



FINANCIAL

Section

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Independent Auditor's Report

To the Board of Trustees
Missouri State Employees' Retirement System
Jefferson City, Missouri

Report on the Audit of the Financial Statements

Opinions

We have audited the financial statements of pension funds and custodial fund, collectively the aggregate fiduciary funds of the Missouri State Employees' Retirement System (MOSERS), a pension (and other employee benefit) trust fund of the state of Missouri, as of and for the year ended June 30, 2024, and the related notes to the financial statements, which collectively comprise MOSERS' basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the respective fiduciary net position of the pension funds and custodial fund, collectively the aggregate fiduciary funds of MOSERS, as of June 30, 2024, and the respective changes in fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

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

Responsibilities of Management for the Financial Statements

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

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about MOSERS' 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.

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Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our 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 MOSERS' 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 MOSERS' ability to continue as a going concern for a reasonable period of time.

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

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and required supplementary information on pages 20-23 and 52-59 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 an opinion on the financial statements that collectively comprise the MOSERS *Basic Financial Statements*. The additional supplementary information accompanying financial information listed as additional supplemental schedules in the table of contents 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 auditing standards generally accepted in the United States of America. In our opinion, the additional supplementary information accompanying financial information listed as additional supplemental schedules in the table of contents are 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 auditor's report thereon. Our opinion on the *Basic Financial Statements* does 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 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.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated October 21, 2024, on our consideration of the MOSERS 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 MOSERS' 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 MOSERS' internal control over financial reporting and compliance.



Boise, Idaho

October 21, 2024

Management's Discussion and Analysis

This discussion and analysis of the Missouri State Employees' Retirement System (MOSERS) provides an overview of the retirement system's financial activities for the fiscal year ended June 30, 2024. It is intended to be used in conjunction with the *Transmittal Letter* beginning on page 6 and *Basic Financial Statements* and *Notes to the Basic Financial Statements*, beginning on page 24 of this report.

Using This Financial Report

This *Annual Comprehensive Financial Report* (ACFR) reflects the activities of MOSERS as reported in the *Statements of Fiduciary Net Position* and the *Statements of Changes in Fiduciary Net Position*, which begin on page 24. These statements are prepared in conformity with generally accepted accounting principles. The *Notes to the Basic Financial Statements* are an integral part of the financial statements and include additional information not readily evident in the statements themselves. The *Required Supplementary Information* (RSI) and *Additional Financial Information* following the *Notes to the Basic Financial Statements* provide historical information and additional details considered useful in evaluating the condition of the plan.

See the *Actuarial Section* of this report for a detailed discussion of the actuarial value of assets and liabilities and the funded status of the plans.

The *Basic Financial Statements* contained in this section of the ACFR consist of:

- The *Statements of Fiduciary Net Position* report the fiduciary funds' assets, deferred outflows, liabilities, deferred inflows, and resulting net position, where total assets plus deferred outflows less current liabilities and deferred inflows equal net position held in trust for future pension benefits available at the end of the fiscal year. It is a snapshot of the financial position of the fiduciary funds at that specific point in time.
- The *Statements of Changes in Fiduciary Net Position* summarize the fiduciary funds' financial transactions that have occurred during the fiscal year where additions less deductions equal the change in net position. It supports the change that has occurred from the prior year's net position on the *Statements of Fiduciary Net Position*.
- The *Notes to the Basic Financial Statements* are an integral part of the above financial statements and include additional information not readily evident in the statements themselves.

Funding Analysis

Funded status is presented using two different valuation methods within this document for two different purposes. One valuation method is for the purpose of determining contribution rates, and the other method is required by Governmental Accounting Standards Board (GASB) Statement 67, *Financial Reporting for Pension Plans*, to provide information about the net pension liability as of a specific point in time using the fair value of investment assets. The valuation method used for determining contribution rates smooths investment activity over a period of five years to minimize the impact investment market volatility can have on contribution rates.

Funding Methodology for Determining Contribution Rates

The unfunded actuarial accrued liability (UAAL) for the Missouri State Employees' Plan (MSEP) increased by approximately \$700 million from \$6.9 billion at June 30, 2023, to \$7.6 billion at June 30, 2024, with a corresponding decrease in funded percentage from 57.6% to 55.3%. Like last year, the primary causes of the increase in the UAAL were actuarial losses on active employee covered payroll and retiree cost of living adjustments driven by inflation. Increases to both of these exceeded long-term actuarial assumptions. The increase in covered payroll of active employees, along with the COLA adjustments to pension benefits, caused the projection of future benefit payments to increase. Although increases in covered payroll increase the UAAL, it has a less significant effect on the contribution rate because the larger covered payroll base naturally results in more retirement contributions flowing into the system.

The year over year payroll growth for active members was most pronounced during the first half of the fiscal year. The growth in number of active MSEP members continued into the first half of this fiscal year, however it mostly leveled off during the second half of the year after getting close to pre-pandemic levels.

The UAAL for the Judicial Plan increased by \$19 million from \$447 million at June 30, 2023, to \$466 million at June 30, 2024, with a decrease in funded percentage from 31.7% to 31.0%.

The assumed rate of investment return was 6.95% for both the MSEP and the Judicial Plan.

Financial Reporting Methodology required by GASB Statement 67

The fund net position as a percentage of total pension liability decreased from 52.9% at June 30, 2023, to 52.0% at June 30, 2024, for the MSEP Fund, and increased from 29.08% to 29.12% for the Judicial Plan Fund. See the *Required Supplementary Information* section of this report for more information about net pension liability and related information.

Financial Reporting Highlights

The *Summary Comparative Statements of Fiduciary Net Position*, and the *Summary Comparative Statements of Changes in Fiduciary Net Position* presented below are designed to provide the reader of this report with a high level overview of MOSERS' financial activity and net position.

Summary Comparative Statements of Fiduciary Net Position

	As of June 30, 2024	As of June 30, 2023	Amount of Change	Percentage Change
Assets				
Administrative operating cash and equivalents	\$ 16,374,267	\$ 14,176,248	\$ 2,198,019	15.50%
Receivables	682,177,634	801,745,263	(119,567,629)	(14.91)
Investments	12,303,351,397	12,207,445,578	95,905,819	0.79
Capital assets, net of accumulated depreciation	16,728,940	15,148,833	1,580,107	10.43
Total assets	13,018,632,238	13,038,515,922	(19,883,684)	(0.15)
Deferred outflow of resources	1,008,133	1,078,184	(70,051)	(6.50)
Liabilities				
Administrative and other payables	18,426,077	16,049,335	2,376,742	14.81
Investment related payables and obligations	3,993,980,968	4,263,787,195	(269,806,227)	(6.33)
MOSERS investment portfolio liability (MIP)	3,838,147	3,632,433	205,714	5.66
Net OPEB liability	5,574,870	5,635,287	(60,417)	(1.07)
Total liabilities	4,021,820,062	4,289,104,250	(267,284,188)	(6.23)
Deferred inflow of resources	2,185,471	2,256,993	(71,522)	(3.17)
Net position restricted for fiduciary activities	\$ 8,995,634,838	\$ 8,748,232,863	\$ 247,401,975	2.83

The largest components of the net position of the pension trust funds are investments, and investment related receivables and liabilities. The majority of MOSERS' receivable balances are comprised of investment related transactions, such as pending trade settlements, and interest and dividends receivable. Investment related liabilities include payables for investments purchased, manager fees payable, and obligations under repurchase agreements. MOSERS investment portfolio liability (MIP) represents the amount Missouri Deferred Compensation Plan participants have invested in MOSERS' portfolio.

The investment portfolio, which includes investments, and investment related receivable and liability balances experienced positive performance this year. The markets were somewhat volatile during the fiscal year due to uncertainty about economic growth, concern about geopolitical events, and optimism about technological advancements in artificial intelligence. MOSERS experienced a 6.59% time-weighted return on plan assets. MOSERS, like other mature pension plans, relies in part on cash flow generated from investments, to fund benefit payments.

Another noteworthy change in MOSERS' *Statement of Fiduciary Net Position* is the increase in capital assets related to the continued development of our new pension administration system. MOSERS capitalized approximately \$1.7 million in project costs incurred during the year. When the new pension administration system is implemented, these capitalized software development project costs will be amortized over the estimated useful life of the system. The project timeline has been extended to allow more time to test the system prior to deployment, and the project is now expected to be completed in 2025.

Summary Comparative Statements of Changes in Fiduciary Net Position

	Year Ended June 30, 2024	Year Ended June 30, 2023	Amount of Change	Percentage Change
Additions				
Contributions	\$ 811,296,711	\$ 1,206,881,008	\$ (395,584,297)	(32.78%)
Net investment income	569,520,077	181,851,788	387,668,289	213.18
Miscellaneous income	481,148	480,766	382	0.08
Total additions	1,381,297,936	1,389,213,562	(7,915,626)	(0.57)
Deductions				
Benefit payments	1,070,147,669	1,024,251,130	45,896,539	4.48
Premium disbursements	34,574,075	31,737,102	2,836,973	8.94
Service transfers and refunds	16,708,833	12,425,868	4,282,965	34.47
Administrative expenses	12,465,384	11,555,745	909,639	7.87
Total deductions	1,133,895,961	1,079,969,845	53,926,116	4.99
Net increase (decrease)	247,401,975	309,243,717	(61,841,742)	(20.00)
Net position beginning of year	8,748,232,863	8,438,989,146	309,243,717	3.66
Net positions restricted for fiduciary activities	\$ 8,995,634,838	\$ 8,748,232,863	\$ 247,401,975	2.83

Investment Results

MOSERS' total fund net position increased by \$0.2 billion, to end at \$9.0 billion in fiscal year 2024. Net position increased slightly from last year, driven primarily by investment returns. The fund returned a time-weighted return of 6.59% in fiscal year 2024 compared to 2.53% in fiscal year 2023.

In an effort to bring inflation under control, the Federal Reserve steadily increased the federal funds rate over time until they reached a target rate range of 5.25% to 5.50% in July 2023. Yield rates for long treasuries continued to rise during fiscal year 2024. This shift to a higher interest rate environment, combined with uncertainty about the future, has generally resulted in mixed results in many asset classes this year. Like last year, growth assets experienced positive returns but our fixed income assets in total produced negative returns. As further discussed in the *Investment Section* of this report, we continue to recognize the importance of diversifying our investment assets to contribute to our long-term success.

It is also important to note that investment gains and losses are actuarially smoothed over a 5-year period to prevent market volatility from causing significant year-to-year changes in the contribution rate.

The *Investment Section* of this report contains additional information regarding investments activity.

Contribution Revenue

After excluding the \$500 million ad hoc contribution from the state of Missouri, contribution revenue increased by 14.8% from the prior year. This increase in contribution revenue is primarily due to two factors: the contribution rate increased, and the covered payroll of active benefit-eligible employees increased. The contribution rate is set in advance; however, unexpected changes in covered payroll can cause contribution revenue to come in above or below expectation.

The employer retirement contribution rates for the MSEP members is a primary driver for total fund contributions revenue. This rate increased from 26.33% in fiscal year 2023 to 27.26% in fiscal year 2024. The employee contribution rates for 2011 tier members is set by statute at 4% of gross pay. The percent of MSEP 2011 tier members who contribute 4% continues to grow every year to make up a larger percentage of our overall membership base. As of June 30, 2024, 66% of the active membership population were MSEP 2011 members.

Covered payroll is the other primary factor that ultimately determines our contribution revenue. There was a significant increase in covered payroll during the fiscal year. The active MSEP membership base increased this year by 3.7%, close to levels immediately preceding the pandemic. Active MSEP member covered payroll increased this year by 11.1%. These increases were greater than our actuarial assumptions.

Judicial Plan contributions and Insurance fund premium contributions each account for less than 10% of total fund contributions revenues. Covered payroll for judges increased 6.6% over last year based on the actuarial valuation report. Judges contributions revenue was almost 5% greater than last year because of the increase in covered payroll. In addition, the active membership population was comprised of 77% of Judicial Plan 2011 tier members, compared to 73% last year. Insurance fund premium contributions were also higher than the prior year.

The *Actuarial Section* of this report contains more information about our actuarial assumptions and experience.

Benefits Expenses

Benefit payment expenses were 4.48% greater than the prior year due to a growing retiree population and cost-of-living adjustments (COLAs).

The population of retirees receiving benefits continued to grow during the fiscal year. A growing retiree population puts upward pressure on the contribution rate. Schedules of retirees added and removed from the benefit rolls can be viewed on pages 104-105 of the *Actuarial Section* of this report.

COLAs provided to existing benefit recipients also cause benefit expenses to increase each year. Members employed before August 28, 1997, who retired under the MSEP, receive a COLA of at least 4% each year (maximum 5%) until they reach their COLA cap. For general state employees, COLAs are based on 80% of the percentage increase in the average Consumer Price Index (CPI) from one year to the next. The maximum increase is 5% (minimum 0%). The cost-of-living adjustment for fiscal year 2024 was 3.293%.

Administrative Expenses

Administrative expenses totaled \$12.5 million in fiscal year 2024, compared to \$11.6 million in fiscal year 2023. MOSERS experienced an increase in administrative expense due mainly due to increases in personnel services, fringe benefits, and professional services.

Requests for Information

This financial report is designed to provide a general overview of the System's finances for all those who are interested. Questions concerning any of the information provided in this report or requests for additional information should be addressed to MOSERS, at P.O. Box 209, Jefferson City, MO 65102 or by email at sunshinelanrequest@mosers.org.

