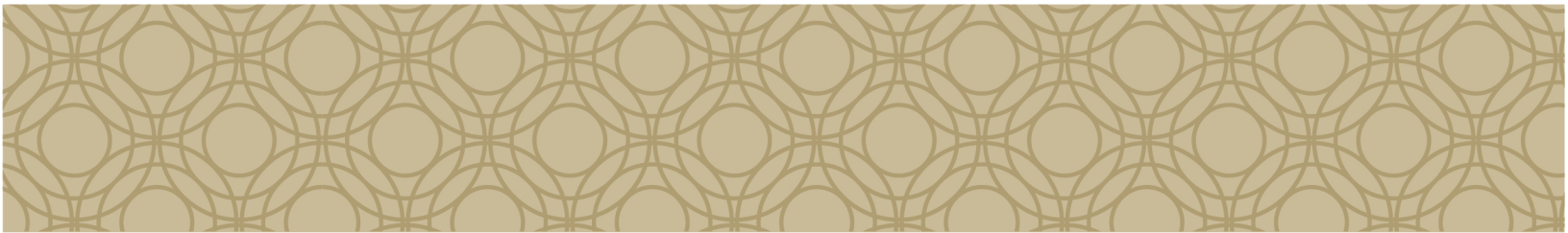


BENEFITS BY DESIGN



Missouri State Employees' Retirement System
A Pension Trust Fund of the State of Missouri
Schedules of GASB 68 Pension Information
for Participating Employers
Fiscal Year Ended June 30, 2023





Independent Auditor's Report

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

Report on Audit of Schedule of Allocations and Schedule of Pension Amounts by Employer

Opinions

We have audited the accompanying schedules of employer allocations of the Missouri State Employees' Plan and Missouri Judicial Plan, pension trust funds administered by the Missouri State Employees' Retirement System, collectively the System as of and for the year ended June 30, 2023, and related notes. We have also audited the totals for the columns titled net pension liability, total deferred outflows of resources, total deferred inflow of resources, discount rate sensitivity and plan pension expense (specified column totals) included in the accompanying schedule of pension amounts by employer (collectively the Schedules) of the System as of and for the year ended June 30, 2023, and related notes.

In our opinion, the Schedules referred to above present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflow of resources, discount rate sensitivity, and plan pension expense for all participating entities for the System as of and for the year ended June 30, 2023, in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Schedules section of our report. We are required to be independent of the System and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Other Matters

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the System as of and for the year ended June 30, 2023, and our report thereon, dated November 13, 2023, expressed an unmodified opinion on those financial statements.

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Independent Auditor's Report

Responsibilities of Management for the Schedules

Management is responsible for the preparation and fair presentation of the Schedules 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 the Schedules that is free from material misstatement, whether due to fraud or error.

Auditor's Responsibilities for the Audit of the Schedules

Our objectives are to obtain reasonable assurance about whether the Schedules as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS 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 Schedules.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the Schedules, 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 Schedules.
- 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 the System's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the Schedules.

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.

Supplementary Information

Our audit was conducted for the purpose of forming opinions on the Schedules of the System. The Schedule of Net Deferred Outflows and Inflows of Resources by Employer to be Recognized in Pension Expense – MSEP and Judicial Plan and the Schedule of Employer Covered Payroll – MSEP and Judicial Plan are presented for purposes of additional analysis and are not a required part of the financial statements.

The Schedule of Net Deferred Outflows and Inflows of Resources by Employer to be Recognized as Pension Expense – MSEP and Judicial Plan are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the Schedules. Such information has been subjected to the auditing procedures applied in the audit of the Schedules and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the Schedules, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Net Deferred Outflows and Inflows of Resources by Employer to be Recognized in Pension Expense – MSEP and Judicial Plan are fairly stated, in all material respects, in relation to the Schedules as a whole.

Independent Auditor's Report

The Schedules of Employer Covered Payroll – MSEP and Judicial Plan have not been subjected to the auditing procedures applied in the audit of the Schedules and, accordingly, we do not express an opinion or provide any assurance on them.

Restriction on Use

Our report is intended solely for the information and use of the System's management, the Board of Trustee, System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.

