REPORT OF

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

JUNE 30, 2022

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INDEPENDENT AUDITORS' REPORT

The Board of Trustees
Missouri Department of Transportation and
Highway Patrol Employees' Retirement System

Opinion

We have audited the accompanying statement of fiduciary net position of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (the System), as of June 30, 2022, and the related statement of changes in fiduciary net position for the year then ended, and the related notes to the financial statements, which collectively comprise the System's basic financial statements as listed in the table on contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the System as of June 30, 2022, and the changes in fiduciary net position for the year then ended, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

We conducted our audit in accordance with U.S. generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditors' Responsibilities of the Audit of the Financial Statements section of our report. We are required to be independent of the System and to meet our 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 bases for our audit opinion.

Responsibilities of Management for the Financial Statements

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

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

Auditors' Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our 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 generally accepted 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 generally accepted 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 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 financial statements.

- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the System's ability to continue as a going concern for a reasonable period of time.

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

Required Supplementary Information

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 4 through 6 and the schedules of changes in the employers' net pension liability, employers' contributions, investment returns, changes in net OPEB liability and related ratios, MPERS' proportionate share of net OPEB liability, and related notes on pages 29 through 32 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with U.S. generally accepted auditing standards, 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.

Other Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Systems' basic financial statements. The schedule of administrative expenses, schedule of investment expenses, and the schedule of consultant and professional expenses on pages 33 through 35 are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The schedule of administrative expenses, schedule of investment expenses, and the schedule of consultant and professional expenses on pages 33 through 35 are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the financial statements. The information on pages 33 through 35 have 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 U.S. generally accepted auditing standards. In our opinion, the information on pages 33 through 35 is fairly stated in all material respects in relation to the basic financial statements as a whole.

Williams-Keepers LLC

Columbia, Missouri
November 8, 2022

The management of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (the System, or MPERS) provides this discussion and analysis of the System's financial performance for the fiscal year ended June 30, 2021. While this discussion is intended to summarize the financial status of MPERS, readers should consider this information in conjunction with the information that is furnished in the more detailed financial statements and corresponding notes.

DESCRIPTION OF BASIC FINANCIAL STATEMENTS

As required by the Governmental Accounting Standards Board (GASB) accounting standards, this financial report consists of Management's Discussion and Analysis (this section), the basic financial statements (including notes to the basic financial statements), and other required supplementary information.

Financial Statements report information about MPERS, using accounting methods similar to those used by private-sector companies, by using the economic resources measurement focus and accrual basis of accounting. These statements provide both long-term and short-term information about the System's overall financial status. These statements follow this Management's Discussion and Analysis section:

- The *Statement of Fiduciary Net Position* includes all the System's assets and deferred outflows of resources, and liabilities and deferred inflows of resources, with the difference reported as net position.
- The *Statement of Changes in Fiduciary Net Position* accounts for all the current year's additions (income) and deductions (expenses), regardless of when cash is received or paid.

Notes to the Financial Statements are included following the financial statements. The notes to the financial statements provide additional information that is essential for a full understanding of the data provided in the financial statements.

Required Supplementary Information follows the notes and further supports the information in the financial statements.

Supplementary Information follows the required supplementary information and provides additional detailed administrative and investment expense information.

ANALYSIS OF FINANCIAL POSITION AND RESULTS OF OPERATIONS

Overall, the financial position of MPERS increased by $63.3 million, reported as the "net increase". This is primarily a result of the increase in the fair value of investments for the year ended June 30, 2022. The funded status of the plan showed an increase of 3.92%, primarily due to the positive investment returns.

The following schedules present summarized comparative data from the System's financial statements for each of the fiscal years ended June 30, 2022 and 2021. Following each schedule is a brief summary providing explanation and analyses of the major reasons for changes in the condensed financial statements.

Summarized Comparative Statements of Fiduciary Net Position

	As of June 30, 2022	As of June 30, 2021	% Change 2022 / 2021
Cash and Receivables	$ 119,368,464	$ 27,488,024	334.3
Investments	3,058,469,276	3,002,537,498	1.9
Invested Securities Lending Collateral	23,800,466	117,448,756	-79.7
Capital Assets	388,915	383,217	1.5
Total Assets	**3,202,027,121**	**3,147,857,495**	**1.7**
Deferred Outflows of Resources	**513,253**	**361,851**	**41.8**
Accounts Payable	108,303,592	19,344,757	459.9
OPEB Obligation	2,367,620	2,019,603	17.2
Securities Lending Collateral	24,560,325	122,747,636	-80.0
Total Liabilities	**135,231,537**	**144,111,996**	**-6.2**
Deferred Inflows of Resources	**115,751**	**182,122**	**-36.4**
Net Position Restricted for Pensions	**$3,067,193,086**	**$3,003,925,228**	**2.1**

The increase in cash and receivables is primarily attributable to an increase of investment sales receivable as of June 30, 2022. Fluctuations in this area are normal, based on investment activity.

The System's investments represent the main component of total assets. These investments include equities, fixed income, limited partnerships, hedge funds, and short-term investments. The increase in fair value of investments as of June 30, 2022, is a result of the positive investment performance during the fiscal year. The fiscal year 2022 investment return was 3.94% as calculated on a time-weighted rate of return methodology.

Capital assets increased in fiscal year 2022 due to improvements made to a recently purchased parcel of land adjacent to the MPERS office.

Deferred outflows of resources are related to Other Post-Employment Benefits (OPEB), required by Governmental Accounting Standards Board (GASB) Statement 75. The deferred outflows of resources relate to the timing of contributions paid and changes in assumptions.

The largest component of liabilities in fiscal year 2022 is accounts payable. The increase in accounts payable for fiscal year 2022 is attributable to higher investment purchases payable. Fluctuations in this area are normal, based on investment activity. Another component of liabilities is securities lending collateral. This represents the amount owed for collateral to be returned as the result of investment securities lent. The corresponding securities lending collateral asset is valued at a lower amount than the securities lending collateral liability due to the fair value of the securities on loan being less than the collateral value.

Deferred inflows of resources are related to OPEB. The deferred inflows of resources relate primarily to the amortization of changes in actuarial assumptions.

The System's net position restricted for pensions was $3.067 billion as of June 30, 2022, a $63.3 million increase from the $3.004 billion net position as of June 30, 2021.

Summarized Comparative Statements of Changes in Fiduciary Net Position

	Year Ended June 30, 2022	Year Ended June 30, 2021	% Change 2022 / 2021
Contributions	$ 225,366,897	$ 217,389,127	3.7
Net Investment Income	122,767,485	699,644,251	-82.5
Other Income	195	286	-31.8
Total Additions	**348,134,577**	**917,033,664**	**-62.0**
Benefits	279,637,701	270,122,851	3.5
Administrative Expenses	5,229,018	4,585,473	14.0
Total Deductions	**284,866,719**	**274,708,324**	**3.7**
Net Increase	63,267,858	642,325,340	-90.2
Net Position – Beginning	3,003,925,228	2,361,599,888	27.2
Net Position – Ending	**$3,067,193,086**	**$3,003,925,228**	**2.1**

Net investment income, a primary component of plan additions, was $122.8 million for fiscal year 2022, which represented a 3.94% return for the fiscal year ended June 30, 2022. In comparison, the fiscal year 2021 income of $699.6 million represented an investment return of 30.80%. Annual fluctuations within the broad investment markets are outside the control of the System and are expected to fluctuate from year to year; however, fiscal year 2021 was an exceptional year as markets recovered from the losses incurred during the onset of the COVID-19 pandemic. Fiscal year 2022 investment returns proved just as exceptional as fiscal year 2021 given that MPERS had a positive return of 3.94% when the median public fund return was a negative 10.8%. The Board of Trustees has approved a diversified asset allocation that, over long periods of time, is expected to realize the assumed actuarial rate of investment return of 6.50%.

Total benefits increased $9.5 million from fiscal year 2021 to fiscal year 2022 due to increases in the total number of retirees, service transfer payments, and employee contribution refunds.

The increase in fiscal year 2022 administrative expenses is due to higher personnel and related benefit expenses incurred as a result of the strong investment returns and outperformance over policy benchmarks.

CURRENTLY KNOWN FACTS AND RECENT EVENTS

Based on the June 30, 2022 actuarial valuation, the Board of Trustees approved a decrease to the required state contribution rate for uniformed patrol of 58.00%, effective July 1, 2023. The rate applied to non-uniformed payroll (MoDOT, civilian patrol, and MPERS) remains at 58.00%.

Based on the June 30, 2021 actuarial valuation, the Board of Trustees approved an increase to the required state contribution rate for uniformed patrol of 58.65%, effective July 1, 2022. The rate applied to non-uniformed payroll (MoDOT, civilian patrol, and MPERS) remained at 58.00%.

CONTACTING THE RETIREMENT SYSTEM'S MANAGEMENT

This financial report is designed to provide a general overview of the System's finances. Questions about this report or requests for additional financial information should be sent to:

MoDOT and Patrol Employees' Retirement System
PO Box 1930
Jefferson City, MO 65102-1930
mpers@mpers.org

Statement of Fiduciary Net Position

As of June 30, 2022

ASSETS	
Cash	$ 1,063,596
Receivables	
Contributions	9,378,544
Accrued Interest and Income	6,888,452
Investment Sales	102,034,872
Other	3,000
Total Receivables	118,304,868
Investments, at Fair Value	
Equities	110,372,581
Fixed Income	905,805,465
Limited Partnerships	1,699,581,098
Hedge Funds	43,697,485
Short-Term Investments	299,012,647
Total Investments	3,058,469,276
Invested Securities Lending Collateral	23,800,466
Capital Assets, Net of Depreciation	
Land	188,319
Building and Improvements	581,619
Furniture, Equipment, and Software	3,438,789
Accumulated Depreciation	(3,819,812)
Capital Assets, Net of Depreciation	388,915
TOTAL ASSETS	**$3,202,027,121**
DEFERRED OUTFLOWS OF RESOURCES	**$ 513,253**
LIABILITIES	
Accounts Payable	$ 2,048,797
OPEB Obligation	2,367,620
Security Lending Collateral	24,560,325
Investment Purchases	106,254,795
TOTAL LIABILITIES	**$ 135,231,537**
DEFERRED INFLOWS OF RESOURCES	**$ 115,751**
NET POSITION RESTRICTED FOR PENSIONS	**$3,067,193,086**

See accompanying Notes to the Financial Statements.

