Special Needs: If you have special needs addressed by the American's with Disability Act, please notify Lois Wankum directly at (573) 298-6080 or through the Relay Missouri System, TDD 1-800-735-2966, at least five working days prior to the meeting

A G E N D A

MoDOT & Patrol Employees' Retirement System
1913 William Street, Jefferson City, Missouri

Audit Committee

Wednesday, November 8, 2017
1:30 p.m.

1. **Presentation of FY2017 Audit**
   ~ presented by Mr. Mike Oldelehr, (Williams-Keepers LLC)

2. **ERM (Enterprise Risk Management) Rollout**
   ~ presented by Mr. Greg Beck, MPERS' Assistant Executive Director

Attorney Client Privileged Communications and Records Protected From Disclosure By Law	Section 610.021(1), (14) and 610.010(6) RSMo
Lease, purchase or sale of real estate	Section 610.021(2) RSMo
Personnel administration regarding particular employees	Section 610.021(3), (13) RSMo
Nonjudicial mental or physical health proceedings	Section 610.021(5) RSMo
Competitive bidding specs, sealed bids, or negotiated contracts	Section 610.021(11), (12) RSMo
Confidential or privileged auditor communications	Section 610.021(17) RSMo

REPORT OF

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

JUNE 30, 2017

INDEPENDENT AUDITORS' REPORT

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

Report on the Financial Statements

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, 2017, 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.

Management's Responsibility 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.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with U.S. generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the System at June 30, 2017, and the changes in fiduciary net position for the year then ended, in conformity with U.S. generally accepted accounting principles.

Other Matters

Required Supplementary Information

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3 through 6 and the schedules of employers' net pension liability, changes in the employers' net pension liability, employers' contributions, investment returns, OPEB funding progress, and related notes on pages 32 through 35 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 System's financial statements as a whole. The additional information presented on pages 36 through 38 are presented for purposes of additional analysis and are not a required part of the financial statements.

The additional information is the responsibility of management and was derived from and relate directly to the underlying accounting and other records used to prepare the financial statements. The additional information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with U.S. generally accepted auditing standards. In our opinion, the additional information presented on pages 36 through 38 is fairly stated in all material respects in relation to the basic financial statements as a whole.

November 8, 2017

MANAGEMENT'S DISCUSSION AND ANALYSIS

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, 2017. 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 liabilities, with the difference between the two 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.

ANALYSIS OF FINANCIAL POSITION AND RESULTS OF OPERATIONS

Overall, the financial position of MPERS strengthened by $178 million, reported as the "net increase." This is primarily a result of net appreciation in the fair value of investments for the year ended June 30, 2017. The funded status of the plan showed an increase of 1.67%, primarily due to actuarial gains and MPERS' accelerated funding policy.

The following schedules present summarized comparative data from the System's financial statements for each of the fiscal years ended June 30, 2017 and 2016. 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, 2017	As of June 30, 2016	% Change 2017/2016
Cash and Receivables	$ 18,697,840	$ 20,195,007	-7
Investments	2,162,264,152	1,982,820,836	9
Invested Securities Lending Collateral	56,823,478	51,560,512	10
Capital Assets	1,204,317	1,569,100	-23
Total Assets	2,238,989,787	2,056,145,455	9
Accounts Payable	10,109,326	10,668,117	-5
OPEB Obligation	715,962	680,169	5
Securities Lending Collateral	58,389,459	52,723,223	11
Total Liabilities	69,214,747	64,071,509	8
Net Position	**$ 2,169,775,040**	**$ 1,992,073,946**	**9**

The decrease in cash and receivables is primarily attributable to lower accrued investment interest and investment sales receivables as of June 30, 2017. Some fluctuations in this area are normal, based on investment activity.

The System's investments represent the main component of total assets. These investments include holdings of stock, government-sponsored enterprises, bonds, mortgages, real estate, timber, hedge funds, securities lending collateral, limited partnerships, and other fixed income investments. The increase in fair value of investments as of June 30, 2017 is primarily due to favorable market conditions experienced during FY2017. The FY2017 investment return was 11.22% as calculated on a time-weighted rate of return methodology.

Capital assets decreased in FY2017 due to depreciation of existing assets and only minimal purchases of new equipment during the year.

The decrease in accounts payable for FY2017 is primarily attributable to lower investment purchases payable. Some fluctuations in this area are normal, based on investment activity.

The Other Post-Employment Benefit (OPEB) obligation liability of $715,962 at June 30, 2017 and $680,169 at June 30, 2016 reflects the System's provision of post-employment health care benefits through its participation in the MoDOT and MSHP Medical and Life Insurance Plan. This plan is an internal service fund of the Missouri Department of Transportation (MoDOT); therefore, assets have not been set aside. With this, the increase from FY2016 to FY2017 is expected.

The largest component of liabilities is securities lending collateral. This represents the amount owed for collateral to be returned as the result of securities lent. The increase in securities lending collateral liability from FY2016 to FY2017 is due to the increase in the fair value of investments. The corresponding securities lending collateral asset is valued at a lower amount than the securities lending collateral liability at June 30, 2017 due to the market value of the securities on loan being less than the collateral value.

The System's total net position was $2.170 billion at June 30, 2017, a $178 million increase from the $1.992 billion at June 30, 2016.

Summarized Comparative Statements of Changes in Fiduciary Net Position

	Year Ended June 30, 2017	Year Ended June 30, 2016	% Change 2017/2016
Contributions	$ 213,198,963	$ 205,821,588	4
Net Investment Income	220,301,127	21,432,090	928
Other Income	614	5	12180
Net Additions	433,500,704	227,253,683	91
Benefits	251,284,152	240,176,011	5
Administrative Expenses	4,515,458	4,370,860	3
Total Deductions	255,799,610	244,546,871	5
Net Increase (Decrease)	177,701,094	(17,293,188)	1228
Net Position-Beginning	1,992,073,946	2,009,367,134	-1
Net Position-Ending	**$ 2,169,775,040**	**$ 1,992,073,946**	**9**

The main component of the changes in contributions to MPERS is employer contributions. In FY2017, the contribution rate for the non-uniformed Highway Patrol and MoDOT decreased by 0.05% and the contribution rate for the uniformed Highway Patrol increased by 0.04% from the FY2016 rates. Even though contribution rates stayed relatively flat, there was an increase in total contributions, primarily attributable to an increase in corresponding employers' payroll.

Net investment income, a primary component of plan additions, resulted in income of $220 million for FY2017. The income represented an 11.22% return for the fiscal year ended June 30, 2017. In comparison, the FY2016 gain of $21 million represented an investment return of 1.01%. Annual fluctuations within the broad investment markets are outside of the control of the System and are expected to fluctuate from year to year. 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 7.75%.

Benefits increased primarily due to an increase in the total number of retirees for the years shown.

Administrative expenses increased in FY2017 due to career progression and general increases in the costs of services.

CURRENTLY KNOWN FACTS AND RECENT EVENTS

Based on the June 30, 2016 actuarial valuation, the Board of Trustees approved no change in the required state contribution rate, effective July 1, 2017. The rate applied to both non-uniformed payroll (MoDOT, civilian patrol, and MPERS) and uniformed patrol payroll remains at 58.00%.

Based on the June 30, 2017 actuarial valuation, the Board of Trustees approved no change in the required state contribution, effective July 1, 2018. The rate applied to both non-uniformed payroll (MoDOT, civilian patrol and MPERS) and uniformed patrol payroll will remain 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, 2017

ASSETS:		
Cash	$	171,775
Receivables		
Contributions		8,714,163
Accrued Interest and Income		5,686,056
Investment Sales		4,073,357
Other		52,489
Total Receivables		18,526,065
Investments, at Fair Value		
Stocks and Rights/Warrants		358,551,039
Government Obligations		278,549,207
Corporate Bonds		13,954,059
Real Estate		241,412,274
Mortgages and Asset-Backed Securities		283,863,896
Hedge Funds		149,640,781
Short-Term Investments		167,590,589
Limited Partnerships		668,702,307
Total Investments		2,162,264,152
Invested Securities Lending Collateral		56,823,478
Net Investment in Capital Assets		
Land		84,000
Building		581,619
Furniture, Equipment and Software		3,514,780
Accumulated Depreciation		(2,976,082)
Net Investment in Capital Assets		1,204,317
TOTAL ASSETS	**$**	**2,238,989,787**
LIABILITIES:		
Accounts Payable		1,922,521
OPEB Obligation		715,962
Security Lending Collateral		58,389,459
Investment Purchases		8,186,805
TOTAL LIABILITIES	**$**	**69,214,747**
NET POSITION RESTRICTED FOR PENSIONS	**$**	**2,169,775,040**

See accompanying Notes to the Financial Statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

For the Year Ended June 30, 2017

ADDITIONS:		
Contributions-Employer	$	206,562,924
Contributions-Employee		3,238,502
Contributions-Service Transfers from Other System		1,744,107
Contributions-Other		1,653,430
Total Contributions		213,198,963
Investment Income from Investing Activities		
Net Appreciation in Fair Value of Investments		187,425,144
Interest and Dividends		63,059,296
Less: Investment Expenses		30,460,874
Net Investment Income		220,023,566
Income from Securities Lending Activities		
Securities Lending Gross Income		551,362
Less: Securities Lending Expenses, net		273,801
Net Income from Securities Lending Activities		277,561
Other Income		614
NET ADDITIONS	**$**	**433,500,704**
DEDUCTIONS:		
Monthly Benefits		
Retiree and Survivor Annuity Benefits		227,997,513
BackDROP Payments		16,887,349
Disability Benefits		2,498,178
Death Benefits		855,153
Service Transfer Payments		2,724,631
Employee Contribution Refunds		321,328
Administrative Expenses		4,515,458
TOTAL DEDUCTIONS	**$**	**255,799,610**
NET INCREASE		177,701,094
NET POSITION RESTRICTED FOR PENSIONS		
Beginning of Year		**1,992,073,946**
End of Year	**$**	**2,169,775,040**

See accompanying Notes to the Financial Statements.

NOTES TO THE FINANCIAL STATEMENTS

For the Year Ended June 30, 2017

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 and paid. 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 $1,000. 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 Director of the MoDOT and Superintendent of the MSHP 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, 2017

	Closed	Year 2000	2011 Tier	Total
Retirees, Beneficiaries, and Disabilities				
Currently Receiving Benefits	5,016	3,855	5	8,876
Terminated Employees Entitled to				
But Not Yet Receiving Benefits	1,440	879	0	2,319
Active Employees				
Vested	2,615	2,473	0	5,088
Non-Vested	2	82	2,279	2,363
Total Membership	**9,073**	**7,289**	**2,284**	**18,646**

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 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.

<u>Year 2000 Plan-2011 Tier Description</u>

Employees covered by the 2011 Tier are fully vested for benefits upon earning 10 years of creditable service. Under the 2011 Tier, MoDOT and civilian employees may retire with full benefits upon the earliest of attaining:

- Age 67 and with 10 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 10 years of creditable service.