Statements of Fiduciary Net Position

As of June 30, 2024

	MSEP Pension Fund	Judicial Pension Fund	Insurance Custodial Fund	Total
Assets				
Administrative operating cash and cash equivalents	\$ 10,812,204	\$ 1,887,062	\$ 3,675,001	\$ 16,374,267
Receivables				
Contributions and premiums	32,150,952	1,794,680	1,038,278	34,983,910
Investment income	368,067,856	8,133,653	0	376,201,509
Investment sales	265,051,192	5,872,054	0	270,923,246
Other receivables	68,969	0	0	68,969
Total receivables	665,338,969	15,800,387	1,038,278	682,177,634
Investments and derivatives				
Investments - cash and cash equivalents	1,352,193,931	29,937,340	0	1,382,131,271
Investments - treasuries	4,415,730,266	97,706,558	0	4,513,436,824
Investments - fixed income	225,950,092	5,010,466	0	230,960,558
Investments - equities	190,795,788	4,213,943	0	195,009,731
Investments - real estate investment trusts	429,078,006	9,501,327	0	438,579,333
Investments - equity and fixed income commingled funds	985,515,345	21,799,968	0	1,007,315,313
Investments - alternatives and limited partnerships	4,431,522,226	98,026,926	0	4,529,549,152
Investments - derivative instruments	6,231,077	138,138	0	6,369,215
Total investments and derivatives	12,037,016,731	266,334,666	0	12,303,351,397
Capital assets, net of accumulated depreciation	16,728,940	0	0	16,728,940
Total assets	12,729,896,844	284,022,115	4,713,279	13,018,632,238
Deferred outflow of resources	986,102	22,031	0	1,008,133
Liabilities				
Administrative and benefit expense payables	12,555,501	753,593	4,297,166	17,606,260
Employee vacation and overtime liability	801,901	17,916	0	819,817
Payable for investments purchased	151,960,873	3,360,607	0	155,321,480
Management fees payable	1,160,370	26,443	0	1,186,813
Investment activities payable	277,698,980	6,133,451	0	283,832,431
Obligations under repurchase agreements	3,476,714,318	76,925,926	0	3,553,640,244
MOSERS investment portfolio liability (MIP)	3,755,065	83,082	0	3,838,147
Net OPEB liability	5,453,042	121,828	0	5,574,870
Total liabilities	3,930,100,050	87,422,846	4,297,166	4,021,820,062
Deferred inflow of resources	2,137,712	47,759	0	2,185,471
Net position restricted for pension activities	8,798,645,184	196,573,541	0	8,995,218,725
Net position restricted for custodial activities	0	0	416,113	416,113
Net position restricted for fiduciary activities	\$ 8,798,645,184	\$ 196,573,541	\$ 416,113	\$ 8,995,634,838

See accompanying *Notes to the Basic Financial Statements*.

Statements of Changes in Fiduciary Net Position

For the Year Ended June 30, 2024

	MSEP Pension Fund	Judicial Pension Fund	Insurance Custodial Fund	Total
Additions				
<i>Contributions and premiums</i>				
Employer contributions and premiums	\$ 671,523,865	\$ 40,748,235	\$ 16,240,835	\$ 728,512,935
Employee contributions and premiums	58,710,640	2,029,670	18,380,817	79,121,127
Member purchases of service credit	1,063,108	0	0	1,063,108
Service transfer contributions	4,220,333	0	0	4,220,333
Prepaid employer contributions discount	(1,620,792)	0	0	(1,620,792)
Total contributions and premiums	733,897,154	42,777,905	34,621,652	811,296,711
<i>Investment activity</i>				
Investing activity income:				
Net appreciation in fair value of investments	773,277,136	17,271,248	0	790,548,384
Interest	110,539,787	2,533,082	203,253	113,276,122
Dividends	23,146,091	516,404	0	23,662,495
Other	172,536	3,848	0	176,384
Total investing activity income	907,135,550	20,324,582	203,253	927,663,385
Investing activity expenses:				
Management and incentives fees	163,862,182	3,660,003	0	167,522,185
Custody and other fees	651,415	14,551	0	665,966
Consultant fees	868,752	19,383	0	888,135
Internal investment activity expenses	9,965,685	90,114	0	10,055,799
Total investing activity expenses	175,348,034	3,784,051	0	179,132,085
Reverse repurchase agreement activity:				
Income from assets in reverse repurchase agreements	18,176,926	418,223	0	18,595,149
Interest expense from reverse repurchase agreements	(193,294,810)	(4,311,562)	0	(197,606,372)
Total net loss from reverse repurchase agreement activity	(175,117,884)	(3,893,339)	0	(179,011,223)
Total net investment income	556,669,632	12,647,192	203,253	569,520,077
Miscellaneous income	1,025	3	480,120	481,148
Total additions	1,290,567,811	55,425,100	35,305,025	1,381,297,936
Deductions				
Benefit payments	969,924,539	48,947,605	0	1,018,872,144
Premium disbursements	0	0	34,574,075	34,574,075
BackDROP payments	51,101,956	0	0	51,101,956
Buyout and lump-sum payments	173,569	0	0	173,569
Service transfer payments	7,111,722	0	0	7,111,722
Contribution and premium refunds	9,518,285	31,249	47,577	9,597,111
Administrative expenses	11,885,804	99,460	480,120	12,465,384
Total deductions	1,049,715,875	49,078,314	35,101,772	1,133,895,961
Net increase in net position	240,851,936	6,346,786	203,253	247,401,975
Net position restricted for fiduciary activities:				
Beginning of year	8,557,793,248	190,226,755	212,860	8,748,232,863
End of year	\$ 8,798,645,184	\$ 196,573,541	\$ 416,113	\$ 8,995,634,838

See accompanying *Notes to the Basic Financial Statements*.

Notes to the Basic Financial Statements

Note 1 – Plan Descriptions and Contribution Information

The MSEP and the Judicial Plan are pension plans covering substantially all state of Missouri employees and judges.

Missouri State Employees’ Plan (MSEP)

The MSEP is a cost-sharing multiple-employer, defined benefit public employee retirement plan with two benefit structures known as the MSEP (closed plan) and MSEP 2000 (which includes the MSEP 2011 tier), which are administered by the Missouri State Employees’ Retirement System (MOSERS) in accordance with Sections 104.010 and 104.312 to 104.1215 of the Revised Statutes of Missouri (RSMo). As established under Section 104.320, RSMo, MOSERS is a body corporate and an instrumentality of the state. The System is vested with the powers and duties specified in Sections 104.010 and 104.312 to 104.1215, RSMo, and such other powers as may be necessary or proper to enable it, its officers, employees, and agents to carry out fully and effectively all the purposes of Sections 104.010 and 104.312 to 104.1215, RSMo.

Responsibility for the operation and administration of the System is vested in the 11-member MOSERS Board of Trustees (the Board) as defined by state law. Due to the nature of MOSERS’ reliance on funding from the state of Missouri and the overall control of the plan document by the legislative and executive branches of state government, the MSEP is considered a pension trust fund of the state of Missouri, and is included in the state’s financial reports as a pension trust fund.

The Board intends to follow a financing pattern that computes and requires contribution amounts which, expressed as a percent of active member payroll, will remain approximately level from year to year and from one generation of citizens to the next. For the year ended June 30, 2024, the employer contribution rate was 27.26% of covered payroll.

Complete recognition of the year-to-year swings in the fair value of System assets would produce contribution rate changes that would run counter to the “approximately level” goal. A common actuarial practice, referred to as asset smoothing, is used to address that issue. Recognizing the difference between the actual and assumed investment returns over a closed, five-year period helps ensure a more stable contribution rate.

At any point in time, the actuarial value of assets will be more or less than the fair value but, if the smoothing method is prudent and properly constructed, those values will converge over time. As of June 30, 2024, the ratio of actuarial value of assets to fair value of assets was 106.33%, for the MSEP.

Per the June 30, 2024, actuarial valuation, membership in the MSEP consisted of the following:

Retirees and beneficiaries currently receiving benefits		55,579
Active		
Vested	25,105	
Nonvested	19,575	44,680
Inactive		
Vested (not yet receiving benefits)*	17,962	
Nonvested (with contribution balances)	34,969	52,931
Total membership		153,190

** Includes 130 members on leave of absence and 491 members on long-term disability*

Generally, all full-time state employees, employed before July 2000, who became vested and were not covered under another state-sponsored retirement plan, are eligible for membership in the MSEP (closed plan). Full-time state employees who were employed after July 1, 2000, but before January 1, 2011, are members of the MSEP 2000.

Those first employed in a benefit-eligible position on or after January 1, 2011, are members of the MSEP 2011 tier of the MSEP 2000.

MOSERS participates as an employer in the MSEP and MSEP 2000, including the MSEP 2011 tier.

Unless otherwise delineated, data for the MSEP is inclusive of members in the MSEP 2000 and MSEP 2011, which all provide defined benefit pension, survivor, life insurance, and long-term disability benefits.

Employer contributions for the MSEP are determined through annual actuarial valuations. The required contributions are expressed as a percentage of covered payroll. The state of Missouri and its component employers make required contributions to the plans. Employer contributions for the fiscal year ended June 30, 2024, were 27.26% of covered payroll. Members of MSEP and MSEP 2000 do not make employee contributions. Members of MSEP 2011 tier are required to contribute 4% of covered payroll.

Final average pay (FAP) is the average pay of a member for the 36 full, consecutive months of service before termination of employment when the member's pay was greatest. If the member was on workers compensation leave of absence or medical leave of absence due to an employee illness, or on long-term disability, FAP is the amount of pay the member would have received, but for such leave of absence as reported and verified by the employing department. If the member was employed for less than 36 months, FAP is the average monthly pay of a member during the period for which the member was employed.

For a summary of benefits for general state employees, legislators, and statewide elected officials under the MSEP, MSEP 2000, and MSEP 2011 tier, refer to the *Summary of Plan Provisions* in the *Actuarial Section* of this report.

MSEP (closed plan)

General state employees are fully vested for benefits upon accruing five years of credited service. Under the MSEP, general employees may retire with full benefits upon the earliest of attaining:

- Age 65 with 5 years of service; or
- Age 60 with 15 years of service; or
- Age 48 with age and service equaling 80 or more – “Rule of 80.”

General employees may retire early at age 55 with at least 10 years of service with reduced benefits. The base benefit in the general employee plan is equal to 1.6% multiplied by the final average pay multiplied by years of credited service.

Members employed prior to August 28, 1997, receive cost-of-living adjustments (COLAs) annually based on 80% of the percentage increase in the average consumer price index (CPI) from one year to the next, with a minimum rate of 4% and maximum rate of 5% until the cumulative amount of COLAs equal 65% of the original benefit. Thereafter, the 4% minimum rate is eliminated. Members employed on or after August 28, 1997, and members who have met their COLA cap receive COLAs annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

Qualified, inactive-vested members may make a one-time election to receive the present value of their future benefit in a lump-sum payment rather than a monthly benefit at retirement age. To qualify, members must have left state employment on or after October 1, 1984, and prior to September 1, 2002, have less than 10 years of service, not be within five years of retirement eligibility, and meet age requirements. In addition, if members left state employment on or after August 28, 1997, and prior to September 1, 2002, the present value of their benefit must be less than \$10,000.

MSEP 2000

General state employees are fully vested for benefits upon accruing five years of credited service. Under the MSEP 2000, general employees may retire with full benefits upon the earliest of attaining:

- Age 62 with 5 years of service; or
- Age 48 with age and service equaling 80 or more – “Rule of 80.”

General employees may retire early at age 57 with at least five years of service with reduced benefits. The base benefit in the general employee plan is equal to 1.7% multiplied by final average pay multiplied by years of credited service.

Those retiring under the “Rule of 80” receive an additional temporary benefit equivalent to 0.8% multiplied by final average pay multiplied by years of credited service, which is payable until age 62.

COLAs are provided annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

MSEP 2011 Tier

On July 19, 2010, legislation was signed into law adding a new tier (MSEP 2011) to the MSEP 2000 defined benefit pension plan. This tier includes all members first employed in a benefit-eligible position on or after January 1, 2011.

Legislation signed into law on July 14, 2017, changed the original vesting requirement of 10 years to five years for actively employed members of the MSEP 2011, effective January 1, 2018.

Under the MSEP 2011, general employees may retire with full benefits upon the earliest of attaining:

- Age 67 with 5 years of service; or
- Age 55 with age and service equaling 90 or more – “Rule of 90.”

General employees may retire early at age 62 with at least five years of service with reduced benefits. The base benefit in the general employee plan is equal to 1.7% multiplied by final average pay multiplied by years of credited service.

Those retiring under “Rule of 90” receive an additional temporary benefit equivalent to 0.8% multiplied by final average pay multiplied by years of credited service, which is payable until age 62.

COLAs are provided annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

Judicial Plan

The Judicial Plan is a single-employer, defined benefit public employee retirement plan administered in accordance with Sections 476.445 to 476.690, RSMo. Responsibility for the operation and administration of the Judicial Plan is vested in the MOSERS Board of Trustees. Due to the nature of MOSERS’ reliance on funding from the state of Missouri and the overall control of the plan document by the legislative and executive branches of state government, the Judicial Plan is considered a pension trust fund of the state of Missouri financial reporting entity and is included in the state’s financial reports as a pension trust fund.

Judges and commissioners of the supreme court or the court of appeals, judges of any circuit court, probate court, magistrate court, court of common pleas, court of criminal corrections, justices of the peace, commissioners or deputy commissioners of the probate division of the circuit court appointed after February 29, 1972, in a first class county having a charter form of government in a city not within a county, commissioners of the juvenile division of the circuit court appointed pursuant to Section 211.023, RSMo, commissioners of the drug court or commissioners of any family court are eligible for membership in the Judicial Plan. The Judicial Plan provides defined benefit pension and survivor benefits. Members are immediately vested.

