040,073	44,714	8.63%
2019	1	15,679	518	736,263,798	46,959	5.02%
2020	1	14,693	410	771,347,604	52,498	11.80%
2021	1	15,695	472	823,395,477	52,462	(0.07%)
2022	**1**	**15,254**	**467**	**810,402,643**	**53,127**	**1.27%**
Total of Health Care Trust Funds						
2013	547	200,183		$7,530,220,378	$37,617	—
2014	565	202,750		7,795,669,760	38,450	2.21%
2015	572	203,969		8,106,659,440	39,745	3.37%
2016	584	206,691		8,359,069,646	40,442	1.75%
2017	409	207,769	8,782	8,585,478,300	41,322	2.18%
2018	410	211,584	9,336	9,121,874,778	43,112	4.33%
2019	411	213,294	9,553	9,570,668,378	44,871	4.08%
2020	410	200,858	8,291	9,759,466,328	48,589	8.29%
2021	409	207,269	9,067	10,161,294,690	49,025	0.90%
2022	**410**	**206,646**	**9,122**	**10,481,464,773**	**50,722**	**3.46%**

[1] Prior to 2017, employer counts were based on separate units of government. Beginning in 2017, new guidance under GASB 74 classifies a primary government and its component units as one employer. The 2017 employer count is presented for purposes of complying with GASB 74 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA.

[2] Participating employer counts prior to 2017 include charter schools operating within the School and DPS Divisions.

[3] Information prior to 2017 was not required.

COLORADO PERA

Statistical Section

COLORADO PERA®

The Statistical Section presents detailed information that assists users in utilizing the basic financial statements, notes to basic financial statements, and required supplementary information to assess the economic condition of PERA.

Overview

Financial Trends

The following schedules show trend information about the changes and growth in PERA's fiduciary net position over the past 10 years:

- ***Changes in Fiduciary Net Position***
- ***Benefits and Refund Deductions From Fiduciary Net Position by Type***

Operating Information

The following schedules contain information related to the services that PERA provides and the activities it performs:

- ***Member and Benefit Recipient Statistics***[1]
- ***Breakdown of Membership by Percentage***[1]
- ***Schedule of Average Retirement Benefits Payable—All Division Trust Funds***[1]
- ***Schedule of Average Retirement Benefits Payable***[1]
- ***Benefit Payments—All Division Trust Funds***[1]
- ***Schedule of Retirees and Survivors by Types of Benefits***[1]
- ***Schedule of Average Benefit Payments***[1]
- ***Schedule of Contribution Rate History***
- ***Principal Participating Employers***

[1] Data for schedules are provided by the consulting actuary, Segal

Note: Schedules and information are derived from PERA internal sources unless otherwise noted.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

State Division Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$704,797**	$664,304	$646,386	$612,282	$583,164
Nonemployer contributions[1]	**198,247**	76,706	—	77,088	78,489
Member contributions[1]	**360,523**	329,652	298,264	257,803	236,313
Purchased service	**35,699**	39,514	28,522	29,494	25,227
Net investment income (loss)	**(2,657,031)**	2,806,442	2,652,870	2,764,719	(497,562)
Other	**171**	6,038	9,390	22	7,888
Total additions	**(1,357,594)**	3,922,656	3,635,432	3,741,408	433,519
Deductions					
Benefit payments	**1,778,067**	1,726,503	1,675,048	1,637,168	1,608,534
Refunds	**82,321**	74,520	57,921	61,832	65,253
Disability insurance premiums	**849**	1,013	1,360	1,965	2,093
Administrative expenses	**13,312**	12,051	11,385	11,294	11,903
Other	**9,139**	2,950	2,634	2,707	3,017
Total deductions	**1,883,688**	1,817,037	1,748,348	1,714,966	1,690,800
Change in fiduciary net position	**(3,241,282)**	2,105,619	1,887,084	2,026,442	(1,257,281)
Fiduciary net position held at beginning of year	**19,985,566**	17,879,947	15,992,863	13,966,421	15,223,702
Fiduciary net position held at end of year	**$16,744,284**	**$19,985,566**	**$17,879,947**	**$15,992,863**	**$13,966,421**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$563,977	$521,804	$484,005	$444,372	$401,658
Member contributions[1]	228,978	223,005	217,980	211,610	202,799
Purchased service	27,442	24,528	26,946	22,446	22,241
Net investment income	2,391,683	947,981	210,337	780,762	1,931,658
Other	15,860	8,708	5,023	3,289	4,869
Total additions	3,227,940	1,726,026	944,291	1,462,479	2,563,225
Deductions					
Benefit payments	1,554,290	1,483,828	1,417,862	1,352,293	1,295,780
Refunds	58,696	60,137	63,567	61,152	68,735
Disability insurance premiums	2,035	2,106	2,088	2,309	2,229
Administrative expenses	11,745	11,271	10,779	10,067	9,780
Other	3,652	3,040	3,406	3,171	3,593
Total deductions	1,630,418	1,560,382	1,497,702	1,428,992	1,380,117
Change in fiduciary net position	1,597,522	165,644	(553,411)	33,487	1,183,108
Fiduciary net position held at beginning of year	13,626,180	13,460,536	14,013,947	13,980,460	12,797,352
Fiduciary net position held at end of year	**$15,223,702**	**$13,626,180**	**$13,460,536**	**$14,013,947**	**$13,980,460**

[1] Employer, nonemployer, and member contribution rate history is shown on pages 247-248.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

School Division Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$1,201,265**	$1,113,636	$1,048,992	$1,002,760	$923,910
Nonemployer contributions[1]	**350,393**	127,781	—	127,367	126,505
Member contributions[1]	**642,202**	574,948	501,214	436,899	386,811
Purchased service	**57,469**	55,901	35,633	25,992	27,525
Net investment income (loss)	**(4,623,013)**	4,847,781	4,556,622	4,676,607	(838,899)
Other	**5,545**	130	123	364	7,957
Total additions	**(2,366,139)**	6,720,177	6,142,584	6,269,989	633,809
Deductions					
Benefit payments	**2,723,667**	2,624,924	2,535,509	2,468,021	2,413,387
Refunds	**88,355**	81,725	67,873	73,871	76,035
Disability insurance premiums	**1,435**	1,679	2,286	3,338	3,506
Administrative expenses	**25,562**	22,608	22,779	22,619	23,560
Other	**3,935**	8,702	11,349	8,293	2,501
Total deductions	**2,842,954**	2,739,638	2,639,796	2,576,142	2,518,989
Change in fiduciary net position	**(5,209,093)**	3,980,539	3,502,788	3,693,847	(1,885,180)
Fiduciary net position held at beginning of year	**34,654,724**	30,674,185	27,171,397	23,477,550	25,362,730
Fiduciary net position held at end of year	**$29,445,631**	**$34,654,724**	**$30,674,185**	**$27,171,397**	**$23,477,550**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$857,740	$812,740	$754,182	$686,323	$624,784
Member contributions[1]	368,740	359,059	348,537	334,585	322,217
Purchased service	30,313	27,422	23,841	21,935	19,285
Net investment income	3,982,275	1,569,026	344,000	1,274,862	3,136,269
Other	106	109	96	112	139
Total additions	5,239,174	2,768,356	1,470,656	2,317,817	4,102,694
Deductions					
Benefit payments	2,334,003	2,231,475	2,134,754	2,032,628	1,932,756
Refunds	74,637	65,715	70,298	77,171	76,980
Disability insurance premiums	3,347	3,454	3,400	3,748	3,655
Administrative expenses	23,019	21,991	20,865	19,290	18,523
Other	22,484	17,443	9,178	4,376	7,132
Total deductions	2,457,490	2,340,078	2,238,495	2,137,213	2,039,046
Change in fiduciary net position	2,781,684	428,278	(767,839)	180,604	2,063,648
Fiduciary net position held at beginning of year	22,581,046	22,152,768	22,920,607	22,740,003	20,676,355
Fiduciary net position held at end of year	**$25,362,730**	**$22,581,046**	**$22,152,768**	**$22,920,607**	**$22,740,003**

[1] Employer, nonemployer, and member contribution rate history is shown on page 249.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31
(Dollars in Thousands)

Local Government Division Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$108,748**	$96,481	$89,662	$85,597	$81,358
Member contributions[1]	**71,339**	63,035	58,067	55,003	52,421
Purchased service	**9,420**	14,061	8,891	7,820	5,642
Net investment income (loss)	**(781,550)**	820,403	771,556	792,219	(142,476)
Other	**73**	23	24	14	840
Total additions	**(591,970)**	994,003	928,200	940,653	(2,215)
Deductions					
Benefit payments	**336,721**	322,106	307,795	297,447	286,745
Refunds	**13,391**	16,034	12,828	14,761	15,716
Disability insurance premiums	**195**	235	296	421	442
Administrative expenses	**3,450**	3,065	2,459	2,476	2,621
Other	**5,794**	3,084	3,146	3,975	3,958
Total deductions	**359,551**	344,524	326,524	319,080	309,482
Change in fiduciary net position	**(951,521)**	649,479	601,676	621,573	(311,697)
Fiduciary net position held at beginning of year	**5,844,117**	5,194,638	4,592,962	3,971,389	4,283,086
Fiduciary net position held at end of year	**$4,892,596**	**$5,844,117**	**$5,194,638**	**$4,592,962**	**$3,971,389**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$78,291	$75,132	$70,415	$68,719	$67,197
Member contributions[1]	50,472	48,470	45,400	43,792	42,627
Purchased service	6,325	3,981	6,586	5,498	7,363
Employer disaffiliation	1,063	—	—	186,006	—
Net investment income	669,011	261,276	56,328	200,394	482,297
Other	14	17	15	14	14
Total additions	805,176	388,876	178,744	504,423	599,498
Deductions					
Benefit payments	274,258	258,967	244,948	232,055	217,875
Refunds	14,530	12,938	20,410	24,436	32,480
Disability insurance premiums	430	439	431	481	479
Administrative expenses	2,541	2,395	2,253	2,091	2,021
Other	3,837	1,140	1,661	2,204	4,463
Total deductions	295,596	275,879	269,703	261,267	257,318
Change in fiduciary net position	509,580	112,997	(90,959)	243,156	342,180
Fiduciary net position held at beginning of year	3,773,506	3,660,509	3,751,468	3,508,312	3,166,132
Fiduciary net position held at end of year	**$4,283,086**	**$3,773,506**	**$3,660,509**	**$3,751,468**	**$3,508,312**

[1] Employer and member contribution rate history is shown on pages 250.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

Judicial Division Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$12,318**	$9,787	$10,402	$10,649	$8,299
Nonemployer contributions[1]	**3,576**	1,360	—	1,344	1,385
Member contributions[1]	**7,844**	8,589	6,637	4,575	4,064
Purchased service	**978**	800	1,060	612	636
Net investment income (loss)	**(63,501)**	66,030	61,634	61,719	(11,006)
Other	**4,525**	5,436	2,546	6,697	225
Total additions	**(34,260)**	92,002	82,279	85,596	3,603
Deductions					
Benefit payments	**32,715**	31,201	29,409	28,056	26,236
Refunds	**218**	266	48	—	186
Disability insurance premiums	**18**	21	28	41	41
Administrative expenses	**212**	186	87	84	86
Other	**33**	53	90	27	70
Total deductions	**33,196**	31,727	29,662	28,208	26,619
Change in fiduciary net position	**(67,456)**	60,275	52,617	57,388	(23,016)
Fiduciary net position held at beginning of year	**477,126**	416,851	364,234	306,846	329,862
Fiduciary net position held at end of year	**$409,670**	**$477,126**	**$416,851**	**$364,234**	**$306,846**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$8,080	$8,024	$7,702	$7,070	$6,587
Member contributions[1]	3,955	3,928	3,772	3,461	3,224
Purchased service	908	109	425	835	240
Net investment income	51,173	19,783	4,149	15,299	37,096
Other	2,379	2,800	3,247	256	1,451
Total additions	66,495	34,644	19,295	26,921	48,598
Deductions					
Benefit payments	25,250	22,734	21,158	19,800	18,616
Refunds	7	109	—	60	385
Disability insurance premiums	41	45	42	43	40
Administrative expenses	86	81	77	72	69
Other	153	122	166	100	52
Total deductions	25,537	23,091	21,443	20,075	19,162
Change in fiduciary net position	40,958	11,553	(2,148)	6,846	29,436
Fiduciary net position held at beginning of year	288,904	277,351	279,499	272,653	243,217
Fiduciary net position held at end of year	**$329,862**	**$288,904**	**$277,351**	**$279,499**	**$272,653**

[1] Employer, nonemployer, and member contribution rate history is shown on page 251.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

DPS Division Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$74,199**	$65,215	$56,245	$43,340	$35,994
Nonemployer contributions[1]	**52,784**	19,153	—	19,201	18,621
Member contributions[1]	**92,164**	86,184	73,939	62,961	58,172
Purchased service	**3,960**	3,970	1,517	2,535	2,926
Net investment income (loss)	**(619,265)**	649,370	610,847	632,669	(114,070)
Other	**875**	15	12	3,030	770
Total additions	**(395,283)**	823,907	742,560	763,736	2,413
Deductions					
Benefit payments	**282,557**	280,045	278,081	277,849	276,223
Refunds	**16,913**	11,527	9,344	10,738	11,197
Disability insurance premiums	**190**	227	294	397	405
Administrative expenses	**3,133**	2,829	2,667	2,713	2,919
Other	**223**	3,130	1,022	55	5,267
Total deductions	**303,016**	297,758	291,408	291,752	296,011
Change in fiduciary net position	**(698,299)**	526,149	451,152	471,984	(293,598)
Fiduciary net position held at beginning of year	**4,633,727**	4,107,578	3,656,426	3,184,442	3,478,040
Fiduciary net position held at end of year	**$3,935,428**	**$4,633,727**	**$4,107,578**	**$3,656,426**	**$3,184,442**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$27,578	$17,071	$8,494	$18,478	$25,157
Member contributions[1]	54,354	52,740	49,973	47,083	43,564
Purchased service	2,466	2,112	3,585	2,326	1,834
Net investment income	548,585	218,415	49,172	182,823	452,919
Other	3,870	3,264	11	13	269
Total additions	636,853	293,602	111,235	250,723	523,743
Deductions					
Benefit payments	271,189	263,152	255,068	247,005	237,921
Refunds	10,277	8,521	7,897	8,063	6,733
Disability insurance premiums	378	398	358	366	338
Administrative expenses	2,857	2,754	2,599	2,377	2,240
Other	89	129	1,775	1,560	150
Total deductions	284,790	274,954	267,697	259,371	247,382
Change in fiduciary net position	352,063	18,648	(156,462)	(8,648)	276,361
Fiduciary net position held at beginning of year	3,125,977	3,107,329	3,263,791	3,272,439	2,996,078
Fiduciary net position held at end of year	**$3,478,040**	**$3,125,977**	**$3,107,329**	**$3,263,791**	**$3,272,439**