Statement of Changes in Fiduciary Net Position

For the Year Ended June 30, 2022

ADDITIONS	
Contributions	
Employer	$ 212,711,117
Employee	5,899,734
Service Transfers from Other System	4,334,202
Other	2,421,844
Total Contributions	225,366,897
Investment Income from Investing Activities	
Net Appreciation in Fair Value of Investments	133,304,933
Interest and Dividends	58,448,600
Investment Expenses	(69,169,944)
Net Investment Gain	122,583,589
Income from Securities Lending Activities	
Securities Lending Gross Income	287,978
Securities Lending Expenses, net	(104,082)
Net Income from securities Lending Activities	183,896
Other Income	195
TOTAL ADDITIONS	**$ 348,134,577**
DEDUCTIONS	
Benefits Expenses	
Retiree and Survivor Annuity Benefits	$ 254,733,514
BackDROP Payments	17,688,088
Disability Benefits	2,303,783
Death Benefits	1,130,000
Service Transfer Payments	2,757,330
Employee Contributions Refunds	1,024,986
Total Benefits Expenses	279,637,701
Administrative Expenses	5,229,018
TOTAL DEDUCTIONS	**$ 284,866,719**
NET INCREASE	$ 63,267,858
NET POSITION RESTRICTED FOR PENSIONS	
Beginning of Year	**$3,003,925,228**
End of Year	**$3,067,193,086**

See accompanying Notes to the Financial Statements.

NOTE 1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

As established under Section 104.020 of the Revised Statutes of Missouri (RSMo.), the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (MPERS) is a body corporate and an instrumentality of the State of Missouri (State). Due to the nature of MPERS' reliance on funding from the Missouri Department of Transportation (MoDOT) and the Missouri State Highway Patrol (MSHP) and control of the overall plan document by the legislative and executive branches of state government, MPERS is considered a part of the State of Missouri financial reporting entity and is included in the State's financial reports as a component unit shown as a pension trust fund.

Note 1 (a) - Basis of Accounting
The financial statements were prepared using the accrual basis of accounting. Contributions are due to MPERS when employee services have been performed. Contributions are recognized as revenues when due, pursuant to statutory requirements. Benefits are recognized when due and payable and expenses are recorded when the corresponding obligations are incurred. Dividend income is recognized when dividends are declared. Interest income is recognized when earned.

Note 1 (b) - Method Used to Value Investments
Investments are reported at fair value on a trade date basis. Bonds and stocks traded on a national or international exchange are valued at the reported sales price at current exchange rates. Mortgages are valued on the basis of future principal and interest payments and are discounted at prevailing interest rates for similar instruments. The fair value of real estate and timber investments are based on net asset value estimates provided by the general partners' administrators or portfolio managers, which are compared to independent appraisals. Investments that do not have an established market are reported at estimated fair value. The fair value of the hedge fund portfolios and partnership portfolios are based on valuations of the underlying assets as reported by the general partner or portfolio manager.

Note 1 (c) - Net Investment in Capital Assets
MPERS capitalizes assets with an expected useful life greater than one year and a cost greater than $5,000. Capital assets are depreciated on the straight-line method over the estimated useful lives of the related assets. The estimated useful lives are as follows:

Furniture, Equipment and Software	3-10 years
Building and Improvements	30 years

Note 1 (d) - Use of 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 reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

NOTE 2 – PLAN DESCRIPTIONS AND CONTRIBUTION INFORMATION

MPERS is a body corporate and an instrumentality of the state as a multiple-employer, public employee retirement system with one plan that has three benefit structures known as the Closed Plan, the Year 2000 Plan, and the Year 2000 Plan-2011 Tier. The plan provides retirement, survivor, and disability benefits for employees of MoDOT, MSHP, and MPERS. The plan is administered in accordance with the requirements of a cost sharing, multiple-employer, public employee retirement plan under the Revised Statutes of Missouri. In MPERS are vested the powers and duties specified in sections 104.010 to 104.312, 104.601 to 104.805, and 104.1003 to 104.1093, 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 outlined pursuant to these sections. Responsibility for the operation and administration of the System is vested in the Board of Trustees, which consists of eleven members, four elected by the active and retired plan members, three Highway and Transportation Commissioners, a State Senator appointed by the President pro tem of the Senate, a State Representative appointed by the Speaker of the House, and the MoDOT Director and MSHP Superintendent who serve as ex-officio members. Detailed information regarding contributions can be found in Note 5.

Generally, all covered employees hired before July 1, 2000, are eligible for membership in the Closed Plan. All covered employees hired on or after July 1, 2000, and before January 1, 2011, are eligible for membership in the Year 2000 Plan. All covered employees hired on or after January 1, 2011, are eligible for membership in the Year 2000 Plan's 2011 Tier.

Membership in the Closed Plan, Year 2000 Plan, and 2011 Tier as of June 30, 2022

	Closed	Year 2000	Tier 2011	Total
Retirees, Beneficiaries, and Disabilities Currently Receiving Benefits	4,809	4,622	55	9,486
Terminated Employees Entitled to But Not Yet Receiving Benefits	929	1,025	302	2,256
Active Employees				
Vested	1,504	1,960	1,342	4,806
Non-Vested	3	51	1,996	2,050
Total Membership	**7,245**	**7,658**	**3,695**	**18,598**

Closed Plan Description

Employees covered by the Closed Plan are fully vested for benefits upon receiving 5 years of creditable service. Under the Closed Plan, MoDOT and civilian employees may retire with full benefits upon the earliest of attaining:

- Age 65 with 4 or more years of creditable service (active);
- Age 65 with 5 or more years of creditable service (terminated & vested);
- Age 60 with 15 or more years of creditable service (active or terminated & vested); or
- "Rule of 80" – at least age 48 with sum of member's age and service equaling 80 or more (active or terminated & vested).

The following provisions apply for uniformed patrol members of the Closed Plan:

- Age 55 with 4 or more years of creditable service (active);
- Age 55 with 5 or more years of creditable service (terminated & vested);
- "Rule of 80" – at least age 48 with sum of member's age and service equaling 80 or more (active or terminated & vested); or
- Mandatory retirement at age 60 (active).

All non-uniformed members may retire early, with reduced benefits, at age 55 with at least 10 years of creditable service.

The base benefit in the Closed Plan is equal to 1.6% multiplied by the final average pay multiplied by years of creditable service. For members of the uniformed patrol, the base benefit is calculated by applying the same formula, then multiplying the product by 1.333333.

Retired uniformed members will receive an additional benefit of $90 per month, plus cost-of-living adjustments (COLAs), until attainment of age 65. This payment, however, is reduced by any amount earned during gainful employment. This benefit is not available to uniformed members hired on or after January 1, 1995, or to vested deferred members.

For members employed prior to August 28, 1997, COLAs are provided annually based on 80% of the increase in the consumer price index for all urban consumers for the United States (CPI-U). The minimum rate is 4% and the maximum rate is 5%, until the cumulative amount of COLAs equals 65% of the original benefit. Thereafter, the 4% minimum rate is eliminated, and the annual COLA rate will be equal to 80% of the increase in the CPI-U (annual maximum of 5%). For members employed on or after August 28, 1997, COLAs are provided annually based on 80% of the increase in the CPI-U, up to a maximum rate of 5%.

The BackDROP is a payment option that is available to eligible members upon retirement. This option provides for a benefit to be calculated as if the member elected to retire at a previous date. If the BackDROP is elected, the monthly benefit payable on the actual retirement date is based on the benefit that would have been received by the member had he/she left employment and retired on the BackDROP date. In addition, the member will receive a lump sum payment equal to 90% of the life income annuity amount the member would have received during the BackDROP period. This lump sum amount includes any COLAs and other benefit increases; also, credit will be received for the unused sick leave balance as of the date of retirement.

The life income annuity payment option (which contains no provision for survivorship) and the life income with 60 or 120 month guaranteed payment options are available to all members. Joint and 50% or 100% survivor options are available if married at the time of retirement. In the Closed Plan, the reduction for the joint & 100% survivor option is based on the difference between the age of the member and the survivor. There is no reduction for the joint and 50% survivor option.

If a reduced joint and survivor option is chosen at the time of retirement and the spouse precedes the member in death, the benefit will revert back (pop-up) to a normal annuity, upon appropriate notification to MPERS.

Members may name a new spouse as beneficiary if:

- They were single at retirement and since married;
- They elected a spouse option at the time of retirement, the spouse preceded the member in death, and then a remarriage occurred.

The member has 1 year from the date of marriage to re-elect a payment option and name a new spouse.

All members who retire from active employment or long-term disability, or begin receiving normal or work-related disability benefits, on or after September 28, 1985, are provided a $5,000 death benefit payable to designated beneficiaries.

Year 2000 Plan Description

Employees covered by the Year 2000 Plan are fully vested for benefits upon earning 5 years of creditable service. Under the Year 2000 Plan, MoDOT and civilian employees may retire with full benefits upon the earliest of attaining:

- Age 62 and with 5 or more years of creditable service (active or terminated & vested);
- "Rule of 80" – at least age 48 with sum of member's age and service equaling 80 or more (active).

The following provisions apply for uniformed patrol members of the Year 2000 Plan:

- "Rule of 80" – at least age 48 with sum of member's age and service equaling 80 or more (active);
- Mandatory retirement at age 60 (active only).

All members may retire early with reduced benefits at age 57 with at least 5 years of creditable service.

The base benefit in the Year 2000 Plan is equal to 1.7% multiplied by the final average pay multiplied by years of creditable service. Members retiring under the Rule of 80, and uniform patrol members retiring at the mandatory retirement age (currently 60), receive an additional temporary benefit until age 62. The temporary benefit is equivalent to 0.8% multiplied by final average pay multiplied by years of creditable service.

COLAs are provided annually based on 80% of the increase in the CPI-U, up to a maximum rate of 5%.

The BackDROP is a payment option that may be available to members upon retirement. This option provides for a monthly benefit to be calculated as if the member elected to retire at a previous date. If the BackDROP is elected, the monthly benefit payable on the actual retirement date is based on the benefit that would have been received by the member had he/she left employment and retired on the BackDROP date. In addition, the member will receive a lump sum payment equal to 90% of the life income annuity amount the member would have received during the BackDROP period. This lump sum amount includes any temporary benefits, COLAs, and other benefit increases; also, credit will be received for the unused sick leave balance as of the date of retirement.