Per the June 30, 2024, actuarial valuation, membership in the Judicial Plan consisted of the following:

Retirees and beneficiaries currently receiving benefits		626
Active		
Vested	424	
Nonvested	0	424
Inactive		
Vested (not yet receiving benefits)		30
Total membership		1,080

Funding of the Judicial Plan on an actuarial basis began on July 1, 1998. Employer contributions are determined through annual actuarial valuations. For the year ended June 30, 2024, the employer contribution rate was 59.83% of covered payroll. The state of Missouri makes the employer contribution to the Judicial Plan. Members of the Judicial Plan (closed plan) do not make employee contributions. Members of the Judicial Plan 2011 tier are required to contribute 4% of covered payroll.

Judicial Plan (closed plan)

Members of the Judicial Plan may retire with full benefits upon the earliest of attaining:

- Age 62 with 12 years of service; or
- Age 60 with 15 years of service; or
- Age 55 with 20 years of service.

Employees may retire early at age 62 with less than 12 years of service, or age 60 with less than 15 years of service with a reduced benefit that is based upon years of service relative to 12 or 15 years.

In the Judicial Plan, the base benefit for members with 12 or more years of service is equivalent to 50% of compensation on the highest court served.

Members first employed prior to August 28, 1997, receive COLAs annually based on 80% of the percentage increase in the average CPI from one year to the next, with a minimum rate of 4% and a maximum rate of 5% until the cumulative amount of COLAs equals 65% of the original benefit. Thereafter, the 4% minimum rate is eliminated. Members first employed on or after August 28, 1997, and members who have met their COLA cap receive COLAs annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

Qualified, inactive-vested members may make a one-time election to receive the present value of their future benefit in a lump-sum payment rather than a monthly benefit at retirement age. To qualify, they must have left state employment on or after August 28, 1997, and prior to September 1, 2002, have less than 10 years of service, not be within five years of retirement eligibility, and have a benefit present value of less than \$10,000.

Judicial Plan 2011 Tier

On July 19, 2010, an additional tier of the defined benefit Judicial Plan was signed into law. This tier (Judicial Plan 2011) includes all new judicial members first employed as a judge on or after January 1, 2011.

Under the Judicial Plan 2011, members may retire with full benefits upon the earliest of attaining:

- Age 67 with 12 years of service; or
- Age 62 with 20 years of service.

Judicial Plan 2011 members may retire early at age 67 with less than 12 years of service with reduced benefits, or age 62 with less than 20 years of service with a reduced benefit based on years of service.

For a more detailed summary of benefits for members of the Judicial Plan, refer to the *Summary of Plan Provisions* in the *Actuarial Section* of this report.

Administrative Law Judges and Legal Advisors' Plan

On April 26, 2005, Senate Bill 202 was enacted, which terminated the Administrative Law Judges and Legal Advisors' Plan (ALJLAP) for new hires only. Under this legislation, administrative law judges and legal advisors (ALJs) who assume a position after April 26, 2005, and would have otherwise been covered by the ALJLAP will instead participate in the MSEP or the MSEP 2000, depending on when they initially became state employees. For fiscal years 2005 and after, all liabilities and assets of the ALJLAP were transferred and combined with the MSEP. Membership totals for the ALJLAP are included in the MSEP in all relevant sections of this report.

Missouri State Insured Defined Benefit Insurance Plan

The Missouri State Insured Defined Benefit Insurance Plan is administered through and underwritten by The Standard Insurance Company (The Standard), which is a third-party administrator with oversight by MOSERS. It provides basic life insurance in an amount equal to one times an employee's annual salary while actively employed (with a \$15,000 minimum) to eligible members of the MSEP, MSEP 2000, and MSEP 2011 (except employees of the Missouri Department of Conservation and certain state universities), Judicial Plan, Judicial Plan 2011, and certain members of the Public School Retirement System (PSRS).

The plan also provides duty-related death benefits, optional life insurance for active employees and retirees who are eligible for basic coverage, and a long-term disability insurance plan for eligible members. For a more detailed description of insurance benefits, refer to pages 118-119 in the *Actuarial Section* of this report.

Due to the nature of MOSERS' reliance on funding from the state of Missouri and its component employers, and the overall control of the plan document by the legislative and executive branches of state government, the Missouri State Insured Defined Benefit Insurance Plan is considered a component unit of the state of Missouri financial reporting entity and is included in the state's financial reports.

State of Missouri Deferred Compensation Plan (MO Deferred Comp)

MO Deferred Comp is a retirement savings plan for state of Missouri employees, including faculty and staff at 10 state colleges and universities. Money invested in the plan provides income in retirement to supplement the member's defined benefit pension and Social Security benefits. Funds are automatically deducted from the employee's pay and placed in their account. The participant decides how the money will be invested. Employees may also roll over eligible pre-tax distributions from other qualified retirement plans.

The MO Deferred Comp plan is comprised of a 457 deferred compensation plan for employee contributions and a related 401(a) plan for an employer incentive match contribution. MOSERS uses MissionSquare Retirement as an external provider for record keeping for the plans. These plans have separately issued financial statements. The net position of these plans was approximately \$2.3 billion and \$673.9 million as of June 30, 2024, for the 457 and 401(a) plans, respectively.

MOSERS unitizes investments for the purpose of allowing participants in the State of Missouri Deferred Compensation Plan the option to invest in the MOSERS investment portfolio (MIP). For financial reporting purposes, investments throughout this ACFR are reported in whole and include 0.04%, or approximately \$3.8 million, of the units invested in the MIP by Deferred Compensation participants. Effective June 30, 2017, the option to invest in the MIP fund was no longer available to Plan participants. All participants invested in the MIP fund as of that date may continue to defer into it, but no rollovers or new elections are permitted.

Audited financial statements for the State of Missouri Deferred Compensation Plan can be viewed online at www.modeferrredcomp.org.

Colleges & Universities Retirement Plan (CURP)

The Colleges & Universities Retirement Plan (CURP) is a defined contribution plan administered by MOSERS for education employees (as determined by the university) at nine Missouri state universities. Retirement income from the plan is dependent upon the employee's plan account balance at retirement. The employee's plan account balance is built from mandatory contributions to the plan and the investment returns generated from employee-selected investment options. To be eligible for the CURP, the employee must:

- Meet the definition of "education employee" as defined by their employer, and
- Be employed in this position for the first time on or after July 1, 2002, and
- Not have previous employment in a position covered by another defined benefit pension plan administered by MOSERS, and
- Be employed at a participating regional Missouri university.

After six years of participation in CURP, the employee may transfer to a MOSERS defined benefit pension plan and will immediately become a vested member of MSEP 2011. By transferring to MOSERS, the employee forfeits all rights to future participation in CURP (i.e., they can't go back to CURP). However, the employee will continue to own and control their CURP account. CURP activities are not included within this report.

Note 2 – Summary of Significant Accounting Policies

Basis of Accounting

The accompanying financial statements are prepared in accordance with accounting principles generally accepted in the U.S. that apply to governmental accounting on an accrual basis.

Contributions are recognized as revenues when due, pursuant to statutory requirements. Benefits, refunds, and BackDROP payments are recognized when due and payable. Administrative and other expenses are recorded when the corresponding liabilities are incurred.

Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the accompanying financial statements and disclosures. Actual results could differ from those estimates.

Method Used to Value Investments

Investment assets are reported at fair value, in accordance with Standards issued by the Governmental Accounting Standards Board (see Note 3 for discussion of the valuation methodology for investment assets). The *Schedule of Investments and Derivative Instruments Measured at Fair Value* in Note 3 presents the fair value information of the investments as reported on the *Statements of Fiduciary Net Position*.

MOSERS' Participation in Other Post-Employment Benefit (OPEB) Programs

Other Post-Employment Benefit (OPEB) related items, including: net OPEB liability, deferred outflows of resources, deferred inflows of resources, net OPEB expense, fiduciary net assets, and additions to and deductions from fiduciary net assets have been determined on the same basis as they are reported by MCHCP. For this purpose, employer contributions are recognized as revenue when due and payable. Benefits are recognized when due and payable in accordance with the terms of the Plan (see *Note 7 – MCHCP Post-Employment Retiree Health Care OPEB Program*).

Capital & Intangible Assets

The MOSERS building and other capital assets are stated at cost less accumulated depreciation. Intangible assets include software applications and are stated at cost less accumulated amortization. Intangible assets are reported with capital assets in the *Statements of Changes in Fiduciary Net Position*. Capital and intangible assets are depreciated on a straight-line basis over their estimated useful lives. MOSERS evaluates leases and subscription-based information technology arrangements to determine if they should be capitalized as right-to-use assets. Right-to-use assets are depreciated on a straight-line basis over the non-cancellable life of the lease, including only those optional periods for which MOSERS is reasonably certain to renew the subscription.

Note 3 – Cash and Investments

Cash Deposits with Financial Institutions

MOSERS requires its business bank to collateralize amounts on deposits that exceed the Federal Deposit Insurance Corporation (FDIC) insured amount. The types of collateral security shall be included on a list maintained by the State Treasurer’s office in accordance with Section 30.270, RSMo. Securities pledged as collateral are held in agency by a separate bank. As of June 30, 2024, all deposit balances with MOSERS’ business bank in excess of FDIC insurance limits were fully collateralized.

Investment Policy

Section 104.440, RSMo allows the Board of Trustees to invest the trust fund assets in accordance with the prudent person rule. In June 2018, the Board voted to adopt a new asset allocation, which includes four broad categories: growth, income, inflation hedge, and absolute return.

MOSERS’ policy, with respect to the allocation of invested assets, is established and amended by a majority vote by the Board of Trustees. The Board’s guiding principles with respect to the investment of MOSERS’ assets are to maximize total return within prudent risk parameters, and act in the exclusive interest of the members of the System. The Board has developed a policy allocation that is designed to achieve the long-term required return objectives of the System, given certain risk constraints. The current asset allocation reflects a diversified portfolio, which will perform well in a variety of economic conditions and will help reduce the portfolio’s overall volatility.

The Board has authorized staff to create and maintain a portfolio that utilizes a modest amount of leverage in order to diversify the risk across the four asset class categories contained in the portfolio. The market exposure is limited to 1.5 times capital. The limit may also be stated as 150% of capital. The table below illustrates the fair value, market exposure, and policy exposure of the portfolio by asset class as of June 30, 2024.

Schedule of Internally Managed Leverage

	Fair Value Capital	Percent of Portfolio at Fair Value	Market Exposure	Percent of Portfolio at Market Exposure	Policy Exposure
Growth	\$ 4,058,350,830	45.3%	\$ 4,047,455,791	45.2%	45.0%
Income	1,654,144,807	18.5	3,102,973,562	34.7	35.0
Inflation hedge	1,396,470,835	15.6	3,551,907,885	39.7	40.0
Absolute return	1,843,615,244	20.6	1,843,610,589	20.6	20.0
Total portfolio	\$ 8,952,581,716	100.0%	\$ 12,545,947,827	140.1%	140.0%

Percentages may not total due to rounding.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate rates of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future rates of return by the target asset allocation percentage and by adjusting for expected inflation, volatility, and correlations. Best estimates of the real rates of return for each major asset class included in MOSERS' target asset allocation as of June 30, 2024, are summarized in the table below.

Target Asset Allocation

Asset Class	Policy Allocation	Long-Term Expected Nominal Return*	Long-Term Expected Real Return	Weighted Average Long-Term Expected Nominal Return
Global public equities	30.0%	7.7%	5.8%	2.3%
Global private equities	15.0	9.3	7.4	1.4
Long treasuries	25.0	3.5	1.6	0.9
Core bonds	10.0	3.1	1.2	0.3
Commodities	5.0	5.5	3.6	0.3
TIPS	25.0	2.7	0.8	0.7
Private real assets	5.0	7.1	5.2	0.3
Public real assets	5.0	7.7	5.8	0.4
Hedge funds	5.0	4.8	2.9	0.2
Alternative beta	10.0	5.3	3.4	0.5
Private credit	5.0	9.5	7.6	0.5
Cash and cash equivalents**	(40.0)	0.0	0.0	0.0
	<u>100.0%</u>			
			Correlation/volatility adjustment	(0.6)
			Long-term expected net nominal return	7.2
			Less: investment inflation assumption	(1.9)
			Long-term expected geometric net real return	<u>5.3 %</u>

* Long-term expected arithmetic returns of the asset classes at the time of the asset allocation study for the portfolio.

** Cash and cash equivalents policy allocation amounts are negative due to use of leverage.

Money-Weighted Rate of Return

The annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 6.73% for the year ended June 30, 2024. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

Fair Value Measurement

MOSERS categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset 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).

- **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 that are measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

The 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.

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. MOSERS' assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset or liability. The tables on pages 35-36 show the fair value leveling of the investments and additional information for investments valued at net asset value.

Debt, equities, and investment derivatives classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities.

Debt securities classified in Level 2 have non-proprietary information that was readily available to market participants from multiple independent sources, which are known to be actively involved in the market. Pricing inputs may include market quotations, yields, maturities, call features, and ratings. Derivative securities classified in Level 2 are contracts whose values are derived daily from associated traded securities.

Fair values for the private real estate investments are based on appraisals. Fair values of the limited partnership investments are based on valuations of the underlying companies of the limited partnerships as reported by the general partner. Certain limited partnerships reflect values and related performance on a quarter lag basis due to the nature of those investments and the time it takes to value them. Fair value of the commingled funds is determined based on the underlying asset values. The remaining assets are primarily valued by the System's master custodian using the last trade price information supplied by various pricing data vendors.