[1] Employer, nonemployer, and member contribution rate history is shown on page 252.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

Voluntary Investment Program

	2022	2021	2020	2019	2018
Additions					
Employer contributions	**$6,792**	$6,170	$5,917	$5,701	$5,409
Member contributions	**147,445**	145,612	140,656	140,519	132,189
Net investment income (loss)	**(761,880)**	679,465	558,980	700,274	(165,371)
Other	**2,284**	5,484	2,402	2,443	2,322
Total additions	**(605,359)**	836,731	707,955	848,937	(25,451)
Deductions					
Distributions	**318,144**	287,582	207,260	213,010	202,684
Administrative expenses	**1,961**	2,034	3,926	3,592	3,310
Other	**1,275**	1,933	1,746	1,656	1,598
Total deductions	**321,380**	291,549	212,932	218,258	207,592
Change in fiduciary net position	**(926,739)**	545,182	495,023	630,679	(233,043)
Fiduciary net position held at beginning of year	**4,713,012**	4,167,830	3,672,807	3,042,128	3,275,171
Fiduciary net position held at end of year	**$3,786,273**	**$4,713,012**	**$4,167,830**	**$3,672,807**	**$3,042,128**

	2017	2016	2015	2014	2013
Additions					
Employer contributions	$5,072	$4,740	$3,889	$3,866	$3,679
Member contributions	135,303	129,909	129,990	126,112	120,203
Net investment income (loss)	469,233	206,933	(11,773)	188,199	423,877
Other	2,207	2,170	2,237	2,291	2,141
Total additions	611,815	343,752	124,343	320,468	549,900
Deductions					
Distributions	162,019	154,202	158,215	144,329	142,064
Administrative expenses	2,877	2,814	3,010	3,050	3,137
Other	1,411	1,172	1,019	839	624
Total deductions	166,307	158,188	162,244	148,218	145,825
Change in fiduciary net position	445,508	185,564	(37,901)	172,250	404,075
Fiduciary net position held at beginning of year	2,829,663	2,644,099	2,682,000	2,509,750	2,105,675
Fiduciary net position held at end of year	**$3,275,171**	**$2,829,663**	**$2,644,099**	**$2,682,000**	**$2,509,750**

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

Defined Contribution Retirement Plan

	2022	2021	2020	2019	2018
Additions					
Employer contributions	**$19,553**	$18,046	$16,780	$15,184	$13,201
Member contributions	**20,956**	18,720	15,753	12,967	10,573
Net investment income (loss)	**(63,490)**	51,234	41,820	48,559	(15,381)
Other	**1,456**	50	16	21	11
Total additions	**(21,525)**	88,050	74,369	76,731	8,404
Deductions					
Distributions	**25,334**	23,798	15,100	15,445	12,722
Administrative expenses	**849**	753	1,118	997	819
Other	**118**	165	147	135	166
Total deductions	**26,301**	24,716	16,365	16,577	13,707
Change in fiduciary net position	**(47,826)**	63,334	58,004	60,154	(5,303)
Fiduciary net position held at beginning of year	**387,278**	323,944	265,940	205,786	211,089
Fiduciary net position held at end of year	**$339,452**	**$387,278**	**$323,944**	**$265,940**	**$205,786**

	2017	2016	2015	2014	2013
Additions					
Employer contributions	$14,309	$13,060	$12,428	$11,531	$11,090
Member contributions	11,411	10,382	9,830	9,179	8,828
Net investment income (loss)	29,372	12,601	(2,466)	6,745	17,416
Other	39	92	9	8	6
Total additions	55,131	36,135	19,801	27,463	37,340
Deductions					
Distributions	10,593	8,932	9,419	8,690	6,314
Administrative expenses	739	726	774	738	744
Other	116	97	48	69	49
Total deductions	11,448	9,755	10,241	9,497	7,107
Change in fiduciary net position	43,683	26,380	9,560	17,966	30,233
Fiduciary net position held at beginning of year	167,406	141,026	131,466	113,500	83,267
Fiduciary net position held at end of year	**$211,089**	**$167,406**	**$141,026**	**$131,466**	**$113,500**

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

Deferred Compensation Plan

	2022	2021	2020	2019	2018
Additions					
Employer contributions	**$37**	$38	$40	$32	$29
Member contributions	**80,757**	78,549	70,764	64,151	57,981
Net investment income (loss)	**(188,999)**	164,189	137,023	163,879	(47,542)
Other	**496**	678	553	578	574
Total additions	**(107,709)**	243,454	208,380	228,640	11,042
Deductions					
Distributions	**93,974**	77,334	51,559	55,317	56,568
Administrative expenses	**574**	589	1,329	1,188	1,094
Other	**532**	846	777	759	756
Total deductions	**95,080**	78,769	53,665	57,264	58,418
Change in fiduciary net position	**(202,789)**	164,685	154,715	171,376	(47,376)
Fiduciary net position held at beginning of year	**1,308,999**	1,144,314	989,599	818,223	865,599
Fiduciary net position held at end of year	**$1,106,210**	**$1,308,999**	**$1,144,314**	**$989,599**	**$818,223**

	2017	2016	2015	2014	2013
Additions					
Employer contributions	$50	$26	$27	$43	$20
Member contributions	57,088	51,601	49,719	50,370	44,449
Net investment income (loss)	105,027	51,372	(6,427)	32,133	88,565
Other	510	496	484	478	428
Total additions	162,675	103,495	43,803	83,024	133,462
Deductions					
Distributions	47,067	41,922	39,945	35,584	32,854
Administrative expenses	993	963	1,071	1,074	1,094
Other	698	604	562	517	430
Total deductions	48,758	43,489	41,578	37,175	34,378
Change in fiduciary net position	113,917	60,006	2,225	45,849	99,084
Fiduciary net position held at beginning of year	751,682	691,676	689,451	643,602	544,518
Fiduciary net position held at end of year	**$865,599**	**$751,682**	**$691,676**	**$689,451**	**$643,602**

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

Health Care Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$103,818**	$97,974	$94,634	$92,011	$86,559
Net investment income (loss)	**(70,476)**	68,319	60,280	53,867	(9,678)
Other	**9,004**	8,108	7,909	6,984	8,373
Total additions	**42,346**	174,401	162,823	152,862	85,254
Deductions					
Benefit payments	**83,145**	63,893	53,023	58,221	61,777
Administrative expenses	**7,136**	12,976	10,977	9,290	20,401
Other	**110**	84	32	33	106
Total deductions	**90,391**	76,953	64,032	67,544	82,284
Change in fiduciary net position	**(48,045)**	97,448	98,791	85,318	2,970
Fiduciary net position held at beginning of year	**560,749**	463,301	364,510	279,192	276,222
Fiduciary net position held at end of year	**$512,704**	**$560,749**	**$463,301**	**$364,510**	**$279,192**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$83,077	$80,825	$78,463	$75,631	$72,784
Retiree health care premiums	—	138,021	127,873	105,459	114,364
Federal health care subsidies	—	—	—	—	15,731
Employer disaffiliation	96	—	—	3,994	—
Net investment income	44,990	19,021	4,807	18,203	46,097
Other	9,760	9,175	9,993	9,813	10,522
Total additions	137,923	247,042	221,136	213,100	259,498
Deductions					
Benefit payments	102,665	243,662	234,414	200,627	222,860
Administrative expenses	19,162	19,166	19,261	16,612	13,766
Other	102	491	594	832	—
Total deductions	121,929	263,319	254,269	218,071	236,626
Change in fiduciary net position	15,994	(16,277)	(33,133)	(4,971)	22,872
Fiduciary net position held at beginning of year	260,228	276,505	309,638	314,609	291,737
Fiduciary net position held at end of year	**$276,222**	**$260,228**	**$276,505**	**$309,638**	**$314,609**

[1] Employer contribution rate history is shown on page 252.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

DPS Health Care Trust Fund

	2022	2021	2020	2019	2018
Additions					
Employer contributions[1]	**$8,744**	$8,622	$8,045	$7,649	$7,417
Net investment income (loss)	**(7,311)**	6,963	6,019	4,892	(894)
Other	**306**	206	224	188	205
Total additions	**1,739**	15,791	14,288	12,729	6,728
Deductions					
Benefit payments	**4,022**	3,516	3,086	3,644	4,158
Administrative expenses	**434**	639	516	477	845
Other	**1**	4	1	1	4
Total deductions	**4,457**	4,159	3,603	4,122	5,007
Change in fiduciary net position	**(2,718)**	11,632	10,685	8,607	1,721
Fiduciary net position held at beginning of year	**54,953**	43,321	32,636	24,029	22,308
Fiduciary net position held at end of year	**$52,235**	**$54,953**	**$43,321**	**$32,636**	**$24,029**

	2017	2016	2015	2014	2013
Additions					
Employer contributions[1]	$6,930	$6,723	$6,371	$6,003	$5,558
Retiree health care premiums	—	6,738	6,275	4,442	4,719
Federal health care subsidies	—	—	—	—	563
Net investment income	3,305	1,235	254	938	2,277
Other	242	289	301	281	312
Total additions	10,477	14,985	13,201	11,664	13,429
Deductions					
Benefit payments	5,694	12,748	12,442	10,432	11,222
Administrative expenses	808	818	822	668	561
Other	4	18	22	32	—
Total deductions	6,506	13,584	13,286	11,132	11,783
Change in fiduciary net position	3,971	1,401	(85)	532	1,646
Fiduciary net position held at beginning of year	18,337	16,936	17,021	16,489	14,843
Fiduciary net position held at end of year	**$22,308**	**$18,337**	**$16,936**	**$17,021**	**$16,489**

[1] Employer contribution rate history is shown on page 252.

CHANGES IN FIDUCIARY NET POSITION

For the Years Ended December 31

(Dollars in Thousands)

Life Insurance Reserve

	2022	2021	2020	2019	2018
Additions					
Net investment income (loss)	**($3,927)**	$4,125	$3,909	$3,901	($684)
Other	**—**	—	—	—	4
Total additions	**(3,927)**	4,125	3,909	3,901	(680)
Deductions					
Life insurance premiums	**533**	540	512	479	433
Administrative expenses	**79**	80	224	123	111
Total deductions	**612**	620	736	602	544
Change in fiduciary net position	**(4,539)**	3,505	3,173	3,299	(1,224)
Fiduciary net position held at beginning of year	**27,819**	24,314	21,141	17,842	19,066
Fiduciary net position held at end of year	**$23,280**	**$27,819**	**$24,314**	**$21,141**	**$17,842**

	2017	2016	2015	2014	2013
Additions					
Net investment income	$3,241	$1,289	$302	$1,068	$2,630
Total additions	3,241	1,289	302	1,068	2,630
Deductions					
Life insurance premiums	373	306	250	196	131
Administrative expenses	493	1,032	805	871	871
Total deductions	866	1,338	1,055	1,067	1,002
Change in fiduciary net position	2,375	(49)	(753)	1	1,628
Fiduciary net position held at beginning of year	16,691	16,740	17,493	17,492	15,864
Fiduciary net position held at end of year	**$19,066**	**$16,691**	**$16,740**	**$17,493**	**$17,492**

BENEFITS AND REFUND DEDUCTIONS FROM FIDUCIARY NET POSITION BY TYPE

For the Years Ended December 31

(Dollars in Thousands)

State Division Trust Fund

	2022	2021	2020	2019	2018
Type of Benefit					
Retirees	**$1,686,686**	$1,634,075	$1,581,249	$1,540,738	$1,510,747
Disability	**76,539**	77,589	78,987	81,434	82,947
Survivors	**14,842**	14,839	14,812	14,996	14,840
Total benefits	**$1,778,067**	**$1,726,503**	**$1,675,048**	**$1,637,168**	**$1,608,534**
Type of Refund					
Separation	**$76,132**	$67,128	$50,097	$55,782	$59,508
Death	**6,102**	7,301	7,791	5,909	5,728
Purchased service	**87**	91	33	141	17
Total refunds	**$82,321**	**$74,520**	**$57,921**	**$61,832**	**$65,253**

	2017	2016	2015	2014	2013
Type of Benefit					
Retirees	$1,456,159	$1,387,374	$1,322,592	$1,257,767	$1,202,238
Disability	83,280	82,221	81,310	80,753	79,854
Survivors	14,851	14,233	13,960	13,773	13,688
Total benefits	**$1,554,290**	**$1,483,828**	**$1,417,862**	**$1,352,293**	**$1,295,780**
Type of Refund					
Separation	$52,079	$54,606	$58,274	$57,895	$64,072
Death	6,561	5,464	5,213	3,058	4,411
Purchased service	56	67	80	199	252
Total refunds	**$58,696**	**$60,137**	**$63,567**	**$61,152**	**$68,735**

School Division Trust Fund

	2022	2021	2020	2019	2018
Type of Benefit					
Retirees	**$2,642,395**	$2,542,456	$2,452,428	$2,384,406	$2,329,157
Disability	**65,199**	66,230	67,467	67,737	68,774
Survivors	**16,073**	16,238	15,614	15,878	15,456
Total benefits	**$2,723,667**	**$2,624,924**	**$2,535,509**	**$2,468,021**	**$2,413,387**
Type of Refund					
Separation	**$81,507**	$74,409	$61,755	$70,200	$70,227
Death	**6,602**	7,183	6,101	3,412	5,678
Purchased service	**246**	133	17	259	130
Total refunds	**$88,355**	**$81,725**	**$67,873**	**$73,871**	**$76,035**

	2017	2016	2015	2014	2013
Type of Benefit					
Retirees	$2,249,855	$2,149,415	$2,053,108	$1,952,989	$1,855,195
Disability	68,537	67,416	67,203	65,780	63,741
Survivors	15,611	14,644	14,443	13,859	13,820
Total benefits	**$2,334,003**	**$2,231,475**	**$2,134,754**	**$2,032,628**	**$1,932,756**
Type of Refund					
Separation	$68,265	$60,873	$66,494	$73,522	$73,215
Death	6,313	4,756	3,621	3,521	3,282
Purchased service	59	86	183	128	483
Total refunds	**$74,637**	**$65,715**	**$70,298**	**$77,171**	**$76,980**