A handwritten signature in black ink that reads "Eide Sully LLP". The signature is written in a cursive, flowing style.

Boise, Idaho
January 10, 2024

Schedule of Employer Allocations

Schedule of Employer Allocations - MSEP

As of and for the year ended June 30, 2023

	Employer Contributions	Employer Allocated Proportion
State of Missouri	\$ 489,416,319	84.38147 %
Environmental Improvement and Energy Resource Authority	95,855	0.01653 %
Harris Stowe State University	2,758,991	0.47568 %
Lincoln University	3,890,560	0.67078 %
Missouri Agriculture & Small Business Development Authority	20,345	0.00351 %
Missouri Consolidated Health Care Plan	889,617	0.15338 %
Missouri Development Finance Board	105,310	0.01816 %
Missouri Housing Development Commission	2,355,322	0.40609 %
Missouri Public Entity Risk Management Fund	220,284	0.03798 %
Missouri Southern State University	4,284,262	0.73866 %
Missouri State University	27,679,071	4.77222 %
Missouri Technology Corporation	15,161	0.00261 %
Missouri Western State University	4,601,722	0.79339 %
Missouri Wine and Grape Board	75,651	0.01304 %
Northwest Missouri State University	9,090,349	1.56729 %
Southeast Missouri State University	10,434,698	1.79907 %
State Technical College of Missouri	3,352,330	0.57798 %
Truman State University	7,237,626	1.24786 %
University of Central Missouri	13,481,020	2.32430 %
Total	<u>\$ 580,004,493</u>	<u>100.00000 %</u>

Schedule of Employer Allocations

Schedule of Employer Allocations - Judicial Plan

As of and for the year ended June 30, 2023

	Employer Contributions	Employer Allocated Proportion
State of Missouri	\$ 39,064,758	100.00000 %
Total	<u>\$ 39,064,758</u>	<u>100.00000 %</u>

Schedule of Pension Amounts by Employer

Schedule of Pension Amounts by Employer - MSEP

As of and for the year ended June 30, 2023

	Discount Rate Sensitivity				Pension Expense		
	June 30, 2023 Net Pension Liability (NPL)	1% Decrease (5.95%)	Current Discount Rate (6.95%)	1% Increase (7.95%)	Proportionate Share of Pension Plan Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
State of Missouri	\$ 6,440,854,850	\$ 8,028,843,050	\$ 6,440,854,850	\$ 5,114,325,851	\$ 596,587,961	\$ 25,365,139	\$ 621,953,100
Environmental Improvement and Energy Resource Authority	1,261,509	1,572,534	1,261,509	1,001,695	116,848	138,016	254,864
Harris Stowe State University	36,309,057	45,261,029	36,309,057	28,831,010	3,363,148	(149,399)	3,213,749
Lincoln University	51,200,851	63,824,384	51,200,851	40,655,758	4,742,509	(1,865,459)	2,877,050
Missouri Agriculture & Small Business Development Authority	267,766	333,784	267,766	212,618	24,802	(133,745)	(108,943)
Missouri Consolidated Health Care Plan	11,707,603	14,594,104	11,707,603	9,296,359	1,084,424	258,211	1,342,635
Missouri Development Finance Board	1,385,928	1,727,627	1,385,928	1,100,488	128,372	(220,246)	(91,874)
Missouri Housing Development Commission	30,996,704	38,638,919	30,996,704	24,612,764	2,871,088	3,045,487	5,916,575
Missouri Public Entity Risk Management Fund	2,899,021	3,613,773	2,899,021	2,301,952	268,524	113,578	382,102
Missouri Southern State University	56,382,069	70,283,028	56,382,069	44,769,876	5,222,422	(5,823,325)	(600,903)
Missouri State University	364,264,299	454,073,404	364,264,299	289,242,090	33,740,195	(3,419,203)	30,320,992
Missouri Technology Corporation	199,527	248,720	199,527	158,433	18,481	(36,711)	(18,230)
Missouri Western State University	60,559,926	75,490,933	60,559,926	48,087,281	5,609,399	(3,364,792)	2,244,607
Missouri Wine and Grape Board	995,575	1,241,033	995,575	790,531	92,216	(19,717)	72,499
Northwest Missouri State University	119,631,490	149,126,549	119,631,490	94,992,735	11,080,937	(607,403)	10,473,534
Southeast Missouri State University	137,323,533	171,180,553	137,323,533	109,041,007	12,719,673	(7,037,201)	5,682,472
State Technical College of Missouri	44,117,561	54,994,714	44,117,561	35,031,310	4,086,415	2,398,121	6,484,536
Truman State University	95,249,180	118,732,798	95,249,180	75,632,095	8,822,511	(5,924,228)	2,898,283
University of Central Missouri	177,413,989	221,155,282	177,413,989	140,874,615	16,433,075	(2,717,123)	13,715,952
Total MSEP	\$ 7,633,020,438	\$ 9,514,936,218	\$ 7,633,020,438	\$ 6,060,958,468	\$ 707,013,000	\$ 0	\$ 707,013,000