Investments and Derivative Instruments Measured at Fair Value

	Total	Fair Value Measurement Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
June 30, 2024				
Investment by fair value level				
Treasuries				
U.S. government securities	\$ 4,513,436,824	\$ 4,513,436,824	\$ 0	\$ 0
Fixed income securities				
Corporate bonds and asset-backed securities	217,258,365	0	217,242,183	16,182
Non-U.S. sovereign	5,925,435	0	5,925,435	0
Municipal bonds	7,540,854	0	7,540,854	0
Collateralized mortgage obligations	235,904	0	235,869	35
Total fixed income securities	230,960,558	0	230,944,341	16,217
Equity				
Real estate investment trusts	438,579,333	438,579,333	0	0
Equity mutual funds	194,845,623	194,845,623	0	0
Other equity securities	164,108	105,690	0	58,418
Total equities	633,589,064	633,530,646	0	58,418
Total investment by fair value level	5,377,986,446	5,146,967,470	230,944,341	74,635
Investments measured at the NAV				
Commingled funds - equity funds	759,242,099			
Commingled funds - investment grade fixed income funds	248,073,214			
Commingled funds - short-term investment funds	16,162,000			
Hedge funds	2,941,425,081			
Private markets funds	1,588,124,071			
Total investments measured at the NAV	5,553,026,465			
Total investments measured at fair value	10,931,012,911	5,146,967,470	230,944,341	74,635
Investment derivative instruments				
Future contracts	4,906,782	4,906,782	0	0
Credit default swap contracts	1,462,433	0	1,462,433	0
Total investment derivative instruments	6,369,215	4,906,782	1,462,433	0
Investments at cost\contract value:				
Cash held in investment accounts	645,969,271			
Repurchase agreements	720,000,000			
Total investments at cost\contract value	1,365,969,271			
Total investments	12,303,351,397	5,151,874,252	232,406,774	74,635
Obligations under repurchase agreements	(3,553,640,244)			
Total investments, net of obligations under repurchase agreements	\$ 8,749,711,153	\$ 5,151,874,252	\$ 232,406,774	\$ 74,635

Investments Measured at the Net Asset Value

	June 30, 2024	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period (Days)
Commingled fund - equity funds	\$ 759,242,099		Daily, Monthly	1-10
Commingled fund - investment grade fixed income funds	248,073,214		Daily	2
Commingled fund - short-term investment fund	16,162,000		Daily	0
Active hedge funds				
Equity market neutral	179,802,085		Quarterly	90
Fund-of-funds	1,234,415,078		Monthly, Quarterly	10-95
Merger arbitrage	120,096,791		Monthly	45
Multi-strategy	1,104,596,877		Monthly, Quarterly	60-90
Quantitative	104,616,603		Monthly, Quarterly	30-60
Relative value volatility	94,339,354		Monthly	30
Securitized credit	100,483,468			
Pending liquidated hedge funds	3,074,825			
Private markets funds	1,588,124,071	\$ 972,228,255		
Total investments measured at the net asset value (NAV)	<u>\$ 5,553,026,465</u>	<u>\$ 972,228,255</u>		

- **Commingled fund - equity funds** – Four equity funds are considered to be commingled in nature. Each are valued at the NAV held at the end of the period based upon the fair value of the underlying investments.
- **Commingled fund - investment grade fixed income funds** – Three fixed income funds are considered to be commingled in nature and are valued at the NAV held at the end of the period based upon the fair value of the underlying investments.
- **Commingled fund - short term investment fund** – One short-term investment fund is considered to be commingled in nature and is valued at the NAV held at the end of the period based upon the fair value of the underlying investments.
- **Equity market neutral hedge fund** – Consisting of one fund, this strategy invests in both long and short U.S. and global equity securities, with the goal of having little to no net market exposure. This investment is valued at the NAV, is redeemable quarterly, and is not subject to lock-up restrictions.
- **Fund-of-funds** – Consisting of four funds, these funds seek to provide diversification by holding a number of funds within a single fund structure. These investments are valued at the NAV, are redeemable monthly or quarterly, and are subject to liquidation of the underlying funds.
- **Merger arbitrage hedge fund** – Consisting of one fund, this strategy invests in the common stock of companies that are involved in publicly announced mergers and seeks to generate attractive returns while dampening volatility. This investment is valued at the NAV, is redeemable monthly, and is not subject to lock-up restrictions.
- **Multi-strategy hedge funds** – Consisting of six funds, these funds aim to pursue varying strategies in order to diversify risks and reduce volatility. These investments are valued at the NAV, are redeemable monthly or quarterly, but are subject to lock-up restrictions.
- **Quantitative hedge funds** – Consisting of two funds, this strategy attempts to achieve uncorrelated returns using advanced statistical methods to select securities across liquid public markets and systematic volatility trading. These investments are valued at the NAV, are redeemable monthly or quarterly, and are not subject to lock-up restrictions.
- **Relative value volatility hedge funds** – Consisting of one fund, this strategy invests liquid volatility-related instruments in listed futures and options primarily in US markets, with the goal of having little to no net market exposure. This investment is valued at the NAV, is redeemable monthly, and is not subject to lock-up restrictions.
- **Securitized credit hedge fund** – Consisting of one fund, this strategy invests in investment grade synthetic securitizations primarily in the US and Europe. This investment is valued at the NAV and is not redeemable.

- **Pending liquidated hedge funds** – Consisting of seven funds which have been fully redeemed as of June 30, 2024, for which MOSERS is awaiting final distribution of the proceeds, which will be received upon sale of the underlying investments or upon completion of the audit of the firm’s annual financial statements.
- **Private markets funds** – The MOSERS private markets portfolio consists of 59 funds with exposure to buyout funds, direct lending, distressed funds, infrastructure, energy, secondary, royalty funds, special situations, and U.S. commercial real estate. The timber portfolio consists of one fund in liquidation which invests in global timberland. The fair values of the majority of these funds have been determined using net assets valued one quarter in arrears plus current quarter cash flows. Most of these funds are not eligible for redemption. Distributions are received as underlying investments in the funds are liquidated, which on average, can occur over the span of five to 10 years.

Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations to MOSERS. As of June 30, 2024, MOSERS’ fixed income assets that are not U.S. government guaranteed represented 27.9% of fixed income securities. In preparing this report, credit risk associated with all fixed income holdings, including collateral for repurchase agreements, has been included. The tables on the following page summarize MOSERS’ fixed income security exposure levels and credit qualities.

As a matter of practice, there are no overarching limitations for credit risk exposures within the overall fixed income portfolio. Each individual portfolio within fixed income is managed in accordance with operational guidelines that are specific as to permissible credit quality ranges, exposure levels within individual quality tiers, and average credit quality.

Credit risk for derivative instruments held by the System results from counterparty risk assumed by MOSERS. This is essentially the risk that the counterparty to a MOSERS transaction will be unable to meet its obligation. Information regarding MOSERS’ credit risk related to derivatives is found under the derivatives disclosures beginning on page 41 of the notes.

The commingled fund - investment grade fixed income funds are invested and reinvested primarily in a portfolio of U.S. dollar denominated investment grade securitized debt obligations, with the objective of approximating the total rate of return of the market for debt securities as defined by the *Bloomberg U.S. Securitized Index*. The average rating for the underlying securities within this fund is AA+.

Average Credit Quality and Exposure Levels of Nongovernment Guaranteed Securities

Fixed Income Security Type	Fair Value June 30, 2024	Percent of all Fixed Income Assets	Weighted Average Credit Quality	Ratings Dispersion Requiring Further Disclosure
Asset-backed securities	\$ 2,541,035	0.0 %	AAA	See below
Collateralized mortgage obligations	235,904	0.0	AA+	See below
Corporate bonds	214,717,330	3.3	A-	See below
Municipal bonds	7,540,854	0.1	AA-	See below
Non-U.S. sovereign	5,925,435	0.1	BBB	See below
Total nongov't. guaranteed fixed income securities	230,960,558	3.5		
Nongov't. guaranteed repurchase agreements	640,000,000	10.0	Not rated	None
Bank deposits held in STIF account	650,000,000	10.2	FDIC insured	None
Commingled funds - investment grade fixed income	248,073,214	3.9	Not rated	None
Pooled instruments	16,162,000	0.3	AAA	None
Total nongov't. guaranteed securities	1,785,195,772	27.9		
U.S. government securities held in portfolio	4,513,436,824	70.8		
Repurchase agreement with U.S. government securities held as collateral	80,000,000	1.3		
Total fixed income securities	\$ 6,378,632,596	100.0%		

Ratings Dispersion Detail - Fair Value

Credit Rating Level	Asset-Backed Securities	Collateralized Mortgage Obligations	Corporate Bonds	Municipal Bonds	Non-U.S. Sovereign
AAA	\$ 2,524,852	\$ 0	\$ 9,108,700	\$ 966,937	\$ 0
AA	0	235,869	7,585,762	3,987,320	1,028,197
A	0	0	89,330,759	2,586,597	2,111,780
BBB	0	0	105,450,712	0	2,453,657
BB	0	0	3,241,397	0	331,801
Not rated	16,183	35	0	0	0
	\$ 2,541,035	\$ 235,904	\$ 214,717,330	\$ 7,540,854	\$ 5,925,435

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. This risk is managed by using the effective duration or option adjusted methodology. It is widely used in the management of fixed income assets by quantifying the risk of interest rate changes. This methodology takes into account optionality on bonds and scales the risk of price changes on bonds depending upon the degree of change in rates and the slope of the yield curve. Within the investment policy, operational guidelines specify the degree of interest rate risk taken within the System’s fixed income portfolios, with the exception of some portfolios in which credit risk is the predominant factor and is also controlled by specific guidelines. MOSERS believes that the reporting of effective duration found in the tables below quantifies to the fullest extent possible the interest rate risk of the System’s fixed income securities.

MOSERS invests in mortgage-backed securities, which have embedded within them the option of being repaid, whereby the borrower has the option to keep the debt outstanding in rising interest rate environments or repay the debt in declining interest rate environments, a factor that advantages the issuer. This risk is incorporated within the effective duration calculation used in the interest rate risk analysis.

Effective Duration of Fixed Income Assets by Security Type

Fixed Income Security Type	Fair Value June 30, 2024	Percent of all Fixed Income Assets	Weighted Average Effective Duration (Years)	Interest Rate Risk Requiring Further Disclosure
U.S. treasuries	\$ 4,513,436,824	70.8%	7.9	See below
Asset-backed securities	2,541,035	0.0	3.8	None
Collateralized mortgage obligations	235,904	0.0	0.1	None
Corporate bonds	214,717,330	3.3	7.2	None
Municipal bonds	7,540,854	0.1	8.2	None
Non-U.S. sovereign	5,925,435	0.1	10.2	None
Bank deposits held in STIF account	650,000,000	10.2	0.0	None
Repurchase agreements	720,000,000	11.3	0.0	None
Commingled funds - investment grade fixed income	248,073,214	3.9	5.9	None
Pooled instruments	16,162,000	0.3	0.0	None
	<u>\$ 6,378,632,596</u>	<u>100.0%</u>	<u>6.1</u>	

Effective Duration Analysis of U.S. Treasuries

Maturity	Fair Value June 30, 2024	Average Effective Duration of the Security Type (Years)	Contribution to Effective Duration (Years)
Less than 1 year to maturity	\$ 401,569,286	0.2	0.0
1- to 10-year maturities	2,425,807,625	4.4	2.4
Long coupon treasuries	1,686,059,913	14.7	5.5
	<u>\$ 4,513,436,824</u>		<u>7.9</u>

Repurchase Agreements

Tri-party repurchase agreements (repos) are a secured loan by a financial institution with the collateral held at a custodian bank. In a tri-party repo transaction, MOSERS transfers cash to a financial institution and the financial institution transfers securities to the custodian bank. Simultaneously, the financial institution promises to repay the loan in the future plus interest in exchange for the return of the securities.

Reverse repurchase agreements (reverse repos) are used to convert securities into cash. In a reverse repo transaction, MOSERS transfers securities that are owned in the portfolio to a financial institution and the financial institution transfers cash to MOSERS. Simultaneously, MOSERS promises to repay the loan in the future plus interest in exchange for the return of the securities.

Typical collateral for repos and reverse repos include treasury securities, agency securities, mortgage-backed securities, investment grade corporate bonds, commercial paper, and common stock. Repos and reverse repos are typically done for an overnight term; however, they can be done for a longer term. MOSERS enters into repo transactions to earn interest on short-term funds and enters into reverse repos to finance the purchase of additional securities.

The yield earned by MOSERS on the repo transactions ranged from 5.06% to 5.44% with maturities of one to five days.

The yield earned by the counterparties on the reverse repo transactions ranged from 4.30% to 5.60% and had maturities of one month to one year. The maturities of the investments made with reverse repo proceeds generally have maturities of one to 30 years.

In repo transactions, MOSERS may have credit risk if the counterparty fails to repay the loan and the value of the securities held as collateral falls below the loan balance. To minimize this risk, MOSERS requires the financial institution to send collateral with a fair value greater than the value of the loan and revalues the collateral on a daily basis. As of fiscal year end, MOSERS held approximately \$34.2 million of counterparty collateral in excess of the repo balance.

In a reverse repo transaction, MOSERS may be subject to credit risk if the counterparty fails to return the securities and the value of the securities held as collateral rise above the loan balance. To minimize this risk, MOSERS sends the minimum amount of collateral required by the financial institution and requires the financial institution to revalue the collateral and return excess collateral on a daily basis. Counterparties held approximately \$13.2 million of MOSERS' collateral in excess of the reverse repo balance as of the end of the fiscal year.

The tables below summarize MOSERS' exposure for repo and reverse repo transactions.