The following provisions apply for uniformed patrol members of the 2011 Tier:

- Age 55 and with 10 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 10 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 10 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. Prior to August 13, 1976, contributions by all plan members were required. Accumulated employee contributions made prior to that time, plus interest, were refunded to applicable members. Maximum contribution rates were eliminated August 13, 1976. 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
Global Equity	30.0%
Private Equity	15.0%
Fixed Income	20.0%
Real Assets	7.5%
Real Estate	10.0%
Hedge Funds	10.0%
Opportunistic Debt	7.5%
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 market 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, 2017, MPERS had a carrying amount of deposits of ($230,192), and a bank balance of $457. 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 at June 30, 2017 totaled $401,967. As of June 30, 2017, 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, 2017, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 11.22%. 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, 2017

	Carrying Amount	Fair Value
Government Obligations	$269,449,652	$278,549,207
Corporate Bonds	13,484,577	13,954,059
Stock and Rights/Warrants	234,434,350	358,551,039
Real Estate	220,658,853	241,412,274
Mortgages & Asset-Backed Securities	297,306,866	283,863,896
Hedge Funds	114,702,809	149,640,781
Limited Partnerships	636,962,049	668,702,307
Short-Term Investments	167,977,753	167,590,589
Total Investments	**$1,954,976,909**	**$2,162,264,152**

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 49% of the total fair value of the System's investments as of June 30, 2017:

Real Estate	$241,412,274
Hedge Funds	149,640,781
Limited Partnerships	668,702,307
	$1,059,755,362

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 as of June 30, 2017

Investments by Fair Value Level	Fair Value	Level 1	Level 2	Level 3
Short Term Securities	$163,527,478	$163,527,478	$0	$0
Debt Securities				
Collateralized Debt Obligations	189,429,902	0	75,881,332	113,548,570
Commercial Mortgage-Backed Securities	55,188,073	0	11,036,956	44,151,117
Corporate Bonds	3,215,221	0	3,215,221	0
Government Commercial Mortgage-Backed Securities	4,935,354	0	1,068,042	3,867,312
Government Mortgage-Backed Securities	35,787,050	0	22,263,894	13,523,157
Municapal Bonds	151,807,106	0	61,494,665	90,312,441
U.S. Government Agencies	77,752,255	0	77,752,255	0
U.S. Treasury Securities	55,859,205	0	55,859,205	0
Total Debt Securities	573,974,167	0	308,571,570	265,402,596
Equity Securities				
Consumer Discretionary	11,706,862	11,706,862	0	0
Conumer Staples	1,624,891	1,624,891	0	0
Energy	68,580,415	68,580,415	0	0
Equity Other	23,131,393	23,131,393	0	0
Financials	19,730,652	19,708,701	21,951	0
Health Care	6,228,069	6,228,069	0	0
Industrials	8,053,303	8,053,303	0	0
Information Technology	11,729,313	11,729,313	0	0
Materials	1,008,628	1,008,628	0	0
Real Estate	7,953,103	7,953,103	0	0
Telecommunication Services	2,363,848	2,363,848	0	0
Utilities	157,612	157,612	0	0
Total Equity Securities	162,268,088	162,246,137	21,951	0
Private Markets				
Private Equity	348,961,860	0	0	348,961,860
Real Estate	72,515,055	0	0	72,515,055
Real Assets	221,757,657	0	0	221,757,657
Opportunistic Debt	156,102,850	0	0	156,102,850
Total Private Markets	799,337,422	0	0	799,337,422
Investment Derivative Instruments				
Equity Futures	150,510	150,510	0	0
Equity Swaps	(218,263)	0	(218,263)	0
FX Forwards (liabilities)	(454,601)	0	(454,601)	0
Total Investment Derivative Instruments	(522,354)	150,510	(672,864)	0
Total Investments by Fair Value Level	1,698,584,801	**$325,924,125**	**$307,920,657**	**$1,064,740,019**
Investments Measured at Net Asset Value				
Equity Long/Short	25,269,335			
Multi-Strategy	21,036,603			
In Liquidation	831,850			
Commodity Trading Advisors	19,288,635			
Activist Equity	27,305,446			
Event	11,518,711			
Fundamental Equity Market Nuetral	15,219,650			
Global Asset Allocation	17,770,549			
Structured Credit -Relative Value	11,400,001			
Commingled International Equity Funds	315,501,388			
Total Investments Measured at Net Asset Value	465,142,169			
Total Investments	**$2,163,726,971**			
Reconciliation to Statement of Fiduciary Net Position				
Total Investments Measured at Fair Value and Derivatives	$2,163,726,971			
Investment Sales Receivable	(4,073,357)			
Investment Purchases Payable	8,186,805			
Accrued Interest and Income	(5,686,056)			
Accrued Expenses	109,789			
Total Investments per Statement of Fiduciary Net Position	**$2,162,264,152**			

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. FX forwards are included due to the valuation coming from observable forward rates on the underlying currencies. 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.

Investments Measured at Net Asset Value as of June 30, 2017

Investments by Fair Value Level	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Hedge Fund				
Equity Long/Short	$25,269,335	$0	Quarterly	45-60 Days
Multi-Strategy	21,036,603	0	Quarterly	60-90 Days
In Liquidation	831,850	0	n/a	n/a
Commodity Trading Advisors	19,288,635	0	Monthly	30 Days
Activist Equity	27,305,446	0	Yearly, Every 3 Years	90 Days
Event	11,518,711	0	Monthly	90 Days
Fundamental Equity Market Neutral	15,219,650	0	Monthly	90 Days
Global Asset Allocation	17,770,549	0	Monthly	5 Days
Structured Credit - Relative Value	11,400,001	0	Quarterly	60 Days
Total Hedge Fund	149,640,781	0		
Commingled International Equity Funds	196,603,293	0	Daily, Monthly	0-30 Days
Commingled International Equity Funds	118,898,095	0	Daily	90 Days
Total Commingled International Equity Funds	315,501,388	0		
Total Investments at Net Asset Value	**$465,142,169**	**$0**		
Private Markets				
Private Equity	$348,961,860	$117,074,892		
Real Estate	72,515,055	68,646,328		
Real Assets	221,757,657	61,038,200		
Opportunistic Debt	156,102,850	113,439,234		
Total Private Markets	$799,337,422	$360,198,654		

Hedge Funds

Equity Long/Short: Consisting of three funds, this strategy invests in both long and short in U.S. and global 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 to nine months.

Multi-Strategy: The three 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 to nine months.

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

Commodity Trading Advisors: MPERS currently has one fund focusing on a systematic strategy that follows medium-term trends. The value of this investment is eligible for redemption in the next two months.

Activist: Consisting of two funds, this strategy focuses on obtaining publicly traded shares of companies and effecting changes within the companies that it owns whether that be value creation through operational, financial or corporate governance changes. One fund's focus is on North American companies and the other fund's focus is on European and Nordic companies. Due to contractual lock-up restrictions and the necessity for activist managers to retain capital in order to realize the desired company changes, 50% of this strategy's investments are eligible for redemption on a rolling three-year basis. The remaining 50% are eligible for redemption on a rolling one-year basis.

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 these investments is eligible for redemption in the next four months.

Fundamental Equity Market Neutral: Consisting of one fund, this strategy invests in both long/short equities capturing price differences and seeks to maintain a neutral exposure to the market by having no sector, industry, market capitalization, or country biases. Due to contractual lock-up restrictions, the value of these investments 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 developing systematic rules for trading positions. Due to contractual lock-up restrictions, the value of these investments is eligible for redemption in the next four months.

Relative Value Hedge Funds: Consisting of one fund, this strategy's main focus is to benefit from valuation discrepancies that may be present in related financial instruments by simultaneously purchasing or selling these instruments. Due to contractual lock-up restrictions, all funds are eligible for redemption within the next six months.

Commingled International Equity Funds

MPERS invests in three international equity funds that are considered to be commingled in nature. Due to contractual lock-up restrictions, 70% of this capital is eligible for redemption in one month; the remaining 30% has daily liquidity.

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 17 direct fund investments and two fund of fund investments. These funds 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 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 20 real estate funds. The noncore real estate book includes 17 real estate funds and invests 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 three investments are in core real estate funds. These funds are open-ended and are eligible for redemption on a daily basis.

Real Assets: The real asset portfolio contains 18 funds that invest in private energy, 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 4 director timber investments and 1 investment under review with earnest money paid. 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 25 funds, provide financing to private 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.

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 as of June 30, 2017

Investment Type	Fair Value	Investment Maturities (in years) less than 1	1 - 5	6 - 10	more than 10
Asset-Backed Securities	$192,390,185	$0	$404,674	$101,341,702	$90,643,809
Commercial Mortgage-Backed Securities	37,572,989	0	910,541	0	36,662,448
Corporate Bonds	7,479,140	0	0	0	7,479,140
Government Agencies	54,571,955	0	3,322,729	12,454,885	38,794,341
Government Bonds	48,267,931	0	0	0	48,267,931
Government Mortgage-Backed Securities	2,118,458	0	888,474	1,229,984	0
Government-issued Commercial Mortgage-Backed	34,230,228	0	0	0	34,230,228
Index Linked Govt Bonds	34,353,968	0	16,251,163	0	18,102,805
Municipal/Provincial Bonds	141,355,353	2,500,605	1,639,955	29,432,813	107,781,980
Non-Govt Backed C.M.O.s	17,552,036	0	0	0	17,552,036
Short Term Bills and Notes	12,557,511	12,557,511	0	0	0
Grand Total	**$582,449,754**	$15,058,116	$23,417,536	$144,459,384	$399,514,718

Note 3 (h) – Investment Credit Ratings

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

Summary of Credit Ratings as of June 30, 2017

Investment Type	Quality Rating	Fair Value
Asset-Backed Securities	AAA	$59,020,076
Asset-Backed Securities	AA	48,249,411
Asset-Backed Securities	A	4,503,854
Asset-Backed Securities	BB	4,447,587
Asset-Backed Securities	not rated	76,169,257
Commercial Mortgage-Backed Securities	AAA	9,661,980
Commercial Mortgage-Backed Securities	AA	300,635
Commercial Mortgage-Backed Securities	BBB	100,250
Commercial Mortgage-Backed Securities	BB	411,132
Commercial Mortgage-Backed Securities	B	5,009,034
Commercial Mortgage-Backed Securities	CCC	977,951
Commercial Mortgage-Backed Securities	not rated	20,436,132
Commercial Mortgage-Backed Securities	us gov guar	675,875
Corporate Bonds	AA	1,090,590
Corporate Bonds	BBB	197,957
Corporate Bonds	not rated	6,190,593
Government Agencies	AA	47,004,796
Government Agencies	us gov guar	7,567,159
Government Bonds	us gov guar	48,267,931
Government Mortgage-Backed Securities	not rated	1,563,712
Government Mortgage-Backed Securities	us gov guar	29,973,524
Govt issue Commercial Mortgage-Backed Securities	us gov guar	4,811,450
Index Linked Government Bonds	us gov guar	34,353,968
Municipal/Provincial Bonds	AAA	39,583,247
Municipal/Provincial Bonds	AA	89,887,838
Municipal/Provincial Bonds	A	4,981,837
Municipal/Provincial Bonds	not rated	6,902,431
Non-Government Backed C.M.O.s	AA	173,600
Non-Government Backed C.M.O.s	A	610,563
Non-Government Backed C.M.O.s	BBB	272,948
Non-Government Backed C.M.O.s	BB	125,308
Non-Government Backed C.M.O.s	B	448,028
Non-Government Backed C.M.O.s	CCC	1,035,824
Non-Government Backed C.M.O.s	CC	143,415
Non-Government Backed C.M.O.s	D	4,607,636
Non-Government Backed C.M.O.s	not rated	10,134,714
Short Term Bills and Notes	us gov guar	12,557,511
Total		**$582,449,754**

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, 2017

Foreign Currency	Equities	Real Estate/ Partnerships	Cash	Total
Australian Dollar	$692,677	$0	$0	$692,677
British Pound Sterling	737,093	11,577,703	1,216,586	13,531,382
Canadian Dollar	155,408	0	0	155,408
Euro	2,186,526	16,038,511	89,539	18,314,576
Hong Kong Dollar	1,370,117	0	0	1,370,117
Japanese Yen	1,631,184	0	0	1,631,184
Singapore Dollar	374,591	0	0	374,591
Total Exposure Risk	**$7,147,596**	**$27,616,214**	**$1,306,125**	**$36,069,935**

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, 2017, 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 125 days as of June 30, 2017. Cash open collateral is invested in a short-term investment pool, which had an interest sensitivity of 33 days as of June 30, 2017. 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 collateral held (including both cash collateral recognized in the Statement of Fiduciary Net Position and non-cash collateral) is:

Collateral Held as of June 30, 2017

Investment Type	
Equities	$31,876,826
Government & government sponsored securities	26,512,633
Total	**$58,389,459**

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, swap contracts, options contracts, and forward foreign currency exchange contracts. MPERS enters 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 $216,970,814 for the various contracts in MPERS' portfolio as of June 30, 2017, is recorded in investments on the Statement of Fiduciary Net Position. The change in fair value of $16,944,180 for the year ended June 30, 2017, is recorded in investment income on the Statement of Changes in Fiduciary Net Position.