The life income annuity payment option (with no provision for survivorship) and the life income with 120 or 180 months guaranteed payment options are available to all members. Joint and 50% or 100% survivorship options are available if married at the time of retirement. The reduction for the joint and 50% or 100% survivor options is based on the member's age at retirement, as well as the age difference between the member and the survivor.

If a reduced joint and survivor option is chosen at the time of retirement and the spouse precedes the member in death, the benefit will revert back (pop-up) to a normal annuity, upon appropriate notification to MPERS.

Members may name a new spouse for survivor benefits if:

- They were single at retirement and since married;
- They elected a spouse option at the time of retirement, the spouse preceded the member in death, and then a remarriage occurred.

The member has 1 year from the date of marriage to re-elect the payment option and name a new spouse.

All members who retire from active employment or long-term disability, or begin receiving work-related disability benefits, on or after July 1, 2000, are provided a $5,000 death benefit payable to designated beneficiaries.

Year 2000 Plan-2011 Tier Description

Employees covered by the 2011 Tier are fully vested for benefits upon earning 5 years of creditable service if they were active on or after January 1, 2018. Under the 2011 Tier, MoDOT and civilian employees may retire with full benefits upon the earliest of attaining:

- Age 67 and with 5 or more years of creditable service (active or terminated & vested);
- “Rule of 90” – at least age 55 with sum of member’s age and service equaling 90 or more (active only).

Active MoDOT and civilian employees may retire early with reduced benefits at age 62 with at least 5 years of creditable service. The following provisions apply for uniformed patrol members of the 2011 Tier:

- Age 55 and with 5 or more years of creditable service (active only);
- Mandatory retirement at age 60 with no minimum service amount (active only).

Terminated and vested uniformed patrol employees may retire at age 67 with 5 or more years of creditable service.

The base benefit in the 2011 Tier is equal to 1.7% multiplied by the final average pay multiplied by years of creditable service. Members retiring under the Rule of 90, and uniform patrol members retiring at the mandatory retirement age (currently 60) or at age 55 with 5 years of creditable service, receive an additional temporary benefit until age 62. The temporary benefit is equivalent to 0.8% multiplied by final average pay multiplied by years of creditable service.

COLAs are provided annually based on 80% of the change in the CPI-U, up to a maximum rate of 5%.

The life income annuity payment option (with no provision for survivorship) and the life income with 120 or 180 months guaranteed payment options are available to all members. Joint and 50% or 100% survivorship options are available if married at the time of retirement. The reduction for the joint and 50% or 100% survivor options is based on the member’s age at retirement, as well as the age difference between the member and the survivor.

If a reduced joint and survivor option is chosen at the time of retirement and the spouse precedes the member in death, the benefit will revert back (pop-up) to a normal annuity, upon appropriate notification to MPERS.

Members may name a new spouse for survivor benefits if:

- They were single at retirement and since married;
- They elected a spouse option at the time of retirement, the spouse preceded the member in death, and then a remarriage occurred.

The member has 1 year from the date of marriage to re-elect the payment option and name a new spouse.

All members who retire from active employment or long-term disability, or begin receiving work-related disability benefits, on or after January 1, 2011, are provided a $5,000 death benefit payable to designated beneficiaries.

Contributions

Beginning January 1, 2011, employee contributions of 4% of gross pay are required for those covered by the Year 2000 Plan-2011 Tier.

Employer contributions are determined through annual actuarial valuations. Administrative expenses are financed through contributions from participating employers and investment earnings.

Participating employers are required to make contributions to the plan based on the actuarially determined rate. Detailed information regarding contributions can be found in Note 5.

NOTE 3 – DEPOSITS AND INVESTMENTS

The Board of Trustees has established policies and procedures by which funds are invested. Section 104.150, RSMo., provides the authority for the Board to invest MPERS funds. Plan assets are invested in a diversified portfolio following prudent standards for preservation of capital, with the goal of achieving the highest possible rate of return consistent with MPERS' tolerance for risk. The Board of Trustees establishes MPERS' asset allocation policy and may amend the policy. The following is MPERS' current asset allocation policy:

Asset Class	Target Allocation
Public Equity	40.0%
Private Equity	10.0%
Traditional Fixed Income	22.5%
Opportunistic Debt	7.5%
Real Assets	10.0%
Real Estate	10.0%
Cash	0.0%

Note 3 (a) - Deposit and Investment Risk Policies

Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the System's investment in a single issuer. Within the traditional asset classes (equities and fixed income), the consultant will aggregate exposures across asset classes to create measures of concentration including industries, countries, and security issuer for Investment staff review.

Investment Custodial Credit Risk

Custodial credit risk is an investment risk that, in the event of the failure of the counterparty to a transaction, the System will not be able to recover the value of its investment or the collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the System, and are held by either: a) the counterparty or b) the counterparty's trust department or agent but not in the System's name. It is the policy of the System to require that all investments be clearly marked as to ownership and, to the extent possible, shall be registered in the name of the System.

Cash Deposit Custodial Credit Risk

Cash deposit custodial credit risk is the risk that, in the event of the failure of depository financial institution, the System will not be able to recover deposits or will not be able to recover collateral securities that are in the possession of an outside party. Missouri state law requires that all public funds must be collateralized with acceptable securities having fair values of at least 100% of the amount of funds on deposit (less any amount covered by FDIC insurance).

Market Risk

Market risk is the risk that the fair value of an investment will be adversely impacted due to a change in value of the underlying market. The three primary market risks prevalent in the System's investment portfolio are equity prices, interest rates, and foreign currencies. Equity risk is the risk that stock prices fall and/or the volatility in the equity market increases. Interest rate risk is the risk that fixed income securities (or any investment primarily valued on a yield basis) will drop in value due to an increase in interest rates. 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 System protects the portfolio against market risks by adopting a diversified asset allocation that limits the amount of exposure to each underlying market risk. Market risks are also controlled by monitoring the types, amounts, and degree of risk that each investment manager takes for their specific mandate.

Investment Credit Risk

Investment credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. Unless authorized under a separate Investment Management Agreement or operating agreement, it is the policy of the System to limit fixed income managers to purchasing securities that possess a minimum credit rating of “Baa” by Moody’s and “BBB” by Standard & Poor’s. Issues subsequently downgraded below these ratings must be brought to the attention of the Chief Investment Officer. Where counterparty risk is present, the System’s investment managers seek to control credit risk through counterparty credit evaluations and approvals, counterparty credit limits and exposure monitoring procedures.

Note 3 (b) - Cash Deposits

Cash balances include short-term securities held by the custodial bank to meet future obligations and operating balances held by the depository bank. As of June 30, 2022, MPERS had a carrying amount of deposits of $(202,347), and a bank balance of $190,262. The FDIC covered the bank balances. To maximize investment income, cash is invested in overnight repurchase agreements, thus causing the negative cash amount disclosed above. The balances in these repurchase agreements on June 30, 2022 totaled $1,265,943. As of June 30, 2022, no investments were held as repurchase agreements that were uninsured or unregistered, with securities held by the counterparty or by its trust department or agent but not in MPERS’ name.

Note 3 (c) – Concentrations

No investments in any one organization (other than those issued or sponsored by the U.S. government and those in pooled investments) represent 5% of plan net position.

Note 3 (d) – Rate of Return

For the year ended June 30, 2022, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 4.00%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Note 3 (e) – Investments

The following table shows MPERS’ investments by type.

Summary of Investments by Type as of June 30, 2022

	Carrying Amount	Fair Value
Equities	$ 132,282,565	$ 110,372,581
Fixed Income	942,839,711	905,805,465
Limited partnerships	1,443,338,857	1,699,581,098
Hedge	21,078,941	43,697,485
Short Term Securities	300,304,466	300,278,590
Securities Lending Collateral	23,800,466	23,800,466
Total Investments	**$2,863,645,006**	$3,083,535,685
Reconciliation to Statement of Fiduciary Net Position:		
Less: Repurchase Agreements		(1,265,943)
Less: Securities Lending Collateral		(23,800,466)
Investments per Statement of Fiduciary Net Position		**$3,058,469,276**

Certain investments are not listed on national exchanges, over-the-counter markets, nor do they have quoted market prices. Their valuation is based on the most current net asset values, independent appraisals, and/or good faith estimates of the investment's fair value provided by the general partner or portfolio manager, cash flow adjusted through fiscal year end. The estimated fair value of these investments may differ significantly from values that would have been used had a ready market existed. The following investments were priced using those methods and comprised 57.00% of the total fair value of the System's investments as of June 30, 2022:

	Fair Value
Hedge Funds	$ 43,697,485
Limited Partnerships	1,699,581,098
	$1,743,278,583

Note 3 (f) – Fair Value Measurements

MPERS 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 give 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: Values derived from valuation techniques in which significant inputs are unobservable. Investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

Investments Measured at Fair Value, June 30, 2022

Investments by Fair Value Level	**Fair Value**	**Level 1**	**Level 2**	**Level 3**
Short Term Securities	$ 287,932,946	$ 286,112,898	$ 1,820,048	$ 0
Debt Securities				
Collateralized Debt Obligations	573,715,966	0	384,558,261	189,157,705
Commercial Mortgage-Backed Securities	42,405,065	0	32,463,368	9,941,697
Corporate Bonds	8,761,463	0	8,761,463	0
Government Commercial Mortgage-Backed Securities	667,943	0	0	667,943
Government Mortgage-Backed Securities	17,059,586	0	14,697,158	2,362,428
Municipal Bonds	134,560,091	0	64,880,766	69,679,325
U.S. Government Agencies	39,876,683	0	39,876,683	0
U.S. Treasury Securities	47,318,713	0	47,318,713	0
Funds – Corporate Bonds	14,244,830	14,244,830	0	0
Total Debt Securities	878,610,340	14,244,830	592,556,412	271,809,098
Equity Securities				
Financials	46,571,123	43,452,953	3,118,170	0
Information Technology	326	326	0	0
Real Estate	40,227,145	40,227,145	0	0
Total Equity Securities	86,798,594	83,680,424	3,118,170	0
Private Markets				
Opportunistic Debt	337,238,784	33,094,554	5,951,289	298,192,941
Private Equity	493,791,854	501,979	0	493,289,875
Real Assets	442,501,053	(801,386)	0	443,302,439
Real Estate	200,032,983	8,562,350	0	191,470,633
Total Private Markets	1,473,564,674	41,357,497	5,951,289	1,426,255,888
Investment Derivative Instruments				
Futures – Swaps	(21,407,894)	0	(21,407,894)	0
Total Investment Derivative Instruments	(21,407,894)	0	(21,407,894)	0
Total Investment by Fair Value Level	$2,705,498,660	**$ 425,395,649**	**$ 582,038,025**	**$ 1,698,064,986**
Investments Measured at Net Asset Value				
Equity Long/Short	1			
Event	4,594,932			
Global Asset Allocation	9,288,906			
In-Liquidation	914,007			
Multi-Strategy	267,890,289			
Private Real Estate Fund	72,962,730			
Structured Credit - Relative Value	11,706			
Total Investments Measured at Net Asset Value	355,662,571			
Total Investments	**$3,061,161,231**			

Reconciliation to Statement of Fiduciary Net Position	
Total Investments Measured at Fair Value and Derivatives	$3,061,161,231
Investment Sales Receivable	(102,034,872)
Investment Purchases Payable	106,254,795
Accrued Interest and Income	(6,888,452)
Accrued Expenses	(23,426)
Total Investments per Statement of Fiduciary Net Position	**$3,058,469,276**

Investments listed as level 1 include equity securities and futures contracts where the price comes from an exchange.