Schedule of Pension Amounts by Employer

Schedule of Pension Amounts by Employer - MSEP (Continued)

As of and for the year ended June 30, 2023

	Deferred Outflows					Deferred Inflows				
	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion	Total Deferred Inflows of Resources
State of Missouri	\$ 301,779,468	\$ 529,953,103	\$ 0	\$ 34,991,311	\$ 866,723,882	\$ 0	\$ 0	\$ 0	\$ 7,927,334	\$ 7,927,334
Environmental Improvement and Energy Resource Authority	59,107	103,797	0	199,122	362,026	0	0	0	12,570	12,570
Harris Stowe State University	1,701,223	2,987,507	0	0	4,688,730	0	0	0	1,431,055	1,431,055
Lincoln University	2,398,962	4,212,803	0	194,045	6,805,810	0	0	0	2,683,985	2,683,985
Missouri Agriculture & Small Business Development Authority	12,546	22,032	0	0	34,578	0	0	0	74,033	74,033
Missouri Consolidated Health Care Plan	548,547	963,301	0	330,017	1,841,865	0	0	0	0	0
Missouri Development Finance Board	64,936	114,034	0	0	178,970	0	0	0	268,440	268,440
Missouri Housing Development Commission	1,452,318	2,550,407	0	2,865,533	6,868,258	0	0	0	0	0
Missouri Public Entity Risk Management Fund	135,831	238,531	0	99,321	473,683	0	0	0	0	0
Missouri Southern State University	2,641,722	4,639,113	0	113,689	7,394,524	0	0	0	5,527,866	5,527,866
Missouri State University	17,067,220	29,971,643	0	3,165,502	50,204,365	0	0	0	6,419,322	6,419,322
Missouri Technology Corporation	9,349	16,417	0	5,013	30,779	0	0	0	2,636	2,636
Missouri Western State University	2,837,472	4,982,867	0	0	7,820,339	0	0	0	917,092	917,092
Missouri Wine and Grape Board	46,647	81,915	0	14,578	143,140	0	0	0	54,732	54,732
Northwest Missouri State University	5,605,207	9,843,271	0	1,372,968	16,821,446	0	0	0	4,100,441	4,100,441
Southeast Missouri State University	6,434,150	11,298,971	0	225,044	17,958,165	0	0	0	8,693,667	8,693,667
State Technical College of Missouri	2,067,082	3,629,990	0	1,097,535	6,794,607	0	0	0	0	0
Truman State University	4,462,800	7,837,096	0	0	12,299,896	0	0	0	5,014,686	5,014,686
University of Central Missouri	8,312,546	14,597,611	0	1,552,614	24,462,771	0	0	0	3,098,433	3,098,433
Total MSEP	\$ 357,637,133	\$ 628,044,409	\$ 0	\$ 46,226,292	\$ 1,031,907,834	\$ 0	\$ 0	\$ 0	\$ 46,226,292	\$ 46,226,292