Investment Derivatives as of June 30, 2017

Type	Classification	Notional/ Fair Value	Unrealized Gain (Loss)
Futures Contracts	Investments, at fair value	$210,481,171	$15,329,411
Swap Contracts	Investments, at fair value	26,936,247	2,922,515
Rights/Warrants	Investments, at fair value	11,828	(192)
Foreign Currency Forward Contracts	Investments, at fair value	(20,458,432)	(1,307,554)
Total		**$216,970,814**	**$16,944,180**

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 the contracts. The associated counterparty's credit rating is an A-.

NOTE 4 – RECEIVABLES

Receivables as of June 30, 2017

Type	
Contributions-MoDOT	$5,323,101
Contributions-MSHP Non-Uniformed	1,169,172
Contributions-MSHP Uniformed	2,026,588
Contributions-Retirement System	195,302
Commission Recapture	758
Securities Lending	51,731
Investment Interest & Income	5,686,056
Investment Sales	4,073,357
Total	**$18,526,065**

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 $206,562,924 for fiscal year 2017, represent funding of normal costs and amortization of the unfunded accrued liability. Actual contributions made were 100% of required contributions. Contribution rates as determined by the System's actuary for the year ended June 30, 2017, 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, 2017, was $219,560,390.

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 at June 30, 2017, were as follows:

Total pension liability	$3,802,443,730
Plan fiduciary net position	(2,169,775,040)
Employers' net pension liability	$1,632,668,690
Plan fiduciary net position as a percentage of the total pension liability	57.06%
Covered Employee Payroll	$356,515,416
Employers' net pension liability as a percentage of covered employee payroll	457.95%

Actuarial Assumptions

The total pension liability amounts were determined by actuarial valuations as of June 30, 2017, using the following actuarial assumptions, applied to all prior periods included in the measurement:

Inflation	3.0%
Salary Increases	3.5% to 11%
Investment Rate of Return	7.75%

The mortality tables, for post-retirement mortality, used in evaluating allowances to be paid to non-disabled pensioners were the R-P 2000 Combined Healthy Mortality Tables projected 16 years and set back 1 year for males and females. Pre-retirement mortality used was 70% for males and 50% for females of the post-retirement tables set back 1 year for males and set back 1 year for females. Disabled pension mortality was based on PBGC Disabled Mortality Tables. The healthy mortality tables include a margin for mortality improvement. The margin is in the 16-year projection. The disabled mortality tables do not include a margin for mortality improvement.

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, 2017, (see NOTE 3) are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return
Global Equity	4.80%
Private Equity	6.50%
Fixed Income	0.50%
Opportunistic Debt	4.50%
Real Assets	4.75%
Real Estate	2.75%
Hedge Funds	2.75%

Discount Rate

A single discount rate of 7.75% 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 7.75%. 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, 2017 net pension liability, calculated using a single discount rate of 7.75%, 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 6.75%	Rate Assumption 7.75%	1% Increase 8.75%
Net Pension Liability	$2,075,474,870	$1,632,668,690	$1,262,285,947

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 – PERSONAL SERVICES AND RETIREMENT PLAN

MPERS employed 16 full-time employees and 1 part-time employee on June 30, 2017. Seven 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 FY2017, amounting to $1,087,268. The amounts for FY2017 and the three 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
2015	58.76	907,064
2016	58.05	996,378
2017	58.00	1,087,268

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 administered by MoDOT. 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, Controller's 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. Member and employer required contribution rates average approximately 31.4% and 68.6%, respectively. The Insurance Plan is financed on a pay-as-you-go basis and is an internal service fund of MoDOT.

MoDOT's actuarial valuations for the Insurance Plan are performed biennially. The July 1, 2015 actuarial valuation was used for the FY2016 and FY2017 financial statements. For this period the annual required contribution (ARC) is equal to the annual OPEB cost. MPERS contributed $45,293 in

FY2017 (49.38% of the ARC), including implicit rate subsidies. Although funding is not related to payroll amounts, an equivalent ARC rate would be 4.79% of annual covered payroll of $1,912,145 for FY2017. MPERS' share of the net OPEB obligation was $715,962 at June 30, 2017. MPERS' share of the changes in the Insurance Plan's net OPEB obligation is shown as follows:

OPEB Cost and Obligation for the Year Ended June 30, 2017

Type	
Normal Cost	$37,661
Amortization Payment	50,520
Interest	30,734
Adjustment to ARC	(37,829)
Annual OPEB Cost	81,086
Contributions	(45,293)
Increase in Net OPEB Obligation	35,793
Net OPEB Obligation - Beginning of Year	680,169
Net OPEB Obligation - End of Year	$715,962
% of Annual OPEB Cost Contributed	55.9%

MPERS' annual OPEB cost, percentage of OPEB cost contributed, and net OPEB obligation for the FY2017 and each of the two preceding years is as follows:

Year Ended June 30	Annual OPEB Cost	Percentage of OPEB Cost Contributed	Net OPEB Obligation
2015	$ 77,435	42.60	$ 643,809
2016	81,653	55.50	680,169
2017	81,086	55.90	715,962

Because the Insurance Plan is an internal service fund of MoDOT, the Insurance Plan's assets have not been set aside. Because of this, there is no actuarial value of assets, so the entire actuarial accrued liability (AAL) is unfunded. Based on an actuarial report dated July 1, 2015, MPERS' portion of the AAL is $908,347, which is equal to MPERS' portion of the unfunded actuarial accrued liability (UAAL), as shown below.

Actuarial Accrued Liability

Actuarial Accrued Liability	$908,347
Actuarial Value of Assets	0
Unfunded Actuarial Accrued Liability (UAAL)	$908,347
Funded Ratio (Actuarial Value of Plan Assets/AAL)	0%
Covered Payroll	$1,912,145
UAAL as a Percentage of Covered Payroll	48%

Actuarial valuations of an ongoing plan reflect long-term perspective and involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far

into the future. Examples include assumptions about future employment, mortality, and the healthcare cost trend. These calculations are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future. A schedule of funding progress is presented as required supplementary information following the notes to the financial statements. The schedule of funding progress represents multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing relative to the AAL for benefits.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time of each valuation and the historical pattern of sharing of benefit costs between the employers and plan members to that point. The actuarial methods and assumptions used include techniques that are designed to reduce short-term volatility in actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations. The actuarial methods and assumptions utilized in the valuation are shown on the following table.

Actuarial Methods and Assumptions

Actuarial Cost Method	Projected Unit Credit
UAAL Amortization Method	Level Dollar Amount
UAAL Amortization Period	30 Years
UAAL Amortization Approach	Open
Investment Return (Discount) Rate	4.0%
Healthcare Cost Trend Rate	7%, Decreasing to 4.5% in 2025
Admin Expense Trend (Inflation) Rate	4.0%

NOTE 11 – CAPITAL ASSETS

Summary of Changes in Capital Assets

	6/30/2016 Balance	Additions	Deletions/ Retirements	6/30/2017 Balance
Land	$84,000	$0	$0	$84,000
Building	581,619	0	0	581,619
Furniture, Equipment and Software	3,517,189	4,832	(7,241)	3,514,780
Less: Accumulated Depreciation	(2,613,708)	(369,615)	7,241	(2,976,082)
Total	**$1,569,100**	**($364,783)**	**$0**	**$1,204,317**

NOTE 12 – 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 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 operations.

NOTE 13 – SUBSEQUENT EVENT

In July 2017, legislation was signed into law that allows the Board to offer former vested members a voluntary one-time lump sum distribution, payable in 2018, as an alternative to receiving a monthly installment payable at a future date. The buyout calculation will be 50% of the present value of the future monthly annuity, based on salary and service on record as of October 2017. As it is unknown how many former vested members will elect the buyout, potential savings cannot be determined.

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of the Employers' Net Pension Liability
As of June 30,

	2017	2016	2015	2014	2013
Total Pension Liability	$3,802,443,730	$3,761,733,004	$3,715,845,651	$3,650,241,741	$3,583,975,559
Plan Fiduciary Net Position	2,169,775,040	1,992,073,946	2,009,367,134	1,957,456,213	1,685,732,710
Employers' Net Pension Liability	**$1,632,668,690**	**$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 Employee Payroll	$356,515,416	$344,635,441	$342,264,593	$336,590,797	$323,205,767
Employers' Net Pension Liability as a % of Employee Covered Payroll	457.95%	513.49%	498.58%	502.92%	587.32%

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

	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
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)
Disabilty 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**
Employers' Net Pension Liability - Ending (a) - (b)	**$ 1,632,668,690**	**$ 1,769,659,058**	**$ 1,706,478,517**	**$ 1,692,785,528**	**$ 1,898,242,849**

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.

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Employers' Contributions
Last 10 Fiscal Years

	Actuarially Determined Contribution	Actual Contributions	Contribution Deficiency (Excess)	Covered Employee Payroll	Contributions as a Percentage of Employee Covered Payroll
2008	$ 123,323,265	$ 123,323,265	$ 0	$ 375,527,604	32.84
2009	122,613,975	122,613,975	0	379,140,306	32.34
2010	124,052,534	124,052,534	0	376,258,823	32.97
2011	149,952,750	149,952,750	0	363,345,651	41.27
2012	164,884,467	164,884,467	0	344,514,139	47.86
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

Schedule of Investment Returns
Last 10 Fiscal Years

Fiscal Year Ended June 30	Annual Money-Weighted Rate of Return
2008	-2.29%
2009	-24.88%
2010	12.72%
2011	21.57%
2012	2.80%
2013	13.37%
2014	17.58%
2015	6.62%
2016	1.02%
2017	11.22%

REQUIRED SUPPLEMENTARY INFORMATION

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, 2017
Actuarial Cost Method ..... Entry Age
Amortized Method ..... Level Percentage of Payroll, Closed
Remaining Amortization Period ..... 15 Years (single equivalent period)
Asset Valuation Method ..... 3-Year Smoothed Market: 20% Corridor
Inflation ..... 3.0% (price inflation)
Actuarial Assumptions:
- Investment Rate of Return 7.75%
- Projected Salary Increase ..... 3.5% to 11% (including 3.5% wage inflation)
- Cost-of-Living Adjustments ..... 2.4% Compound

REQUIRED SUPPLEMENTARY INFORMATION

Other Post-Employment Benefit Plan (OPEB)
Schedule of Funding Progress
for MoDOT and MSHP Medical and Life Insurance Plan

Year Ended June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a)/c)
2008	$0	$1,178,303	$1,178,303	0%	$949,751	124%
2010[1]	0	1,036,681	1,036,681	0%	930,172	111%
2012	0	1,048,333	1,048,333	0%	960,456	109%
2014	0	857,676	857,676	0%	1,203,673	71%
2016	0	908,347	908,347	0%	1,744,734	52%

[1]New assumptions adopted.