Tri-Party Repurchase Agreements by Collateral Type

Collateral Type	Fair Value of Collateral June 30, 2024	Fair Value Including Accrued Interest of Repurchase Agreements June 30, 2024	Excess (Deficit) Collateral	Percent Over Collateralized
U.S. treasuries	\$ 81,618,100	\$ 80,000,000	\$ 1,618,100	
U.S. government agencies	397,800,019	390,000,000	7,800,019	
Common stock	275,099,886	250,000,000	25,099,886	
Accrued interest	0	322,133	(322,133)	
	<u>\$ 754,518,005</u>	<u>\$ 720,322,133</u>	<u>\$ 34,195,872</u>	4.7%

Reverse Repurchase Agreements by Collateral Type

Collateral Type	Fair Value of Collateral June 30, 2024	Fair Value Including Accrued Interest of Repurchase Agreements June 30, 2024	Excess (Deficit) Collateral	Percent Over Collateralized
U.S. treasuries	\$ 3,615,786,863	\$ 3,553,640,244	\$ 62,146,619	
Payables	(26,425,982)	0	(26,425,982)	
Accrued interest	0	22,489,064	(22,489,064)	
	<u>\$ 3,589,360,881</u>	<u>\$ 3,576,129,308</u>	<u>\$ 13,231,573</u>	0.4 %

Foreign Currency Risk

Foreign currency risk is the risk that changes to foreign exchange rates will adversely impact the fair value of non-U.S. Dollar denominated assets. The following table summarizes MOSERS' exposure to foreign currencies for all assets that are held in custody at the System's custodial bank. MOSERS has exposure to foreign currencies in other areas of the portfolio, such as commingled international funds, hedge funds, and private partnerships, which are held in the custody of other banks acting as administrators for the funds. MOSERS' exposure to foreign currency risk in U.S. dollars, as of June 30, 2024, is highlighted in the table below.

Currency Exposures by Asset Class

Currency	Cash & Cash Equivalents	Equities	Fixed Income	Total
Australian Dollar	\$ 8,044,052	\$ 0	\$ 0	\$ 8,044,052
Canadian Dollar	5,220,903	0	0	5,220,903
Euro	6,096,936	(445,037)	(240,428)	5,411,471
Hong Kong Dollar	(7,164,107)	0	0	(7,164,107)
Israeli Shekel	1	0	0	1
Japanese Yen	1,254,384	189,046	136,765	1,580,195
South African Rand	(888,937)	0	0	(888,937)
South Korean Won	760,569	470,998	0	1,231,567
United Kingdom Pound Sterling	1,228,921	0	0	1,228,921
	\$ 14,552,722	\$ 215,007	\$ (103,663)	\$ 14,664,066

Derivatives

Derivative instruments are financial contracts whose values depend on the values of one or more underlying assets, reference rates, or financial indexes. They include futures contracts, swap contracts, options contracts, and forward foreign currency exchange. The following tables summarize the various contracts in the portfolio as of June 30, 2024.

Futures Contracts

Futures Contract	Notional Value	Exposure
Currency futures	\$ (96,275,674)	\$ 1,261,619
Fixed income futures	(191,972,916)	(1,228,183)
Equity index futures	74,483,707	1,208,997
Commodity futures	28,818,669	3,664,349
Total	\$ (184,946,214)	\$ 4,906,782

Swap Contracts

Counterparty Credit Rating	Notional Value	Exposure
Total return swaps - equity		
A+	\$ 2,065,223,923	\$ 71,092,720
Total	\$ 2,065,223,923	\$ 71,092,720
Total return swaps - fixed income		
A+	\$ 665,948,969	\$ 10,621,916
A	118,999,516	0
Total	\$ 784,948,485	\$ 10,621,916
Total return swaps - commodities		
A+	\$ 422,522,247	\$ 0
A	25,800,686	0
Total	\$ 448,322,933	\$ 0

While the Board has no formal policy specific to derivatives, the MOSERS investment implementation program, through its external managers, holds investments in futures contracts and swap contracts. MOSERS enters into these certain derivative instruments as investments primarily to enhance the performance and reduce the volatility of its portfolio. It enters swaps and futures contracts to gain or hedge exposure to certain markets and to manage interest rate risk.

The notional values associated with these derivative instruments are generally not recorded in the financial statements; however, the fair values of these instruments are recorded in the *Statements of Fiduciary Net Position* and the total changes in fair value for the year are included as net appreciation in fair value of investments in the *Statements of Changes in Fiduciary Net Position*. For the year ended June 30, 2024, the change in fair value in the swap contracts resulted in a gain of \$267 million of investment income. The change in fair value in the futures contracts resulted in a loss of \$10.6 million of investment income. Foreign currency risk associated with derivative activities is included in the *Currency Exposures by Asset Class* table. MOSERS does not anticipate additional significant market risk from the derivative arrangements.

MOSERS could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. MOSERS' investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, and exposure monitoring procedures. MOSERS anticipates that the counterparties will be able to satisfy their obligations under the contracts. Investments in limited partnerships and commingled funds may include derivatives that are not shown in the derivative totals.

Securities Lending Program

The Board of Trustees' *Investment Policy Statement* permits the pension trust funds to participate in a securities lending program. Fixed income, international equity, and domestic equity securities of the pension trust funds can be loaned to participating brokers who provide collateral in the form of cash, U.S. Treasury or government agency securities, or letters of credit issued by approved banks. Collateral must be provided in the amount of 102% of fair value for domestic loans and 105% of fair value for international loans. MOSERS does not have the authority to pledge or sell collateral securities without borrower default.

There was no securities lending activity in fiscal year 2024.

Note 4 – Capital Assets

Office building, furniture, fixtures, equipment, and software costing \$10,000 or more are capitalized. Capital assets are valued at cost and reported net of accumulated depreciation. Improvements, which increase the useful life of the property, are also capitalized. The cost of internally developed software incurred during the application development state, including staff payroll costs, are capitalized in accordance with GASB Statement No. 51, *Accounting and Financial Reporting for Intangible Assets*. Maintenance and repairs are charged to expense as incurred. Depreciation is computed using the straight-line method over the estimated useful life of the related assets according to the following guidelines:

- 5 years for furniture, fixtures, and equipment
- 40 years for building
- 5 years for software

Schedules of the capital asset account balances for the year ended June 30, 2024, are as follows:

Capital Assets

	Right-to-Use Assets	CIP - Internally Developed Pension Admin. System	Building and Building Improvements *	Furniture, Fixtures and Equipment	Software	Total Capital Assets
Capital assets						
Balances June 30, 2023	\$ 1,378,363	\$ 11,685,401	\$ 4,475,671	\$ 2,116,394	\$ 728,761	\$ 20,384,590
Additions	623,966	1,690,113	21,418	60,416	0	2,395,913
Deletions	(247,989)	0	0	(8,995)	0	(256,984)
Capital assets June 30, 2024	1,754,340	13,375,514	4,497,089	2,167,815	728,761	22,523,519
Accumulated depreciation						
Balances June 30, 2023	596,735	0	2,350,922	1,563,422	724,678	5,235,757
Depreciation expense	499,988	0	105,155	189,329	527	794,999
Deletions	(227,182)	0	0	(8,995)	0	(236,177)
Accumulated depreciation June 30, 2024	869,541	0	2,456,077	1,743,756	725,205	5,794,579
Net capital assets June 30, 2024	\$ 884,799	\$ 13,375,514	\$ 2,041,012	\$ 424,059	\$ 3,556	\$ 16,728,940

* Building and Building Improvements includes \$267,286 of land that the building is situated on.

Capital Assets - Right-to-Use Assets

	Right-to-Use Assets Buildings	Right-to-Use Assets Software	Total Right-to-Use Assets
Right-to-use assets			
Balances June 30, 2023	\$ 278,312	\$ 1,100,051	\$ 1,378,363
Additions	0	623,966	623,966
Deletions	0	(247,989)	(247,989)
Right-to-use assets June 30, 2024	278,312	1,476,028	1,754,340
Accumulated amortization			
Balances June 30, 2023	125,829	470,906	596,735
Depreciation expense	94,834	405,154	499,988
Deletions	0	(227,182)	(227,182)
Accumulated amortization June 30, 2024	220,663	648,878	869,541
Net right-to-use assets June 30, 2024	\$ 57,649	\$ 827,150	\$ 884,799

Right-to-Use Assets

Right-to-use assets consist of leased office space and subscription-based software. The intangible right-to-use assets and related liabilities are recorded under GASB Statement No. 87, *Leases*, and GASB Statement No. 96, *Subscription-Based Information Technology Arrangements*. The capitalized value of right-to-use assets and lease liabilities has been calculated based on the future lease payments, discounted to present value. The difference between the liability booked to record the present value of these future payment obligations, and the actual lease payments, is reported as interest expense.

The recording of these liabilities resulted in a future minimum lease commitment, as follows:

Schedule of Minimum Lease Commitments

Year Ended June 30	Building			Software		
	Principal	Imputed Interest	Total	Principal	Imputed Interest	Total
2025	\$ 57,649	\$ 578	\$ 58,227	\$ 273,408	\$ 31,576	\$ 304,984
2026	0	0	0	261,297	20,521	281,818
2027	0	0	0	98,492	9,925	108,417
2028	0	0	0	107,718	5,814	113,532
2029	0	0	0	86,235	1,444	87,679
Total commitments	\$ 57,649	\$ 578	\$ 58,227	\$ 827,150	\$ 69,280	\$ 896,430

The changes in the lease liability amounts are reported in the following table:

Schedule of Changes in Lease Liability Amount

	Right-to-Use Assets Buildings	Right-to-Use Assets Software	Total Right-to-Use Assets
Balances June 30, 2023	\$ 152,483	\$ 629,145	\$ 781,628
Increases to liability	0	623,966	623,966
Decreases from liability	(94,834)	(425,961)	(520,795)
Net capital assets June 30, 2024	\$ 57,649	\$ 827,150	\$ 884,799

Note 5 – Employers’ Net Pension Liability

The components of net pension liability as of June 30, 2024, are in the *Schedule of Employers’ Net Pension Liability* below.

Schedule of Employers’ Net Pension Liability

	MSEP	Judicial Plan
Total pension liability	\$ 16,915,028,387	\$ 675,035,481
MOSERS’ fiduciary net position	8,798,645,184	196,573,541
Employers’ net pension liability	<u>\$ 8,116,383,203</u>	<u>\$ 478,461,940</u>
Plan net position as a percentage of the total pension liability	52.02%	29.12%
Covered payroll	\$ 2,463,403,760	\$ 68,106,694
Employers’ net pension liability as a percentage of covered payroll	329.48%	702.52%

An actuarial valuation of an ongoing plan involves estimates of the reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and future salary increases. Amounts determined regarding the net pension liability are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The *Schedule of Changes in Employers’ Net Pension Liability* presents multi-year trend information about whether the plan fiduciary net positions are increasing or decreasing over time relative to the total pension liability. These schedules are presented in the *Required Supplementary Information*. The total pension liability as of June 30, 2024, is \$16,915,028,387 for the MSEP and \$675,035,481 for the Judicial Plan based on an actuarial valuation performed as of June 30, 2024, and a measurement date of June 30, 2024, using generally accepted actuarial procedures.

Actuarial Assumptions Used to Determine Net Pension Liability

An actuarial experience study covering the five-year period ended June 30, 2020, was performed in 2021. A summary of the assumptions used to calculate the net pension liability is contained in the table below. The next experience study is scheduled for 2026.

Summary of Actuarial Assumptions for the MSEP & the Judicial Plan Used to Determine Net Pension Liability

Valuation date	June 30, 2024
Actuarial cost method	Entry age normal
Asset valuation method	Fair value
Investment rate of return, net of investment expense	6.95%
Projected salary increases	2.75 – 10.00% (MSEP) 3.00% (Judicial Plan)
Rate of payroll growth	2.25%
COLAs	4% or 1.80% *
Price inflation	2.25%

* 4.00% compounded annually, when a minimum COLA of 4.00% is in effect. 1.80% compounded annually, when no minimum COLA is in effect (80% of price inflation).

Mortality Rates - MSEP

Pre-retirement mortality rates were based on the Pub-2010 General Members Below Median Employee mortality table, set back two years for males and set forward one year for females. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for retirees were based on the Pub-2010 General Members Below Median Healthy Retiree mortality table, scaled by 104%, set back two years for males and set forward one year for females. Mortality projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for beneficiaries were based on the Pub-2010 General Members Below Median Contingent Survivor mortality table, set back two years for males and set forward one year for females. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Disabled mortality rates were based on the Pub-2010 Non-Safety Disabled Retiree mortality table, without mortality projection.

Mortality Rates - Judicial Plan

Pre-retirement mortality rates were based on the Pub-2010 General Members Median Employee mortality table. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for retirees were based on the Pub-2010 General Members Median Healthy Retiree mortality table. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for beneficiaries were based on the Pub-2010 General Members Median Contingent Survivor mortality table. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Discount Rate

The discount rate used to measure the total pension liability was 6.95%, net of investment expenses. The projection of cash flows used to determine the discount rate assumed that contributions from participating employers will be made using the actuarially determined rates. Based on those assumptions, MOSERS’ fiduciary net position was projected to be available to make all the projected future benefit payments of the current plan members. As a result, the long-term expected rate of return on pension plan investments, net of investment expense of 6.95%, was applied to all periods of projected benefit payments to determine the total pension liability.

The table below presents the net pension liability of the plans, as of June 30, 2024, calculated using the discount rate of 6.95%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1% lower (5.95%) or 1% higher (7.95%) than the current rate.

Sensitivity of Net Pension Liability to Changes in the Discount Rate

Employers’ Net Pension Liability	1% Decrease 5.95%	Current Discount Rate 6.95%	1% Increase 7.95%
MSEP	\$ 10,076,615,263	\$ 8,116,383,203	\$ 6,479,063,398
Judicial Plan	\$ 543,691,214	\$ 478,461,940	\$ 422,445,589

The funding status of the plans and *Employer Schedule of Funding Progress* can be found in the *Actuarial Section* on page 100.

Note 6 – Retiree Life Insurance and Long-Term Disability Insurance Programs

In addition to the defined benefit pension provided through MOSERS, the state of Missouri also funds, either partially or in its entirety, retiree life insurance, and long-term disability insurance programs for eligible members. These insurance programs are underwritten by The Standard. MOSERS collects premiums for participants of these programs and remits them to the The Standard on behalf of the state of Missouri.