Schedule of Pension Amounts by Employer

Schedule of Pension Amounts by Employer - Judicial Plan

As of and for the year ended June 30, 2023

	Discount Rate Sensitivity				Pension Expense
	June 30, 2023 Net Pension Liability (NPL)	1% Decrease (5.95%)	Current Discount Rate (6.95%)	1% Increase (7.95%)	Total Employer Pension Expense
State of Missouri	\$ 464,015,568	\$ 527,860,952	\$ 464,015,568	\$ 409,270,520	\$ 40,384,252
Total Judicial Plan	\$ 464,015,568	\$ 527,860,952	\$ 464,015,568	\$ 409,270,520	\$ 40,384,252

Schedule of Pension Amounts by Employer

Schedule of Pension Amounts by Employer - Judicial Plan (Continued)

As of and for the year ended June 30, 2023

	Deferred Outflows				Deferred Inflows			
	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Earnings on Pension Plan Investments	Changes of Assumptions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Earnings on Pension Plan Investments	Changes of Assumptions	Total Deferred Inflows of Resources
State of Missouri	\$ 10,735,318	\$ 14,830,775	\$ 255,619	\$ 25,821,712	\$ 7,359,258	\$ 0	\$ 1,357,112	\$ 8,716,370
Total Judicial Plan	\$ 10,735,318	\$ 14,830,775	\$ 255,619	\$ 25,821,712	\$ 7,359,258	\$ 0	\$ 1,357,112	\$ 8,716,370

Note 1 - Plan Descriptions

The Missouri State Employees' Retirement System (MOSERS or the System) consists of two plans: the Missouri State Employees' Plan (MSEP) and the Judicial Plan.

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 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 other state government agencies 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.

Generally, all full-time state employees hired before July 2000, who were not covered under another state sponsored retirement plan, are eligible for membership in the MSEP (closed plan). Full-time state employees hired after July 2000, and before January 2011, are eligible for membership in the MSEP 2000. Employees hired for the first time on or after January 2011, are eligible for membership in the MSEP 2011 tier of the MSEP 2000. MOSERS participates as an employer in the MSEP and MSEP 2000. The MSEP provides retirement, survivor, and disability benefits.

The Judicial Plan is a single-employer, 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. 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 component unit 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 the circuit court, probate court, magistrate court, court of common pleas, court of criminal corrections, justices of the peace, or commissioners or deputy commissioners of the circuit court appointed after February 29, 1972, commissioners of the juvenile division of the circuit court appointed pursuant to Section 11.023, RSMo, commissioners of the drug court pursuant to Section 478.466, RSMo, or commissioners of the family court are eligible for membership in the Judicial Plan. The Judicial Plan provides retirement, survivor, and disability benefits. Members are immediately vested.

Notes to Schedules

Further information related to required contributions, pension benefits, other plan terms, and investments and related return and financial information related to MOSERS is available as described in Note 6.

Participating employers in the MSEP, for which amounts are allocated in the schedules include the state of Missouri, component units of the state of Missouri, and related organizations excluded from the state of Missouri's reporting entity. The state of Missouri is the only participating employer in the Judicial Plan.

The employer contribution rate for pension plans for the year ended June 30, 2023 were as follows:

Exhibit 1: Employer Contribution Rate for Pension Plans

	MSEP	Judicial Plan
Rate as percentage of payroll	26.33 %	60.17 %

Note 2 – Condensed Summary of Significant Accounting Policies

MOSERS employers are required to report pension information in their financial statements in accordance with Governmental Accounting Standards. The *Schedules of Employer Allocations* and *Schedules of Pension Amounts by Employer* provide employers with the required information for financial reporting under that standard.

The underlying financial information used to prepare the pension allocation schedules is based on MOSERS' financial statements and its accounting and payroll reporting systems. The financial statements of both MSEP and the Judicial Plan were prepared using the accrual basis of accounting and in accordance with U.S. generally accepted accounting principles.

Member and employer contributions are recognized when due, pursuant to formal commitments and statutory requirements. Benefits and refunds of employee contributions are recognized when due and payable in accordance with the statutes governing MOSERS. Expenses are recognized when the liability is incurred, regardless of when payment is made. Investments are reported at fair value on a trade date basis.