Investments listed as level 2 include debt securities where an independent pricing evaluator had direct observable information including: trading volume, multiple sources of market data and benchmark spreads. The equity index swap is included because the valuation inputs include an observable interest rate and the underlying index.

Investments listed as level 3 include debt securities where an independent pricing evaluator did not have direct observable information and had limited market information for comparable securities. Significant inputs used in the valuation are not available aside from the evaluator providing the price. Direct investments in private equity, real estate, credit, and real assets are included because the valuation techniques utilize discounted cash flows or other non-observable market information by manager.

Private Markets Measured at Fair Value as of June 30, 2022

Private Markets	**Fair Value**	**Unfunded Commitments**
Private Equity	$ 493,791,854	$ 162,783,851
Real Estate	200,032,983	164,719,981
Real Assets	442,501,053	83,979,170
Opportunistic Debt	337,238,784	190,021,292
Total Private Markets	**$ 1,473,564,674**	**$ 601,504,294**

Private Markets

Private equity, real estate, real assets, and opportunistic debt are the four asset classes that fall into the category of private market funds. These funds invest in the equity or debt of private companies.

Private Equity: The private equity portfolio includes 29 direct fund investments and three fund of fund investments. These funds mostly invest in private companies adding value through operational or industry expertise and vast networks. The majority of the private equity allocation is in buyout funds with a smaller portion in venture capital and growth equity funds. These funds are not eligible for redemption. Distributions are received as underlying investments within the funds are liquidated, which on average can occur over the span of six to ten years.

Real Estate: The real estate portfolio consists of 30 real estate funds. The noncore real estate book includes 25 real estate funds that invest in value-add or opportunistic strategies. These funds are not eligible for redemption. Distributions are received as underlying investments within the funds are liquidated, which on average can occur over the span of six to ten years. The remaining five investments are in core real estate funds. Four of these funds are open-ended. Four are eligible for redemption on a quarterly basis and one on a daily basis.

Real Assets: The real asset portfolio contains 35 funds that invest in private energy, aviation, mining, and shipping companies. The timber portfolio, which includes both ownership in timber funds and direct timber investments, is also within the real assets portfolio. The timber portfolio has 12 direct timber investments. These funds and investments are not eligible for redemption. Distributions are received as underlying investments and investments within the funds are liquidated, which on average can occur over the span of six to ten years.

Opportunistic Debt: The opportunistic debt portfolio, comprised of 36 funds, provide financing to various companies. While this portfolio has a U.S. bias, some funds invest internationally with exposures in Europe and Asia. These funds are not eligible for redemption. Distributions are received as underlying investments within the funds are liquidated, which on average can occur over the span of three to five years.

Investments Measured at Net Asset Value as of June 30, 2022

Investments at Net Asset Value	Net Asset Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Hedge Funds				
Equity Long/Short	$ 1	$ 0	Quarterly	45 days
Event Driven	4,594,932	0	Monthly	90 days
Global Asset Allocation	9,288,906	0	Monthly	5-60 days
In-Liquidation	914,007	0	In Liquidation	
Multi-Strategy	267,890,289	0	Monthly	60-90 days
Structured Credit – Relative Value	11,706	0	Quarterly	60 days
Total Hedge Funds	282,699,841	0		
Private Real Estate Funds	72,962,730	0	Daily	90 days
Total Investments at Net Asset Value	**$355,662,571**	**$ 0**		

Hedge Funds

Equity Long/Short: Consisting of one fund, this strategy invests in both long and short in Asia Pacific equity securities, with a goal of adding growth and minimizing market exposure. Due to contractual lock-up restrictions, the value of these investments is eligible for redemption in the next six months.

Event Driven: Consisting of one fund, this strategy seeks to gain an advantage from pricing inefficiencies that may occur at the onset or aftermath of a merger, corporate action, or related event. Due to contractual lock-up restrictions, the value of this fund is eligible for redemption in the next four months.

Global Asset Allocation: Consisting of one fund, this strategy is highly diversified and uses fundamental research to develop systematic rules for trading positions. Due to contractual lock-up restrictions, the value of this fund is eligible for redemption in the next 35 days.

Hedge Funds in Liquidation: MPERS currently has a small investment in two hedge funds that are in liquidation. These funds have closed and MPERS is awaiting the sale of final assets.

Multi-Strategy: The two funds that make up this group aim to pursue varying strategies in order to diversify risks and reduce volatility. Due to contractual lock-up restrictions, the value of these investments is eligible for redemption in the next six months.

Structured Credit – Relative Value: MPERS currently has one fund that is in liquidation in this strategy.

Private Real Estate Funds

MPERS invests in five core private real estate funds that are commingled in nature. Four are eligible for redemption on a quarterly basis and one on a daily basis.

Note 3 (g) – Investment Interest Rate Risk

The following table summarizes the maturities of government obligations, corporate bonds, convertible corporate bonds, mortgages, and asset-backed securities which are exposed to interest rate risk.

Summary of Weighted Average Maturities at June 30, 2022

		Investment Maturities (in years)			
Investment Type	**Fair Value**	**Less than 1**	**1 – 5**	**6 – 10**	**More than 10**
Asset-Backed Securities	$579,701,180	$ 62,874,457	$ 37,143,255	$156,513,168	$323,170,300
Commercial Mortgage-Backed Securities	36,061,674	0	0	3,499,152	32,562,522
Corporate Bonds	8,668,538	0	3,565,604	185,319	4,917,615
Government Agencies	39,495,438	0	0	1,772,848	37,722,590
Government Bonds	25,898,516	0	0	0	25,898,516
Government Mortgage-Backed Securities	17,005,243	2,115	83,556	230,104	16,689,468
Government-Issued Commercial Mortgage-Backed Securities	642,686	0	0	0	642,686
Index Linked Government Bonds	21,076,516	0	0	8,789,002	12,287,514
Municipal/Provincial Bonds	155,769,466	945,501	10,440,330	27,810,785	116,572,850
Non-Government-Backed C.M.O.’s	7,241,378	0	589,331	0	6,652,047
Short Term Bills and Notes	1,820,048	1,820,048	0	0	0
Total	**$893,380,683**	**$ 65,642,121**	**$ 51,822,076**	**$198,800,378**	**$577,116,108**

NOTE 3(h) – Investment Credit Ratings

The table below summarizes the credit ratings of the government obligations, corporate bonds, mortgages, and asset-backed securities.

Investment Type	AAA	AA	A	BBB	BB	B	CCC	CC	Not Rated	US Government Guaranteed	Total
Asset-Backed Securities	$194,277,963	$ 74,079,786	$ 10,540,501	$ 0	$ 918,714	$ 93,506,794	$ 0	$ 6,427,832	$199,949,590	$ 0	$ 36,061,674
Commercial Mortgage-Backed Securities	9,181,349	1,614,799	0	0	0	0	0	0	25,258,536	6,990	36,061,674
Corporate Bonds	0	4,917,615	2,001,120	1,749,803	0	0	0	0	0	0	8,668,538
Government Agencies	0	36,631,566	0	0	0	0	0	0	0	2,863,872	39,495,438
Government Bonds	0	0	0	0	0	0	0	0	4,702,813	21,195,703	25,898,516
Government Mortgage-Backed Securities	0	0	0	0	0	0	0	0	46,641	16,958,602	17,005,243
Government-Issued Commercial Mortgage-Backed Securities	0	0	0	0	0	0	0	0	0	642,686	642,686
Index Linked Government Bonds	0	0	0	0	0	0	0	0	8,789,002	12,287,514	21,076,516
Municipal/Provincial Bonds	27,345,600	89,786,988	0	0	0	0	0	0	38,636,878	0	155,769,466
Non-Government-Backed C.M.O.'s	2,278,801	0	0	133,175	0	0	1,883,537	0	2,945,865	0	7,241,378
Short Term Bills and Notes	0	0	0	0	0	0	0	0	1,820,048	0	1,820,048
Total	**$233,083,713**	**$207,030,754**	**$ 12,541,621**	**$ 1,882,978**	**$ 918,714**	**$ 93,506,794**	**$ 1,883,537**	**$ 6,427,832**	**$282,149,373**	**$ 53,955,367**	**$893,380,683**

Note 3 (i) – Investment Foreign Currency Risk

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 MPERS' exposure to foreign currencies for all assets that are held in custody at the System's custodial bank. MPERS 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.