Retiree Life Insurance

Members who retire on or after October 1, 1985, are eligible for \$5,000 of state-sponsored basic life insurance coverage if they retire directly from active employment. As of June 30, 2024, 30,448 retirees were participating in the program. This insured defined benefit coverage is financed on a percentage of payroll (.115%) and is purchased as a group policy through The Standard. The cost for the year ended June 30, 2024, was \$2,438,374. Premiums are contributed entirely by the state and its component employers as provided by Section 104.515, RSMo.

Retirees of the Department of Labor and Industrial Relations (DOLIR) who retired prior to January 1, 1996, are eligible for state-sponsored insured defined benefit insurance coverage in the same amount of coverage they were receiving through the DOLIR. As of June 30, 2024, 62 retirees were participating in the program. The coverage for this closed group is purchased as a group policy at a current cost of \$2.07 per thousand dollars of coverage, per month, per eligible participant (\$7,881 for the year ended June 30, 2024). Premiums are paid entirely by the DOLIR as provided by Section 288.225, RSMo. Retirees of the DOLIR who retired on or after January 1, 1996, are eligible for \$5,000 of state-sponsored life insurance coverage if they retire directly from active employment. They are included in the group described in the preceding paragraph.

Long-Term Disability Insurance (LTD)

MOSERS provides LTD coverage for eligible members and generally includes those active members of MOSERS' retirement plans who do not have other disability coverage and are not yet eligible to receive normal (unreduced) retirement benefits.

There were 24,456 members covered under the program as of June 30, 2024. This insured defined benefit coverage is financed on a percentage of covered payroll (0.0445%). Purchased as a group policy, LTD is administered by The Standard. The cost for the year ended June 30, 2024, was \$8,648,765. Premiums are contributed by the state and its component employers, as provided for by Section 104.515, RSMo.

Note 7 – MCHCP Post-Employment Retiree Health Care OPEB Program

MOSERS participates as an employer in a cost-sharing, multiple-employer, defined benefit, other post-employment benefits plan, the State Retiree Welfare Benefit Trust (SRWBT), operated by Missouri Consolidated Health Care Plan (MCHCP). Employees may participate at retirement if eligible to receive a monthly retirement benefit from MOSERS. The terms and conditions governing post-employment benefits are vested with the MCHCP Board of Trustees within the authority granted under Chapter 103, Sections 103.003 through 103.178, RSMo. The SRWBT does not issue a separate stand-alone financial report. Financial activity of the SRWBT is included in the *MCHCP Annual Comprehensive Financial Report* as a fiduciary fund and is intended to present only the financial position of the activities attributable to the SRWBT. Additionally, MCHCP is considered a component unit of the state of Missouri reporting entity and is included in the state’s financial report.

The Plan’s financial statements are available on the MCHCP website at www.mchcp.org.

Benefits

The SRWBT was established and organized on June 27, 2008, pursuant to Sections 103.003 through 103.178, RSMo, to provide health and welfare benefits for the exclusive benefit of current and future retired employees of the state and their dependents who meet eligibility requirements, except for those retired members covered by other OPEB plans of the state. The three medical plans from MCHCP offer the same basic coverage such as preventative care and freedom to choose care from a nationwide network of primary care providers, specialists, pharmacies, and hospitals, usually at a lower negotiated group discount and the same covered benefits for both medical and pharmacy. Benefits are the same in all three plans; other aspects differ such as premium, deductible, and out-of-pocket costs. Retiree benefits are the same as for active employees, until they are Medicare eligible.

Contributions

Contributions are established and may be amended by the MCHCP Board of Trustees with the authority granted under Chapter 103, Sections 103.003 through 103.178, RSMo. For the fiscal year ended June 30, 2023, employers were required to contribute, on average, 4.05% of active employee covered payroll to fund current fiscal year cost of retiree plan benefits. Employees do not contribute to this plan.

OPEB Liabilities, OPEB Expense, Deferred Outflows of Resources, and Deferred Inflows of Resources

At June 30, 2024, MOSERS reported a liability of \$5,574,870 for its proportionate share of the net OPEB liability. The net OPEB liability was measured as of June 30, 2023, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of that date. MOSERS’ proportion of the net OPEB liability was based on a projection of its long-term share of contributions to the OPEB plan relative to the projected contributions of all participating entities, actuarially determined. At June 30, 2023, MOSERS’ proportionate share was 0.3869%. For the year ended June 30, 2024, MOSERS recognized a net increase in administrative costs of \$222,221 related to OPEB expense. As of June 30, 2024, MOSERS reported deferred outflows of resources and deferred inflows of resources as follows:

Deferred Outflows/Inflows of Resources Related to Post-Employment Retiree Health Care

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	\$ 261,746	\$ 41,159
Changes of assumptions	0	1,710,196
Net difference between projected and actual earnings on plan investments	35,496	0
Changes in proportion and differences between MOSERS’ contributions and proportionate share of contributions	426,785	434,116
MOSERS’ contributions subsequent to the measurement date	284,106	0
	\$ 1,008,133	\$ 2,185,471

The \$284,106 currently reported as deferred outflows of resources related to OPEB resulting from MOSERS' contributions subsequent to the measurement date will be recognized as a reduction of the net OPEB liability in the year ended June 30, 2025. Other amounts reported as deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

Deferred Outflows/Inflows of Resources Related to Post-Employment Retiree Health Care to be Recognized in Future Years

Year Ending June 30

2025	\$ 276,424
2026	279,573
2027	265,061
2028	286,033
2029	235,338
Thereafter	119,015
Total	\$ 1,461,444

Actuarial Assumptions

The collective total OPEB liability for the June 30, 2023, measurement date was determined by an actuarial valuation as of July 1, 2023. This actuarial valuation used the following actuarial assumptions:

Summary of MCHCP's Actuarial Assumptions for Post-Employment Retiree Health Care

Valuation year	July 1, 2022 - June 30, 2023
Actuarial cost method	Entry age normal, level percentage of payroll
Asset valuation method	Fair value
Discount rate	5.50%
Projected payroll growth rate	4.0%
Inflation rate	3.0%
Health care cost trend rate (medical & prescription drugs combined)	
Non-Medicare	6.68% *
	* (6.68% in fiscal year 2024, 6.59% in fiscal year 2025, 6.29% in fiscal year 2026, 5.99% in fiscal year 2027, 5.69% in fiscal year 2028, 5.38% in fiscal year 2029, 5.16% in fiscal year 2030, 5.02% in fiscal year 2031, 4.88% in fiscal year 2032, 4.73% in fiscal year 2033, 4.58% in fiscal year 2034, and 4.50% in fiscal year 2035 and later.)
Medicare	11.79% **
	** (11.79% in fiscal year 2024, 12.54% in fiscal year 2025, 11.38% in fiscal year 2026, 9.06% in fiscal year 2027, 7.19% in fiscal year 2028, 6.75% in fiscal year 2029, 6.33% in fiscal year 2030, 5.93% in fiscal year 2031, 5.52% in fiscal year 2032, 5.11% in fiscal year 2033, 4.70% in fiscal year 2034, then 4.50% in fiscal year 2035 and later.)

Mortality: *Pre-Retirement*: Pri-2012 Employee Amount-weighted Mortality Table projected generationally using MP-2021.

Annuitant: Pri-2012 Retiree Amount-weighted Mortality Table projected generationally using MP-2021.

The last experience study was conducted in 2020. Termination rates and retirement rates are updated based on an experience study conducted in 2020. Participation and dependent coverage assumptions were updated based upon an experience study conducted in July 2020. Per capita claims costs, administrative expenses, and retiree contributions were updated based on analysis of 2023 rates.

Change in Assumptions and Methods Since Prior Valuation

Per capita health costs, administrative expenses, and retiree contributions were updated to reflect current experience. Trend assumptions were revised to reflect future expectations. There were no changes in benefits.

Sensitivity to Changes in the Health Care Cost Trend Rates

The following table presents MOSERS’ net OPEB liability, calculated using the current trend rate, as well as what the net OPEB liability would be if it were calculated using a trend rate that is one percent lower or one percent higher:

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

	1% Decrease in Trend Rates	Current Trend Rates	1% Increase in Trend Rates
Net OPEB liability	\$ 4,757,223	\$ 5,574,870	\$ 6,598,705

Discount Rate

A discount rate of 5.5% was used to measure the total OPEB liabilities. The projection of cash flows used to determine the discount rate assumed that contributions from plan members will be made at the current contribution rates and the contributions will be made at statutorily required rates, actuarially determined. This discount rate was determined as the best estimate of the expected return on plan assets as of the measurement date.

Sensitivity to Changes in the MCHCP Discount Rate

The following table presents MOSERS’ net OPEB liability, calculated using a discount rate of 5.5%, as well as what the net OPEB liability would be if it were calculated using a discount rate that is one percent lower or one percent higher:

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

	1% Decrease in Discount Rate (4.5%)	Current Discount Rate (5.5%)	1% Increase in Discount Rate (6.5%)
Net OPEB liability	\$ 6,539,276	\$ 5,574,870	\$ 4,796,281

Long-Term Expected Rate of Return

The target allocation and expected real rate of return for each major asset class are listed below:

MCHCP Long-Term Expected Rate of Return

Asset Class	Target Allocation	Expected Real Rate of Return
Domestic large cap stocks	17.0%	5.9%
Domestic mid cap stocks	4.0	5.9
Domestic small cap stocks	6.0	5.6
Global equity	5.0	9.4
Domestic fixed income	67.0	4.2
Cash equivalents	1.0	3.5

Note 8 – Commitments

As of June 30, 2024, MOSERS has \$972.2 million in unfunded commitments in the private asset class.

MOSERS has contracted with various software and consulting firms to provide and implement a pension administration system at a cost of approximately \$10.4 million. In addition to the cost of the system, MOSERS has engaged consultants to assist with project governance, change management, and data validation. The contracts for these consulting services have an approximate cost of \$3.2 million. As of June 30, 2024, the remaining commitments on these agreements was approximately \$1.9 million.

Note 9 – Contingencies

There were no contingencies which would have a material impact on the financial statements as of June 30, 2024.

Note 10 – Risk Management

MOSERS is exposed to various risks of loss related to natural disasters, errors and omissions, loss of assets, torts, etc. MOSERS has chosen to cover such losses through the purchase of commercial insurance to help mitigate some of the exposure to those risks. In the previous three years, MOSERS has not experienced any losses that exceeded our insurance coverage limits.

Schedule of Changes in Employers' Net Pension Liability - MSEP

Last Ten Fiscal Years

	2024	2023	2022	2021	2020
Total pension liability					
Service cost	\$ 185,156,962	\$ 166,052,284	\$ 166,110,518	\$ 162,668,072	\$ 159,559,528
Interest on the total pension liability	1,089,983,221	1,037,223,987	1,017,493,541	959,662,398	960,644,327
Benefit changes	0	0	0	0	0
Difference between expected and actual experience	486,904,589	570,092,422	77,335,262	133,886,066	(70,371,777)
Assumption changes	0	0	0	515,859,705	124,766,739
Benefit payments and member refunds	(1,037,830,071)	(991,550,039)	(962,590,826)	(919,838,592)	(873,816,238)
Net change in total pension liability	724,214,701	781,818,654	298,348,495	852,237,649	300,782,579
Total pension liability - beginning	16,190,813,686	15,408,995,032	15,110,646,537	14,258,408,888	13,957,626,309
Total pension liability - ending (a)	\$16,915,028,387	\$16,190,813,686	\$15,408,995,032	\$15,110,646,537	\$14,258,408,888
Plan fiduciary net position					
Employer contributions	\$ 669,903,073	\$ 1,080,661,379	\$ 471,302,256	\$ 463,293,368	\$ 436,895,653
Employee contributions	58,710,640	48,487,731	39,809,873	37,571,263	35,141,960
Pension plan net investment income (loss)	556,669,632	177,598,790	(816,407,543)	2,032,991,086	400,354,303
Benefit payments and member refunds	(1,037,830,071)	(991,550,039)	(962,590,826)	(919,838,592)	(873,816,238)
Pension plan administrative expense	(11,885,804)	(10,984,550)	(9,248,916)	(8,816,943)	(8,398,164)
Other	5,284,466	5,165,340	5,619,673	3,899,365	4,187,740
Net change in plan fiduciary net position	240,851,936	309,378,651	(1,271,515,483)	1,609,099,547	(5,634,746)
Plan fiduciary net position - beginning	8,557,793,248	8,248,414,597	9,519,930,080	7,910,830,533	7,916,465,279
Plan fiduciary net position - ending (b)	8,798,645,184	8,557,793,248	8,248,414,597	9,519,930,080	7,910,830,533
Net pension liability - ending (a)-(b)	\$ 8,116,383,203	\$ 7,633,020,438	\$ 7,160,580,435	\$ 5,590,716,457	\$ 6,347,578,355
Plan fiduciary net position as a percentage of total pension liability	52.02%	52.86%	53.53%	63.00%	55.48%
Covered payroll	\$ 2,463,403,760	\$ 2,211,853,954	\$ 2,004,688,456	\$ 2,024,883,601	\$ 2,006,870,248
Net pension liability as a percentage of covered payroll	329.48%	345.10%	357.19%	276.10%	316.29%

 See accompanying *Notes to the Schedules of Required Supplementary Information - Pension Trust Funds*.