Total employer contributions due for the fiscal year are generally used as the basis for determining each employer's proportionate share of the collective pension amounts reported on the schedules. However, the System is excluded from all allocations. As a result, contributions totaling \$2,223,740 related to the System's members were excluded from the *Schedules of Employer Allocations*.

The net pension liability is based on each plan's fiduciary net position as reported in its financial statements and the estimated total pension liability estimated by MOSERS' actuary as of each fiscal year-end. It is allocated based on each employer's proportionate share of contributions.

Notes to Schedules

Deferred inflows and outflows, except for the change in proportion, are allocated based on each employer's proportionate share of contributions for the fiscal year. The difference between expected and actual investment earnings on pension plan investments is amortized as a component of pension expense over five years on a straight-line basis while the differences between expected and actual experience and changes in assumptions are amortized as a component of pension expense over the expected average remaining service lifetime (EARSL) of all participants. Deferred inflows and outflows related to the change in proportion used for allocation purposes from one fiscal year to the next are estimated by reallocating beginning balances using the ending allocation percentage and amortizing the difference over the EARSL as a component of pension expense. The remaining unamortized deferred inflows and outflows are reported in the *Schedule of Pension Amounts by Employer*. Each year's layer of deferred inflows and outflows retains its original calculated EARSL.

Pension expense is based on the service cost earned by participants during the fiscal year, interest on the total pension liability, certain changes in plan fiduciary net position, and the current year amortization of deferred inflows and outflows. It is allocated based on each employer's proportionate share of collective plan amounts and its specific amortization of change in proportion deferred item.

The preparation of these schedules in conformity with U.S. generally accepted accounting principles requires management to make significant estimates and assumptions that affect the reported amounts during the reporting period. Actual results could differ from those estimates.

Note 3 – Actuarial Assumptions, Methods and Net Pension Liability

Net Pension Liability of Employers

The components of the net pension liability as of June 30, 2023 were as follows:

Exhibit 2: Net Pension Liability of Employers

	MSEP	Judicial Plan
Total pension liability	\$ 16,190,813,686	\$ 654,242,323
MOSERS' fiduciary net position	<u>8,557,793,248</u>	<u>190,226,755</u>
Employers' net pension liability	<u>\$ 7,633,020,438</u>	<u>\$ 464,015,568</u>
Plan net position as a percentage of the total pension liability	52.86 %	29.08 %
Employers' covered payroll *	\$ 2,202,798,929	\$ 64,923,979
Employers' net pension liability as a percentage of covered payroll *	346.51 %	714.71 %

*Amounts reported as *Covered payroll*, and *Net pension liability as a percentage of covered payroll* in these *GASB 68 Employer Schedules* differ from amounts reported in MOSERS' annual actuarial valuation and *Annual Comprehensive Financial Report (ACFR)*. MOSERS internal payroll costs are included in the covered payroll figures reported in the annual actuarial valuation and *ACFR*, but are excluded from amounts reported in these *GASB 68 schedules* because net pension liability must be allocated among the participating employers, and not the System for the purposes of *GASB Statement 68*. In addition, the covered payroll figures reported in annual actuarial valuation and the *ACFR* include estimates for June payroll amounts to facilitate a timely completion of those reports, but amounts reported in these *GASB 68 Employer Schedules* are based on actual amounts.

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*, which can be found in MOSERS *ACFR*, presents multi-year trend information about whether the plan fiduciary net positions are increasing or decreasing over time relative to the total pension liability. The total pension liability, as of June 30, 2023, is \$16,190,813,686 for MSEP and \$654,242,323 for the Judicial Plan based on an actuarial valuation performed as of June 30, 2023, and a measurement date of June 30, 2023, using generally accepted actuarial procedures.

Notes to Schedules

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.

Exhibit 3: Summary of Actuarial Assumptions for the MSEP & the Judicial Plan Used to Determine Net Pension Liability

	Assumption
Valuation date	June 30, 2023
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).

** General Assembly members are assumed to get salary increases of 2.5%.

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.

Notes to Schedules

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%. 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, 2023, 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.