BENEFITS AND REFUND DEDUCTIONS FROM FIDUCIARY NET POSITION BY TYPE

For the Years Ended December 31

(Dollars in Thousands)

(CONTINUED)

Local Government Division Trust Fund

	2022	2021	2020	2019	2018
Type of Benefit					
Retirees	**$318,330**	$303,545	$288,944	$278,543	$267,669
Disability	**15,481**	15,868	16,215	16,315	16,582
Survivors	**2,910**	2,693	2,636	2,589	2,494
Total benefits	**$336,721**	**$322,106**	**$307,795**	**$297,447**	**$286,745**
Type of Refund					
Separation	**$12,740**	$14,725	$11,734	$13,070	$14,587
Death	**610**	1,279	1,053	1,691	1,128
Purchased service	**41**	30	41	—	1
Total refunds	**$13,391**	**$16,034**	**$12,828**	**$14,761**	**$15,716**

	2017	2016	2015	2014	2013
Type of Benefit					
Retirees	$255,105	$240,432	$226,400	$213,962	$199,821
Disability	16,775	16,274	16,327	16,045	16,022
Survivors	2,378	2,261	2,221	2,048	2,032
Total benefits	**$274,258**	**$258,967**	**$244,948**	**$232,055**	**$217,875**
Type of Refund					
Separation	$13,095	$12,017	$18,062	$23,034	$31,268
Death	1,434	921	2,317	1,401	1,201
Purchased service	1	—	31	1	11
Total refunds	**$14,530**	**$12,938**	**$20,410**	**$24,436**	**$32,480**

Judicial Division Trust Fund

	2022	2021	2020	2019	2018
Type of Benefit					
Retirees	**$31,660**	$30,121	$28,181	$26,812	$24,982
Disability	**790**	800	887	893	926
Survivors	**265**	280	341	351	328
Total benefits	**$32,715**	**$31,201**	**$29,409**	**$28,056**	**$26,236**
Type of Refund					
Separation	**$218**	$266	$48	$—	$50
Death	**—**	—	—	—	136
Total refunds	**$218**	**$266**	**$48**	**$—**	**$186**

	2017	2016	2015	2014	2013
Type of Benefit					
Retirees	$23,993	$21,485	$19,901	$18,573	$17,362
Disability	933	939	938	917	908
Survivors	324	310	319	310	346
Total benefits	**$25,250**	**$22,734**	**$21,158**	**$19,800**	**$18,616**
Type of Refund					
Separation	$7	$109	$—	$60	$385
Total refunds	**$7**	**$109**	**$—**	**$60**	**$385**

BENEFITS AND REFUND DEDUCTIONS FROM FIDUCIARY NET POSITION BY TYPE

For the Years Ended December 31

(Dollars in Thousands)

(CONTINUED)

DPS Division Trust Fund

	2022	2021	2020	2019	2018
Type of Benefit					
Retirees	**$272,927**	$270,210	$268,201	$267,956	$266,260
Disability	**8,017**	8,216	8,335	8,358	8,278
Survivors	**1,613**	1,619	1,545	1,535	1,685
Total benefits	**$282,557**	**$280,045**	**$278,081**	**$277,849**	**$276,223**
Type of Refund					
Separation	**$16,295**	$10,851	$8,913	$10,486	$10,652
Death	**617**	673	431	250	545
Purchased service	**1**	3	—	2	—
Total refunds	**$16,913**	**$11,527**	**$9,344**	**$10,738**	**$11,197**

	2017	2016	2015	2014	2013
Type of Benefit					
Retirees	$261,361	$253,641	$245,683	$237,955	$228,692
Disability	8,221	7,929	7,804	7,482	7,592
Survivors	1,607	1,582	1,581	1,568	1,637
Total benefits	**$271,189**	**$263,152**	**$255,068**	**$247,005**	**$237,921**
Type of Refund					
Separation	$9,873	$7,894	$7,685	$7,424	$6,558
Death	349	616	207	631	160
Purchased service	55	11	5	8	15
Total refunds	**$10,277**	**$8,521**	**$7,897**	**$8,063**	**$6,733**

MEMBER AND BENEFIT RECIPIENT STATISTICS[1]

(In Actual Dollars)

	State Division	School Division	Local Government Division	Judicial Division	DPS Division	Total
Active Members						
Active members as of 12/31/2022	**50,892**	**128,057**	**12,103**	**340**	**15,254**	**206,646**
Retirements during 2022						
Disability retirements	45	50	5	—	8	**108**
Service retirements	1,978	3,773	425	24	297	**6,497**
Total	**2,023**	**3,823**	**430**	**24**	**305**	**6,605**
Retirement Benefits						
Total receiving disability and service retirement benefits on 12/31/2022	41,990	71,479	8,392	422	7,042	**129,325**
Total retiring during 2022	2,023	3,823	430	24	305	**6,605**
Cobeneficiaries continuing after retiree's death	608	685	108	5	127	**1,533**
Returning to retirement rolls from suspension	7	23	3	—	5	**38**
Total	44,628	76,010	8,933	451	7,479	**137,501**
Retirees and cobeneficiaries deceased during year	1,794	2,257	299	16	355	**4,721**
Retirees suspending benefits to return to work	33	58	4	—	6	**101**
Data adjustment	1	2	—	—	—	**3**
Total receiving retirement benefits on 12/31/2022	**42,800**	**73,693**	**8,630**	**435**	**7,118**	**132,676**[2]
Annual retirement benefits for retirees as of 12/31/2022	$1,767,904,513	$2,736,666,778	$335,155,008	$33,578,519	$282,017,833	$5,155,322,651
Average monthly benefit on 12/31/2022	$3,442	$3,095	$3,236	$6,433	$3,302	$3,238
Average monthly benefit for all members who retired during 2022	$2,960	$2,626	$2,731	$7,530	$2,694	$2,756
Survivor Benefits						
Total survivors being paid on 12/31/2022	954	1,246	178	9	130	2,517[2]
Annual benefits payable to survivors as of 12/31/2022	$22,024,525	$20,930,212	$4,213,604	$323,052	$2,468,369	$49,959,762
Future Benefits						
Future retirements	9,738	23,817	3,173	31	3,165	39,924
Total annual future benefits	$129,962,636	$210,063,291	$46,213,201	$1,604,918	$36,995,939	$424,839,985
Future survivor beneficiaries of inactive members	106	155	21	2	8	292[2]
Total annual future benefits	$1,192,490	$2,073,875	$238,276	$—	$103,150	$3,607,791

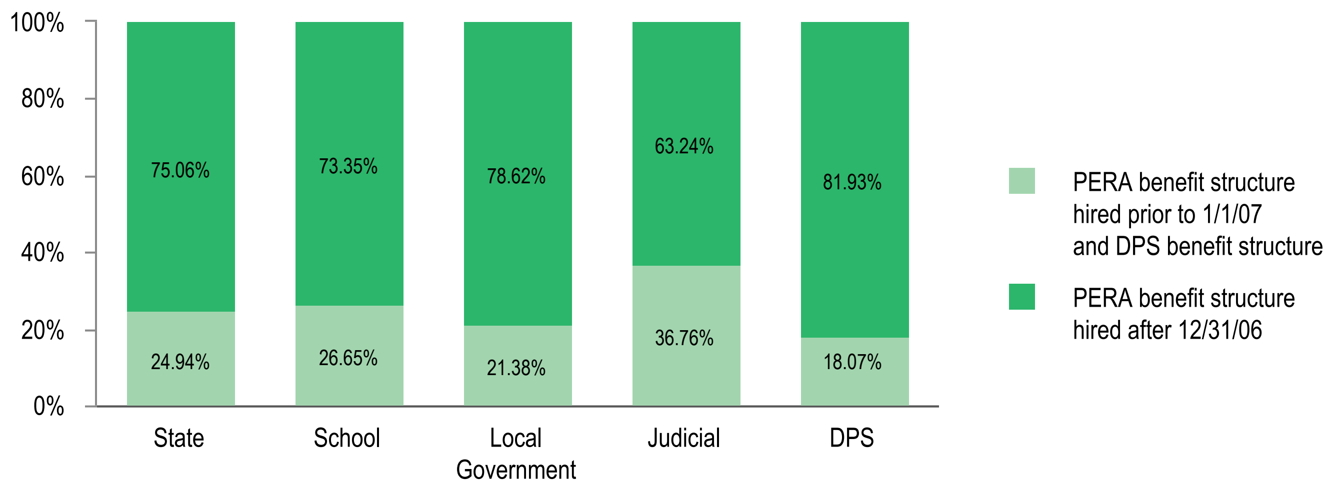
[1] In addition, as of December 31, 2022, there was a total of 289,856 non-vested inactive members due a refund of their contributions as follows: State Division—91,705; School Division—151,524; Local Government Division—30,243; Judicial Division—7; and DPS Division—16,377.

[2] These line items make up the total for retirees and beneficiaries reported on page 49 in Note 1 of the Notes to the Financial Statements in the Financial Section.

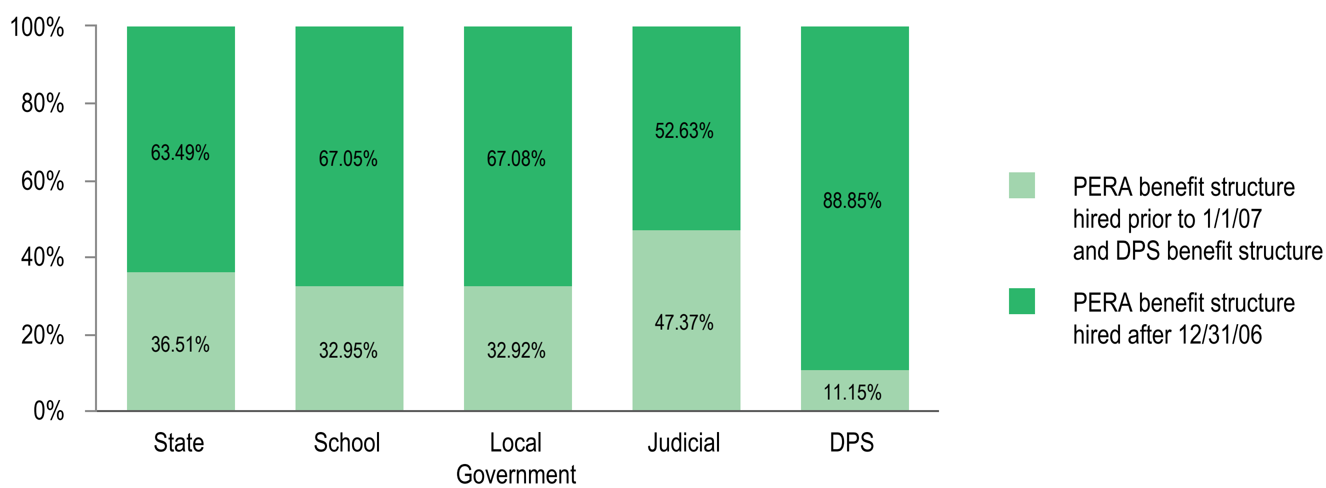
BREAKDOWN OF MEMBERSHIP BY PERCENTAGE

As of December 31, 2022

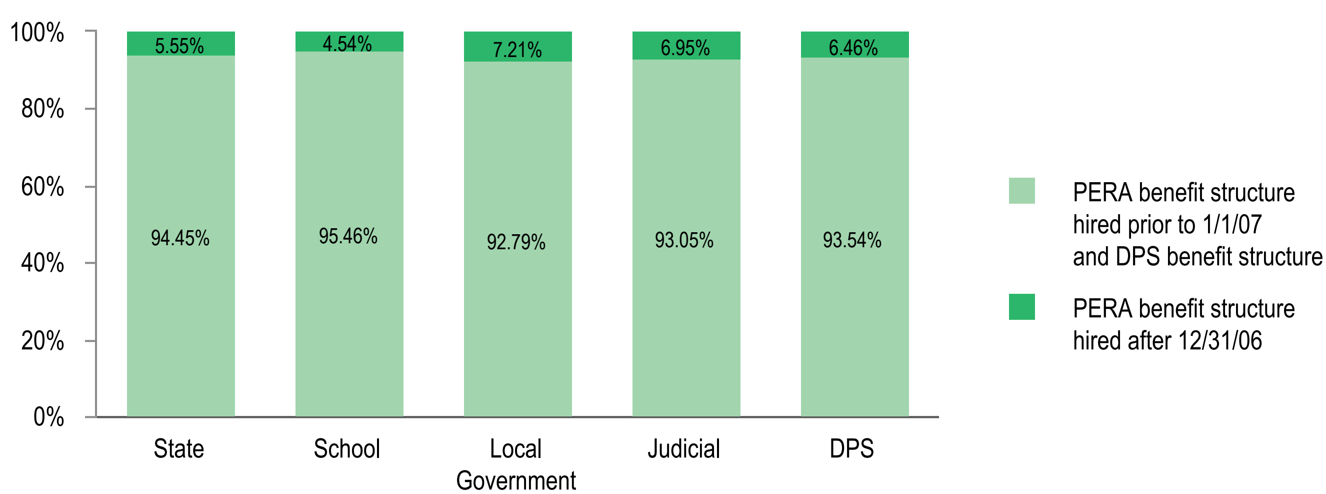
Active Members by Division



Inactive Members by Division (Vested and Non-Vested)



Retirees and Survivors by Division (Includes Deferred Survivors)



SCHEDULE OF AVERAGE RETIREMENT BENEFITS PAYABLE—ALL DIVISION TRUST FUNDS[1]

(In Actual Dollars)

Year Ended	Average Monthly Benefit	Average Age at Retirement	Average Current Age of Retirees	Average Years of Service at Retirement	Average Age at Death
12/31/2022	**$3,238**	**59.1**	**72.7**	**22.6**	**81.2**
12/31/2021	3,220	59.0	72.5	22.7	83.0
12/31/2020	3,204	58.9	72.3	22.8	81.5
12/31/2019	3,179	58.8	72.0	22.9	82.3
12/31/2018	3,208	58.8	71.7	23.0	82.5
12/31/2017	3,232	58.6	71.5	23.1	82.5
12/31/2016	3,193	58.5	71.2	23.2	82.5
12/31/2015	3,153	58.4	70.9	23.3	82.2
12/31/2014	3,112	58.3	70.7	23.4	82.8
12/31/2013	3,068	58.2	70.4	23.5	82.0

[1] Includes disability retirements, but not survivor benefits.