Actuarial valuations are performed biennially. The July 1, 2015 actuarial valuation was used for FY2017 and FY2016 financial statements, the July 1, 2013 actuarial valuation was used for FY2015 and FY2014 financial statements, and the July 1, 2011 actuarial valuation was used for FY2012 and FY2013 financial statements, the July 1, 2009 actuarial valuation was used for FY2010 and FY2011 financial statements, and the July 1, 2007 actuarial valuation was used for FY2008 and FY2009 financial statements. This reporting requirement is being implemented prospectively, as prior years' data is not available.

Because this plan is an internal service fund of MoDOT, assets have not been set aside. Therefore, there is no actuarial value of assets. This results in a calculated funded ratio of zero percent.

Notes to the OPEB Schedule of Funding Progress

The information presented in the above schedule was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows:

Valuation Date ..... July 1, 2015
Actuarial Cost Method ..... Projected Unit Credit
UAAL Amortization Method ..... Level Dollar Amount
UAAL Amortization Period ..... 30 Years
UAAL Amortization Approach ..... Open
Investment Return (discount) Rate 4.0%
Healthcare Cost Trend Rate ..... 7.0%, Decreasing to 4.5% in 2025
Admin Expense Trend (Inflation) Rate 4.0%

Supplementary Information

Schedule of Administrative Expenses

For The Year Ended June 30, 2017

Personnel Services:	
Salary Expense	$1,912,145
Employee Benefit Expense	1,480,485
Total Personnel Services	**3,392,630**
Professional Services:	
Actuarial Services	107,950
Audit Services	46,000
Legislative Consultant	30,000
Investment Special Consulting	15,000
Insurance Consultant	6,000
Other Consultant Fees	1,807
Fiduciary Insurance	11,830
IT Hosting and Support	226,477
Other	3,562
Total Professional Services	**448,626**
Miscellaneous:	
Depreciation	369,827
Meetings/Travel/Education	90,139
Equipment/Supplies	67,094
Printing/Postage	32,720
Bank Service Charge	9,036
Building Expenses	50,751
Other	54,635
Total Miscellaneous	**674,202**
Total Administrative Expenses	**$4,515,458**

Supplementary Information

Schedule of Investment Expenses

For the Year Ended June 30, 2017

Investment Income Expenses:	
Management and Performance Fees	
Global Equity	$2,346,355
Fixed Income Core	127,852
Opportunistic Debt	4,930,597
Real Estate	4,964,523
Private Equity	4,510,209
Real Assets	6,221,404
Hedge Funds	5,558,941
Cash	646,161
Total Management and Performance Fees	**29,306,042**
Investment Custodial Fee	54,308
Performance Management	173,663
General Consultant (Monitoring) Fee	322,059
Other Investment Expenses	604,802
Total Investment Income Expenses	**$30,460,874**
Securities Lending Expenses:	
Borrower Rebates	$154,991
Bank Fees	118,810
Total Securities Lending Expenses	**$273,801**

Supplementary Information

Schedule of Consultant and Professional Expenses

For the Year Ended June 30, 2017

Professional/Consultant	Nature of Service	
Levi, Ray & Shoup, Inc.	Information Technology	$178,221
Gabriel, Roeder, Smith & Co.	Actuarial	107,950
Williams-Keepers, LLC	Financial Audit	46,000
Huber & Associates	Information Technology	44,055
Michael G. Winter Consultants, LLC	Legislative Consulting	30,000
Sikich, LLP	Information Technology	4,201
Evercore Group LLC	Market Research	15,000
Charlesworth Benefits	Risk Management Consulting	6,000
Alliant Insurance Services, Inc.	Director's & Officer's Insurance	10,712
Thompson Coburn, LLP	Legal Consulting	1,807
MO Division of Employment Security	Death Audit Services	456
LexisNexis Risk Data Management	Death Audit Services	600
MO Dept. of Health & Senior Services	Death Audit Services	630
Alliant Insurance Services, Inc.	Employee Crime Bond	1,118
The Berwyn Group	Death Audit Services	1,876
Total Operating Consultant and Professional Expenses		**$448,626**

New England Pension Consultants	General Consulting/Monitoring	$322,059
The Northern Trust Company	Performance Management	173,663
The Northern Trust Company	Investment Custodian	54,308
Total Investment Consultant and Professional Expenses		**$550,030**

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

MANAGEMENT LETTER

JUNE 30, 2017

November 1, 2017

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, 2017, 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. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness yet important enough to merit attention by those charged with governance.

Our consideration of internal control 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.

However, 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

3rd PARTY INFORMATION TECHNOLOGY (IT) PROVIDER CONTROLS

During the 2014 fiscal year, the System contracted with a 3rd party IT provider to host the System's pension administration system and associated lines of business applications. We noted the System has not received a Service Organization Controls (SOC) 2 report from this IT provider. SOC 2 reports are examination engagements undertaken by a service auditor to report on controls at an organization that provides services to user entities when those controls are likely to be relevant to user entities' internal control over financial reporting. These reports specifically address controls related to security, availability, processing integrity, confidentiality, and privacy. As such, we were unable to determine if the controls in place at the 3rd party IT

provider adequately address risks related to physical security, change management, and backup & recovery. The System could be putting its information at risk if the IT provider has not implemented proper controls.

We recommend the System request the IT provider make available a SOC 2, Type 2 report. The System can then use this information to assess the adequacy of controls in place at the IT provider as well as determine the extent of controls the System should implement to minimize its risk in this area.

Status: Management has initiated discussions with the 3rd party IT provider requesting they have the necessary testing performed to issue a SOC report. The 3rd party IT provider is currently having an examination performed and plans to issue a SOC 2, Type 2 audit report by June 2018.

PRIOR YEAR RECOMMENDATION IMPLEMENTED

DISASTER RECOVERY PLAN

We recommended management develop a disaster recovery plan that included, but was not limited to, the following matters:

- Location of, and access to, off-site storage;
- A listing of all data files that would have to be obtained from the off-site storage location;
- Identification of a back-up location (name and telephone number) with similar or compatible equipment for emergency processing (Management should make arrangements for such back-up with another company, a computer vendor, or a service center. The agreement should be in writing.);
- Responsibilities of various personnel in an emergency;
- Priority of critical applications and reporting requirements during the emergency period.

Status: Management has fully implemented this recommendation.

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

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

COMMUNICATION OF AUDIT RELATED MATTERS

JUNE 30, 2017

November 1, 2017

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, 2017, and have issued our report thereon dated November 1, 2017. 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 July 31, 2017. 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. In accordance with the terms of our engagement letter, we will advise management about the appropriateness of accounting policies and their application. 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, 2017. We noted no transactions entered into by the System during the year for which there is a lack of authoritative guidance or consensus. All significant transactions have been recognized in the financial statements in the proper period.

For the year ending June 30, 2018, the System will be required to implement Governmental Accounting Standards Board (GASB) Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. This Statement establishes standards for recognizing and measuring liabilities, deferred outflows and inflows of resources, and expenses/expenditures. This Statement identifies the methods and assumptions that are required to be used to project benefit payments, discount projected benefit payments to their actuarial present value, and attribute that present value to periods of employee service. In general, this Statement will require the System to record and report the net liability for postemployment benefits other than pensions, along with deferred outflows of resources, deferred inflows of resources, and expenses/expenditures. It also requires significant changes to the footnote disclosures and required supplementary information.

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' net 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. Estimated useful lives of capital assets are generally based on past experience with similar assets. Employers' net 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.

The disclosures in the financial statements are neutral, consistent and clear. 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, the funded status of the plan, and the net pension liability of employers.

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 audit, other than those that are trivial, and communicate them to the appropriate level of management. For purposes of this letter, professional standards define a significant audit adjustment as a proposed correction to the financial statements that, in our judgment, may not have been detected except through our auditing procedures. These adjustments may include those proposed by us but not recorded by the System that potentially cause future financial statements to be materially misstated, even though we have concluded that such an adjustment is not material to the current financial statements. We proposed the following audit adjustment to the financial statements as a result of our audit, which was reviewed by Management who determined the effects are immaterial to the financial statements as a whole.

- To increase investments and net change in fair value of three alternative investments by a total of $3,003,651 due to the System's custodian not including all investment activity of the funds in the balance reported to the System. The System has communicated with the custodian to report the full activity of these investments in future periods.

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 employers' net pension liability, changes in the net pension liability, employer contributions, investment returns, and OPEB funding progress, 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.

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

TO: Audit Committee

FROM: Scott Simon
Greg Beck

RE: Enterprise Risk Management program

DATE: November 1, 2017

The Enterprise Risk Management (ERM) program is well under way at MPERS. We believe that the Audit Committee is the most logical place to report our ERM activities. The Audit Committee chair can decide how much, if any, discussion to share with the full board.

While we are more than happy to share all of our ERM efforts with the committee, for now we believe a summary is appropriate. This memo will serve as an agenda for the Audit Committee meeting.

Item 1 – Why ERM? ERM promotes risk awareness for staff which in turn encourages risk management. In our view, MPERS has two core responsibilities, customer service and risk management. It is important to note that we are in the risk management business, not the risk elimination business. We believe implementation of ERM is critical because our current operation would not support the need for a full time internal audit function. Our view is that a successful ERM program is a practical alternative to an internal audit function.

Item 2 – Every ERM program must follow some sort of framework in order to have a basis for how the program is to function. We have a spreadsheet (available upon request) that contains our framework, risk matrices (how we measure the identified risks), and charts that help explain the risks. We will share selected items from this spreadsheet with the Audit Committee. We will also share our newly created risk documents that were based on the work of an internal audit group.

Item 3 –ERM is not a "one and done" type of project. The ERM program will require quite a bit of up front learning and then settle into a once a month or quarterly effort. But it is important that the ERM program continues and becomes more refined as it progresses.

Item 4 – ERM requires support from the top, including executive staff and the Board of Trustees. Staff will periodically share important ERM activities to affirm the Board's support. We have completed the MPERS ERM policy. That document is attached and we will go over that briefly at the audit committee meeting.

Given that ERM is a new concept at MPERS, we need to gauge the level of involvement the committee desires. Are you content knowing we are utilizing ERM and receiving periodic updates or do you want to be more involved along the way?

Again, we are more than happy to share everything with you, so please do not hesitate to ask to see other documents or ask us about the process.

Tab 1

FRAMEWORK

MPERS Risk Management

A successful enterprise risk management (ERM) program begins with understanding risk, which is the potential for action or inaction to cause loss, harm or missed opportunity. Some risk must be taken to create value and to foster innovation. Other risks should be avoided or managed to protect resources. A successful ERM program will help recognize, assess, and communicate both of these types of risk across the organization.

Risk Management Principles

Enterprise risk management encompasses:

- Aligning risk appetite and strategy
- Enhancing risk response decisions
- Reducing operational surprises and losses
- Identifying and managing multiple and cross-enterprise risks
- Seizing opportunities
- Improving deployment of capital

Risk management:

- Creates and protects value
- Is an integral part of all organizational processes
- Is part of decision making
- Explicitly addresses uncertainty
- Is systematic, structured and timely
- Takes human and cultural factors into account
- Is transparent and inclusive
- Is dynamic, iterative and responsive to change
- Facilitates continual improvement of the organization
- Is based on the best available information

MPERS ERM Framework

The risk management framework at MPERS will be an integral part of management, embedded in the culture and practices, and tailored to the business processes of the System. It will incorporate the following:

1. Understanding the System and the context, both internal and external, in which it operates
2. Defining risk criteria and key risk indicators
3. Risk assessment:
   a. Risk identification
   b. Risk analysis
   c. Risk evaluation
4. Risk treatment options
5. Monitoring and review of:
   a. Progress in implementation of risk treatment plans
   b. The risk management process
6. Communication of risk management performance to stakeholders
7. Continual improvement of the risk management process

Each one of these seven framework topics will be discussed on the next two pages.