Schedule of Changes in Employers' Net Pension Liability - MSEP (continued)

Last Ten Fiscal Years

	2019	2018	2017	2016	2015
Total pension liability					
Service cost	\$ 158,190,866	\$ 157,351,979	\$ 152,766,134	\$ 149,021,755	\$ 150,412,577
Interest on the total pension liability	956,725,536	956,201,619	945,654,398	913,877,923	896,451,618
Benefit changes	0	0	(1,696,059)	0	0
Difference between expected and actual experience	7,426,685	(118,252,032)	(104,203,260)	61,150,083	(27,983,267)
Assumption changes	74,340,841	351,899,973	202,554,786	656,805,085	(57,568,553)
Benefit payments and member refunds	(851,821,580)	(886,711,473)	(793,964,857)	(757,310,503)	(728,265,800)
Net change in total pension liability	344,862,348	460,490,066	401,111,142	1,023,544,343	233,046,575
Total pension liability - beginning	13,612,763,961	13,152,273,895	12,751,162,753	11,727,618,410	11,494,571,835
Total pension liability - ending (a)	\$13,957,626,309	\$13,612,763,961	\$13,152,273,895	\$12,751,162,753	\$11,727,618,410
Plan fiduciary net position					
Employer contributions	\$ 394,150,042	\$ 379,557,962	\$ 335,217,422	\$ 329,957,369	\$ 329,752,832
Employee contributions	31,286,632	28,303,994	25,439,343	21,684,920	18,099,455
Pension plan net investment income (loss)	313,159,178	576,188,826	272,595,668	1,740,269	(237,070,529)
Benefit payments and member refunds	(851,821,580)	(886,711,473)	(793,964,857)	(757,310,503)	(728,265,800)
Pension plan administrative expense	(9,200,826)	(9,799,256)	(8,759,341)	(8,489,375)	(8,077,692)
Other	4,383,409	1,610,073	5,668,849	4,923,622	5,434,820
Net change in plan fiduciary net position	(118,043,145)	89,150,126	(163,802,916)	(407,493,698)	(620,126,914)
Plan fiduciary net position - beginning	8,034,508,424	7,945,358,298	8,109,161,214	8,516,654,912	9,136,781,826
Plan fiduciary net position - ending (b)	7,916,465,279	8,034,508,424	7,945,358,298	8,109,161,214	8,516,654,912
Net pension liability - ending (a)-(b)	\$ 6,041,161,030	\$ 5,578,255,537	\$ 5,206,915,597	\$ 4,642,001,539	\$ 3,210,963,498
Plan fiduciary net position as a percentage of total pension liability	56.72%	59.02%	60.41%	63.60%	72.62%
Covered payroll	\$ 1,950,272,350	\$ 1,951,454,817	\$ 1,975,353,105	\$ 1,921,528,936	\$ 1,918,527,768
Net pension liability as a percentage of covered payroll	309.76%	285.85%	263.59%	241.58%	167.37%

 See accompanying *Notes to the Schedules of Required Supplementary Information - Pension Trust Funds*.

Schedule of Changes in Employers' Net Pension Liability - Judicial Plan

Last Ten Fiscal Years

	2024	2023	2022	2021	2020
Total pension liability					
Service cost	\$ 13,144,478	\$ 13,037,787	\$ 13,303,763	\$ 12,872,644	\$ 13,119,646
Interest on the total pension liability	43,796,414	42,246,794	42,073,646	42,004,675	42,458,800
Benefit changes	0	0	0	0	0
Difference between expected and actual experience	12,831,120	14,023,318	(9,088,237)	(6,886,109)	(14,933,643)
Assumption changes	0	0	0	(4,928,456)	6,341,771
Benefit payments and member refunds	(48,978,854)	(45,108,589)	(42,530,378)	(41,625,546)	(39,622,268)
Net change in total pension liability	20,793,158	24,199,310	3,758,794	1,437,208	7,364,306
Total pension liability - beginning	654,242,323	630,043,013	626,284,219	624,847,011	617,482,705
Total pension liability - ending (a)	\$ 675,035,481	\$ 654,242,323	\$ 630,043,013	\$ 626,284,219	\$ 624,847,011
Plan fiduciary net position					
Employer contributions	\$ 40,748,235	\$ 39,064,758	\$ 39,228,848	\$ 39,996,509	\$ 39,174,515
Employee contributions	2,029,670	1,746,913	1,550,712	1,448,428	1,314,570
Pension plan net investment income (loss)	12,647,192	4,165,663	(18,801,946)	44,049,707	8,162,709
Benefit payments	(48,978,854)	(45,108,589)	(42,530,378)	(41,625,546)	(39,622,268)
Pension plan administrative expense	(99,460)	(91,076)	(79,492)	(75,822)	(74,450)
Other	3	0	0	0	0
Net change in plan fiduciary net position	\$ 6,346,786	\$ (222,331)	\$ (20,632,256)	\$ 43,793,276	\$ 8,955,076
Plan fiduciary net position - beginning	190,226,755	190,449,086	211,081,342	167,288,066	158,332,990
Plan fiduciary net position - ending (b)	196,573,541	190,226,755	190,449,086	211,081,342	167,288,066
Net pension liability - ending (a)-(b)	\$ 478,461,940	\$ 464,015,568	\$ 439,593,927	\$ 415,202,877	\$ 457,558,945
Plan fiduciary net position as a percentage of total pension liability	29.12%	29.08%	30.23%	33.70%	26.77%
Covered payroll	\$ 68,106,694	\$ 64,923,979	\$ 63,333,626	\$ 63,105,884	\$ 61,402,061
Net pension liability as a percentage of covered payroll	702.52%	714.71%	694.09%	657.95%	745.18%

See accompanying *Notes to the Schedules of Required Supplementary Information - Pension Trust Funds*.

Schedule of Changes in Employers' Net Pension Liability - Judicial Plan (continued)

Last Ten Fiscal Years

	2019	2018	2017	2016	2015
Total pension liability					
Service cost	\$ 13,573,453	\$ 12,997,198	\$ 12,945,567	\$ 10,932,097	\$ 10,613,686
Interest on the total pension liability	41,710,768	41,018,371	40,617,091	37,755,240	36,161,612
Benefit changes	0	0	0	0	0
Difference between expected and actual experience	978,884	(1,319,696)	(10,687,091)	(5,036,696)	5,103,664
Assumption changes	5,024,057	12,332,042	7,905,466	53,991,379	0
Benefit payments and member refunds	(37,593,049)	(35,657,248)	(33,984,725)	(32,989,714)	(31,245,906)
Net change in total pension liability	23,694,113	29,370,667	16,796,308	64,652,306	20,633,056
Total pension liability - beginning	593,788,592	564,417,925	547,621,617	482,969,311	462,336,255
Total pension liability - ending (a)	\$ 617,482,705	\$ 593,788,592	\$ 564,417,925	\$ 547,621,617	\$ 482,969,311
Plan fiduciary net position					
Employer contributions	\$ 38,604,668	\$ 36,892,203	\$ 34,246,826	\$ 33,642,498	\$ 32,696,686
Employee contributions	1,138,101	902,319	786,745	661,206	488,193
Pension plan net investment income (loss)	6,051,941	10,677,666	4,680,131	28,081	(3,610,352)
Benefit payments	(37,593,049)	(35,657,248)	(33,984,725)	(32,989,714)	(31,245,906)
Pension plan administrative expense	(72,141)	(181,595)	(150,387)	(136,983)	(123,015)
Other	3,895	(68,711)	0	0	0
Net change in plan fiduciary net position	\$ 8,133,415	\$ 12,564,634	\$ 5,578,590	\$ 1,205,088	\$ (1,794,394)
Plan fiduciary net position - beginning	150,199,575	137,634,941	132,056,351	130,851,263	132,645,657
Plan fiduciary net position - ending (b)	158,332,990	150,199,575	137,634,941	132,056,351	130,851,263
Net pension liability - ending (a)-(b)	\$ 459,149,715	\$ 443,589,017	\$ 426,782,984	\$ 415,565,266	\$ 352,118,048
Plan fiduciary net position as a percentage of total pension liability	25.64%	25.30%	24.39%	24.11%	27.09%
Covered payroll	\$ 60,594,362	\$ 59,417,302	\$ 58,591,661	\$ 57,421,016	\$ 55,656,457
Net pension liability as a percentage of covered payroll	757.74%	746.57%	728.40%	723.72%	632.66%

See accompanying *Notes to the Schedules of Required Supplementary Information - Pension Trust Funds*.

Pension Trust Funds
Schedules of Employer Contributions
 Last Ten Fiscal Years

MSEP

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution*	Contribution Deficiency (Excess)	Covered Payroll**	Contributions as a Percentage of Covered Payroll ***
2024	\$ 669,903,073	\$ 669,903,073	\$ 0	\$ 2,463,403,760	27.19%
2023	580,661,379	1,080,661,379	(500,000,000)	2,211,853,954	48.86
2022	471,302,256	471,302,256	0	2,004,688,456	23.51
2021	463,293,368	463,293,368	0	2,024,883,601	22.88
2020	436,895,653	436,895,653	0	2,006,870,248	21.77
2019	394,150,042	394,150,042	0	1,950,272,350	20.21
2018	379,557,962	379,557,962	0	1,951,454,817	19.45
2017	322,772,697	335,217,422	(12,444,725)	1,975,353,105	16.97
2016	310,124,928	329,957,369	(19,832,414)	1,921,528,936	16.97
2015	329,752,832	329,752,832	0	1,918,527,768	16.97

Judicial Plan

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution*	Contribution Deficiency (Excess)	Covered Payroll**	Contributions as a Percentage of Covered Payroll
2024	\$ 40,748,235	\$ 40,748,235	\$ 0	\$ 68,106,694	59.83%
2023	39,064,758	39,064,758	0	64,923,979	60.17
2022	39,228,848	39,228,848	0	63,333,626	61.94
2021	39,996,509	39,996,509	0	63,105,884	63.38
2020	39,174,515	39,174,515	0	61,402,061	63.80
2019	38,604,668	38,604,668	0	60,594,362	63.71
2018	36,892,203	36,892,203	0	59,417,302	62.09
2017	32,670,710	34,246,826	(1,576,116)	58,591,661	58.45
2016	31,604,527	33,642,498	(2,037,971)	57,421,016	58.45
2015	32,696,686	32,696,686	0	55,656,457	58.45

* Since the percent of payroll contributions rate was applied to the pension payroll during the fiscal year, the actuarially determined contribution is equal to the actual contribution. In fiscal years 2016 and 2017, excess contributions were made because the actuarially determined contribution rate fell below the Board-established minimum contribution rate.

** For fiscal years 2016 and prior, covered payroll totals from the valuation report were used, which includes actual covered payroll from July through May with estimated amounts for June. For fiscal years 2017 and forward, covered payroll totals used are actual covered payroll from July through June, as reported in the GASB 67 report.

*** Beginning in fiscal year 2023, the employers were given the option to prepay contributions at certain times during the year and receive an actuarially determined present value discount based on MOSERS' investment return assumption. During fiscal year 2023, MOSERS received a one-time contribution of \$500 million from the state of Missouri.

See accompanying Notes to the Schedules of Required Supplementary Information - Pension Trust Funds.

Pension Trust Funds

Schedule of Annual Money-Weighted Rate of Return on Investments

Last Ten Fiscal Years

Year Ended June 30	Annual Money-Weighted Rate of Return - Net of Investment Expense
2024	6.73 %
2023	2.13
2022	(8.75)
2021	26.56
2020	5.25
2019	4.10
2018	7.57
2017	3.51
2016	0.08
2015	(2.60)

See accompanying *Notes to the Schedules of Required Supplementary Information - Pension Trust Funds*.

Notes to the Schedules of Required Supplementary Information - Pension Trust Funds

Actuarial Methods and Assumptions for Valuations Performed as of June 30, 2024

The entry age normal actuarial cost method of valuation is used in determining liabilities and normal cost. Regular actuarial valuations provide valuable information about the composite change in the unfunded actuarial accrued liabilities (whether or not the liabilities are increasing or decreasing, and by how much). Since the future cannot be predicted with precision, actual experience is expected to differ from assumed experience. Differences occurring in the past between assumed experience and actual experience (actuarial gains and losses) become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized to produce payments (principal and interest), which are expressed as a percent of payroll. A layered, closed 25-year amortization period was used for the June 30, 2024, valuations to determine the fiscal year 2026 contribution rates. The actuarial value is calculated by recognizing the difference between the actual and expected return on the fair value of assets each year over a closed five-year period. In addition, the total unrecognized investment experience as of June 30, 2017, was recognized evenly over a seven-year period beginning June 30, 2018. With the June 30, 2024, valuation, this experience has been fully recognized.

The investment return rate assumption remained constant at 6.95% per year as of June 30, 2024, compounded annually (net of investment expenses). The price inflation assumption used was 2.25% per year. Projected salary assumptions were 2.75% to 10.00% for the MSEP and 3.00% for the Judicial Plan. The assumption used for annual post-retirement benefit increases (COLAs) is 4.0% (on a compound basis) when a minimum COLA is in effect. When no minimum COLA is in effect, the annual COLA is assumed to be 1.80% (80% of the 2.25% price inflation) on a compounded basis.

Actuarial Assumptions and Methods Used to Set the Actuarially Determined Contributions - Five-Year Review

MSEP & Judicial

Valuation year	2024	2023	2022	2021	2020
Contribution rate for fiscal year	2026	2025	2024	2023	2022
Actuarial cost method	Entry age normal	Entry age normal	Entry age normal	Entry age normal	Entry age normal
Amortization method	Layered bases approach - Level percentage of payroll	Layered bases approach - Level percentage of payroll	Layered bases approach - Level percentage of payroll	Layered bases approach - Level percentage of payroll	Layered bases approach - Level percentage of payroll
Amortization periods	Closed 25-year period	Closed 25-year period	Closed 25-year period	Closed 25-year period	Closed 30-year period
Inflation	2.25%	2.25%	2.25%	2.25%	2.25%
Cost-of-living adjustment	4% or 1.80%	4% or 1.80%	4% or 1.80%	4% or 1.80%	4% or 1.80%
Salary increase	varied	varied	varied	3.00	varied
Payroll growth	2.25%	2.25%	2.25%	2.25%	2.25%
Investment rate of return	6.95%	6.95%	6.95%	6.95%	6.95%

Schedule of Proportionate Share of the Net OPEB Liability

For Years Ended June 30, 2018 – 2024*

State Retiree Welfare Benefit Trust

	2024	2023	2022	2021	2020	2019	2018
MOSERS' proportion of the net OPEB liability	0.3869%	0.4000%	0.3760%	0.4313%	0.4352%	0.4375%	0.4121%
MOSERS' proportionate share of the net OPEB liability	\$5,574,870	\$5,635,287	\$6,413,236	\$7,682,560	\$7,697,649	\$7,666,038	\$7,272,038
MOSERS' covered payroll	\$7,700,645	\$7,262,074	\$7,004,895	\$7,569,252	\$7,370,032	\$7,056,668	\$6,669,717
MOSERS' proportionate share of the net OPEB liability as a percentage of its covered payroll	72.39%	77.60%	91.55%	101.50%	104.45%	108.64%	109.03%
Plan fiduciary net position as a percentage of the total OPEB liability	12.18%	12.12%	10.14%	8.24%	7.31%	6.90%	6.64%

* The amounts presented in this schedule were determined as of the previous fiscal year end. Intended to show information for 10 years, data for additional years will be displayed as it becomes available.