SCHEDULE OF AVERAGE RETIREMENT BENEFITS PAYABLE[1]

(In Actual Dollars)

	State Division	School Division	Local Government Division	Judicial Division	DPS Division
For All Retirees Year Ended 12/31/2022					
Average monthly benefit	**$3,442**	**$3,095**	**$3,236**	**$6,433**	**$3,302**
Average age at retirement	**58.9**	**59.2**	**59.1**	**62.6**	**59.7**
Average age	**72.8**	**72.6**	**71.1**	**75.2**	**75.0**
Average years of service at retirement	**22.5**	**22.8**	**20.9**	**23.2**	**23.2**
Average age at death	**81.0**	**81.4**	**78.6**	**87.1**	**83.0**
For Members Who Retired During 2022					
Average monthly benefit	**$2,960**	**$2,626**	**$2,731**	**$7,530**	**$2,694**
Average age at retirement	**62.5**	**61.8**	**62.9**	**64.0**	**62.8**
Average years of service	**19.6**	**20.5**	**17.3**	**21.8**	**18.7**
For All Retirees Year Ended 12/31/2021					
Average monthly benefit	$3,419	$3,079	$3,212	$6,237	$3,293
Average age at retirement	58.8	59.1	58.9	62.5	59.6
Average age	72.6	72.4	70.8	75.2	75.0
Average years of service at retirement	22.5	22.9	21.0	23.2	23.5
Average age at death	82.7	83.1	79.8	85.4	85.8
For Members Who Retired During 2021					
Average monthly benefit	$3,034	$2,542	$2,696	$6,588	$2,375
Average age at retirement	62.5	62.0	62.7	65.4	63.5
Average years of service	20.5	20.6	17.7	21.8	18.2

[1] Includes disability retirements, but not survivor benefits

SCHEDULE OF AVERAGE RETIREMENT BENEFITS PAYABLE[1] (CONTINUED)

(In Actual Dollars)

	State Division	School Division	Local Government Division	Judicial Division	DPS Division
For All Retirees Year Ended 12/31/2020					
Average monthly benefit	$3,393	$3,067	$3,201	$6,123	$3,284
Average age at retirement	58.7	59.0	58.8	62.3	59.5
Average age	72.4	72.2	70.4	74.9	74.8
Average years of service at retirement	22.6	23.0	21.2	23.2	23.8
Average age at death	81.0	81.7	79.0	87.9	83.6
For Members Who Retired During 2020					
Average monthly benefit	$2,772	$2,353	$2,798	$7,140	$2,500
Average age at retirement	62.6	62.2	62.9	66.9	63.8
Average years of service	19.9	20.2	18.9	23.8	18.6
For All Retirees Year Ended 12/31/2019					
Average monthly benefit	$3,360	$3,050	$3,160	$5,984	$3,252
Average age at retirement	58.6	58.9	58.6	62.0	59.4
Average age	72.1	71.9	70.0	74.8	74.6
Average years of service at retirement	22.7	23.1	21.3	23.1	24.0
Average age at death	82.4	82.1	79.2	86.2	84.9
For Members Who Retired During 2019					
Average monthly benefit	$2,767	$2,267	$2,622	$6,529	$2,464
Average age at retirement	62.2	61.7	61.9	63.8	63.6
Average years of service	19.7	20.0	17.9	21.0	18.4
For All Retirees Year Ended 12/31/2018					
Average monthly benefit	$3,379	$3,085	$3,187	$5,915	$3,278
Average age at retirement	58.6	58.8	58.6	62.0	59.4
Average age	71.9	71.6	69.7	75.0	74.3
Average years of service at retirement	22.8	23.2	21.4	23.3	24.2
Average age at death	82.7	82.4	79.8	83.2	84.6
For Members Who Retired During 2018					
Average monthly benefit	$2,795	$2,291	$2,853	$7,556	$2,749
Average age at retirement	63.2	62.8	62.8	67.5	63.3
Average years of service	20.1	20.3	18.8	25.1	20.1
For All Retirees Year Ended 12/31/2017					
Average monthly benefit	$3,397	$3,115	$3,188	$5,864	$3,290
Average age at retirement	58.4	58.7	58.4	61.8	59.3
Average age	71.7	71.3	69.3	74.3	74.2
Average years of service at retirement	22.9	23.3	21.5	23.2	24.4
Average age at death	82.1	82.8	78.2	82.9	85.2
For Members Who Retired During 2017					
Average monthly benefit	$2,866	$2,304	$2,669	$7,747	$2,608
Average age at retirement	61.7	61.7	61.9	66.1	62.0
Average years of service	20.6	20.4	18.7	25.6	19.3

[1] Includes disability retirements, but not survivor benefits

SCHEDULE OF AVERAGE RETIREMENT BENEFITS PAYABLE[1] (CONTINUED)

(In Actual Dollars)

	State Division	School Division	Local Government Division	Judicial Division	DPS Division
For All Retirees Year Ended 12/31/2016					
Average monthly benefit	$3,345	$3,086	$3,145	$5,624	$3,248
Average age at retirement	58.3	58.6	58.2	61.6	59.2
Average age	71.4	71.0	69.0	74.2	74.0
Average years of service at retirement	22.9	23.4	21.7	23.0	24.7
Average age at death	82.4	82.7	80.1	84.2	83.3
For Members Who Retired During 2016					
Average monthly benefit	$2,812	$2,303	$2,467	$6,192	$2,520
Average age at retirement	61.6	61.4	61.2	65.6	62.6
Average years of service	20.7	20.7	18.1	21.4	19.2
For All Retirees Year Ended 12/31/2015					
Average monthly benefit	$3,294	$3,052	$3,114	$5,379	$3,206
Average age at retirement	58.2	58.5	58.1	61.4	59.1
Average age	71.2	70.7	68.6	74.5	73.9
Average years of service at retirement	23.0	23.5	21.8	22.9	25.0
Average age at death	81.7	82.2	79.6	78.9	85.3
For Members Who Retired During 2015					
Average monthly benefit	$2,828	$2,293	$2,750	$7,030	$2,493
Average age at retirement	61.4	61.3	61.1	65.1	62.9
Average years of service	21.0	20.7	19.7	25.7	18.7
For All Retirees Year Ended 12/31/2014					
Average monthly benefit	$3,241	$3,019	$3,067	$5,158	$3,169
Average age at retirement	58.1	58.4	58.0	61.4	59.0
Average age	71.0	70.4	68.3	74.5	73.7
Average years of service at retirement	23.0	23.6	21.9	22.7	25.3
Average age at death	82.2	83.1	78.8	81.1	85.2
For Members Who Retired During 2014					
Average monthly benefit	$2,760	$2,405	$2,352	$4,969	$2,593
Average age at retirement	61.3	60.9	61.3	66.2	63.2
Average years of service	20.8	21.0	18.4	20.0	19.6
For All Retirees Year Ended 12/31/2013					
Average monthly benefit	$3,185	$2,980	$3,044	$5,077	$3,121
Average age at retirement	58.0	58.3	57.8	61.3	58.8
Average age	70.8	70.0	67.9	74.2	73.5
Average years of service at retirement	23.0	23.6	22.1	22.8	25.5
Average age at death	82.5	81.4	78.6	88.2	84.8
For Members Who Retired During 2013					
Average monthly benefit	$2,837	$2,455	$2,509	$6,857	$2,776
Average age at retirement	60.7	60.8	60.1	64.9	61.7
Average years of service	21.2	21.3	18.9	26.2	19.6

[1] Includes disability retirements, but not survivor benefits.

BENEFIT PAYMENTS—ALL DIVISION TRUST FUNDS

As of December 31, 2022

(In Actual Dollars)

Benefit Payments[1,2]

At the end of 2022, PERA was paying benefits to more than 135,000 retired public employees and their beneficiaries who received an average benefit of $3,212 per month. For benefit recipients, this may be the primary source of retirement income as most PERA benefit recipients do not qualify for Social Security payments.

The PERA service retirement formula for calculating benefits, specified in State law as of December 31, 2022, is 2.5% multiplied by years of service multiplied by Highest Average Salary (HAS). HAS[3] is defined in State law as one-twelfth of the average of the highest annual salaries on which contributions were paid that are associated with three periods of 12 consecutive months of service credit. The three 12-month periods do not have to be consecutive, nor do they have to be the last three years of employment. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year salary increase limitation for HAS calculation purposes. The year-to-year limit for members who were eligible to retire on January 1, 2011, and hired before January 1, 2007, is 15%. All other members are subject to an 8% year-to-year limit in their HAS calculation. This annual limit applied to salaries in the HAS years is designed to moderate salary "spiking."

Approximately 67.9% (91,825) of recipients receive less than $50,000 a year in PERA benefits, as the following graph demonstrates. Slightly less than 2.1% (2,838) of PERA benefit recipients receive an annual benefit payment of $100,000 or more. Generally, these benefit recipients had high salaries and a significant number of years of service credit.

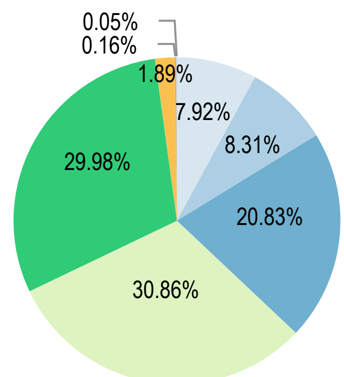
[1] Includes amounts paid under replacement benefit arrangements.

[2] Does not include deferred survivors and benefits that ended or were suspended in 2022.

[3] Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

PERA BENEFIT PAYMENTS BY DOLLAR AMOUNT OF ANNUAL BENEFIT AND NUMBER OF BENEFIT RECIPIENTS

Benefit Range[1]	Number of Benefit Recipients[2]
$0 - $4,999	10,709
$5,000 - $9,999	11,236
$10,000 - $24,999	28,154
$25,000 - $49,999	41,726
$50,000 - $99,999	40,530
$100,000 - $149,999	2,555
$150,000 - $199,999	216
$200,000+	67
Total Benefit Recipients	**135,193**



[1] Includes amounts paid under replacement benefit arrangements.

[2] Does not include 292 deferred survivors.

BENEFIT PAYMENTS—ALL DIVISION TRUST FUNDS

As of December 31, 2022

(In Actual Dollars)

Benefit Payments by Decile

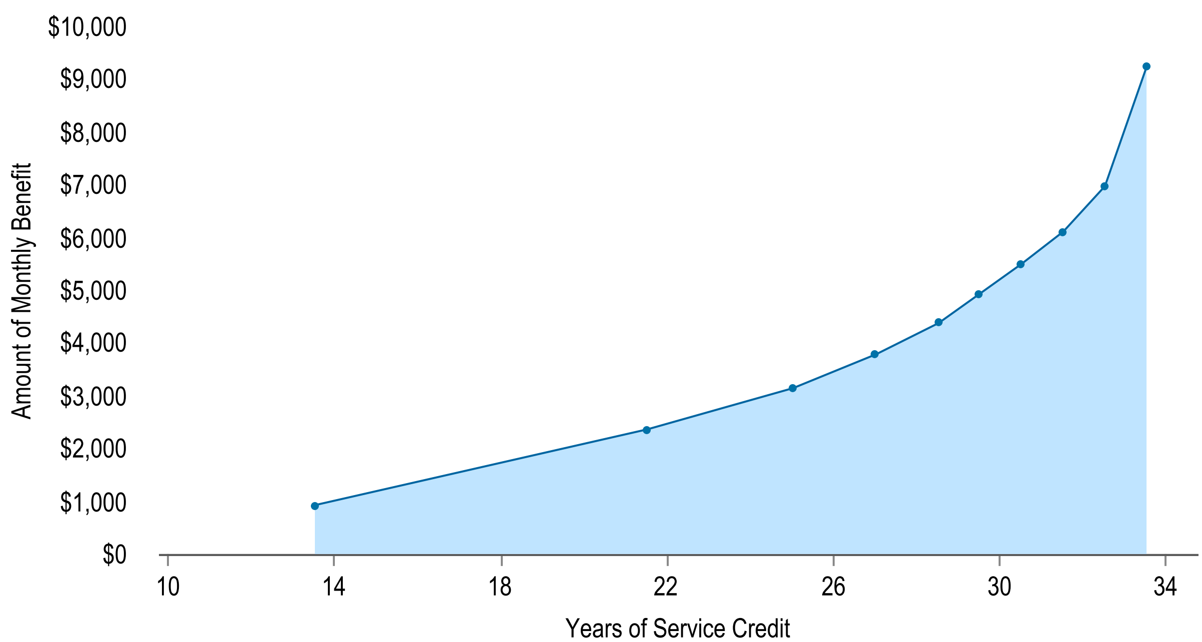
Another way to examine the data is to group benefit recipients and the benefits they receive into benefit payment ranges as a percentage of the total. The following table shows that, for the one-third of PERA benefit recipients (46,900) in the lowest decile, the average benefit is $11,112 a year. This group retired at an average age of 61 with over 13 years of service credit. For the top decile, on the other end of the scale, the average benefit is $110,748 a year. However, this group, on average, had just over 33 years of service credit, which is more than twice the length of the average service credit of those in the lowest decile. For the 6,605 new retirees in 2022, the average monthly benefit is $2,759. These members retired at an average age of 62 with 19.94 years of service credit.

Decile	Number of Benefit Recipients[1]	Percent of Benefit Recipients	Average Monthly Benefit[2]	Average Age at Retirement	Average Service Credit
1%–10%	46,900	34.69%	$926	61	13.37
11%–20%	18,372	13.59%	2,364	58	21.41
21%–30%	13,811	10.22%	3,144	58	24.59
31%–40%	11,465	8.48%	3,787	58	26.84
41%–50%	9,922	7.34%	4,377	57	28.44
51%–60%	8,792	6.50%	4,939	57	29.64
61%–70%	7,893	5.84%	5,502	57	30.56
71%–80%	7,104	5.25%	6,112	57	31.22
81%–90%	6,228	4.61%	6,972	57	32.11
91%–100%	4,706	3.48%	9,229	58	33.19
Total	**135,193**	**100.00%**	**3,212**	**59**	**22.00**

[1] Does not include 292 deferred survivors.

[2] Includes amounts paid under replacement benefit arrangements.

Average Monthly Benefit Payment by Years of Service Credit



SCHEDULE OF RETIREES AND SURVIVORS BY TYPES OF BENEFITS

As of December 31, 2022

Types of Benefits

1—Age and service retirement.

2—Disability retirement.

3—Survivor payment—Option 3.