MPERS Risk Management

Framework – Detailed Discussion

1 **Context** is established by reviewing both internal and external factors. External factors can include cultural, political, legal, regulatory, and economic factors, among others, including reputation and perceptions of stakeholders. Internal factors can include the System's mission, vision, strategy, objectives, policies, structure, values, information systems, and operational processes.

2a **Risk criteria** are used to evaluate the significance of risk and should be consistent with the System's risk management policy. Factors to be considered when defining risk criteria include legal and regulatory constraints, how likelihood and impact are defined, how speed of onset (velocity) is determined, how the level of risk is measured, the amount of risk the System is willing to take to achieve its objectives (risk appetite), and the level at which risk becomes acceptable or tolerable (risk tolerance).

2b **Key risk indicators** provide an early warning signal to management regarding impending risks involved in a particular activity or process. Key risk indicators are parameters that measure business processes and provide a prior notification of possible adverse consequences of risk events. Key risk indicators should be in sync with the objectives and goals of the System and complement key performance indicators. When designed appropriately and applied reasonably, key risk indicators can prove helpful in preventing adverse situations and facilitating steps to manage them. See page 5 for key risk indicators.

3 **Risk assessment** involves the processes of risk identification, risk analysis, and risk evaluation:

3a **Risk identification** involves the creation of a comprehensive list of events (found in our risk matricies in this spreadsheet), the source of which could be both internal and external, that could affect the achievement of System objectives. Events can be either negative (risks) or positive (opportunities). Staff with appropriate knowledge of specific system business unit objectives/procedures should be involved in identifying risks.

3b **Risk analysis** involves understanding the origin and consequences of a risk event. Analysis typically considers the likelihood of an event occurring (frequency or probability of occurrence) and the impact or consequences that can occur before controls and mitigating activities are applied. Consideration is also given to the identification of controls and mitigating activities to prevent, detect, or reduce the impact of the risk event. A thorough analysis of risk events is the foundation of risk evaluation to determine the impact, the likelihood, the speed of onset (velocity), and mitigating controls. The results of the risk analysis can be plotted on a risk matrix. The colored tabs in this spreadsheet contain the risk matrix for each of the six key risks.

3c **Risk evaluation** is the process of comparing the level of residual risk determined during risk analysis with risk criteria, risk appetite, and risk tolerance. Based on the risk evaluation, decisions regarding risk treatment/response and priority can be made.

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MPERS Risk Management

Framework - Detailed Discussion

Risk treatment refers to the selection of one or more actions or responses for managing or modifying risks, and the process for implementing those actions. Typical treatments or responses fall within the following categories or a combination thereof:

- Avoidance – exiting or deciding not to enter into activities that give rise to risk
- Reduction – actions taken (control activities) to reduce or mitigate likelihood, impact or both
- 4 Sharing – reducing risk likelihood and/or impact by transferring or otherwise sharing a portion of the risk
- Acceptance – making an informed decision not to take any action to affect likelihood or impact
- Exploiting – accepting or increasing the risk to maximize the potential benefit (opportunities)

Risk treatment involves a cyclical process of assessing the effect of a treatment or a response on a risk, deciding whether the residual risk level is tolerable, implementing a new risk treatment if necessary, and assessing the impact of the new treatment/response on the risk.

Ongoing monitoring of the risk management function occurs during the normal course of management activities to assess the presence and functioning of its components over time. Changes in strategy, objectives, structure, technology, operating processes, products and services, and personnel all have an effect on risk management. The
5 nature of existing risks may change and new risks may emerge causing the need to reassess, determine if risk treatment decisions remain appropriate and control activities are effective and functioning as intended. Monitoring of the effectiveness of risk management activities and progress in implementation of risk treatment plans should take place during the normal course of business for all units and functions. Periodically, the ERM committees will facilitate the self-assessment of risk activities in particular units or functions by those responsible for those functions. The results of these self-assessments will be documented and reviewed by the respective committee.

Risk management reporting process will evolve as requirements and risk management best practices change. The following categories of reporting are proposed when the ERM process is mature:

Quarterly: The respective ERM committees will meet to prepare a report to the Audit Committee for presentation at the next committee meeting on the status of key
6 risks as compared to the previous quarter including trending, progress toward implementation of risk treatments/responses, and forward-looking statements about the nature of risk for the System.

Annually: A report summarizing the results of risk management activities for the current fiscal year will be prepared by the Assistant Executive Director, approved by the Executive Director, and presented to the Audit Committee.

The risk management program at MPERS will be subject to **continual review and improvement**, with changes made to methodologies, processes, and tools employed to
7 measure risk as necessary to maintain a program that employs best practices in the risk management profession. The ERM champion will benchmark himself to best practices used by its peers in the public pension industry.

MPERS Risk Management

Framework – Risk Categories

MPERS has grouped its risks into two main risk groups and those are; managing the assets and managing the organization. There are six basic risk topics that are used to categorize the risks MPERS faces as shown below.

KEY RISK CATEGORIES

Group	Managing the Assets		Managing the Organization			
Key Risk	Fiduciary Risk	Investment Risk	Strategic Risk	Governmental Environment	Operational Risk	Reputational Risk

MPERS has defined risk policies, strategies, and risk appetites for each of the six key risks noted above.

Risk policies are used to define, in general terms, our goal for each key risk.

Risk strategies are more detailed goal statements for each risk policy which help guide staff on how to manage each key risk.

Risk appetites define the amount or level of risk we are willing to accept in pursut of our organizational goals. The risk appetite statements:

- reflect the strategy and organizational goals,
- recognize there will always be a balance between competing demands when managing the risks,
- consider the limitations of the business resources and structure,
- document what we will and will not do for each key risk, and
- acknowledge our willingness to take on certain levels of risk.

See pages 6 and 7 for each of the key risk policies, strategies, and appetites.

MPERS created a list of actions (found on page 8) that we never want to occur. Those items could be viewed as starting points for risk appetite statements. Those statements will be **provided to the Audit Committee** to allow for discussion on risk topics.

MPERS has defined its "Top Ten" overall risks that the System must manage. Not all of these risks are such that the risk must be entirely eliminated. For example, the investment staff must take risk to lessen the burden on the employers' contribution rates. These overall risks generally do not change over time but could be modified as the environment in which we work changes. The top ten list of risks can be found on page 9. The list of overall risks will be **provided to the Audit Committee** as a point of discussion for how MPERS' staff view risks.

MPERS created a risk matrix for each of the six key risks. Each matrix attempts to quantify the individual risks noted by staff. The matrix takes into account the likelihood of each risk event, the probable impact if the risk event were to occur, and the velocity of the risk event. The velocity is an estimate of how long staff has to prepare for any one risk event. There is a tab in this spreadsheet for each key risk matrix. The tabs' colors correspond to the colors noted above. The matricies are designed for staff use only but are available for audit committee or board review at any time.

MPERS' staff created a chart (page 10) that provides some insight into how risks are viewed by stakeholders versus how those same risks impact the System. What may seem like an important risk to the stakeholders may have minimal impact on the System and vice versa. This chart will be **provided to the Audit Committee** as a starting point on how staff views risk in context.

The risk matrices can be used to map out the top 10 risk events on a plot, taking into account likelihood and impact. This sort of map is commonly referred to as a heat map. The heat map can be found in this spreadsheet; however, the heat map will only be used by the ERM committees as a reference point for discussion of the ERM process at MPERS.

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MPERS Risk Management

Framework – Key Risk Indicators

Key Risk	Key Risk Indicator	Key Risk Indicator Maturity/Status
Fiduciary Risk	Increase in time to pay death benefits	This should be tracked
	Retirement benefits paid late	This can be tracked but should be extremely rare
	Increase in the number of intrusion attempts or failed login attempts	This can be tracked, but we need to figure out how best to do that
	Decrease in ratio of active members to retirees (more so than assumed by actuary)	This is found each year in valuation report
	Abnormal demographic increases or decreases	Five year experience study covers this
	Judicial interpretations of retirement laws	Would be tracked if a retirement case is litigated
Investment Risk	Change in the performance of the portfolio	This is being tracked
	Long-term (10-year) returns fall below assumed rate of return	This is being tracked
	Portfolio returns decrease in relation to peers	This is being tracked
	Short-term cash liquidity falls below two months of retirement benefit payroll	Not tracked officially, but can be tracked
	Changes in CPI	This is being tracked
	Market volatility	Not tracked officially, but can be tracked
Strategic Risk	Decrease in funded ratio	Is found each year in valuation report
	Decrease in the amount paid by the employers	Is found each year in valuation report, if it were to happen it would be a major event
	Increase in contribution rate	Is found each year in valuation report
	Increase in board turnover	Not tracked officially, but can be tracked
	Increase in staff turnover	Staff turnover fairly rare so it is not tracked officially, but can be tracked
	Key staff reaching retirement age	Should not be an issue for several years, so risk is not tracked officially, but can be tracked
Governmental Environment Risk	Increase in frequency of regulatory reviews (i.e., IRS review or state auditor review)	These are rare for MPERS and not worth tracking
	Increase in compliance violations or fines	These are rare for MPERS and not worth tracking
	Number of new retirement bills filed each year	This could be tracked
	Legislation introduced limiting investment options (divestiture)	These are rare for MPERS and not worth tracking
	Legislation introduced mandating actuarial standards	These are rare for MPERS and not worth tracking
Operational Risk	Increase in time between business continuity plan tests or updates to the plan	This could be tracked
	Increase in recovery time objectives	This could be tracked
	Failure to keep pace with scheduled building and computer infrastructure maintenance or replacement programs	This could be tracked
	Increase in the number of help desk tickets	Huber would have to report this to us, but they should track it
	Increase in downtime of networks	Huber would have to report this to us, but they should track it
Reputational Risk	Increase in adverse media coverage	This should be tracked
	Increase or decrease in professional qualifications of staff	This should be tracked
	Increase in customer complaints or decrease in customer satisfaction	This is measured
	Number of failed recruitments of staff	Not tracked officially, but can be tracked
	Declining applicant pool	Not tracked officially, but can be tracked

MPERS Risk Management

KEY RISK POLICIES, STRATEGIES, & APPETITES

Key Risk	Risk Policy	Risk Strategies	Risk Appetites
Fiduciary	Fiduciary duty requires that assets be managed with reasonable care, skill, prudence, and diligence following the prudent person standard.	F1 Our Board and staff comply with fiduciary standards and the Conflict of Interest Policy. F2 Our mission, to manage investments for retirement and public trust funds with the highest standard of professional conduct for the exclusive benefit of fund beneficiaries, is clear to our stakeholders, Board, and staff. F3 Our decisions are made in the best interest of our beneficiaries.	We focus on the mission to serve all beneficiaries. We establish and enforce policies and procedures that govern decision making. We ensure that our mission and values framework is used consistently to guide decisions. We ensure our values and expectations are understood and integrated throughout the Board and staff. We adhere to the highest level of industry standards and regulations. We will not make decisions for personal benefit. We will not allow external pressures to direct the outcomes of decisions.
Investment	We maximize returns at a prudent level of risk recognizing that risk tolerance can vary by stakeholder.	I1 We invest a diversified portfolio in a thoughtful manner to meet or exceed the actuarially assumed rate of return set by the Board. I2 We invest with highly skilled managers and partners. I3 We monitor the investment performance, risk, and expenses of the fund.	We have Board policies and investment beliefs that describe investment risk limits. We maintain stable asset allocation focused on a long-term strategy and diversification. We invest with those in which we have conviction based on our assessment of people, structure, and strategy. We manage for a higher risk-adjusted return in private markets where applicable. We ensure the expected return compensates us for the risks taken. We track the long-term trends for strategic impact on the total portfolio. We will invest in alternative assets which may result in relatively higher fees. We will not be short-term market investors. We will not invest in an area until we have the expertise and resources. We will not accept strategy drift either internally or by external managers. We will not be overly influenced by market trends or herd mentality.
Strategic	We take the risks necessary to reach our strategic goals.	S1 We implement a strategic framework that balances value, support, and capacity in support of a skillful Board to meet the long-term goals of the stakeholders. S2 We challenge our business assumptions and are vigilant in identifying causes of failure. S3 We take risk while maintaining a margin of safety and sustained operational discipline.	We clearly articulate our mission and approach for achieving our goals. We adjust our plans based on resources and information. We empower staff to take appropriate risk. We cultivate leadership and accountability. We will not ignore failures. We will not accept strategy drift. We will not let our strategy be influenced by short-term trends.