Schedule of Employer Contributions for OPEB

For Years Ended June 30, 2018 – 2024*

	2024	2023	2022	2021	2020	2019	2018
Contractually required contribution	\$ 284,106	\$ 286,406	\$ 291,661	\$ 283,613	\$ 311,510	\$ 331,275	\$ 301,182
Contributions in relation to the contractually required contribution	\$ 284,106	\$ 286,406	\$ 291,661	\$ 283,613	\$ 311,510	\$ 331,275	\$ 301,182
Contribution deficiency (excess)	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Covered payroll	\$8,440,246	\$7,700,645	\$7,262,074	\$7,004,895	\$7,569,252	\$7,370,032	\$7,056,668
Contributions as a percentage of covered payroll	3.37%	3.72%	4.02%	4.05%	4.12%	4.49%	4.27%

* Intended to show information for 10 years, data for additional years will be displayed as it becomes available.

Schedules of Investment Expenses

For the Year Ended June 30, 2024

Investing activity	MSEP	Judicial Plan	Total
Investment management and incentive fees			
Equity			
Artisan International Value Fund	\$ 2,929,400	\$ 65,431	\$ 2,994,831
Baillie Gifford Intl Alpha Private Equity	1,004,173	22,429	1,026,602
Baillie Gifford EM Private Equity	671,907	15,008	686,915
NS Partners Emerging Markets	1,934,535	43,210	1,977,745
Silchester International Investors	1,954,545	43,656	1,998,201
Fixed Income			
BlackRock, Inc.	84,263	1,882	86,145
Multi-asset			
NISA Investment Advisors	5,266,602	117,634	5,384,236
Alternatives			
Aberdeen Standard Investments	1,226,973	27,406	1,254,379
Aberdeen Davi Alpha	954,252	21,314	975,566
Actis Emerging Markets 3	65,536	1,464	67,000
Actis Emerging Markets 4	487,120	10,880	498,000
Altas Partners Holdings III L.P.	1,177,410	26,298	1,203,708
Appian Natural Resources Fund III	1,849,353	41,307	1,890,660
Arlington Capital Partners VI, L.P.	2,858,691	63,851	2,922,542
Avista Healthcare Partners VI, L.P.	3,920,091	87,559	4,007,650
Axiom Asia Private Capital Fund II, L.P.	49,755	1,111	50,866
Axiom Asia Private Capital Fund III, L.P.	566,701	12,658	579,359
Axiom Asia Fund 6, L.P.	533,044	11,906	544,950
Axxon Brazil Private Equity Fund II B, L.P.	103,174	2,304	105,478
BlackRock Private Equity Co-Investments 2021, LP	1,773,643	39,616	1,813,259
Blackstone Real Estate Partners IV	55,154	1,232	56,386
Blackstone Real Estate Partners V	937	21	958
Blackstone Real Estate Partners VI	101,132	2,259	103,391
Blackstone Real Estate Partners VII	(986,197)	(22,028)	(1,008,225)
Blackstone Topaz Fund, L.P.	4,514,434	100,834	4,615,268
Blackstone Topaz Private Credit	2,487,896	55,569	2,543,465
Blue Diamond Non-Directional Fund	3,170,721	70,821	3,241,542
Brevan Howard Alpha Strategies Fund, L.P.	16,577,041	370,263	16,947,304
Catalyst Fund Limited Partnership III	82,985	1,854	84,839
Catalyst Fund Limited Partnership IV	98,010	2,189	100,199
Catalyst Fund Limited Partnership V	1,806,163	40,342	1,846,505
CBRE U.S. Core Partners, LP	1,291,207	28,840	1,320,047
Centiva Capital	13,609,463	303,979	13,913,442
Comvest Credit Partners 2023, L.P.	441,983	9,872	451,855

Schedule of Investment Expenses continued on following page.

Schedules of Investment Expenses (continued)

For the Year Ended June 30, 2024

Schedule of Investment Expenses continued from previous page

Investing activity	MSEP	Judicial Plan	Total
Cornwall Domestic, LP	\$ 5,204	\$ 116	\$ 5,320
DE Shaw Dioptr Fund, LLC	4,729,396	105,635	4,835,031
EIG Energy Fund XIV, LP	77,427	1,729	79,156
EIG Energy Fund XV, LP	72,719	1,624	74,343
EIG Energy Fund XVI, LP	229,260	5,121	234,381
EIG Co-Investment	29,121	650	29,771
Eilser Multi-Strategy Fund, L.P.	18,348,981	409,840	18,758,821
Elliott International Limited	11,093,187	247,776	11,340,963
Exodus Point Partners Fund	13,894,873	310,354	14,205,227
Farallon Capital Institutional Partners, L.P.	(6,633)	(148)	(6,781)
Gateway Energy & Resource Holdings, LLC	18,507	413	18,920
Global Forest Partners GTI7 Institutional Investors Company Limited	3,841	86	3,927
Gryphon Partners VI, L.P.	3,936,649	87,928	4,024,577
Harrison Street Real Estate Core Property Fund, L.P.	454,531	10,152	464,683
HBK Merger Strategies Offshore Fund, Ltd.	3,033,415	67,754	3,101,169
HIG Middle Mkt LBO Fund IV, L.P.	1,552,103	34,668	1,586,771
JLL Partners Fund V, L.P.	133,622	2,985	136,607
JLL Partners Fund VI, L.P.	(3,822)	(85)	(3,907)
King Street Capital, LP	12,843	287	13,130
LaSalle Property Fund	773,648	17,280	790,928
Linden Capital Partners II, L.P.	218,923	4,890	223,813
Mercato Partners Traverse IV, L.P.	4,665,048	104,198	4,769,246
Merit Energy Partners F-II, L.P.	1,332	30	1,362
MGG Evergreen Cardinal Fund, L.P.	588,946	13,155	602,101
MHR Institutional Partners IIA, L.P.	(10,132)	(226)	(10,358)
MHR Institutional Partners III, L.P.	18,727	418	19,145
MHR Institutional Partners IV, L.P.	553,768	12,369	566,137
Millennium USA L.P.	(932,020)	(20,817)	(952,837)
Millennium Technology Value Partners II	(40,611)	(907)	(41,518)
Oaktree Real Estate Income Fund, L.P.	1,057,270	23,615	1,080,885
OCM Opportunities Fund VIIb, L.P.	5,491	123	5,614
OCM Opportunities Fund VIIIb, L.P.	1,274,965	28,477	1,303,442
OCM Power Opportunities Fund III, L.P.	64,217	1,434	65,651
Partners Group Direct Equity IV A, L.P.	1,979,026	44,203	2,023,229
Partners Group Direct Equity V A, L.P.	(518,016)	(11,570)	(529,586)
Portfolio Advisors Secondary Fund IV, L.P.	2,418,964	54,030	2,472,994
Silver Creek Special Opportunities Fund I, LP	26,442	591	27,033
Silver Creek Special Opportunities Fund II, LP	37,176	830	38,006
Standard Investment Research Hedged Equity Fund	5,422,644	121,119	5,543,763
Stockbridge Core & Value Advisors, LLC	530,060	11,839	541,899

Schedule of Investment Expenses continued on following page.

Schedules of Investment Expenses (continued)

For the Year Ended June 30, 2024

Schedule of Investment Expenses continued from previous page

Investing activity	MSEP	Judicial Plan	Total
TA Realty Core Property Fund, L.P.	\$ 718,687	\$ 16,052	\$ 734,739
Thomas H. Lee Partners L.P.	2,704,568	60,409	2,764,977
Vista Equity Partners VIII, L.P.	3,059,631	68,339	3,127,970
Voleon Institutional Strategies Fund LP	4,848,839	108,303	4,957,142
Voleon Investors Fund LP	1,243,146	27,767	1,270,913
Warren Equity Partners VI, L.P.	2,874,122	64,196	2,938,318
Total investment management and incentive fees	163,862,182	3,660,003	167,522,185
Other investment fees			
<i>Investment consultant fees</i>			
Egan-Jones Ratings Company	8,804	196	9,000
Meketa Investment Group	284,047	6,338	290,385
NEPC	313,016	6,984	320,000
Verus Advisory, Inc.	262,885	5,865	268,750
Total investment consultant fees	868,752	19,383	888,135
<i>Investment custodial and other fees</i>			
BNY Mellon (custodial)	446,565	9,975	456,540
BNY Mellon (performance calculation)	204,850	4,576	209,426
Total investment custodial and other fees	651,415	14,551	665,966
Internal investment activity expenses	9,965,685	90,114	10,055,799
Total investing activity expenses	\$ 175,348,034	\$ 3,784,051	\$ 179,132,085

Schedule of Internal Investment Activity Expenses*For the Year Ended June 30, 2024*

Personnel services	
Salaries	\$ 2,377,126
Fringe benefits	996,931
Total personnel services	<u>3,374,057</u>
Professional services	
Attorney services	5,888,406
Total professional services	<u>5,888,406</u>
Communications	
Telephone	5,630
Total communications	<u>5,630</u>
Facilities	
Utilities	8,019
Lease expense	89,776
Facility maintenance	1,685
Total facilities	<u>99,480</u>
Software and equipment	
Computer supplies and software	209,069
Total software and equipment	<u>209,069</u>
Education, meetings, and travel	
Professional development including travel	33,554
Due diligence travel	27,986
Total education, meetings, and travel	<u>61,540</u>
General	
Research and information services	398,026
Membership dues	13,690
Office supplies	1,582
Periodicals and publications	3,919
Recruiting	400
Total general	<u>417,617</u>
Total internal investment activity expenses	<u>\$ 10,055,799</u>

Schedule of Administrative Expenses

For the Year Ended June 30, 2024

Personnel services	
Salaries	\$ 6,283,717
Fringe benefits	3,197,382
Total personnel services	<u>9,481,099</u>
Professional services	
Consulting services	148,869
Attorney services	61,181
Auditing services	63,523
Actuarial services	190,708
Total professional services	<u>464,281</u>
Communications	
Postage and mailing	222,509
Telephone and internet	72,557
Printing	21,758
Video production	2,093
Total communications	<u>318,917</u>
Facilities	
Utilities	85,402
Facility maintenance	51,322
Vehicle maintenance and operation	4,492
Total facilities	<u>141,216</u>
Software and equipment	
Maintenance agreements and licenses	879,938
Computer supplies and software	84,513
Equipment rental	56,894
Gain on sale of equipment	(3,739)
Total software and equipment	<u>1,017,606</u>
Education, meetings, and travel	
Professional development including travel	104,548
Board travel and meetings	15,692
MOSERS sponsored seminars	91,420
Due diligence	1,631
Total education, meetings, and travel	<u>213,291</u>
General	
Depreciation and amortization	295,011
Insurance	219,215
Business continuity	100,777
Banking services	52,883
Research and information services	56,340
Office supplies and miscellaneous	56,527
Membership dues	27,713
Recruiting and outreach	20,508
Total general	<u>828,974</u>
Total administrative expenses	<u>\$ 12,465,384</u>

Schedule of Professional Service Fees

For the Year Ended June 30, 2024

Professional Services	
Operations administrative expenses	
<i>Actuarial services</i>	
CavMac	\$ 190,708
<i>Total actuarial services</i>	<u>190,708</u>
<i>Attorney services</i>	
Ice Miller, LLP	9,287
Thompson Coburn, LLP	51,894
<i>Total attorney services</i>	<u>61,181</u>
<i>Auditing services</i>	
Eide Bailly, LLP	63,523
<i>Total auditing services</i>	<u>63,523</u>
<i>Consulting services</i>	
Black Hills Information Security – information technology	91,086
Charlesworth & Associates – risk management	13,842
Gamble & Schlemeier, Ltd. – governmental affairs	32,327
Huber & Associates – information technology	6,400
Linea Solutions – information technology	3,125
Other consulting services	2,089
<i>Total consulting services</i>	<u>148,869</u>
Total operations administrative expenses	<u>464,281</u>
Investment administrative expenses	
<i>Attorney services</i>	
Bates White, LLC	802,141
Cassels Brock & Blackwell, LLP	137,409
Delta Consulting Group, Ltd.	13,974
Guru Discovery, LLC	550,934
Hemming Morse, LLP	34,799
Quinn Emanuel Urquhart & Sullivan, LLP	3,768,970
Thompson Coburn, LLP	578,541
Other attorney services	1,638
<i>Total attorney services</i>	<u>5,888,406</u>
Total investment administrative expenses	<u>5,888,406</u>
Total professional services expenses	<u>\$ 6,352,687</u>

Information on investment management and consulting fees can be found in the Schedules of Investment Expenses on pages 60-62.

Capitalized professional service fees for the pension administration system	
<i>Consulting services</i>	
ICON Integration and Design, Inc.	\$ 232,042
Tegrit	1,268,636
<i>Total consulting services</i>	<u>\$ 1,500,678</u>

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