4—Survivor payment—children, spouse, or dependent parent.

5—Surviving spouse with future benefit.

6—Former member with future benefit.

Option Selected

Retirees select one of the following options at retirement:

1—Single-life benefit.

2—Joint benefit with 1/2 to surviving cobeneficiary.

3—Joint and survivor benefit.

4—Joint benefit with 1/2 to either survivor. (No longer offered to members retiring.)

Surviving Cobeneficiary

Retiree has predeceased the cobeneficiary.

Surviving Retiree

Cobeneficiary has predeceased the retiree.

State Division

Amount of Monthly Benefit	Total	Types of Benefits					
(In Actual Dollars)	(Columns 1–5)	1	2	3	4	5	6
$1-$1,000	6,645	6,091	210	28	256	60	5,866
$1,001-$2,000	7,300	5,792	1,136	45	290	37	2,613
$2,001-$3,000	7,786	6,502	1,116	38	125	5	799
$3,001-$4,000	6,932	6,500	341	34	54	3	265
$4,001-$5,000	5,343	5,216	87	17	22	1	90
$5,001+	9,854	9,774	35	37	8	—	105
Total	**43,860**	**39,875**	**2,925**	**199**	**755**	**106**	**9,738**

Amount of Monthly Benefit[1]	Option Selected				Surviving Cobeneficiary	Surviving Retiree
(In Actual Dollars)	1	2	3	4		
$1-$1,000	4,184	408	1,148	1	551	9
$1,001-$2,000	3,989	750	1,212	1	956	20
$2,001-$3,000	4,299	1,020	1,386	1	879	33
$3,001-$4,000	3,767	1,133	1,363	—	566	12
$4,001-$5,000	2,717	1,019	1,202	2	348	15
$5,001+	4,720	2,081	2,525	1	468	14
Total	**23,676**	**6,411**	**8,836**	**6**	**3,768**	**103**

[1] For Types of Benefits 1 and 2 above.

SCHEDULE OF RETIREES AND SURVIVORS BY TYPES OF BENEFITS

As of December 31, 2022

Types of Benefits

1—Age and service retirement.

2—Disability retirement.

3—Survivor payment—Option 3.

4—Survivor payment—children, spouse, or dependent parent.

5—Surviving spouse with future benefit.

6—Former member with future benefit.

Option Selected

Retirees select one of the following options at retirement:

1—Single-life benefit.

2—Joint benefit with 1/2 to surviving cobeneficiary.

3—Joint and survivor benefit.

4—Joint benefit with 1/2 to either survivor. (No longer offered to members retiring.)

Surviving Cobeneficiary

Retiree has predeceased the cobeneficiary.

Surviving Retiree

Cobeneficiary has predeceased the retiree.

School Division

Amount of Monthly Benefit (In Actual Dollars)	Total (Columns 1–5)	Types of Benefits 1	2	3	4	5	6
$1-$1,000	16,852	15,479	665	56	563	89	18,607
$1,001-$2,000	12,133	10,768	1,005	43	275	42	3,929
$2,001-$3,000	10,624	9,782	661	22	146	13	873
$3,001-$4,000	10,135	9,739	309	22	61	4	252
$4,001-$5,000	9,449	9,291	124	9	21	4	101
$5,001+	15,901	15,827	43	18	10	3	55
Total	**75,094**	**70,886**	**2,807**	**170**	**1,076**	**155**	**23,817**

Amount of Monthly Benefit[1] (In Actual Dollars)	Option Selected 1	2	3	4	Surviving Cobeneficiary	Surviving Retiree
$1-$1,000	11,429	1,150	2,546	1	992	26
$1,001-$2,000	7,557	1,492	1,750	2	940	32
$2,001-$3,000	6,216	1,692	1,642	1	855	37
$3,001-$4,000	6,147	1,927	1,539	1	416	18
$4,001-$5,000	5,413	2,062	1,616	1	312	11
$5,001+	9,914	3,342	2,226	4	375	9
Total	**46,676**	**11,665**	**11,319**	**10**	**3,890**	**133**

[1] For Types of Benefits 1 and 2 above.

SCHEDULE OF RETIREES AND SURVIVORS BY TYPES OF BENEFITS

As of December 31, 2022

Types of Benefits

1—Age and service retirement.

2—Disability retirement.

3—Survivor payment—Option 3.

4—Survivor payment—children, spouse, or dependent parent.

5—Surviving spouse with future benefit.

6—Former member with future benefit.

Option Selected

Retirees select one of the following options at retirement:

1—Single-life benefit.

2—Joint benefit with 1/2 to surviving cobeneficiary.

3—Joint and survivor benefit.

4—Joint benefit with 1/2 to either survivor. (No longer offered to members retiring.)

Surviving Cobeneficiary

Retiree has predeceased the cobeneficiary.

Surviving Retiree

Cobeneficiary has predeceased the retiree.

Local Government Division

Amount of Monthly Benefit	Total	Types of Benefits					
(In Actual Dollars)	(Columns 1–5)	1	2	3	4	5	6
$1-$1,000	1,640	1,537	51	5	38	9	1,796
$1,001-$2,000	1,670	1,369	223	9	57	12	871
$2,001-$3,000	1,484	1,222	227	10	25	—	309
$3,001-$4,000	1,251	1,160	75	3	13	—	108
$4,001-$5,000	954	928	15	6	5	—	44
$5,001+	1,830	1,817	6	6	1	—	45
Total	**8,829**	**8,033**	**597**	**39**	**139**	**21**	**3,173**

Amount of Monthly Benefit[1]	Option Selected				Surviving Cobeneficiary	Surviving Retiree
(In Actual Dollars)	1	2	3	4		
$1-$1,000	1,068	120	284	—	114	2
$1,001-$2,000	932	185	300	1	168	6
$2,001-$3,000	765	243	315	—	122	4
$3,001-$4,000	656	241	247	—	89	2
$4,001-$5,000	466	203	224	—	49	1
$5,001+	775	443	537	—	68	—
Total	**4,662**	**1,435**	**1,907**	**1**	**610**	**15**

[1] For Types of Benefits 1 and 2 above.

SCHEDULE OF RETIREES AND SURVIVORS BY TYPES OF BENEFITS

As of December 31, 2022

Types of Benefits

1—Age and service retirement.

2—Disability retirement.

3—Survivor payment—Option 3.

4—Survivor payment—children, spouse, or dependent parent.

5—Surviving spouse with future benefit.

6—Former member with future benefit.

Option Selected

Retirees select one of the following options at retirement:

1—Single-life benefit.

2—Joint benefit with 1/2 to surviving cobeneficiary.

3—Joint and survivor benefit.

4—Joint benefit with 1/2 to either survivor. (No longer offered to members retiring.)

Surviving Cobeneficiary

Retiree has predeceased the cobeneficiary.

Surviving Retiree

Cobeneficiary has predeceased the retiree.

Judicial Division

Amount of Monthly Benefit	Total	Types of Benefits					
(In Actual Dollars)	(Columns 1–5)	1	2	3	4	5	6
$1-$1,000	22	19	1	—	—	2	1
$1,001-$2,000	26	22	1	—	3	—	5
$2,001-$3,000	28	27	—	—	1	—	6
$3,001-$4,000	34	29	2	—	3	—	6
$4,001-$5,000	35	29	5	—	1	—	3
$5,001+	301	294	6	1	—	—	10
Total	**446**	**420**	**15**	**1**	**8**	**2**	**31**

Amount of Monthly Benefit[1]	Option Selected				Surviving	Surviving
(In Actual Dollars)	1	2	3	4	Cobeneficiary	Retiree
$1-$1,000	8	1	4	—	7	—
$1,001-$2,000	7	1	5	—	10	—
$2,001-$3,000	6	6	9	—	6	—
$3,001-$4,000	10	5	9	—	7	—
$4,001-$5,000	12	3	11	—	8	—
$5,001+	100	71	104	—	25	—
Total	**143**	**87**	**142**	**—**	**63**	**—**

[1] For Types of Benefits 1 and 2 above.

SCHEDULE OF RETIREES AND SURVIVORS BY TYPES OF BENEFITS

As of December 31, 2022

Types of Benefits

1—Age and service retirement.

2—Disability retirement.

3—Survivor payment—Option 3.

4—Survivor payment—children, spouse, or dependent parent.

5—Surviving spouse with future benefit.

6—Former member with future benefit.

Option Selected

Retirees select one of the following options at retirement:

1—Single-life benefit.

2—Joint benefit with 1/2 to surviving cobeneficiary.

3—Joint and survivor benefit.

4—Joint benefit with 1/2 to either survivor. (No longer offered to members retiring.)

Surviving Cobeneficiary

Retiree has predeceased the cobeneficiary.

Surviving Retiree

Cobeneficiary has predeceased the retiree.

DPS Division

Amount of Monthly Benefit	Total	Types of Benefits					
(In Actual Dollars)	(Columns 1–5)	1	2	3	4	5	6
$1-$1,000	1,089	962	62	2	57	6	2,044
$1,001-$2,000	1,168	1,043	99	2	23	1	837
$2,001-$3,000	1,111	988	93	11	19	—	208
$3,001-$4,000	1,193	1,145	38	8	2	—	54
$4,001-$5,000	1,251	1,223	23	2	2	1	12
$5,001+	1,444	1,437	5	1	1	—	10
Total	**7,256**	**6,798**	**320**	**26**	**104**	**8**	**3,165**

Amount of Monthly Benefit[1]	Option Selected[2]				Surviving	Surviving	Cobeneficiaries
(In Actual Dollars)	1	2	3	4	Cobeneficiary	Retiree	Both Deceased
$1-$1,000	724	50	156	—	69	23	2
$1,001-$2,000	719	96	172	—	111	44	—
$2,001-$3,000	624	82	205	—	105	63	2
$3,001-$4,000	632	116	244	—	129	60	2
$4,001-$5,000	597	112	314	—	122	99	2
$5,001+	746	145	354	—	117	79	1
Total	**4,042**	**601**	**1,445**	**—**	**653**	**368**	**9**

[1] For Types of Benefits 1 and 2 above.

[2] The equivalent DPS benefit structure options are as follows:
PERA Option 1 = Options A, B, and D (D is discontinued)
PERA Option 2 = Options P2 and E (E is discontinued)
PERA Option 3 = Options P3 and C (C is discontinued)

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

State Division

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$178**	**$751**	**$1,417**	**$2,141**	**$3,151**	**$4,389**	**$5,955**
Average highest average salary	**$2,928**	**$4,196**	**$5,020**	**$5,305**	**$5,990**	**$6,740**	**$7,492**
Number of service retirees	**146**	**267**	**258**	**261**	**365**	**302**	**379**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$155	$767	$1,342	$2,050	$3,118	$4,249	$5,782
Average highest average salary	$2,484	$4,449	$4,724	$4,872	$5,966	$6,574	$7,404
Number of service retirees	110	239	253	242	364	325	421
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$183	$634	$1,166	$1,990	$2,888	$4,105	$5,660
Average highest average salary	$2,948	$3,700	$4,229	$4,844	$5,538	$6,459	$7,169
Number of service retirees	129	228	262	240	333	290	359
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$146	$674	$1,212	$1,948	$2,897	$4,102	$5,660
Average highest average salary	$2,608	$3,902	$4,401	$4,743	$5,607	$6,358	$7,235
Number of service retirees	110	229	237	231	287	282	325
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$153	$596	$1,250	$1,997	$2,880	$3,981	$5,571
Average highest average salary	$2,721	$3,531	$4,332	$4,838	$5,559	$6,179	$7,111
Number of service retirees	83	281	228	234	306	303	379
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	$233	$704	$1,287	$2,102	$3,025	$4,355	$5,618
Average highest average salary	$3,134	$3,869	$4,312	$4,860	$5,532	$6,465	$7,162
Number of service retirees	102	238	253	271	338	357	322
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	$240	$641	$1,285	$2,050	$2,983	$4,128	$5,593
Average highest average salary	$3,010	$3,477	$4,394	$4,790	$5,397	$6,130	$6,957
Number of service retirees	103	244	233	238	319	357	319
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	$241	$770	$1,339	$2,111	$2,934	$4,121	$5,232
Average highest average salary	$2,851	$4,043	$4,506	$4,766	$5,260	$6,074	$6,490
Number of service retirees	82	246	214	222	293	348	324
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	$228	$626	$1,239	$1,996	$2,930	$4,002	$5,438
Average highest average salary	$2,960	$3,421	$4,046	$4,609	$5,351	$5,904	$6,642
Number of service retirees	64	204	218	212	278	327	261
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	$269	$628	$1,288	$1,997	$2,853	$4,165	$5,285
Average highest average salary	$2,836	$3,508	$4,030	$4,527	$5,150	$6,196	$6,617
Number of service retirees	64	173	151	167	236	296	252

Note: HAS is defined as one-twelfth of the average of the highest annual salaries associated with three periods of 12 consecutive months of service credit. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year increase limitation, which is designed to moderate “spiking.” Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

School Division

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$106**	**$431**	**$836**	**$1,548**	**$2,607**	**$3,872**	**$5,319**
Average highest average salary	**$1,634**	**$2,516**	**$3,055**	**$3,768**	**$4,922**	**$5,908**	**$6,789**
Number of service retirees	**200**	**466**	**402**	**472**	**810**	**705**	**718**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$121	$434	$839	$1,536	$2,489	$3,730	$5,225
Average highest average salary	$1,915	$2,600	$3,038	$3,757	$4,751	$5,730	$6,741
Number of service retirees	151	476	426	477	799	640	707
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$85	$416	$821	$1,504	$2,266	$3,579	$5,046
Average highest average salary	$1,447	$2,522	$2,957	$3,604	$4,349	$5,440	$6,460
Number of service retirees	167	379	464	485	702	564	608
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$138	$396	$786	$1,440	$2,321	$3,503	$4,911
Average highest average salary	$1,981	$2,339	$2,854	$3,519	$4,428	$5,374	$6,356
Number of service retirees	141	366	440	377	635	509	512
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$124	$436	$805	$1,440	$2,254	$3,580	$4,833
Average highest average salary	$1,951	$2,574	$2,917	$3,535	$4,296	$5,435	$6,175
Number of service retirees	122	365	451	474	640	551	541
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	$185	$433	$925	$1,582	$2,418	$3,794	$4,891
Average highest average salary	$1,980	$2,351	$3,118	$3,615	$4,393	$5,547	$6,067
Number of service retirees	159	370	463	485	611	590	428
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	$127	$430	$879	$1,684	$2,304	$3,727	$4,695
Average highest average salary	$1,796	$2,325	$2,924	$3,799	$4,156	$5,388	$5,851
Number of service retirees	118	384	388	408	565	589	422
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	$221	$436	$899	$1,565	$2,400	$3,682	$4,621
Average highest average salary	$2,015	$2,317	$3,058	$3,538	$4,322	$5,347	$5,741
Number of service retirees	110	372	398	397	544	618	395
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	$194	$467	$939	$1,661	$2,407	$3,726	$4,778
Average highest average salary	$2,108	$2,580	$3,189	$3,706	$4,372	$5,422	$5,908
Number of service retirees	106	362	401	392	531	597	465
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	$201	$474	$976	$1,687	$2,448	$3,685	$4,739
Average highest average salary	$1,791	$2,726	$3,197	$3,721	$4,357	$5,318	$5,886
Number of service retirees	79	350	339	311	492	571	441