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MPERS Risk Management

KEY RISK POLICIES, STRATEGIES & APPETITES

Key Risk	Risk Policy	Risk Strategies	Risk Appetites
Governmental Environment	Governmental environment risk is reduced through engagement of the marketplace and stakeholders.	GE1 We fulfill our obligations as both a governmental organization and a fiduciary. GE2 We are transparent and accountable. GE3 We will use our website to publish information that has been deemed useful to our members and stakeholders. GE4 We will engage with state legislators to ensure our message is delivered to them.	We will speak with one voice. We will monitor government mandates. We will engage with outside interests when appropriate. We will educate stakeholders in a proactive manner. We will maintain the highest ethical standards. We will not seek publicity to the detriment of our integrity. We will not sacrifice our fiduciary duty at the expense of our reputation. We will not manage beyond our governance structure.
Operational	Successful operations have strong controls and a commitment to continual improvement.	O1 We manage all operations efficiently. O2 We optimize the System's limited resources through sound business practices. O3 We comply with rules, regulations, processes, and procedures. O4 We budget what we believe we will need for the year without excessive cushion.	We will establish processes and programs that provide independent oversight when possible. We will engage with the best partners. We will empower staff to identify operational efficiencies. We will maintain a business continuity plan that manages risks during extraordinary circumstances. We value accuracy over speed and accept that deliverables can change. We will manage outsourcing risks associated with vendors. We will change providers to improve services or manage risk. We will recruit and retain the best personnel. We will develop innovative programs and embrace new technology within budgetary constraints. We will provide a safe work environment for staff and visitors. We will not allow controls to be ignored or circumvented. We will not allow audit recommendations to go unaddressed.
Reputational	We believe in our mission and manage our reputational risk.	R1 We work to be viewed as a valuable employment recruitment and retention tool for our covered employers. R2 We strive to be a strategic investor to maintain the trust and confidence of our board, beneficiaries, legislature, and executive branch.	We will actively manage each of the key risks. We are commit to transparent business practices. We have zero tolerance for corruption. We will invest in a manner that earns public confidence by serving the long-term needs of our stakeholders. We will not allow errors to go uncorrected. We will not operate outside of an established ethical framework. We will not publish any information that would be perceived as controversial. We will not make investments without thorough due diligence or outside our area of expertise.

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MPERS Risk Management

MPERS Goals for Key Risks

Fiduciary

We never want to default on our promised benefits.
We never want to purposely deny any member their earned benefits.
We never want staff/Board to behave unethically.
We never want to ignore the advice of the actuary.

Investment

We never want an investment asset to be confiscated.
We never want to be associated with partners who have weak ethical cultures or poor response to ethical issues.

Strategic

We never want to lose sight of our long-term mission or those we serve.
We never want to lose the Board's trust.

Governmental Environment

We never want politics or other agendas to override our fiduciary decision making.
We never want to lose our perspective of our place in state government or the statutes and polices within which we work.

Operational – Human Resource

We never want a major staff exodus to occur.
We never want to be unable to attract qualified staff.

Operational – Accounting/Technology/Operations

We never want to wire money to the wrong place.
We never want to have a material valuation error.
We never want investments/money to be lost or mishandled.
We never want a data breach.
We never want to be unprepared for a data breach or disaster.
We never want to be unable to pay staff or be late paying bills.
We never want fraud to occur.

Reputational

We never want to lose our good reputation.
We never want to release confidential information or fail to release public information upon request.
We never want to turn anyone away from a public meeting.

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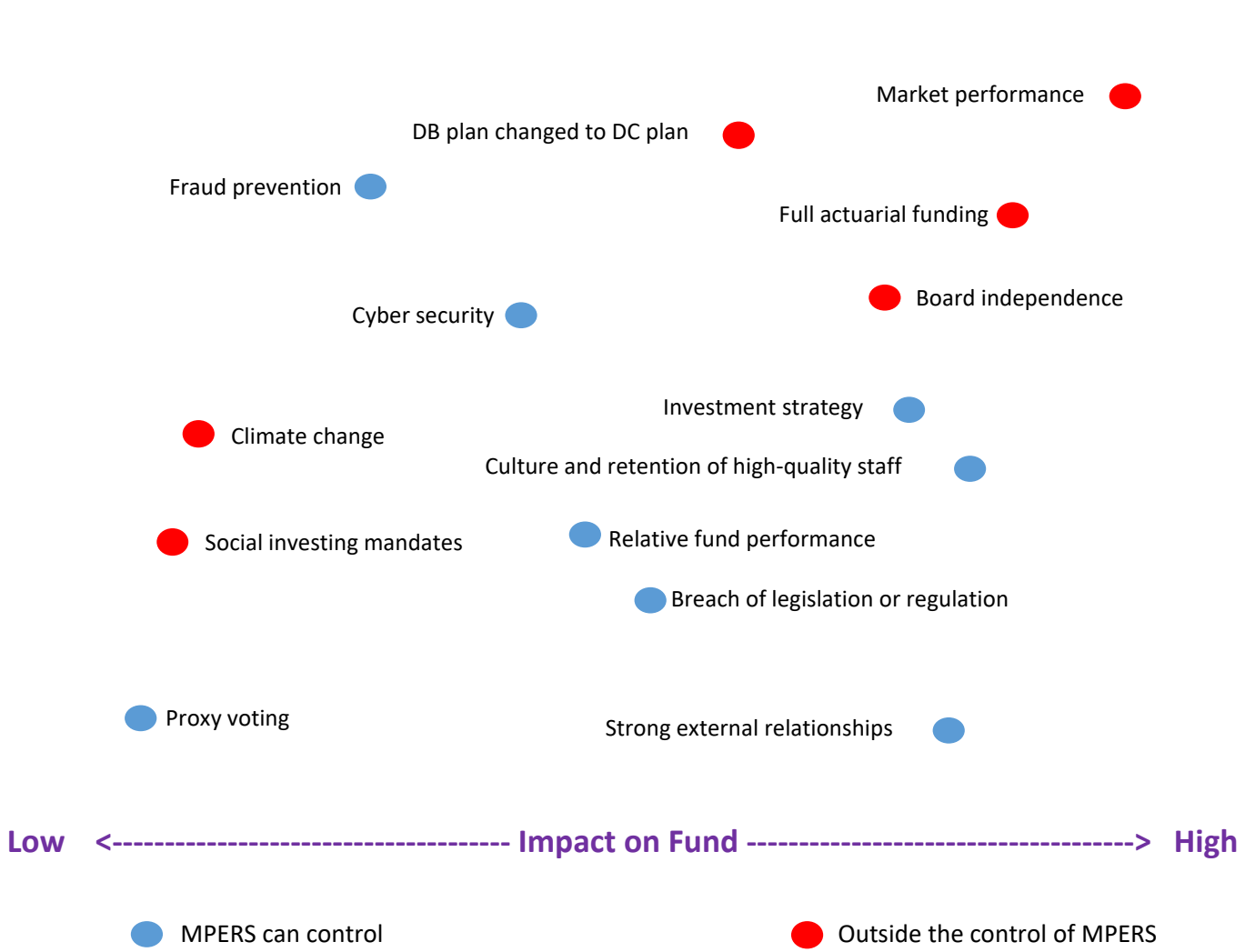
MPERS Risk Management

MPERS Top Ten Overall Goals and Risks

	KEY RISK	BUSINESS OBJECTIVE OR GOAL	NEGATIVE RISK (RISK AVOIDANCE)	POSITIVE RISK (RISK TAKING)	RISK OWNER	OVERSIGHT
1	Investment Risk	Provide for present and future benefit payments through sound investment practices.	Fund performance objectives not achieved as set in the Investment Policy/Governance Policy.	Risk assets are included in the portfolio to help ensure the assumed rate of return is met or exceeded.	Chief Investment Officer	Investment Committee
2	Operational Risk	Ensure accuracy and validity of actuarial methodologies, studies, and assumptions.	Inaccurate actuarial methodologies and assumptions.	We will wait to conduct experience studies every five years.	Executive Director	Board
3	Fiduciary Risk	Ensure the contribution rates provide for long term viability of MPERS' defined benefit plan.	Insufficient contribution payments or contribution rates to amortize unfunded actuarial liability and sustain the system.	Contribution rate reserve fund created to help minimize downside investment returns and their impact on the contribution rate.	Executive Director	Board
4	Operational Risk	Ensure cost effective, efficient, and sustainable processes and systems that enable MPERS to serve its members and beneficiaries now and in the future.	Untimely and/or inaccurate delivery of benefits and services due to failure of or inadequate processes, systems, staff actions, or data.	Continue to enhance both the accounting system and the pension administration system to maximize capabilities and functionality.	Executive Director	Budget Committee
5	Reputational Risk	Protect the confidentiality, integrity, and availability of MPERS' systems, networks, and information assets.	Loss of information security or compliance violations as a result of unauthorized or unintentional breaches.	Provide members with a secure portal to conduct transactions via the internet.	Executive Director	Board
6	Operational Risk	Ensure the sustainability of critical business processes and systems.	Inability to achieve business objectives due to lack of compliance with internal controls, lack of accessibility to systems, and/or loss of critical staff knowledge.	Seek out new and improved methods to make our processes more efficient and effective. The annual performance review for operations staff helps retain staff.	Asst. Executive Director	Executive Director
7	Operational Risk	Ensure accurate and timely financial reporting in compliance with federal and state laws as well as Governmental Accounting Standards.	Incomplete or inaccurate financial information & weaknesses in internal controls jeopardizes an unqualified audit opinion.	Continue to enhance the financial reporting process to ensure the stakeholders are aware of how MPERS operates.	Chief Financial Officer	Audit Committee
8	Governmental Environment Risk	Ensure the defined benefit program continues to be a fundamental component of MoDOT and Patrol employees' retirement.	Negative impacts to funded status of the plan & members' retirement security caused by legislative changes.	Seek audiences with legislative members and/or the governor to provide information on the value of the DB plan.	Executive Director	Board
9	Reputational Risk	Sustain the trust of our members, stakeholders, and the public.	Loss of confidence in MPERS as a respected fiduciary of public funds.	Ensure our message is being delivered to and received by the stakeholders.	Executive Director	Board
10	Strategic Risk	Successfully implement business processes and technology tools to facilitate cost effective, efficient, and sustainable processes and systems.	Unable to successfully transform the data and business processes within established scope, schedule, and budget.	Continue to seek out improved methods/technologies and invest in computer systems to enable MPERS to better serve the members.	Executive Director	Board

MPERS Risk Management

MPERS and the Risk Environment



Tab 2

OPERATIONAL RISK POLICY

OPERATIONAL RISK CONSIDERATIONS

MPERS
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MoDOT and Patrol Employees' Retirement System

As of
April 27, 2017

OPERATIONAL RISK CONSIDERATIONS

TABLE OF CONTENTS

OPERATIONAL RISK CONSIDERATIONS

Operational Risk Considerations

INTRODUCTION

Public pension systems (Systems) face a large number of risks on the administrative and benefits side of the business. Some inherent risks do not change much over time. However, other risks and the mitigating controls for all risks are often affected by the constant changes in technology and the environment in which Systems operate. This document lists some of the risks that our system faces and some of the controls to mitigate these risks.