Exposure to Foreign Currency Risk as of June 30, 2022

Foreign Currency	Equities	Fixed Income	Real Estate / Partnerships	Cash and Cash Equivalents	Total
Australian Dollar	$ 397,186	$ 0	$ 0	$ 0	$ 397,186
British Pound Sterling	291,980	1,257,602	244,275	67,491	1,861,348
Canadian Dollar	319,433	0	0	(193,069)	126,364
Euro	671,096	931,742	41,025,244	120,692	42,748,774
Hong Kong Dollar	499,018	0	0	0	499,018
New Israeli Shekel	0	0	0	1,820,048	1,820,048
Japanese Yen	851,609	0	0	0	851,609
Singapore Dollar	315,282	0	0	0	315,282
Total Exposure Risk	**$ 3,345,604**	**$ 2,189,344**	**$41,269,519**	**$ 1,815,162**	**$48,619,629**

Note 3 (j) – Securities Lending

In accordance with the Board of Trustees' investment policy, MPERS participates in a securities lending program. The Northern Trust Company administers the program. There are no restrictions on the amount of securities that may be lent.

Securities that may be loaned include U.S. government and agency securities, corporate equity, and fixed income securities. Collateral may include cash, U.S. government securities and irrevocable letters of credit. U.S. securities are loaned in exchange for collateral valued at 102% of the fair value of the securities, plus any accrued interest. Non-U.S. securities are loaned in exchange for collateral valued at 105% of the fair value of the securities, plus any accrued interest. On June 30, 2022, MPERS had no credit risk exposure to borrowers since the amount of collateral exceeded the amount of the loans.

Non-cash collateral cannot be pledged or sold unless the borrower defaults. The average term of the System's loans was approximately 57 days as of June 30, 2022. Cash open collateral is invested in a short-term investment pool, which had an interest sensitivity of 24 days as of June 30, 2022. Cash collateral may also be invested separately in "term loans", in which case the investments match the loan term. These loans can be terminated on demand by either lender or borrower. There were no known violations of legal or contractual provisions, or borrower or lending agent default losses. There were no dividends or coupon payments owing on the securities lent. Securities lending earnings are credited on approximately the fifteenth day of the following month.

Indemnification deals with a situation in which a client's securities would not be returned due to the insolvency of a borrower and Northern Trust would fail to live up to its contractual responsibilities relating to the lending of those securities. Northern Trust's responsibilities include performing appropriate borrower and collateral investment credit analyses and demanding adequate types and levels of collateral.

The following table summarizes the collateral held (including both cash collateral recognized in the Statement of Fiduciary Net Position and non-cash collateral).

Collateral Held as of June 30, 2022

Investment Type	
Equities	$41,698,182
Corporate Fixed	586,387
Government & Government-Sponsored Securities	637,020
Agencies	1,433,329
Total	**$44,354,918**

Note 3 (k) – Derivatives

A derivative financial instrument is an investment whose value depends on the values of one or more underlying assets, financial indexes, or commodity prices. These investments include futures contracts, options contracts, and forward foreign currency exchange. Derivative financial instruments involve credit risk and market risk, as described in Note 3(a), in varying levels.

Through MPERS' external managers, MPERS holds investments in futures contracts, swaps contracts, options contracts, and forward foreign currency exchange contracts. MPERS enters into futures and swaps contracts to gain exposure to certain markets and enters into forward foreign exchange contracts primarily to hedge foreign currency exposure.

The notional value related to these derivative instruments is generally not recorded on the financial statements; however, the change in fair value of these instruments is incorporated in performance. The notional/fair value of $887,560,000 for the various contracts in MPERS' portfolio as of June 30, 2022, is recorded in investments on the Statement of Fiduciary Net Position. The change in fair value of $(159,219,477) for the year ended June 30, 2022, is recorded in investment income on the Statement of Changes in Fiduciary Net Position.

Investment Derivatives as of June 30, 2022

Type	Classification	Notional / Fair Value	Unrealized Gain / (Loss)
Foreign Currency Forward Contracts	Investments, at fair value	$ 6,177,885	$ 40,186
Futures Contracts	Investments, at fair value	643,536,117	(103,815,932)
Swaps Contracts	Investments, at fair value	237,845,998	(55,443,701)
Total		**$887,560,000**	**$(159,219,447)**

Through the use of derivatives, MPERS is exposed to risk that the counterparties involved in the contracts are unable to meet the terms of their obligation. MPERS' investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, and exposure monitoring procedures. MPERS anticipates the counterparties will be able to satisfy their obligations under contract. The associated counterparty's credit rating is an A+.

NOTE 4 – RECEIVABLES

Receivables as of June 30, 2022

Type	Total
Contributions – MoDOT	$ 5,660,739
Contributions – MSHP Non-Uniformed	1,295,582
Contributions – MSHP Uniformed	2,169,068
Contributions – MPERS	253,155
Investment Interest & Income	6,888,452
Investment Sales	102,034,872
Miscellaneous	3,000
Total	**$118,304,868**

NOTE 5 – CONTRIBUTIONS

MoDOT, MSHP, and MPERS make contributions to the System, as do employees covered under the Year 2000 Plan- 2011 Tier. MPERS permanent funding policy provides for actuarially determined employer contributions using the entry-age normal cost method on a closed group basis (consisting of normal cost and amortization of any unfunded accrued liabilities over a 30-year period, beginning July 1, 2006). (The objective is to reduce the period by one year each year.) A temporary accelerated policy has been adopted where the total contribution is based on entry-age normal cost plus a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities. Both amortization periods are closed periods starting July 1, 2010. This temporary accelerated policy was adopted by the MPERS' Board of Trustees on September 17, 2009 and will remain in effect until such time as the retiree liability becomes 100% funded or the permanent policy produces a higher contribution rate. Actuarially determined rates, expressed as percentages of annual covered payroll, provide for amounts sufficient to fund those benefits designated by state statute to be funded in advance. Actuarial assumptions used to compute contribution requirements are the same as those used to compute the pension benefit obligation. The employee contribution rate for members of the Year 2000 Plan-2011 Tier is set by statute.

Required employer contributions totaling $212,711,117 for fiscal year 2022, represent funding of normal costs and amortization of the unfunded accrued liability. Actual contributions made were 100% of required contributions. Contribution rates as of June 30, 2022, as determined by the actuarial valuation for the year ended June 30, 2020, are shown in the following table. The Board established actual rates to be the same as the actuarially determined rates.

Contribution Rates

MoDOT, MPERS & Civilian Patrol	Uniformed Patrol	2011 Tier Employee
58.00%	58.00%	4.00%

At the September 26, 2014, Board meeting, the Board adopted the use of a contribution rate stabilization reserve that would result in an MPERS employer contribution rate similar to the fiscal year 2015 rates. The reserve is intended to keep the contribution relatively level over time and may be used if the investment market experiences a downturn in the future. The Board further adopted (in February 2015) that the employer contribution rate would not fall below 58% unless 1) the fund became fully funded or 2) the contribution stabilization reserve reached $250 million. The balance of the reserve as of June 30, 2022, was $170,663,656.

NOTE 6 – DEFERRED RETIREMENT OPTION PROGRAM

MPERS currently provides a BackDROP option. This is an election made at the time of actual retirement. In effect, it provides members an option to elect to receive a portion of their benefits as cash. Since the election is not made until the member actually retires, the option is not treated as a DROP provision in accordance with generally accepted accounting principles.

NOTE 7 – NET PENSION LIABILITY OF EMPLOYERS

The components of the net pension liability of the employers as of June 30, 2022, were as follows:

Total pension liability	$ 4,410,685,047
Plan fiduciary net position	(3,067,193,086)
Employers' net pension liability	$ 1,343,491,961
Plan fiduciary net position as a percentage of the total pension liability	69.54%
Covered payroll	$ 367,493,332
Employers' net pension liability as a percentage of covered payroll	365,58%

Actuarial Assumptions

The total pension liability amounts were determined by actuarial valuations as of June 30, 2022, using the following actuarial assumptions, applied to all prior periods included in the measurement:

Inflation (price inflation)	2.25%
Salary Increases (includes 3.00% wage inflation)	3.00% to 12.45%
Investment Rate of Return	6.50%

The mortality tables, for post-retirement mortality, used in evaluating allowances to be paid to non-disabled pensioners were the RP-2014 Healthy Mortality Tables projected to 2022 using projection scale MP-2017. Pre-retirement mortality used were the RP-2014 Employee Mortality Table projected to 2022 using projection scale MP- 2017 and multiplied by a factor of 65%. Disabled pension mortality was based on RP-2014 Disabled Retiree Annuitant Mortality Tables projected to 2022 using projection scale MP-2017.

The long-term (30 year) expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return were adopted by the plan's trustees after considering input from the plan's investment consultants and actuary. These estimates for each major asset class included in MPERS' target asset allocation as of June 30, 2022, (see Note 3) are summarized in the following table:

Asset Class	Long-Term Expected Rate of Return
Global Equity	3.4%
Private Equity	7.4%
Fixed Income	1.4%
Opportunistic Debt	5.6%
Real Assets	3.7%
Real Estate	2.0%

Discount Rate

A single discount rate of 6.50% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 6.50%. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. The employers pay the same contribution rate for each employee regardless of the plan the employee was hired under. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's June 30, 2022, net pension liability, calculated using a single discount rate of 6.50%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

Current Single Discount			
	1% Decrease 5.50%	**Rate Assumption 6.50%**	**1% Increase 7.50%**
Net Pension Liability	$1,868,572,532	$1,343,491,961	$906,377,429

NOTE 8 – EMPLOYER PROPORTIONATE SHARE

MPERS, as the administrative agent for the pension system, is also an employer of the pension system. The administrative expenses of the pension system are included in the deductions to the pension system's fiduciary net position. While the employer contributions of the other participating employers are funded from outside revenue sources, the employer contributions of MPERS are funded from sources already recognized as revenues, such as earnings on plan investments or contributions paid by the other participating employers. Attempting to allocate a portion of the net pension liability to MPERS as an employer would result in an allocation of the net pension liability to the other participating employers. Accordingly, MPERS excludes its contributions from the employer proportionate share calculation for the reporting of a net pension liability, by assigning itself a proportionate share of 0%. This exclusion, in essence, shifts the portion of the net pension liability that would accrue to MPERS to the other participating employers.

NOTE 9 – PERSONNEL SERVICES AND RETIREMENT PLAN

MPERS employed 18 full-time employees as of June 30, 2022. Eleven former MPERS employees have retired.

Full-time employees are members of the System (see Note 8). For these employees, MPERS accrued 58.00% of payroll during fiscal year 2022, amounting to $1,374,954. The amounts for fiscal year 2022 and the four preceding years are shown below. These amounts are recorded as both a contribution and administrative expense. Information regarding the retirement plans can be found in Notes 2 and 5.