Note: HAS is defined as one-twelfth of the average of the highest annual salaries associated with three periods of 12 consecutive months of service credit. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year increase limitation, which is designed to moderate "spiking." Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

Local Government Division

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$274**	**$790**	**$1,568**	**$2,475**	**$3,579**	**$4,662**	**$6,077**
Average highest average salary	**$3,981**	**$5,094**	**$5,515**	**$6,203**	**$6,990**	**$7,218**	**$7,749**
Number of service retirees	**37**	**87**	**49**	**63**	**91**	**50**	**48**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$211	$798	$1,535	$2,388	$3,233	$4,747	$6,020
Average highest average salary	$3,890	$4,900	$5,714	$5,572	$6,306	$7,384	$7,580
Number of service retirees	40	99	68	71	77	65	65
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$175	$785	$1,443	$2,156	$3,169	$4,339	$5,914
Average highest average salary	$2,982	$5,165	$5,315	$5,477	$6,390	$6,877	$7,724
Number of service retirees	26	75	50	58	68	60	67
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$204	$737	$1,336	$2,127	$3,042	$4,447	$5,849
Average highest average salary	$3,752	$4,816	$5,056	$5,270	$6,155	$7,081	$7,701
Number of service retirees	26	66	71	62	64	62	54
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$224	$600	$1,496	$2,232	$3,054	$4,745	$6,276
Average highest average salary	$3,698	$3,820	$5,655	$5,428	$5,865	$7,485	$8,237
Number of service retirees	19	63	82	43	76	60	61
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	$240	$621	$1,282	$2,202	$3,241	$4,687	$5,720
Average highest average salary	$4,224	$3,889	$4,675	$5,056	$6,165	$6,969	$7,260
Number of service retirees	29	60	72	52	78	54	55
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	$323	$686	$1,401	$2,195	$2,761	$4,569	$5,378
Average highest average salary	$4,580	$4,031	$5,104	$5,506	$5,255	$6,796	$6,648
Number of service retirees	15	73	77	49	55	52	46
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	$252	$663	$1,202	$2,255	$3,152	$3,970	$5,814
Average highest average salary	$3,727	$4,141	$4,581	$5,481	$5,960	$5,896	$7,317
Number of service retirees	16	64	62	36	76	70	60
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	$241	$680	$1,185	$2,190	$3,110	$4,068	$4,796
Average highest average salary	$4,005	$3,912	$4,206	$5,106	$5,805	$6,299	$6,037
Number of service retirees	15	87	63	42	61	59	48
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	$211	$650	$1,259	$2,156	$2,733	$4,020	$5,692
Average highest average salary	$3,013	$3,743	$4,467	$5,107	$5,311	$6,024	$7,353
Number of service retirees	16	58	47	36	49	73	34

Note: HAS is defined as one-twelfth of the average of the highest annual salaries associated with three periods of 12 consecutive months of service credit. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year increase limitation, which is designed to moderate “spiking.” Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

Judicial Division

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$—**	**$3,157**	**$5,535**	**$6,021**	**$7,462**	**$8,665**	**$11,757**
Average highest average salary	**$—**	**$15,239**	**$15,357**	**$15,041**	**$14,590**	**$14,567**	**$14,630**
Number of service retirees	**—**	**2**	**1**	**3**	**12**	**3**	**3**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$230	$2,878	$3,366	$5,796	$6,473	$8,659	$9,838
Average highest average salary	$2,704	$15,526	$12,689	$14,582	$12,528	$13,876	$13,822
Number of service retirees	1	1	7	3	4	3	9
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$—	$1,655	$3,737	$2,485	$7,289	$7,859	$11,031
Average highest average salary	$—	$9,117	$13,912	$6,658	$14,385	$12,619	$14,277
Number of service retirees	—	2	2	3	6	5	7
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$—	$505	$3,822	$5,548	$6,389	$9,190	$11,134
Average highest average salary	$—	$4,208	$13,596	$13,969	$13,267	$13,950	$13,458
Number of service retirees	—	2	4	7	3	7	3
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$—	$2,763	$—	$5,841	$6,403	$8,926	$11,277
Average highest average salary	$—	$13,617	$—	$13,351	$13,378	$13,548	$15,287
Number of service retirees	—	1	—	1	2	1	2
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	$—	$1,929	$3,419	$6,000	$—	$8,369	$11,366
Average highest average salary	$—	$13,295	$9,786	$12,308	$—	$12,825	$13,840
Number of service retirees	—	3	3	2	—	8	8
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	$679	$1,868	$3,471	$5,044	$5,641	$8,291	$10,086
Average highest average salary	$6,905	$12,839	$12,526	$12,043	$11,450	$13,030	$13,340
Number of service retirees	2	2	1	6	3	7	5
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	$—	$—	$4,012	$4,158	$5,913	$7,635	$9,227
Average highest average salary	$—	$—	$13,045	$11,602	$11,664	$12,097	$12,331
Number of service retirees	—	—	2	1	6	4	6
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	$—	$1,505	$2,767	$4,432	$6,197	$7,806	$7,287
Average highest average salary	$—	$9,209	$10,444	$10,910	$11,182	$12,370	$9,350
Number of service retirees	—	3	3	1	4	2	3
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	$—	$—	$3,596	$—	$—	$9,561	$9,427
Average highest average salary	$—	$—	$9,119	$—	$—	$11,271	$10,871
Number of service retirees	—	—	3	—	—	1	4

Note: HAS is defined as one-twelfth of the average of the highest annual salaries associated with three periods of 12 consecutive months of service credit. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year increase limitation, which is designed to moderate “spiking.” Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

DPS Division

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$74**	**$689**	**$967**	**$2,058**	**$3,604**	**$4,384**	**$5,983**
Average highest average salary	**$1,917**	**$3,849**	**$3,407**	**$5,655**	**$6,964**	**$6,931**	**$7,623**
Number of service retirees	**10**	**45**	**76**	**24**	**37**	**66**	**39**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$116	$558	$893	$2,119	$2,821	$4,257	$5,537
Average highest average salary	$2,188	$3,279	$3,238	$5,596	$5,618	$6,617	$7,155
Number of service retirees	10	51	52	32	29	45	33
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$22	$595	$837	$2,163	$2,893	$4,307	$5,498
Average highest average salary	$795	$3,388	$3,142	$5,382	$5,959	$6,833	$7,201
Number of service retirees	5	27	61	29	25	35	36
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$119	$519	$1,361	$2,205	$2,644	$4,237	$5,801
Average highest average salary	$2,828	$3,093	$5,082	$5,691	$5,223	$6,601	$7,292
Number of service retirees	8	56	34	28	28	37	32
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$77	$475	$1,369	$1,748	$2,727	$4,334	$5,337
Average highest average salary	$1,890	$2,972	$4,821	$4,714	$5,464	$6,788	$6,831
Number of service retirees	5	65	23	34	35	51	61
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	$176	$555	$1,305	$2,089	$3,242	$4,544	$5,416
Average highest average salary	$2,466	$2,926	$4,325	$5,263	$5,682	$6,625	$6,835
Number of service retirees	8	59	21	38	52	58	20
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	$163	$611	$1,462	$1,989	$3,415	$4,133	$5,342
Average highest average salary	$1,938	$3,536	$4,816	$4,955	$6,055	$5,876	$6,785
Number of service retirees	4	59	40	60	59	56	24
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	$230	$702	$1,588	$1,994	$3,147	$4,159	$5,254
Average highest average salary	$1,908	$4,275	$5,022	$4,808	$5,523	$7,318	$6,391
Number of service retirees	12	55	36	37	60	56	19
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	$472	$810	$1,379	$2,233	$3,091	$4,243	$4,862
Average highest average salary	$3,399	$4,593	$4,489	$5,569	$5,607	$6,250	$5,891
Number of service retirees	15	39	44	49	72	44	32
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	$276	$890	$1,365	$1,847	$3,214	$4,350	$5,049
Average highest average salary	$2,532	$5,835	$4,861	$4,618	$5,754	$6,611	$6,097
Number of service retirees	15	30	31	32	69	57	27

Note: HAS is defined as one-twelfth of the average of the highest annual salaries associated with three periods of 12 consecutive months of service credit. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year increase limitation, which is designed to moderate "spiking." Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

All Division Trust Funds

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$148**	**$585**	**$1,091**	**$1,838**	**$2,897**	**$4,088**	**$5,591**
Average highest average salary	**$2,343**	**$3,390**	**$3,903**	**$4,538**	**$5,507**	**$6,273**	**$7,099**
Number of service retirees	**393**	**867**	**786**	**823**	**1,315**	**1,126**	**1,187**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$145	$578	$1,081	$1,798	$2,734	$3,983	$5,499
Average highest average salary	$2,380	$3,428	$3,890	$4,351	$5,237	$6,144	$7,074
Number of service retirees	312	866	806	825	1,273	1,078	1,235
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$130	$595	$837	$2,163	$2,893	$4,307	$5,498
Average highest average salary	$2,151	$3,230	$3,534	$4,177	$4,909	$5,929	$6,851
Number of service retirees	327	711	839	815	1,134	954	1,077
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$147	$526	$1,005	$1,738	$2,549	$3,831	$5,280
Average highest average salary	$2,408	$3,128	$3,670	$4,264	$4,919	$5,919	$6,798
Number of service retirees	285	719	786	705	1,017	897	926
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$142	$514	$1,023	$1,668	$2,516	$3,824	$5,227
Average highest average salary	$2,373	$3,070	$3,671	$4,090	$4,829	$5,876	$6,691
Number of service retirees	229	775	784	786	1,059	966	1,044
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	$207	$553	$1,088	$1,819	$2,707	$4,102	$5,302
Average highest average salary	$2,606	$3,064	$3,684	$4,196	$4,940	$6,039	$6,662
Number of service retirees	298	730	812	848	1,079	1,067	833
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	$192	$540	$1,096	$1,882	$2,621	$3,955	$5,137
Average highest average salary	$2,530	$2,979	$3,730	$4,375	$4,746	$5,783	$6,402
Number of service retirees	242	762	739	761	1,001	1,061	816
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	$231	$587	$1,101	$1,802	$2,686	$3,879	$5,006
Average highest average salary	$2,445	$3,198	$3,753	$4,112	$4,848	$5,738	$6,225
Number of service retirees	220	737	712	693	979	1,096	804
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	$229	$564	$1,084	$1,839	$2,674	$3,863	$5,005
Average highest average salary	$2,620	$3,135	$3,641	$4,207	$4,875	$5,674	$6,165
Number of service retirees	200	695	729	696	946	1,029	809
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	$233	$555	$1,117	$1,822	$2,640	$3,896	$4,999
Average highest average salary	$2,352	$3,196	$3,644	$4,111	$4,747	$5,710	$6,229
Number of service retirees	174	611	571	546	846	998	758

Note: HAS is defined as one-twelfth of the average of the highest annual salaries associated with three periods of 12 consecutive months of service credit. These three periods are tied to a fourth 12-month period which becomes the base year for the year-to-year increase limitation, which is designed to moderate "spiking." Some members of the DPS benefit structure, members in the Judicial Division, and members who did not have five years of service credit on December 31, 2019, have different HAS calculations. Please see Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

Health Care Trust Fund[1]

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$25**	**$57**	**$79**	**$127**	**$167**	**$187**	**$195**
Number of service retirees[2]	**33**	**75**	**111**	**180**	**324**	**271**	**323**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$16	$55	$89	$132	$190	$197	$196
Number of service retirees[2]	21	62	130	152	334	286	412
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$14	$60	$101	$148	$189	$197	$203
Number of service retirees[2]	18	56	106	187	346	325	459
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$15	$57	$102	$147	$195	$203	$205
Number of service retirees[2]	19	57	120	184	316	319	416
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$20	$62	$110	$154	$201	$201	$209
Number of service retirees[2]	7	56	131	177	394	365	482

[1] Information is not available prior to 2018. In future reports, additional years will be added until 10 years of historical data are presented.

[2] Only includes those service retirees participating in PERACare.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

DPS Health Care Trust Fund[1]

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$—**	**$29**	**$75**	**$115**	**$188**	**$186**	**$196**
Number of service retirees[2]	**—**	**2**	**10**	**5**	**10**	**16**	**10**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$29	$92	$85	$130	$148	$203	$216
Number of service retirees[2]	1	1	4	7	5	13	13
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$—	$69	$78	$141	$129	$212	$212
Number of service retirees[2]	—	1	7	10	8	13	18
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$6	$68	$99	$131	$201	$208	$203
Number of service retirees[2]	1	4	9	7	13	16	17
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$—	$65	$67	$170	$203	$208	$208
Number of service retirees[2]	—	8	3	6	13	21	36

[1] Information is not available prior to 2018. In future reports, additional years will be added until 10 years of historical data are presented.

[2] Only includes those service retirees participating in PERACare.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

(In Actual Dollars)

All Health Care Trust Funds[1]

	Years of Service Credit						
Year Retired	**0–5**	**5–10**	**10–15**	**15–20**	**20–25**	**25–30**	**30+**
Period 1/1/2022 to 12/31/2022							
Average monthly benefit	**$25**	**$56**	**$79**	**$127**	**$168**	**$187**	**$195**
Number of service retirees[2]	**33**	**77**	**121**	**185**	**334**	**287**	**333**
Period 1/1/2021 to 12/31/2021							
Average monthly benefit	$16	$56	$89	$132	$190	$197	$197
Number of service retirees[2]	22	63	134	159	339	299	425
Period 1/1/2020 to 12/31/2020							
Average monthly benefit	$14	$60	$100	$148	$187	$198	$203
Number of service retirees[2]	18	57	113	197	354	338	477
Period 1/1/2019 to 12/31/2019							
Average monthly benefit	$14	$58	$102	$147	$195	$203	$205
Number of service retirees[2]	20	61	129	191	329	335	433
Period 1/1/2018 to 12/31/2018							
Average monthly benefit	$20	$62	$109	$154	$201	$201	$209
Number of service retirees[2]	7	64	134	183	407	386	518

[1] Information is not available prior to 2018. In future reports, additional years will be added until 10 years of historical data are presented.