This document is intended to provide a point of reference or a guide to pension fund staff in addressing risks and practices and procedures to address those risks.

It should be understood this document was developed to be as thorough as possible; however, it is not intended to be an exhaustive list of all risks that we may encounter nor is it intended to be a comprehensive checklist of all the controls and other procedures our system should incorporate to address the identified risks. Continual review and update will be required to maintain the integrity of this document.

This document is presented in top down order of responsibility for the system—beginning with the legislative authorities, the board, executive management, etc. Then, the document continues to present the risks and controls in order of the members' life cycle in the system. After each control, an individual or group is noted to indicate where the primary accountability lies for each risk.

PLAN

This document is part of the overall risk management system in place at MPERS. Proper completion of this document will provide the base for future efforts in managing risks.

The assistant executive director, as of March 1, 2017, has reviewed this document and has inserted questions and comments along the way. He will ask staff to review the comments and questions to ensure the identified risks are as controlled as possible. That was completed March 16, 2017. The draft was reviewed by the executive director and approved for distribution on April 19, 2017.

CONCLUSION

There are risks that are not adequately controlled and they are highlighted in red and should be the subject of corrective actions or placed on the FY 2018 Business Plan for corrective action.

I. LEGISLATION/LEGAL ACTIONS/COURT DECISIONS

Risk	Risk that the plan is not implemented in conformance with existing federal/state laws.
Control	Have a competent board and board governance policy, competent staff, appropriate hiring practices, a competent legal office, and appropriate legal counsel. In addition, staff should review new pension legislation that was passed to ensure it is implemented appropriately. IRS determination letters have been obtained in the past with a current determination letter dated March 10, 2017. The qualified status of the plan must be maintained in accordance with changing federal laws. Executive director and general counsel
Risk	Risk that changes required by new federal/state laws or court decisions will not be implemented.
Control	In-house legal counsel along with retained consultants, including our actuary and outside legal counsel, keep us apprised of federal decisions or changes. State law changes and decisions are monitored in-house by legislative workgroup to assure necessary changes are addressed accordingly. General counsel
Risk	Risk that legislators will enact laws/resolutions which have a negative impact on the pension system.
Control	Fiscal notes include the negative consequences (often dealing with equal protection, unrealistic time constraints, Information Technology (IT) constraints, costs, etc.) of enacting proposed legislation. General counsel
Risk	Risk that legislators will enact laws without the involvement of actuaries, the board, and/or pension system management.
Control	We provide the legislative body or committee with fiscal notes reflecting the cost of proposed legislation. This information is required before any final action can be taken on a proposed change pursuant to Section 105.665, RSMo. General counsel
Risk	Risk that legislative actions will change pension benefits and contributions and materially impact funding principles.
Control	The financial impact of proposed legislation is communicated via fiscal notes; subsequently, the impact to contributions and funding principles is known before final action is taken. General counsel
Risk	Risk that the plan cannot fund itself.
Control	There is a statutory requirement that employer contributions are made each pay period and the contribution rates are actuarially determined each year. Executive director

I. LEGISLATION/LEGAL ACTIONS/COURT DECISIONS

Risk	Risk that individual employers negotiate employment contracts that conflict with pension system statutes and rules.
Control	While we have no authority over the decisions or policies established by individual employers, we do communicate and pursue any actions that are contrary to the laws and rules governing our system upon receiving knowledge that they exist. An open line of communication with both the MoDOT Director and the Superintendent of the Highway Patrol is an exceedingly important control for this risk. Executive director

II. ADMINISTRATION

A. Board of Trustees

Risk	Risk that board members are not adequately trained and qualified to perform their functions and fiduciary responsibilities.
Control	An orientation and ongoing education are provided to board members through normally scheduled meetings and an annual workshop. The executive director executive staff also provide one-on-one meetings with board members to provide them the support needed to develop and maintain their understanding of their fiduciary responsibilities. Executive director, assistant executive director, chief investment officer, and general counsel
Risk	Risk that board members do not meet frequently enough to perform their functions and fiduciary responsibilities.
Control	Five meetings are scheduled each year, including a carve out for an educational session. If additional meetings are necessary, they are called upon request. Executive director
Risk	Risk that board members micromanage the public pension plan.
Control	Training, education, and the governance policy all serve to minimize micromanagement. Additionally, the use of committees allows board members to ask more detailed questions in more informal settings which offers them more hands-on discussion which in effect eliminates any micromanagement of the system. Ultimately it is up to the executive director to ensure the board members do not micromanage. Executive director
Risk	Risk that one or more board members may not be independent and/or may have a conflict of interest and/or may not be performing their fiduciary duties solely for the benefit of members, retirees, and beneficiaries.
Control	Incorporated in the board governance policy, the board commits itself and its members to ethical, businesslike, and lawful conduct, including proper use of authority and appropriate decorum when acting as board members. Additional detail regarding the trustee code of conduct is available in the governance policy under “Board Charter.” Executive director

Operational Risk Considerations

A. Board of Trustees

Risk	Risk that board members are not provided sufficient and/or timely information by pension system managers in order to make informed decisions.
Control	The executive director is the board's primary link to operational achievement and conduct so that all authority and accountability of staff, as far as the board is concerned, is considered the authority and accountability of the executive director. With this authority, the executive director assumes full responsibility for providing sufficient and timely information so the board can make informed decisions. The executive director provides, by governance policy, a monthly update to the board via email. In addition to scheduled meetings and updates, the executive director will distribute relevant information as recognized to be sure the board is informed. Executive director

B. Audit Committee

Risk	Risk that there is no audit committee.
Control	MPERS has a fully functioning audit committee. Executive director

C. Executive

Risk	Risk that executives do not have management skills and/or technical knowledge to operate a public pension plan.
Control	Hiring practices established through the board governance policy, position description forms, and minimum qualifications are all utilized to minimize this risk. Training and educational opportunities are also readily available to help improve/enhance management skills, functions, and responsibilities. Executive director
Risk	Risk that executives are engaged in inappropriate activities before being hired and/or during employment, including criminal activity, unethical conduct, and identity theft.
Control	MPERS conducts detailed background checks before hiring, including applicant's education, employment history, current or most recent employment, available criminal history, and personal references. We also have a code of conduct established in our employee handbook. In addition, we consider risk minimizing strategies when developing or replacing policies and/or procedures. Executive director
Risk	Risk that executives do not perform their fiduciary duties solely for the benefit of members, retirees, and beneficiaries.
Control	Executives are required to complete annual financial disclosure/conflict of interest statement that is subject to periodic audit by the Ethics Commission. General counsel

C. Executive

Risk	Risk that executives do not plan, organize, staff, direct, and monitor the organization.
Control	The annual business plan is approved by the Board and monitored by the executive director. In addition, we conduct annual performance reviews to monitor and direct individual behavior. Executive director, assistant executive director, and chief investment officer
Risk	Risk that the system gets involved with inconsequential projects, causing critical functions to suffer.
Control	Core values support an environment of "accountability." We recognize the critical functions of our office and the corresponding responsibilities. When new projects arise, they are accommodated in a manner that is least disruptive to our mission. The Business Plan does not contemplate working on inconsequential projects. Assistant executive director
Risk	Risk that one or more executives may have a conflict of interest.
Control	We have a conflict of interest policy in our personnel policy manual. Executive director

D. Strategic Planning

Risk	Risk that the pension plan does not have adequate planning and documentation, including a mission statement, strategic plan, implementation plans (one or more years), charters, and policies and procedures for all areas (including the board, executive, and each program area).
Control	We have a Business Plan that covers the upcoming three fiscal years. We also have the Governance Policy and an Employee Handbook. Our motto statement is "serving those who keep us safe." Our mission and vision is noted on our website under "about MPERS." Executive director
Risk	Risk that major projects fail or are not completed timely due to inadequate planning.
Control	Personnel are required to report progress to applicable superiors on assigned projects periodically so that accountability is maintained for the Business Plan. Employee performance is subject to formal annual evaluations. Executive director and assistant executive director

III. STAFFING

A. Attracting, Training, Maintaining, Promoting, and Retaining Employees

Risk	Risk that the pension plan does not offer sufficient salaries, wages, benefits, and working conditions to attract, maintain, promote, and retain high-caliber employees.
Control	The system conducts periodic salary surveys for each staff position to evaluate if salary levels are competitive. Those positions deemed to be behind the market level receive a recommendation for an increase. Any such increases must be accepted by the board. In addition, we have a quantitative incentive plan for investments staff and qualitative incentive plan for operations staff that provides monetary incentive to those individuals that exceed expectations. Our facility is well maintained, providing above average working conditions. We also use Survey Monkey to assess employee engagement each year to attempt to address employee issues to minimize the potential for poor morale. Executive director
Risk	Risk that adequate formal and on-the-job training is not provided.
Control	**A training program will be developed in FY 2018 for new operations (benefits) staff.** Based on the position, additional training is utilized annually to reinforce or expand the knowledge base. Employees may also consider participating in professional organizations or boards. Assistant executive director
Risk	Risk that employees are not encouraged to, and provided the opportunity to, acquire skills for higher level positions.
Control	The MPERS Employee Handbook offers employees the opportunity to take college courses to obtain undergraduate and master's degrees. MPERS will also pay for specialized training programs that are relevant to public pension plans. Executive director
Risk	Risk that employees are not encouraged to participate in professional organizations and to obtain professional certifications where appropriate.
Control	The Employee Handbook encourages staff to seek out and participate in professional societies or organizations. Executive director

B. Managing Employees

Risk	Risk that the pension fund managers do not properly manage their employees.
Control	Our managers are accountable for meeting objectives, exceeding customer expectations, managing turnover, etc. Executive director and assistant executive director

B. Managing Employees

Risk	Risk that System departments do not function in harmony with each other.
Control	The separate departments of our organization are expected to work together with one end result in mind—to exceed customer expectations. A breakdown between departments jeopardizes our objective of which we are all accountable. Executive director
Risk	Risk that management and board directives are not communicated to staff.
Control	Board and management directives are communicated in many different forums, from the Employee Handbook to bi-monthly staff meetings. Executive director
Risk	Risk that new employees receive insufficient guidance.
Control	**A training program will be developed in FY 2018 for new operations (benefits) staff.** Even without a training plan, the employee's supervisor is responsible for monitoring and assisting with new hire progression. Assistant executive director /Supervisors
Risk	Risk that there is no continuity during employee turnover, leave, and/or reassignment.
Control	All positions have a backup plan in place. In the event of turnover, an individual or group of individuals assume designated responsibilities to assure our service standards are met. Assistant executive director
Risk	Risk that employees have a conflict of interest.
Control	All staff is required to disclose other employment or affiliation that may involve a conflict of interest to their appropriate manager. Certain employees are required to complete personal financial disclosure reports with the Ethics Commission. Executive director
Risk	Risk that job functions are not clearly defined and communicated to staff.
Control	All positions have a well-defined position description form that defines all duties and responsibilities. This document is delivered to all new hires upon employment and is updated as job duties change or evolve. They are also available on the J:\ drive. Assistant executive director
Risk	Risk that employee evaluations are not timely and/or meaningful.
Control	We have an in-depth evaluation process in place to review the majority of staff on an annual basis. We also have informal meetings with operations staff on a semi-annual basis to monitor progress, success, or the lack thereof. The operations staff evaluations are tied to our incentive plan for operations staff. Assistant executive director
Risk	Risk that staff lacks integrity and ethics.
Control	Our mission statement and core competencies clearly define the expectations of all staff. If actions or behavior do not support these guidelines, employees are held accountable. Executive director