Exhibit 4: Discount Rate Sensitivity

		1% Decrease		Current Discount Rate		1% Increase
Employers' Net Pension Liability		5.95 %		6.95 %		7.95 %
MSEP	\$	9,514,936,218	\$	7,633,020,438	\$	6,060,958,468
Judicial Plan	\$	527,860,952	\$	464,015,568	\$	409,270,520

The current funding policy, if actuarial assumptions are met, results in the projected plan fiduciary net position being sufficient to pay benefits for all future years. Therefore, the current 6.95% discount rate is considered adequate, and the use of the municipal bond rate calculation is not necessary.

Notes to Schedules

Long-Term Expected Rate of Return

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 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 expected are summarized by asset class in the following tables.

Exhibit 5: Long-Term Expected Rate of Return

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 each portfolio.

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

Notes to Schedules

Note 4 – Basis for Allocation

The employers' proportionate share, reported in the *Schedules of Employer Allocations*, is calculated using accrued retirement contributions as of June 30, 2023. Adjustments have been made for employer contributions received that do not reflect an employer's projected long-term contribution effort. As a result, the total employer contribution amounts reported in the *Schedule of Employer Allocations* do not agree with the total employer contribution amounts reported on the *Combined Statements of Changes in Fiduciary Net Position* in MOSERS' June 30, 2023 ACFR.

Exhibit 6: Reconciliation of Employer Contributions

	MSEP	Judicial Plan
Employer Contributions reported in MOSERS' <i>Statement of Changes of Fiduciary Net Position</i> for the Year ended June 30, 2023	\$ 582,381,146	\$ 39,064,758
Adjustments for contributions related to past and future periods	(152,913)	0
Deduct MOSERS contributions not included in the allocation	(2,223,740)	0
Total employer contributions used as the basis for allocating employer's proportionate share of collective pension amounts.	<u>\$ 580,004,493</u>	<u>\$ 39,064,758</u>

The difference in contributions, as reported on the June 30, 2023 *Schedule of Employer Allocations*, and the total employer contributions as reported on the *Combined Statements of Changes in Fiduciary Net Position* in MOSERS' June 30, 2023 ACFR, is a difference between employer contributions and proportionate share of contributions, which is allocated proportionately to employers on the *Schedules of Pension Amounts by Employer*, based on the calculated allocation percentage. That amount is deferred and recognized over the average of the expected remaining service lives of active and inactive members.

Note 5 – Changes in Benefit Terms and Assumptions

The General Assembly passed, and the Governor signed, Senate Bill 75, which removed the statutory requirement that payment of the unfunded actuarial accrued liability be determined using the level percent of payroll amortization method. The Board may, but is not required to, calculate the annual employer contribution using a different amortization method. This change did not impact the June 30, 2023, valuation as Board action was not taken to change the amortization method.

At their September 21, 2023, meeting, the Board voted to increase the minimum employer contribution rate from 16.97% of pay for all years to 28.75% of pay in fiscal year 2025, 30.25% of pay in fiscal year 2026, and 32.00% of pay thereafter. The minimum contribution rate still expires once the System reaches a funded ratio of 80%. This change had no impact on the total pension liability of the System.

Note 6 – Additional Financial and Actuarial Information

Additional financial and actuarial information supporting the preparation of the *Schedules of Employer Allocations* and *Schedules of Pension Amounts by Employer* is included in the Systems' ACFR for the year ended June 30, 2023. The ACFR can be obtained at www.mosers.org.

Supplementary Information

Schedule of Net Deferred Outflows and Inflows of Resources by Employer to be Recognized in Pension Expense - MSEP