Net Obligations

Year Ended June 30	**Annual Contribution Accrual Percent**	**Dollars**
2018	58.00%	$1,127,506
2019	58.00	987,370
2020	58.00	987,743
2021	58.00	1,219,468
2022	58.00	1,374,954

NOTE 10 – OTHER POST-EMPLOYMENT BENEFITS (OPEB)

In addition to the retirement benefits described previously, MPERS provides a portion of health care insurance through the MoDOT and MSHP Medical and Life Insurance Plan (Insurance Plan) in accordance with Missouri State statutes. The Insurance Plan is considered an agent multiple employer defined benefit plan and is administered by MoDOT. The Insurance Plan is financed on a pay-as-you-go basis and is an internal service fund of MoDOT. As of June 30, 2022, there were 9 inactive (retired) members and 18 active employees participating in the Insurance Plan.

Medical insurance benefits are established by the Insurance Plan's Board of Trustees and are approved by the Missouri Highways and Transportation Commission. Benefits include general inpatient and outpatient medical services; mental, nervous and substance abuse care; and prescriptions. Eligible members are employees who retired from the System with a minimum of 5 years of service and who participate in the Insurance Plan. MoDOT issues a publicly available financial report that includes financial statements and required supplementary information for the Insurance Plan. Requests for this report should be addressed to MoDOT, Financial Services Division, P.O. Box 270, Jefferson City, MO 65102.

Employer and member contributions are established by the Insurance Plan's Board of Trustees and are approved by the Missouri Highways and Transportation Commission. Premiums vary by coverage categories, which include retirees, certain disabled employees, spouses, certain dependents, and survivors of deceased employees and retirees.

Changes in Total OPEB Liability

MPERS' proportionate share (0.17%) of the Insurance Plan's net OPEB liability is $2,367,620 which was measured as of July 1, 2021, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of that date.

Summary of Changes in Net OPEB Liability for the Year Ended June 30, 2022

	Total
Beginning Balance	$2,019,603
Changes for the year:	
Service Cost	74,581
Interest Cost	45,896
Changes of benefit terms	0
Differences between expected and actual experience	263,007
Changes in assumptions	(368)
Benefit Payments	(35,099)
Net Changes	348,017
Ending Balance	**$2,367,620**

Deferred Outflows and Inflows

For the year ended June 30, 2022, MPERS recognized net OPEB expense of $162,736 MPERS reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB

	Deferred Outflows	**Deferred Inflows**
Differences between expected and actual experience	$218,809	$ 13,318
Changes of assumptions or other inputs	264,777	102,433
Contributions subsequent to measurement date	29,667	0
Total	**$513,253**	**$115,751**

Deferred outflows resulting from contributions subsequent to the measurement date will be recognized as a change to the net pension liability in each subsequent year. Other deferred amounts related to OPEB will be recognized in expenses as follows:

Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB

Fiscal Year	
2023	$ 71,926
2024	76,500
2025	94,348
2026	107,192
2027	47,536
Total Thereafter	0
	$ 397,502

Actuarial Assumptions

The following actuarial assumptions and other inputs, applied to all periods included in the measurement:

Cost method	Entry Age Normal based upon salary
Salary increases	2.50%
Discount rate	2.16%
Investment rate of return	N/A; the plan is unfunded
Health care cost trend rates	5.90%; decreasing to 4.65% in 2027
Retirees' share of benefit-related costs	43.03% - 60.02%
Admin Expense Trend (Inflation) Rate	3.00%

- The salary increases were based on projected salaries, which include COLAs, provided by MoDOT.
- The discount rate was based on Bond Buyer General Obligation 20-Bond Municipal Bond Index.
- Mortality rates were based on Pub-2010 Public Retirement Plans Safety Employees Mortality Table weighted by Headcount projected by MP-2021.
- The actuarial assumptions used in the June 30, 2022 valuation were based on the results of an actuarial experience study for the period July 1, 2020-June 30, 2021.
- It is assumed the current employer and member contributions will continue as approved by the Commission.

Changes of assumptions and other inputs reflect a change in the discount rate from 2.21% in 2021 to 2.16% in 2022.

The following table illustrates the impact of interest rate sensitivity on the Net OPEB Liability as of June 30, 2022:

Interest Rate Sensitivity

	1% Decrease	**Current Discount Rate**	**1% Increase**
Net OPEB Liability	$2,873,948	$2,367,620	$1,975,843

The following table illustrates the impact of healthcare cost trend sensitivity on the Net OPEB Liability as of June 30, 2022:

Healthcare Cost Trend Sensitivity

	1% Decrease	**Current Discount Rate**	**1% Increase**
Net OPEB Liability	$1,937,227	$2,367,620	$2,931,720

NOTE 11 – CAPITAL ASSETS

Summary of Changes in Capital Assets

	June 30, 2021 Balance	Additions	Deletions / Retirements	June 30, 2022 Balance
Land	$ 159,293	$ 29,026	$ 0	$ 188,319
Building	581,619	0	0	581,619
Furniture, Equipment and Software	3,438,789	0	0	3,438,789
Less: Accumulated Depreciation	(3,796,484)	(23,328)	0	(3,819,812)
Total	**$ 383,217**	**$ 5,698**	**$ 0**	**$ 388,915**

NOTE 12 – COMMITMENTS

MPERS has committed $1,775,534,146 of which $1,174,029,852 has been invested, leaving total unfunded commitments to private equity, real estate, real assets, and opportunistic debt of $601,504,294 as of June 30, 2022. The total unfunded investment commitments are not recorded in the accompanying Statement of Fiduciary Net Position.

NOTE 13 – RISK MANAGEMENT

MPERS is exposed to various risks of loss related to natural disasters, asset theft or damage, errors and omissions, torts, and employee injuries.

MPERS has purchased commercial insurance related to capital asset loss and damage. Ancillary coverage provided through the property policy includes coverage for accounts receivable, loss of money and securities, employee dishonesty, and forgery and alterations. MPERS carries a $2 million umbrella liability policy. MPERS has coverage through Missouri Highway and Transportation Commission’s Self-Insurance Fund related to workers’ compensation. MPERS has also purchased a directors and officers liability policy with $1 million aggregate coverage. This coverage is inclusive of legal defense costs and carries a $35,000 deductible. The State’s Legal Expense Fund covers all state employees and officers, and MPERS has purchased surety bonds for the executive director and staff. Settlements have not exceeded coverages for each of the past three fiscal years.

MPERS has a disaster recovery plan that provides for continued computer operations at a remote location should the retirement office be unavailable for normal computing operations.

Schedule of Changes in the Employers' Net Pension Liability
Year Ended June 30

	2022	2021	2020	2019	2018
Total Pension Liability					
Service Cost [1]	$ 55,097,433	$ 43,726,886	$ 44,048,083	$ 43,971,030	$ 46,621,377
Interest on the Total Pension Liability	275,067,181	278,522,994	274,791,358	271,174,089	286,457,436
Benefit Changes	0	0	0	0	(7,684)
Difference Between Expected and Actual Experience	16,085,222	(26,471,689)	3,494,582	203,459	(37,173,164)
Assumption Change	0	226,319,675	0	0	142,556,109
Benefit Payments [2]	(278,612,715)	(266,108,191)	(262,710,811)	(255,310,406)	(254,131,209)
Refunds	(1,024,986)	(611,132)	(796,107)	(780,538)	(503,007)
Disability Premiums [2]	0	(1,600,628)	(1,640,971)	(1,615,860)	(1,601,605)
Transfers to Other Retirement Systems [2]	0	(1,802,900)	(2,457,945)	(2,111,007)	(2,823,042)
Net Change in Total Pension Liability	**66,612,135**	**251,975,015**	**54,728,189**	**55,530,767**	**179,395,211**
Total Pension Liability – Beginning	**4,344,072,912**	**4,092,097,897**	**4,037,369,708**	**3,981,838,941**	**3,802,443,730**
Total Pension Liability – Ending (a)	**$4,410,685,047**	**$4,344,072,912**	**$4,092,097,897**	**$4,037,369,708**	**$3,981,838,941**
Plan Fiduciary Net Position					
Contributions – Employer	$ 212,711,117	$ 208,212,848	$ 210,871,852	$ 210,166,927	$ 204,955,180
Contributions – Employee [3]	12,655,780	7,095,963	6,547,351	5,996,344	5,001,418
Pension Plan Net Investment Income	122,767,680	699,644,536	(10,667,857)	154,326,818	197,619,838
Benefit Payments [2]	(278,612,715)	(266,108,191)	(262,710,811)	(255,310,406)	(254,131,209)
Refunds	(1,024,986)	(611,132)	(796,107)	(780,538)	(503,007)
Disability Premiums [2]	0	(1,600,628)	(1,640,971)	(1,615,860)	(1,601,605)
Pension Plan Administrative Expense	(5,229,018)	(4,585,473)	(4,291,028)	(4,372,966)	(4,693,492)
Net Transfers [1] [2]	0	277,417	1,025,629	321,363	(955,597)
Net Change in Plan Fiduciary Net Position	**63,267,858**	**642,325,340**	**(61,661,942)**	**108,731,682**	**145,691,526**
Plan Fiduciary Net Position – Beginning	**3,003,925,228**	**2,361,599,888**	**2,423,261,830**	**2,314,530,148**	**2,168,838,622**
Plan Fiduciary Net Position – Ending (b)	**$3,067,193,086**	**$3,003,925,228**	**$2,361,599,888**	**$2,423,261,830**	**$2,314,530,148**
Adjustment – GASB 75 Implementation					
Plan Fiduciary Net Position – Ending (as restated)					
Employers' Net Pension Liability (a) – (b)	**$1,343,491,961**	**$1,340,147,684**	**$1,730,498,009**	**$1,614,107,878**	**$1,667,308,793**
Plan Fiduciary Net Position as a % of Total Pension Liability	69.54%	69.15%	57.71%	60.02%	58.13%
Covered Payroll	$ 367,493,332	$ 359,409,940	$ 363,980,262	$ 362,747,630	$ 353,751,292
Employers' Net Pension Liability as a % of Covered Payroll	365.58%	372.87%	475.44%	444.97%	471.32%

Continued on next page.

(1) Starting fiscal year 2022, Service Cost includes disability expense, service purchases, and transfers from other systems.
(2) Starting fiscal year 2022, Benefit Payments includes disability premiums and transfers to other systems.
(3) Starting fiscal year 2022, Contributions – Employee includes service purchases and transfers from other systems.