[2] Only includes those service retirees participating in PERACare.

SCHEDULE OF CONTRIBUTION RATE HISTORY

State Division (Members other than State Troopers)

Years[1]			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Nonemployer Contribution Rate	Defined Contribution Supplement[3]	Total Contribution Rate
			Percent of Covered Payroll						
1/1/2006	to	12/31/2006	8.00%	10.15%	0.50%	—	—	—	18.65%
1/1/2007	to	12/31/2007	8.00%	10.15%	1.00%	—	—	—	19.15%
1/1/2008	to	12/31/2008	8.00%	10.15%	1.40%	0.50%	—	—	20.05%
1/1/2009	to	12/31/2009	8.00%	10.15%	1.80%	1.00%	—	—	20.95%
1/1/2010	to	6/30/2010	8.00%	10.15%	2.20%	1.50%	—	—	21.85%
7/1/2010	to	12/31/2010	10.50%[4]	7.65%[4]	2.20%	1.50%	—	—	21.85%
1/1/2011	to	12/31/2011	10.50%[4]	7.65%[4]	2.60%	2.00%	—	—	22.75%
1/1/2012	to	6/30/2012	10.50%[4]	7.65%[4]	3.00%	2.50%	—	—	23.65%
7/1/2012	to	12/31/2012	8.00%	10.15%	3.00%	2.50%	—	—	23.65%
1/1/2013	to	12/31/2013	8.00%	10.15%	3.40%	3.00%	—	—	24.55%
1/1/2014	to	12/31/2014	8.00%	10.15%	3.80%	3.50%	—	—	25.45%
1/1/2015	to	12/31/2015	8.00%	10.15%	4.20%	4.00%	—	—	26.35%
1/1/2016	to	12/31/2016	8.00%	10.15%	4.60%	4.50%	—	—	27.25%
1/1/2017	to	12/31/2017	8.00%	10.15%	5.00%	5.00%	—	—	28.15%
1/1/2018	to	12/31/2018	8.00%	10.15%	5.00%	5.00%	2.71%[5]	—	30.86%
1/1/2019	to	6/30/2019	8.00%	10.15%	5.00%	5.00%	2.57%[5,6]	—	30.72%
7/1/2019	to	12/31/2019	8.75%	10.40%	5.00%	5.00%	2.57%[5,6]	—	31.72%
1/1/2020	to	6/30/2020	8.75%	10.40%	5.00%	5.00%	—[7]	—	29.15%
7/1/2020	to	12/31/2020	10.00%	10.90%	5.00%	5.00%	—[7]	—	30.90%
1/1/2021	to	6/30/2021	10.00%	10.90%	5.00%	5.00%	2.48%[5,6]	0.05%	33.43%
7/1/2021	to	12/31/2021	10.50%	10.90%	5.00%	5.00%	2.48%[5,6]	0.05%	33.93%
1/1/2022	**to**	**6/30/2022**	**10.50%**	**10.90%**	**5.00%**	**5.00%**	**6.23%[5,6,8]**	**0.10%**	**37.73%**
7/1/2022	**to**	**12/31/2022**	**11.00%**	**11.40%**	**5.00%**	**5.00%**	**6.23%[5,6,8]**	**0.10%**	**38.73%**

1 This informational schedule begins in 2006, the year the Amortization Equalization Disbursement for employers became effective.

2 All employer contribution rates shown include the Health Care Trust Fund (HCTF) allocation.

3 C.R.S. § 24-51-415 adjusts employer contribution rates for the State Division. See Note 4 of the Notes to the Financial Statements in the Financial Section for additional information.

4 Senate Bills 10-146 and 11-076 required member contributions to increase by 2.50% and employer contributions to decrease by 2.50%.

5 Contributions from a nonemployer contributing entity are required by C.R.S. § 24-51-414 *et seq.* and are remitted to PERA as a single sum in July of each year. For purposes of this schedule, the amount allocated to the State Division is expressed as a percentage of annual covered payroll.

6 The amount allocated to the State Division is shown in both six-month segment contribution summaries. The rate presented in each segment is based on annual covered payroll for improved comparative analysis to the prior year.

7 House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

8 House Bill 22-1029 required a restorative payment for the suspended 2020 contribution.

SCHEDULE OF CONTRIBUTION RATE HISTORY

State Division (State Troopers)

Years[1]			Percent of Covered Payroll						
			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Nonemployer Contribution Rate	Defined Contribution Supplement[3]	Total Contribution Rate
1/1/2006	to	12/31/2006	10.00%	12.85%	0.50%	—	—	—	23.35%
1/1/2007	to	12/31/2007	10.00%	12.85%	1.00%	—	—	—	23.85%
1/1/2008	to	12/31/2008	10.00%	12.85%	1.40%	0.50%	—	—	24.75%
1/1/2009	to	12/31/2009	10.00%	12.85%	1.80%	1.00%	—	—	25.65%
1/1/2010	to	6/30/2010	10.00%	12.85%	2.20%	1.50%	—	—	26.55%
7/1/2010	to	12/31/2010	12.50%[4]	10.35%[4]	2.20%	1.50%	—	—	26.55%
1/1/2011	to	12/31/2011	12.50%[4]	10.35%[4]	2.60%	2.00%	—	—	27.45%
1/1/2012	to	6/30/2012	12.50%[4]	10.35%[4]	3.00%	2.50%	—	—	28.35%
7/1/2012	to	12/31/2012	10.00%	12.85%	3.00%	2.50%	—	—	28.35%
1/1/2013	to	12/31/2013	10.00%	12.85%	3.40%	3.00%	—	—	29.25%
1/1/2014	to	12/31/2014	10.00%	12.85%	3.80%	3.50%	—	—	30.15%
1/1/2015	to	12/31/2015	10.00%	12.85%	4.20%	4.00%	—	—	31.05%
1/1/2016	to	12/31/2016	10.00%	12.85%	4.60%	4.50%	—	—	31.95%
1/1/2017	to	12/31/2017	10.00%	12.85%	5.00%	5.00%	—	—	32.85%
1/1/2018	to	12/31/2018	10.00%	12.85%	5.00%	5.00%	2.71%[5]	—	35.56%
1/1/2019	to	6/30/2019	10.00%	12.85%	5.00%	5.00%	2.57%[5,6]	—	35.42%
7/1/2019	to	12/31/2019	10.75%	13.10%	5.00%	5.00%	2.57%[5,6]	—	36.42%
1/1/2020	to	6/30/2020	10.75%	13.10%	5.00%	5.00%	—[7]	—	33.85%
7/1/2020	to	12/31/2020	12.00%	13.60%	5.00%	5.00%	—[7]	—	35.60%
1/1/2021	to	6/30/2021	12.00%	13.60%	5.00%	5.00%	2.48%[5,6]	0.05%	38.13%
7/1/2021	to	12/31/2021	12.50%	13.60%	5.00%	5.00%	2.48%[5,6]	0.05%	38.63%
1/1/2022	**to**	**6/30/2022**	**12.50%**	**13.60%**	**5.00%**	**5.00%**	**6.23%**[5,6,8]	**0.10%**	**42.43%**
7/1/2022	**to**	**12/31/2022**	**13.00%**	**14.10%**	**5.00%**	**5.00%**	**6.23%**[5,6,8]	**0.10%**	**43.43%**

1 This informational schedule begins in 2006, the year the Amortization Equalization Disbursement for employers became effective.

2 All employer contribution rates shown include the Health Care Trust Fund (HCTF) allocation.

3 C.R.S. § 24-51-415 adjusts employer contribution rates for the State Division. See Note 4 of the Notes to the Financial Statements in the Financial Section for additional information.

4 Senate Bills 10-146 and 11-076 required member contributions to increase by 2.50% and employer contributions to decrease by 2.50%.

5 Contributions from a nonemployer contributing entity are required by C.R.S. § 24-51-414 *et seq.* and are remitted to PERA as a single sum in July of each year. For purposes of this schedule, the amount allocated to the State Division is expressed as a percentage of annual covered payroll.

6 The amount allocated to the State Division is shown in both six-month segment contribution summaries. The rate presented in each segment is based on annual covered payroll for improved comparative analysis to the prior year.

7 House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

8 House Bill 22-1029 required a restorative payment for the suspended 2020 contribution.

SCHEDULE OF CONTRIBUTION RATE HISTORY

School Division

			Percent of Covered Payroll					
Years[1]			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Nonemployer Contribution Rate	Total Contribution Rate
1/1/2006	to	12/31/2006	8.00%	10.15%	0.50%	—	—	18.65%
1/1/2007	to	12/31/2007	8.00%	10.15%	1.00%	—	—	19.15%
1/1/2008	to	12/31/2008	8.00%	10.15%	1.40%	0.50%	—	20.05%
1/1/2009	to	12/31/2009	8.00%	10.15%	1.80%	1.00%	—	20.95%
1/1/2010	to	12/31/2010	8.00%	10.15%	2.20%	1.50%	—	21.85%
1/1/2011	to	12/31/2011	8.00%	10.15%	2.60%	2.00%	—	22.75%
1/1/2012	to	12/31/2012	8.00%	10.15%	3.00%	2.50%	—	23.65%
1/1/2013	to	12/31/2013	8.00%	10.15%	3.40%	3.00%	—	24.55%
1/1/2014	to	12/31/2014	8.00%	10.15%	3.80%	3.50%	—	25.45%
1/1/2015	to	12/31/2015	8.00%	10.15%	4.20%	4.00%	—	26.35%
1/1/2016	to	12/31/2016	8.00%	10.15%	4.50%	4.50%	—	27.15%
1/1/2017	to	12/31/2017	8.00%	10.15%	4.50%	5.00%	—	27.65%
1/1/2018	to	12/31/2018	8.00%	10.15%	4.50%	5.50%	2.64%[3]	30.79%
1/1/2019	to	6/30/2019	8.00%	10.15%	4.50%	5.50%	2.50%[3,4]	30.65%
7/1/2019	to	12/31/2019	8.75%	10.40%	4.50%	5.50%	2.50%[3,4]	31.65%
1/1/2020	to	6/30/2020	8.75%	10.40%	4.50%	5.50%	—[5]	29.15%
7/1/2020	to	12/31/2020	10.00%	10.90%	4.50%	5.50%	—[5]	30.90%
1/1/2021	to	6/30/2021	10.00%	10.90%	4.50%	5.50%	2.34%[3,4]	33.24%
7/1/2021	to	12/31/2021	10.50%	10.90%	4.50%	5.50%	2.34%[3,4]	33.74%
1/1/2022	**to**	**6/30/2022**	**10.50%**	**10.90%**	**4.50%**	**5.50%**	**6.18%**[3,4,6]	**37.58%**
7/1/2022	**to**	**12/31/2022**	**11.00%**	**11.40%**	**4.50%**	**5.50%**	**6.18%**[3,4,6]	**38.58%**

1 This informational schedule begins in 2006, the year the Amortization Equalization Disbursement for employers became effective.

2 All employer contribution rates include the HCTF allocation.

3 Contributions from a nonemployer contributing entity are required by C.R.S. § 24-51-414 *et seq*. and are remitted to PERA as a single sum in July of each year. For purposes of this schedule, the amount allocated to the School Division is expressed as a percentage of annual covered payroll.

4 The amount allocated to the School Division is shown in both six-month segment contribution summaries. The rate presented in each segment is based on annual covered payroll for improved comparative analysis to the prior year.

5 House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

6 House Bill 22-1029 required a restorative payment for the suspended 2020 contribution.

SCHEDULE OF CONTRIBUTION RATE HISTORY

Local Government Division (Members other than State Troopers)

Years[1]			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Defined Contribution Supplement[3]	Total Contribution Rate
			Percent of Covered Payroll					
1/1/2006	to	12/31/2006	8.00%	10.00%	0.50%	—	—	18.50%
1/1/2007	to	12/31/2007	8.00%	10.00%	1.00%	—	—	19.00%
1/1/2008	to	12/31/2008	8.00%	10.00%	1.40%	0.50%	—	19.90%
1/1/2009	to	12/31/2009	8.00%	10.00%	1.80%	1.00%	—	20.80%
1/1/2010	to	6/30/2020	8.00%	10.00%	2.20%	1.50%	—	21.70%
7/1/2020	to	12/31/2020	8.50%	10.50%	2.20%	1.50%	—	22.70%
1/1/2021	to	12/31/2021	8.50%	10.50%	2.20%	1.50%	0.02%	22.72%
1/1/2022	**to**	**6/30/2022**	**8.50%**	**10.50%**	**2.20%**	**1.50%**	**0.03%**	**22.73%**
7/1/2022	**to**	**12/31/2022**	**9.00%**	**11.00%**	**2.20%**	**1.50%**	**0.03%**	**23.73%**

[1] This informational schedule begins in 2006, the year the Amortization Equalization Disbursement for employers became effective.

[2] All employer contribution rates include the HCTF allocation.

[3] C.R.S. § 24-51-415 adjusts employer contribution rates for the Local Government Division. See Note 4 of the Notes to the Financial Statements in the Financial Section for additional information.

Local Government Division (State Troopers)[1]

Years			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Defined Contribution Supplement[3]	Total Contribution Rate
			Percent of Covered Payroll					
1/1/2020	to	6/30/2020	10.75%	13.10%	2.20%	1.50%	—	27.55%
7/1/2020	to	12/31/2020	12.00%	13.60%	2.20%	1.50%	—	29.30%
1/1/2021	to	6/30/2021	12.00%	13.60%	2.20%	1.50%	0.02%	29.32%
7/1/2021	to	12/31/2021	12.50%	13.60%	2.20%	1.50%	0.02%	29.82%
1/1/2022	**to**	**6/30/2022**	**12.50%**	**13.60%**	**2.20%**	**1.50%**	**0.03%**	**29.83%**
7/1/2022	**to**	**12/31/2022**	**13.00%**	**14.10%**	**2.20%**	**1.50%**	**0.03%**	**30.83%**

[1] C.R.S. § 24-51-101 (46), as amended, expanded the definition of "State Troopers" to include certain employees within the Local Government Division. See Note 1 of the Notes to the Financial Statements in the Financial Section for more information.