As of June 30, 2023

	2024	2025	2026	2027	2028	Total
State of Missouri	\$ 313,290,573	\$ 163,624,098	\$ 314,348,279	\$ 67,533,605	\$ 0	\$ 858,796,555
Environmental Improvement and Energy Resource Authority	181,496	93,164	61,568	13,227	0	349,455
Harris Stowe State University	616,527	488,364	1,772,077	380,707	0	3,257,675
Lincoln University	726,968	359,129	2,498,876	536,851	0	4,121,824
Missouri Agriculture and Small Business Development Authority	(42,007)	(13,325)	13,068	2,808	0	(39,456)
Missouri Consolidated Health Care Plan	785,443	362,271	571,394	122,756	0	1,841,864
Missouri Development Finance Board	(134,878)	(36,764)	67,641	14,532	0	(89,469)
Missouri Housing Development Commission	3,717,310	1,313,134	1,512,805	325,006	0	6,868,255
Missouri Public Entity Risk Management Fund	230,656	71,143	141,488	30,397	0	473,684
Missouri Southern State University	(1,054,082)	(422,184)	2,751,748	591,177	0	1,866,659
Missouri State University	15,603,374	6,584,234	17,778,052	3,819,381	0	43,785,041
Missouri Technology Corporation	12,426	3,886	9,738	2,092	0	28,142
Missouri Western State University	2,049,414	1,263,200	2,955,649	634,982	0	6,903,245
Missouri Wine and Grape Board	23,205	6,176	48,589	10,439	0	88,409
Northwest Missouri State University	4,098,865	1,529,123	5,838,659	1,254,359	0	12,721,006
Southeast Missouri State University	634,545	487,963	6,702,125	1,439,864	0	9,264,497
State Technical College of Missouri	3,120,004	1,058,848	2,153,174	462,581	0	6,794,607
Truman State University	897,573	740,260	4,648,671	998,706	0	7,285,210
University of Central Missouri	7,629,604	3,215,760	8,658,755	1,860,220	0	21,364,339
Total	\$ 352,387,016	\$ 180,728,480	\$ 372,532,356	\$ 80,033,690	\$ 0	\$ 985,681,542

Supplementary Information

Schedule of Net Deferred Outflows and Inflows of Resources by Employer to be Recognized in Pension Expense - Judicial Plan

As of June 30, 2023

	2024	2025	2026	2027	2028	Total
State of Missouri	\$ 575,351	\$ 2,754,575	\$ 11,119,972	\$ 2,655,444	\$ 0	\$ 17,105,342
Total	<u>\$ 575,351</u>	<u>\$ 2,754,575</u>	<u>\$ 11,119,972</u>	<u>\$ 2,655,444</u>	<u>\$ 0</u>	<u>\$ 17,105,342</u>

Supplementary Information

Schedule of Employer Covered Payroll - MSEP

For the year ended June 30, 2023 (Unaudited)

	Employer Covered Payroll
State of Missouri	\$ 1,858,751,503
Environmental Improvement and Energy Resource Authority	364,054
Harris Stowe State University	10,478,504
Lincoln University	14,776,039
Missouri Agriculture & Small Business Development Authority	77,270
Missouri Consolidated Health Care Plan	3,378,717
Missouri Development Finance Board	399,963
Missouri Housing Development Commission	8,945,394
Missouri Public Entity Risk Management Fund	836,629
Missouri Southern State University	16,269,270
Missouri State University	105,123,681
Missouri Technology Corporation	57,580
Missouri Western State University	17,477,098
Missouri Wine and Grape Board	287,318
Northwest Missouri State University	34,525,117
Southeast Missouri State University	39,630,445
State Technical College of Missouri	12,731,984
Truman State University	27,488,134
University of Central Missouri	51,200,229
Total	<u>\$ 2,202,798,929</u>

Supplementary Information

Schedule of Employer Covered Payroll - Judicial Plan

For the year ended June 30, 2023 (Unaudited)

	Employer Covered Payroll
State of Missouri	\$ 64,923,979
Total	<u>\$ 64,923,979</u>

Note 1. Recognition Period

The recognition period of the changes in proportion and differences between employer contributions and proportionate share of contributions, as well as the difference between expected and actual experience, and changes in assumptions are recognized over the average expected remaining service lives of active and inactive members. The difference between projected and actual investment earnings is recognized over 5 years. Plan amendments are recognized immediately.

The average expected remaining services lives of active and inactive members were as follows:

Exhibit 7: Average Expected Remaining Service Lives

Average Expected Remaining Service Lives as of Fiscal Year end June 30,	MSEP	Judicial Plan
2023	2.466	4.265
2022	2.639	4.300
2021	2.953	4.140
2020	3.084	4.168
2019	3.263	3.962