Schedule of Changes in the Employers' Net Pension Liability
Year Ended June 30 (continued)

	2017	2016	2015	2014	2013
Total Pension Liability					
Service Cost	$ 45,713,403	$ 45,441,305	$ 45,358,095	$ 44,739,603	$ 44,446,279
Interest on the Total Pension Liability	283,568,441	280,432,068	275,284,910	270,525,608	265,339,848
Benefit Changes	0	0	0	0	0
Difference Between Expected and Actual Experience	(37,286,966)	(39,810,009)	(13,324,219)	(17,614,321)	(13,690,794)
Assumption Change	0	0	0	0	204,396,180
Benefit Payments	(246,617,775)	(236,488,629)	(236,905,323)	(227,958,108)	(220,623,394)
Refunds	(321,328)	(198,106)	(107,395)	(18,686)	(29,300)
Disability Premiums	(1,620,418)	(1,567,825)	(1,554,676)	(1,531,578)	(1,512,685)
Transfers to Other Retirement Systems	(2,724,631)	(1,921,451)	(3,147,482)	(1,876,336)	(629,246)
Net Change in Total Pension Liability	**40,710,726**	**45,887,353**	**65,603,910**	**66,266,182**	**277,696,888**
Total Pension Liability – Beginning	**3,761,733,004**	**3,715,845,651**	**3,650,241,741**	**3,583,975,559**	**3,306,278,671**
Total Pension Liability – Ending (a)	**$3,802,443,730**	**$3,761,733,004**	**$3,715,845,651**	**$3,650,241,741**	**$3,583,975,559**
Plan Fiduciary Net Position					
Contributions – Employer	$ 206,562,924	$ 199,609,396	$ 200,638,571	$ 183,353,841	$ 170,836,117
Contributions – Employee	4,891,932	3,482,513	3,294,162	2,260,563	1,139,450
Pension Plan Net Investment Income	220,301,741	21,432,095	92,645,571	319,445,780	198,141,088
Benefit Payments	(246,617,775)	(236,488,629)	(236,905,323)	(227,958,108)	(220,619,035)
Refunds	(321,328)	(198,106)	(107,395)	(18,686)	(29,300)
Disability Premiums	(1,620,418)	(1,567,825)	(1,554,676)	(1,531,578)	(1,512,685)
Pension Plan Administrative Expense	(4,515,458)	(4,370,860)	(4,066,944)	(3,736,355)	(2,997,225)
Net Transfers	(980,524)	808,228	(2,033,045)	(91,954)	(629,246)
Net Change in Plan Fiduciary Net Position	**177,701,094**	**(17,293,188)**	**51,910,921**	**271,723,503**	**144,329,164**
Plan Fiduciary Net Position – Beginning	**1,992,073,946**	**2,009,367,134**	**1,957,456,213**	**1,685,732,710**	**1,541,403,546**
Plan Fiduciary Net Position – Ending (b)	**$2,169,775,040**	**$1,992,073,946**	**$2,009,367,134**	**$1,957,456,213**	**$1,685,732,710**
Adjustment – GASB 75 Implementation	**(936,418)**				
Plan Fiduciary Net Position – Ending (as restated)	**$2,168,838,622**				
Employers' Net Pension Liability (a) – (b)	**$1,633,605,108**	**$1,769,659,058**	**$1,706,478,517**	**$1,692,785,528**	**$1,898,242,849**
Plan Fiduciary Net Position as a % of Total Pension Liability	57.06%	52.96%	54.08%	53.63%	47.04%
Covered Payroll	$ 356,515,416	$ 344,635,441	$ 342,264,593	$ 336,590,797	$ 323,205,767
Employers' Net Pension Liability as a % of Covered Payroll	457.95%	513.49%	498.58%	502.92%	587.32%

Schedule of Employers' Contributions
Last 10 Fiscal Years

	Actuarially Determined Contributions	Actual Contributions	Contribution Deficiency (Excess)	Covered Payroll*	Contributions as a Percentage of Covered Payroll
2013	$170,836,117	$170,836,117	$0	$329,863,134	51.79%
2014	183,353,841	183,353,841	0	336,799,855	54.44
2015	200,638,571	200,638,571	0	342,211,446	58.63
2016	199,609,396	199,609,396	0	344,154,131	58.00
2017	206,562,924	206,562,924	0	356,142,972	58.00
2018	204,955,180	204,955,180	0	353,371,000	58.00
2019	210,166,927	210,166,927	0	362,356,771	58.00
2020	210,871,852	210,871,852	0	363,572,159	58.00
2021	208,212,848	208,212,848	0	358,987,669	58.00
2022	212,711,117	212,711,117	0	366,743,305	58.00

**Values are estimated from contribution rate and actual contribution amount.*

Schedule of Investment Returns
Last 10 Fiscal Years

Fiscal Year Ended June 30	Annual Money-Weighted Rate of Return
2013	13.37%
2014	17.58
2015	6.62
2016	1.02
2017	11.22
2018	9.20
2019	6.84
2020	(0.44)
2021	30.79
2022	4.00

Notes to Required Supplementary Information

The information presented in the required supplementary schedules was determined as part of the actuarial valuation at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation Date .... June 30, 2022
Actuarial Cost Method .... Entry Age
Amortized Method .... Level Percentage of Payroll, Closed
Remaining Amortization Period .... 11 Years (single equivalent period)
Asset Valuation Method .... 3-Year Smoothed Market: 20% Corridor
Inflation .... 2.25% (price inflation)
Actuarial Assumptions
Investment Rate of Return 6.5%
Projected Salary Increase .... 3.0% to 12.45% (includes 3.0% wage inflation)
Cost-of-Living Adjustments .... 1.8% Compound

Other Post-Employment Benefits (OPEB) Plan
Schedule of Changes in Net OPEB Liability and Related Ratios for MoDOT and MSHP Medical and Life Insurance Plan

	2022	2021	2020	2019	2018
Total OPEB Liability					
Service Cost	$ 74,581	$ 51,302	$ 64,136	$ 66,676	$ 81,000
Interest Cost	45,896	55,700	61,346	54,714	49,929
Changes of benefit terms	0	0	0	0	0
Differences between expected and actual experience	263,007	452	(17,475)	(12,565)	0
Changes in assumptions	(368)	393,621	(58,897)	(81,559)	(238,129)
Benefit Payments	(35,099)	(33,865)	(35,159)	(34,004)	(37,055)
Net Change in total OPEB liability	348,017	467,210	13,951	(6,738)	(144,255)
Total OPEB Liability (Beginning)	**2,019,603**	**1,552,393**	**1,538,442**	**1,545,180**	**1,689,435**
Total OPEB Liability (Ending)	**$ 2,367,620**	**$ 2,019,603**	**$ 1,552,393**	**$ 1,538,442**	**$ 1,545,180**
Plan Fiduciary Net Position					
Contributions	$ 35,099	$ 33,865	$ 35,159	$ 34,004	$ 37,055
Benefit Payments	(35,099)	(33,865)	(35,159)	(34,004)	(37,055)
Net Change in Plan Fiduciary Net Position	**0**	**0**	**0**	**0**	**0**
Plan Fiduciary Net Position (Beginning)	**0**	**0**	**0**	**0**	**0**
Plan Fiduciary Net Position (Ending)	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**
Net OPEB Liability (Ending)	$ 2,367,620	$ 2,019,603	$ 1,552,393	$ 1,538,442	$ 1,545,180
Net Position as a Percentage of OPEB Liability	N/A	N/A	N/A	N/A	N/A
Covered-Employee Payroll	$ 1,889,323	$ 1,791,020	$ 1,760,722	$ 1,639,523	$ 790,000
Net OPEB Liability as a Percentage of Payroll	125.32%	112.76%	88.17%	93.83%	195.59%

Other Post-Employment Benefits (OPEB) Plan
Schedule of MPERS' Proportionate Share of Net OPEB Liability for MoDOT and MSHP Medical and Life Insurance Plan

Year Ended June 30	Proportion of Net OPEB Liability	Proportionate Share of Net OPEB Liability	Covered Employee Payroll	Net OPEB Liability as % of Covered Employee Payroll	Net Position as % of Total OPEB Liability
2018	0.14%	$1,545,180	$ 790,000	195.59%	N/A
2019	0.14%	1,538,442	1,639,523	93.83%	N/A
2020	0.15%	1,552,393	1,760,722	88.17%	N/A
2021	0.15%	2,019,603	1,791,020	112.76%	N/A
2022	0.17%	2,367,620	1,889,323	125.32%	N/A

Note: These schedules are intended to present information for 10 years but may be built prospectively. Additional years will be displayed as they become available.

Schedule of Administrative Expenses
For the Year Ended June 30, 2022

Personnel Services	
Salary Expense	$ 2,371,340
Employee Benefit Expense	1,882,725
Total Personnel Services	**4,254,065**
Professional Services	
Actuarial Services	89,365
Audit Services	57,750
Legislative Consultant	31,200
Board Governance	66,500
Investment Special Consulting	25,000
Insurance Consultant	6,000
Other Consultant Fees	43,544
Fiduciary Insurance	25,230
IT Hosting and Support	318,868
Other	14,544
Total Professional Services	**678,001**
Miscellaneous	
Depreciation	23,328
Meetings / Travel / Education	52,780
Equipment / Supplies	84,676
Printing / Postage	22,555
Bank Service Charge	9,107
Building Expenses	35,231
Other	69,275
Total Miscellaneous	**296,952**
Total Administrative Expenses	**$ 5,229,018**

Schedule of Investment Expenses
For the Year Ended June 30, 2022

Investment Income Expenses	
Management and Performance Fees by Asset Class	
Equities	$ 2,396,140
Fixed Income Core	195,435
Opportunistic Debt	14,070,964
Real Estate	6,615,684
Private Equity	16,932,298
Real Assets	21,037,315
Hedge Funds	5,928,621
Total Management and Performance Fees	**$67,176,457**
Investment Custodial Fees	69,959
Performance Management	230,962
General Consultant (Monitoring) Fee	358,862
Professional Fees	499,105
Other Fees / Expenses	834,599
Total Investment Income Expenses	**$69,169,944**
Securities Lending Expenses	
Borrower Rebates (Refunds)	$ 25,350
Bank Fees	78,732
Total Securities Lending Expenses	**$ 104,082**