[2] All employer contribution rates include the HCTF allocation.

[3] C.R.S. § 24-51-415 adjusts employer contribution rates for the Local Government Division. See Note 4 of the Notes to the Financial Statements in the Financial Section for additional information.

SCHEDULE OF CONTRIBUTION RATE HISTORY

Judicial Division

Years[1]			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Nonemployer Contribution Rate	Total Contribution Rate
			Percent of Covered Payroll					
1/1/2006	to	12/31/2006	8.00%	13.66%	0.50%	—	—	22.16%
1/1/2007	to	12/31/2007	8.00%	13.66%	1.00%	—	—	22.66%
1/1/2008	to	12/31/2008	8.00%	13.66%	1.40%	0.50%	—	23.56%
1/1/2009	to	12/31/2009	8.00%	13.66%	1.80%	1.00%	—	24.46%
1/1/2010	to	6/30/2010	8.00%	13.66%	2.20%	1.50%	—	25.36%
7/1/2010	to	6/30/2012	10.50%[3]	11.16%[3]	2.20%	1.50%	—	25.36%
7/1/2012	to	12/31/2017	8.00%	13.66%	2.20%	1.50%	—	25.36%
1/1/2018	to	12/31/2018	8.00%	13.66%	2.20%	1.50%	2.74%[4]	28.10%
1/1/2019	to	6/30/2019	8.00%	13.66%	3.40%	3.40%	2.51%[4,5]	30.97%
7/1/2019	to	12/31/2019	8.75%	13.91%	3.40%	3.40%	2.51%[4,5]	31.97%
1/1/2020	to	6/30/2020	8.75%	13.91%	3.80%	3.80%	—[6]	30.26%
7/1/2020	to	12/31/2020	15.00%[7] / 10.00%[8]	9.41%[7] / 14.41%[8]	3.80%	3.80%	—[6]	32.01%
1/1/2021	to	6/30/2021	15.00%[7] / 10.00%[8]	9.41%[7] / 14.41%[8]	4.20%	4.20%	2.44%[4,5]	35.25%
7/1/2021	to	12/31/2021	15.50%[7] / 10.50%[8]	9.41%[7] / 14.41%[8]	4.20%	4.20%	2.44%[4,5]	35.75%
1/1/2022	**to**	**6/30/2022**	**15.50%[7] / 10.50%[8]**	**9.41%[7] / 14.41%[8]**	**4.60%**	**4.60%**	**6.32%[4,5,9]**	**40.43%**
7/1/2022	**to**	**12/31/2022**	**11.00%**	**14.91%**	**4.60%**	**4.60%**	**6.32%[4,5,9]**	**41.43%**

1 This informational schedule begins in 2006, the year the Amortization Equalization Disbursement for employers became effective.

2 All employer contribution rates include the HCTF allocation.

3 Senate Bills 10-146 and 11-076 required member contributions to increase by 2.50% and employer contributions to decrease by 2.50%.

4 Contributions from a nonemployer contributing entity are required by C.R.S. § 24-51-414 *et seq.* and are remitted to PERA as a single sum in July of each year. For purposes of this schedule, the amount allocated to the Judicial Division is expressed as a percentage of annual covered payroll.

5 The amount allocated to the Judicial Division is shown in both six-month segment contribution summaries. The rate presented in each segment is based on annual covered payroll for improved comparative analysis to the prior year.

6 House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

7 House Bill 20-1394 required member contributions to increase by 5.00% and employer contributions to decrease by 5.00% for all members of the Judicial Division except those employed by the Denver County Court.

8 Contribution rates for members of the Judicial Division employed by the Denver County Court.

9 House Bill 22-1029 required a restorative payment for the suspended 2020 contribution.

SCHEDULE OF CONTRIBUTION RATE HISTORY

DPS Division[1]

Years			Member Contribution Rate	Employer Contribution Rate[2]	Amortization Equalization Disbursement	Supplemental Amortization Equalization Disbursement	Employer Contribution PCOP Offset[3]	Nonemployer Contribution Rate	Total Contribution Rate
			Percent of Covered Payroll						
1/1/2010	to	12/31/2010	8.00%	13.75%	2.20%	1.50%	(15.04%)	—	10.41%
1/1/2011	to	12/31/2011	8.00%	13.75%	2.60%	2.00%	(14.72%)	—	11.63%
1/1/2012	to	12/31/2012	8.00%	13.75%	3.00%	2.50%	(15.37%)	—	11.88%
1/1/2013	to	12/31/2013	8.00%	13.75%	3.40%	3.00%	(14.51%)	—	13.64%
1/1/2014	to	12/31/2014	8.00%	13.75%	3.80%	3.50%	(16.89%)	—	12.16%
1/1/2015	to	12/31/2015	8.00%	10.15%[4]	4.20%	4.00%	(15.97%)	—	10.38%
1/1/2016	to	12/31/2016	8.00%	10.15%	4.50%	4.50%	(15.54%)	—	11.61%
1/1/2017	to	12/31/2017	8.00%	10.15%	4.50%	5.00%	(14.56%)	—	13.09%
1/1/2018	to	12/31/2018	8.00%	10.15%	4.50%	5.50%	(14.18%)	2.58%[5]	16.55%
1/1/2019	to	6/30/2019	8.00%	10.15%	4.50%	5.50%	(13.35%)[6]	2.61%[5,7]	17.41%
7/1/2019	to	12/31/2019	8.75%	10.40%	4.50%	5.50%	(13.60%)[6]	2.61%[5,7]	18.16%
1/1/2020	to	6/30/2020	8.75%	10.40%	4.50%	5.50%	(12.25%)[6]	—[8]	16.90%
7/1/2020	to	12/31/2020	10.00%	10.90%	4.50%	5.50%	(12.75%)[6]	—[8]	18.15%
1/1/2021	to	6/30/2021	10.00%	10.90%	4.50%	5.50%	(12.09%)	2.33%[5,7]	21.14%
7/1/2021	to	12/31/2021	10.50%	10.90%	4.50%	5.50%	(12.09%)	2.33%[5,7]	21.64%
1/1/2022	**to**	**6/30/2022**	**10.50%**	**10.90%**	**4.50%**	**5.50%**	**(11.22%)**[6]	**6.51%**[5,7,9]	**26.69%**
7/1/2022	**to**	**12/31/2022**	**11.00%**	**11.40%**	**4.50%**	**5.50%**	**(11.72%)**[6]	**6.51%**[5,7,9]	**27.19%**

1 The DPS Division Trust Fund was established on January 1, 2010, and received the net assets of the DPSRS.

2 All employer contribution rates shown include the DPS HCTF allocation.

3 An offset to the DPS Division rate is provided for under C.R.S. § 24-51-412. See Note 4 of the Notes to the Financial Statements in the Financial Section.

4 On June 3, 2015, House Bill 15-1391 reduced the employer contribution rate with a retroactive effective date of January 1, 2015.

5 Contributions from a nonemployer contributing entity are required by C.R.S. § 24-51-414 *et seq.* and are remitted to PERA as a single sum in July of each year. For purposes of this schedule, the amount allocated to the DPS Division is expressed as a percentage of annual covered payroll.

6 To conform with this presentation of contribution rates, the annual PCOP offset for the calendar year has been adjusted based on the portion of the PCOP offset used to satisfy employer contribution requirements for each-six month segment.

7 The amount allocated to the DPS Division is shown in both six-month segment contribution summaries. The rate presented in each segment is based on annual covered payroll for improved comparative analysis to the prior year.

8 House Bill 20-1379 suspended the July 2020 contribution from the nonemployer contributing entity for the State's 2020-21 fiscal year.

9 House Bill 22-1029 required a restorative payment for the suspended 2020 contribution.

Employer Contributions to Health Care Trust Funds

Division/Years			Percent of Covered Payroll Allocated from Employer Contribution to Health Care Trust Funds
State Division			
1/1/2006	to	**12/31/2022**	**1.02%**
School Division			
1/1/2006	to	**12/31/2022**	**1.02%**
Local Government Division			
1/1/2006	to	**12/31/2022**	**1.02%**
Judicial Division			
1/1/2006	to	**12/31/2022**	**1.02%**
DPS Division[1]			
1/1/2010	to	**12/31/2022**	**1.02%**

1 The DPS HCTF was established on January 1, 2010, and received the balance of the Denver Public Schools Retiree Health Benefit Trust.

PRINCIPAL PARTICIPATING EMPLOYERS

State Division Trust Fund[1,2]

	2022			2014		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
State of Colorado	**49,492**	**1**	**97.25%**	50,508	1	91.33%

School Division Trust Fund[1,2]

	2022			2014		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
Jefferson County School District R-1	**11,831**	**1**	**9.24%**	12,184	1	10.19%
Douglas County School District Re 1	**8,829**	**2**	**6.89%**	8,345	2	6.98%
Cherry Creek School District 5	**7,972**	**3**	**6.23%**	7,670	3	6.41%
Adams-Arapahoe School District 28J	**5,673**	**4**	**4.43%**	5,453	4	4.56%
Adams 12 Five Star Schools	**5,348**	**5**	**4.18%**	5,261	5	4.40%
Poudre School District R-1	**4,925**	**6**	**3.85%**	4,425	7	3.70%
Boulder Valley School District RE2	**4,693**	**7**	**3.66%**	4,678	6	3.91%
St. Vrain Valley School District RE1J	**4,630**	**8**	**3.62%**	4,189	9	3.50%
Academy School District #20	**4,117**	**9**	**3.21%**	3,660	10	3.06%
Colorado Springs School District 11	**4,016**	**10**	**3.14%**	4,292	8	3.59%

Local Government Division Trust Fund[1,2]

	2022			2014		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
City of Colorado Springs	**3,536**	**1**	**29.22%**	3,054	1	25.27%
Boulder County	**2,156**	**2**	**17.81%**	2,067	2	17.11%
City of Boulder	**1,374**	**3**	**11.35%**	1,413	3	11.69%

Judicial Division Trust Fund[1,2]

	2022			2014		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
Judicial Department	**334**	**1**	**98.24%**	318	1	95.21%

DPS Division Trust Fund[1,2]

	2022			2014		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
Denver Public School District No. 1	**15,254**	**1**	**100.00%**	15,414	1	100.00%

[1] Guidance under GASB 67 classifies a primary government and its component units as one employer. Due to this change, data for the number of members by employer for years prior to 2014 is not available.

[2] This employer count is presented for purposes of complying with GASB 67 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA.

PRINCIPAL PARTICIPATING EMPLOYERS (CONTINUED)

Health Care Trust Fund[1,2]

	2022			2017		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
State of Colorado	**49,492**	**1**	**25.86%**	51,022	1	26.60%
Jefferson County School District R-1	**11,831**	**2**	**6.18%**	12,295	2	6.41%
Douglas County School District Re 1	**8,829**	**3**	**4.61%**	9,100	3	4.75%
Cherry Creek School District 5	**7,972**	**4**	**4.17%**	7,929	4	4.13%
Adams-Arapahoe School District 28J	**5,673**	**5**	**2.96%**	5,271	5	2.75%
Adams 12 Five Star Schools	**5,348**	**6**	**2.79%**	5,075	6	2.65%
Poudre School District R-1	**4,925**	**7**	**2.57%**			
Boulder Valley School District RE2	**4,693**	**8**	**2.45%**	4,763	7	2.48%
Colorado Springs School District 11				4,448	8	2.32%

DPS Health Care Trust Fund[1,2]

	2022			2017		
Employer	Covered Active Members December 31	Rank	Percentage of Total System	Covered Active Members December 31	Rank	Percentage of Total System
Denver Public School District No. 1	**15,254**	**1**	**100.00%**	15,991	1	100.00%

1 Guidance under GASB Statement No. 74 classifies a primary government and its component units as one employer. Due to this change, data for the number of members by employer for years prior to 2017 is not available.

2 This employer count is presented for purposes of complying with GASB 74 only. For all other purposes, the definition of an employer is governed by Title 24, Article 51 of the C.R.S., PERA's Rules, 8 CCR 1502-1, and, if applicable, the employer's affiliation agreement with PERA.

AFFILIATED EMPLOYERS LIST

A list of affiliated employers can be found on PERA's website on the Employers Page under Affiliating with PERA.

Acronym Section

COLORADO PERA®

AAL	Actuarial Accrued Liability
AAP	Automatic Adjustment Provision
ACFR	Annual Comprehensive Financial Report
ADC	Actuarially Determined Contribution
AED	Amortization Equalization Disbursement
AI	Annual Increase
AIR	Annual Increase Reserve
ASOP	Actuarial Standards of Practice
BOCES	Boards of Cooperative Educational Services
CAPs	Capital Accumulation Plans
CIF	Combined Investment Fund
CMBS	Commercial Mortgage-Backed Securities
CMS	Centers for Medicare & Medicaid Services
COF	Common Operating Fund
C.R.S.	Colorado Revised Statutes
DB	Defined Benefit
DC	Defined Contribution
DC Plan	Defined Contribution Retirement Plan
DPS	Denver Public Schools
DPS HCTF	Denver Public Schools Health Care Trust Fund
DPSRS	Denver Public Schools Retirement System
EA	Entry Age Actuarial Cost Method
ESG	Environmental, Social, and Governance
FNP	Fiduciary Net Position
GAAP	Generally Accepted Accounting Principles
GASB	Governmental Accounting Standards Board
GDP	Gross Domestic Product
HAS	Highest Average Salary
HB	House Bill
HCTF	Health Care Trust Fund
IRC	Internal Revenue Code
MBS	Mortgage-Backed Securities
MD&A	Management's Discussion and Analysis
NAV	Net Asset Value
NOL	Net OPEB Liability
NPA	Net Pension Asset
NPL	Net Pension Liability
OPEB	Other Postemployment Benefit
PCOP	Pension Certificates of Participation
RSI	Required Supplementary Information
SAED	Supplemental Amortization Equalization Disbursement
SB	Senate Bill
SEIR	Single Equivalent Interest Rate
SRI	Socially Responsible Investment
TOL	Total OPEB Liability
TPL	Total Pension Liability
UAAL	Unfunded Actuarial Accrued Liability

COLORADO PERA®

Colorado PERA thanks the following members and employers for being featured in the 2022 Annual Comprehensive Financial Report (ACFR): *James A. Middleton/Jefferson County School District R-1; Judge Jaclyn Casey Brown/Judicial Department (Court of Appeals); and Colorado Parks and Wildlife (Department of Natural Resources).*

COLORADO PERA

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