Schedule of Consultant and Professional Expenses
For the Year Ended June 30, 2022

Professional / Consultant	Nature of Service	
Gabriel, Roeder, Smith & Co.	Actuarial	$ 89,365
LexisNexis Risk Data Management	Death Audit Services	1,800
MO Department of Health & Senior Services	Death Audit Services	603
Pension Benefit Information	Death Audit Services	10,326
Deaf Heart Interpreting Services, LLC	Death Audit Services	1,815
Naught-Naught Agency	Director’s & Officer’s Insurance	22,942
Alliant Insurance Services, Inc.	Employee Crime Bond	2,288
Williams-Keepers, LLC	Financial Audit Services	57,750
Funston Advisory Services, LLC	Governance Consulting	66,500
Midwest Computech	Information Technology	42,898
Huber & Associates	Information Technology	3,575
Levi, Ray & Shoup, Inc.	Information Technology	266,523
Sikich, LLP	Information Technology	5,872
Thompson Coburn, LLP	Legal Consulting	43,544
Michael G. Winter Consultants, LLC	Legislative Consulting	31,200
Evercore Group, LLC	Market Research	25,000
Charlesworth Benefits	Risk Management Consulting	6,000
Total Consultant and Professional Expenses		**$678,001**

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

COMMUNICATION OF AUDIT RELATED MATTERS

JUNE 30, 2022

WILLIAMS KEEPERS LLC
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November 8, 2022

To the Audit Committee of the Board of Trustees of the
Missouri Department of Transportation and
Highway Patrol Employees' Retirement System

We have audited the financial statements of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (the System) for the year ended June 30, 2022, and have issued our report thereon dated November 8, 2022. Professional standards require that we provide you with information about our responsibilities under generally accepted auditing standards, as well as certain information related to the planned scope and timing of our audit. We have communicated such information to the System's Chairman of the Audit Committee of the Board of Trustees in a letter dated June 14, 2022. Professional standards also require that we communicate to you the following information related to our audit.

Significant Audit Findings

Qualitative Aspects of Accounting Practices

Management is responsible for the selection and use of appropriate accounting policies. The significant accounting policies used by the Plan are described in Note 1 to the financial statements. No new accounting policies were adopted and the application of existing policies was not changed during the year ended June 30, 2022. We noted no transactions entered into by the System during the year for which there is a lack of authoritative guidance or consensus. All material significant transactions have been recognized in the financial statements in the proper period.

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ significantly from those expected. The most sensitive estimates affecting the financial statements were: fair value of investments, useful lives of capital assets, and employers' total pension liability and related disclosures.

Management's estimate of the fair value of investments is based on quoted market prices; input from outside investment managers, consultants, and general partners; and current economic conditions. The estimated fair values of alternative investments represent particularly sensitive accounting estimates. Estimated useful lives of capital assets are generally based on past experience with similar assets. Employers' total pension liability and related disclosures are based on actuarial methods and assumptions determined in consultation with the System's actuary. We evaluated the key factors and assumptions used to develop those estimates in determining that they are reasonable in relation to the financial statements taken as a whole.

Certain financial statement disclosures are particularly sensitive because of their significance to the financial statement users. The most sensitive disclosures affecting the financial statements were investments and the net pension liability of employers.

The disclosures in the financial statements are neutral, consistent and clear.

Difficulties Encountered in Performing the Audit

We are pleased to report that we encountered no difficulties in dealing with management in performing and completing our audit. All system personnel cooperated with us fully during the conduct of our audit.

Corrected and Uncorrected Misstatements

Professional standards require us to accumulate all known and likely misstatements identified during the audits, other than those that are trivial, and communicate them to the appropriate level of management. The attached schedule summarizes the uncorrected misstatement of the financial statements. Management has determined that the effect is immaterial to the financial statements as a whole.

Disagreements with Management

For purposes of this letter, professional standards define a disagreement with management as a financial accounting, reporting, or auditing matter, whether or not resolved to our satisfaction, that could be significant to the financial statements or the auditor's report. We are pleased to report that no such disagreements arose during the course of our audit.

Management Representations

We have requested certain representations from management that are included in the management representation letter issued in connection with our audit.

Management Consultations with Other Independent Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters, similar to obtaining a "second opinion" on certain situations. If a consultation involves application of an accounting principle to the System's financial statements or a determination of the type of auditor's opinion that may be expressed on those statements, our professional standards require the consulting accountant to check with us to determine that the consultant has all the relevant facts. To our knowledge, there were no such consultations with other accountants.

Other Audit Findings or Issues

We generally discuss a variety of matters, including the application of accounting principles and auditing standards, with management each year prior to retention as the System's auditors. However, these discussions occurred in the normal course of our professional relationship and our responses were not a condition to our retention.

Other Matters

We applied certain limited procedures to the management's discussion and analysis and the schedules of changes in the employers' net pension liability, employers' contributions, investment returns, changes in net OPEB liability and related ratios, and the System's proportionate share of net OPEB liability, which are required supplementary information (RSI) that supplements the basic financial statements. Our procedures consisted of inquiries of management regarding 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 did not audit the RSI and do not express an opinion or provide any assurance on the RSI.

We were engaged to report on the schedules of administrative expenses, investment expenses, and professional/consultant expenses, which accompany the basic financial statements but are not RSI. With respect to this supplementary information, we made certain inquiries of management and evaluated the form, content, and methods of preparing the information to determine the information complies with U.S. generally accepted accounting principles, the method of preparing it has not changed from the prior period, and the information is appropriate and complete in relation to our audit of the basic financial statements. We compared and reconciled the supplementary information to the underlying accounting records used to prepare the financial statements or to the financial statements themselves.

We were not engaged to report on the introductory, investment, actuarial and statistical sections, which accompany the basic financial statements but are not RSI. Such information has not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on it.

Restriction on Use

We thank System management and staff for their assistance during the course of our audit. We will be pleased to discuss these or any other matters at your convenience. This information is intended solely for the use of the Board of Trustees and management of the System and is not intended to be, and should not be, used by anyone other than these specified parties.

Sincerely,

Williams-Keepers LLC

WILLIAMS-KEEPERS LLC

Missouri Department of Transportaion and Highway Patrol Employees' Retirement System
Passed Adjustment Journal Entry (PAJE) Schedule
June 30, 2022

PAJE No.	Account Description	Increase (Decrease) Asset	(Increase) Decrease Liability	(Increase) Decrease Equity	(Revenue) Expense
1	Hedge funds	$ (399,250)	$ -	$ -	$ -
	Realized loss on sale of investments	-	-	-	399,250
	(To write off Concordia Asia investment)				
	Total effect	$ (399,250)	$ -	$ -	$ 399,250
	Balances	3,202,540,375	(135,347,289)	(3,067,193,086)	(63,267,858)
		-0.01%	0.00%	0.00%	-0.63%

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

MANAGEMENT LETTER

JUNE 30, 2022

WILLIAMS KEEPERS LLC
CERTIFIED PUBLIC ACCOUNTANTS & CONSULTANTS

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November 8, 2022

To the Board of Trustees and Management of the
Missouri Department of Transportation and
Highway Patrol Employees' Retirement System

In planning and performing our audit of the financial statements of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (the System) for the year ended June 30, 2022, in accordance with U.S. generally accepted auditing standards, we considered the System's internal control over financial reporting (internal control) as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the System's internal control. Accordingly, we do not express an opinion on the effectiveness of the System's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the Systems' financial statements will not be prevented, or detected and corrected, on a timely basis.

Our consideration of internal control was for the limited purpose described in the first paragraph and was not designed to identify all deficiencies in internal control that might be material weaknesses. In addition, because of inherent limitations in internal control, including the possibility of management override of controls, misstatements due to error or fraud may occur and not be detected by such controls. Given these limitations, we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

We did become aware of certain deficiencies in internal control that we consider to be significant deficiencies. The following items summarize our comments and suggestions regarding those deficiencies.

CONTINUING RECOMMENDATION

Investment Accounting Procedures and Management Review (significant deficiency)

During a prior year audit, we noted the System did not have documented accounting procedures related to internally managed investments. Due to unforeseen changes in the timber investment portfolio during the prior year, the System transitioned to internally manage three timber investments. The System performed operational procedures over these investments, however, no accounting treatment of these investments had occurred. As such, the activity related to these timber investments was not recorded in the System's financial records as of June 30, 2021. During the current year audit, we noted the System had not timely reconciled cash activity for one of the timber investments, which resulted in aging reconciling items as of June 30, 2022. We recommend the System document routine accounting procedures and to perform the procedures on a timely basis.

During a prior year audit, we noted several instances of errors in the supporting schedules and information provided to us for the alternative investment portfolio. We noted turnover within the investment department resulted in a lack of consistent personnel to perform investment accounting procedures and certain procedures performed by the investment accountant were not documented. In the current year audit, we noted similar errors in the supporting schedules and information provided to us for the alternative investment portfolio. We recommend the System review the written accounting procedures over the alternative investment portfolio to ensure all procedures are documented. We also recommend management perform a detailed review of investment accounting on a routine basis and review information prior to providing to us for audit procedures.

We noted management and performance fees were not properly recorded throughout fiscal year 2022 and the System had ceased the process of reviewing these fees for accuracy and reasonableness. We recommend the System reimplement the procedure of reviewing these fees for accuracy and reasonableness on at least a quarterly basis.

Management's response: We concur.

In the current year, the System transitioned an investment department position to primarily perform the accounting procedures for the internally managed timber investments and began producing financial statements for each investment. The System will have the financial statements of the internally managed investments externally audited for the year ended December 31, 2022.

MPERS reviewed the written accounting procedures over the alternative investment portfolio and ensured all were documented. MPERS will also routinely review investment accounting to ensure the procedures are properly performed and review all information prior to providing it the auditors.

MPERS will reimplement the procedures regarding management and performance fees to ensure these fees are accurately recorded and will review for reasonableness on at least a quarterly basis.

We will be pleased to discuss these or any other matters deemed appropriate at your convenience. This report is intended solely for the information and use of the Board of Trustees, management, and others within the System and is not intended to be and should not be used by anyone other than these specified parties.

Sincerely,

Williams-Keepers LLC

WILLIAMS- KEEPERS LLC