C. Segregating Duties

Risk	Risk that the pension plan does not properly segregate duties among its employees.
Control	Our organizational structure and individual positions are established with balance of power in mind. Segregation of duties is the responsibility of management and is evaluated by the external auditors each year for the areas that impact their audit. All staff have been advised that segregation of duties is important and that any weaknesses are brought to the attention of management. Assistant executive director
Risk	Risk that compensating controls do not adequately mitigate risks in areas where segregation of duties is not sufficiently possible.
Control	There is no 100% guarantee that any set of controls will prevent or catch any and all types of errors or fraud. **However, more can be done with segregating the duties/strengthening the controls in place relating to PensionGold. This will be done in FY 2017 or added to the Business Plan for FY 2018.** Assistant executive director

IV. ENROLLMENT OF MEMBERS

A. Employment and Enrollment of New Members

Risk	Risk that ineligible persons are enrolled.
Control	Our new enrollments come from the employers via SAM II system. We rely on the HR staff at our employers to enroll eligible members into the system. We sponsor HR conferences every two years to reinforce the concept that only eligible employees are to be enrolled into MPERS. We maintain an open dialog with the HR reps at the employers so that they will be willing to call us if they have questions on eligibility. Member contributions (dollars) must be reconciled to the member data base to ensure that only eligible employees are enrolled. Payroll staff and chief financial officer
Risk	Risk that eligible persons are not enrolled.
Control	We review payroll data so anyone reflecting a contribution can be resolved by requesting the necessary enrollment paperwork from employer. HR staff are counseled what type of employee should be enrolled into MPERS. Presumably a person that meets the criteria but is not reported as such would either contact us with questions or figure out that they have been forgotten. Payroll staff
Risk	Risk that members are improperly enrolled.
Control	Employers are continually educated via procedure manual, newsletters (HR Connections), website, etc., about current issues or concerns. We also provide a conference to reinforce and train applicable staff on issues like member enrollment. We also perform computer matches between member records and actual payroll data. Exceptions are investigated and resolved. Payroll staff

Operational Risk Considerations

A. Employment and Enrollment of New Members

Risk	Risk that ghost employees are enrolled as pension system members.
Control	The Assistant executive director periodically verifies our social security number (SSN) data for validity using the Berwyn Group's access to the social security database. Payroll staff reviews reports that reflect any individual we show as a member that does not receive payroll. Investigation into such matters would expose any fraudulent activity. Assistant executive director and payroll staff
Risk	Risk that employees are enrolled in an incorrect employment category, either intentionally or unintentionally.
Control	Individuals that are set up incorrectly in our system should be recognized by payroll staff when the payroll reports run. The categories we use are Closed Plan, Year 2000 Plan, and 2011 Tier. PensionGold has also been programmed to recognize employment dates that correspond with specific plan participation. Payroll staff
Risk	Risk that paper documents are not stored securely before being imaged.
Control	The vast majority of incoming mail relating to member records is scanned by the end of the day, with any incomplete scanning finished the following day. Staff was reminded on 4-20-17 to ensure that all documents containing sensitive data be stored out of sight when not used and especially overnight. Payroll staff
Risk	Risk that sensitive/confidential documents are not properly safeguarded and disposed of when no longer needed.
Control	Scanned items are readily available for three months then destroyed. Other documents are put into locked recycle bins for destruction once no longer needed. Payroll staff and administrative assistant
Risk	Risk that members are not enrolled consistently among various employers.
Control	Our statutory authority to minimize this risk is limited as we are dependent upon the employers to enroll members correctly into SAM II as benefit-eligible employees. We provide routine information to the employers to help support accurate enrollment. Payroll staff

B. Communication with New Members

Risk	Risk that new members do not receive adequate information about the pension plan.
Control	A welcome letter is sent to every new member to make them aware of all benefits provided by the system. Payroll staff
Risk	Risk that benefit specialists are not adequately trained.
Control	**A training program will be developed in FY 2018 for new operations (benefits) staff.** Assistant executive director

B. Communication with New Members

Risk	Risk that information provided to members is not clear or timely, thereby adversely affecting member decisions.
Control	Our service standards assure timely response to member issues. Clarity is a challenge for which we have developed a number of safety nets. Those safety nets include but are not limited to: our benefit specialists' knowledge base, response templates to maximize consistency in responses to members, and satisfaction surveys. Assistant executive director

C. Benefit Formula

Risk	Risk that an incorrect benefit formula is associated with the person.
Control	For estimate purposes, formulas are applied based on the type of plan identifying the person. An error in code could lead to the use of an inappropriate formula. Since we have protection against this, the event is unlikely; however, if it did occur, our benefit audit specialist would recognize the error upon application for retirement. Benefit audit specialist

D. Name

Risk	Risk that the name on the social security card is not required on employment records, as required by IRS Publication 15, Circular E.
Control	We are 100% reliant on the employer to give us the active member's name and SSN. We utilize service with the Social Security Administration (SSA) to verify name/SSN match via the Berwyn Group. Assistant executive director

E. Birth Date

Risk	Risk that the incorrect birthdate is received and/or recorded.
Control	A valid proof of age document (birth certificate, passport, etc.) is required before any benefit can be paid. If married, we require a marriage certificate as well. We also include the birthdate on annual benefit statements for review by member. Benefits auditor

F. Marital Status

Risk	Risk that the incorrect marital status is received and/or recorded.
Control	Proof of marriage documents are required for all married members before a benefit is paid. We must, however, rely on the member to tell us first if they are married or single. If they report single, we have no way to verify this information. Marital status is not a particularly important issue until a benefit is scheduled for payment. Payroll staff

G. Beneficiaries

Risk	Risk that correct beneficiaries are not recorded.
Control	Beneficiary designations are listed on annual benefit statements for member review and verification. Payroll staff
Risk	Risk that beneficiary splits are not recorded correctly.
Control	Prior to the $5000 death benefit being paid, staff will review the beneficiary information on file. The file is reviewed by two people before it is paid. Life insurance benefits are not handled by MPERS. The member statement has the beneficiaries listed if the member actually reads the benefit statement and sees there is an issue with his/her beneficiary listed. When responsive design is up and running and members can change beneficiaries online, we may want to consider sending out periodic email reminders to ensure beneficiaries are up-to-date. Payroll staff

H. Social Security Number (SSN)

Risk	Risk that the incorrect social security number (SSN) is received and/or recorded.
Control	We rely on the employer to ensure the new member's SSN is correctly coded in SAM II which populates our system. Also, the assistant executive director will run a match with SSA for SSN validity via the Berwyn Group. Assistant executive director
Risk	Risk that IRS fines pension system for using incorrect SSN.
Control	See above. Assistant executive director

I. Gender

Risk	Risk that incorrect gender is entered into the system, affecting actuarial calculations.
Control	Membership forms require that each person's gender be identified. All correspondence sent from the system uses applicable salutation. Typically, an error would be reported to us for correction. Payroll staff

V. COLLECTION AND MAINTENANCE OF MEMBER DATA

A. Compensation and Contributions

Risk	Risk that incorrect compensation/contributions data is received and/or recorded.
Control	Payroll staff reconciles monthly, the received contributions versus compensation. Any deviations are reported to the employer for correction. Payroll staff
Risk	Risk that reported compensation includes ineligible components.
Control	Only one-time single sum payments are excluded from benefit determination, which is verified by the benefit audit specialist. Automatic and manual checks are in place to recognize such occurrences so members receive accurate estimates and actual benefits. For instance, any payroll amount greater than 5% from the previous payroll is flagged for review. We do return to the employer and employee any contributions that are on ineligible payroll. Benefit audit specialist
Risk	Risk that retroactive payments are not handled correctly.
Control	Retroactive payments are redistributed by the benefit audit specialist over a specific period of time earned so as not to distort final average pay. Benefit audit specialist
Risk	Risk that contributions received are not credited to the correct accounts.
Control	Payroll staff reviews monthly reconciliations to ensure the employee contributions are posted to the 2011 Tier member's account accurately. Payroll staff
Risk	Risk that second state position is not reported appropriately.
Control	This is done with the ERS reporting and monitored by payroll staff. We also offer periodic reminders to the employers to report secondary appointments correctly. Payroll staff
Risk	Risk that demographic information is not updated or is fraudulently updated.
Control	Benefit specialists and payroll staff authenticate updates to demographic data by requesting name, SSN, address, and date of birth. If human resource staff contacts our office with updates, we verify status by referencing our HR contact list. Members may update information online but must sign on with their userID and password. Payroll staff

Operational Risk Considerations

A. Compensation and Contributions

Risk	Risk that payroll data is not received timely or at all.
Control	Payroll data is loaded into our system once a month by payroll staff. If individual member payroll is not received and no leave of absence is reported, we contact the employer directly to determine the status and correct our records. Payroll staff
Risk	Risk that pension system staff does not follow up on contributions not received.
Control	Missing payroll/contribution data is found during the payroll reconciliation process and the employers are asked to submit the missing contributions on the next payroll file. Payroll staff
Risk	Risk that payroll data is not recorded promptly into the member database, resulting in erroneous benefit calculations which must be updated.
Control	Data is received and uploaded twice a month, no later than four nights before retiree processing begins. Payroll staff
Risk	Risk that incorrect service credit data is received and/or recorded.
Control	Service data must be accompanied by receipt of payroll. If both do not occur simultaneously, a formal investigation occurs by payroll staff. Payroll staff
Risk	Risk that tax-deferred contributions are not included as salary for retirement purposes.
Control	We receive gross pay salary information. A breakdown of tax deferred items is not received and not an issue with our reporting processes. Payroll staff

B. Changes to Member/Retiree Data

Risk	Risk that incorrect and/or unauthorized changes are made to name, address, SSN, date of birth, and other indicative data.
Control	All active members (not receiving benefits) must have their HR representative make changes in SAM II for demographic changes. All benefit recipients can change their mailing address and phone number if they are EFT. If paper check, changes must be made in writing. Payroll staff

B. Changes to Member/Retiree Data

Risk	Risk that members do not give timely notification of change.
Control	**Addresses:** Members are continuously reminded to update addresses in most publications. By sending out annual benefit statements, we are able to initiate broad updates either by members directly, or by our administrative assistant II who researches bad addresses. We also use Accurint to find addresses. **Status:** When our members go on leave, the payroll reports will still balance, assuming the leave is a paid leave. Terminations are generally provided by the employers' HR staff, but if that fails, the payroll reports will not agree with PensionGold and exceptions will be noted and reviewed by payroll staff. Payroll staff
Risk	Risk that data is inconsistent between standalone systems or among data components of integrated systems.
Control	We do not utilize standalone systems as we use PensionGold for pension administration. Assistant executive director
Risk	Risk that paper documents are not stored securely before being imaged.
Control	Our document retention plan should address this issue, as long as all staff is following the retention policy, including document destruction. Staff was reminded on 4-20-17 to ensure that all documents containing sensitive data be stored out of sight when not used and especially overnight. General counsel and all staff
Risk	Risk that changes in employment are not received and/or recorded.
Control	Any time the payroll source (employer) changes from one covered employer to another, our database automatically transfers new service to the current employer. However, staff must manually move the old service to the new employer. For instance, the uniform service must be manually moved to the MoDOT civilian service. If payroll starts or stops at a particular employer, a member of the payroll staff will contact the employer to request necessary paperwork. (The automatic transfer would not assume a break in service but rather that the employee stopped working for one employer on a Monday and on Tuesday started working for the new employer.) Payroll staff
Risk	Risk that portability/reciprocity data is not received and/or entered properly.
Control	Service being transferred or purchased is not added to our database until appropriate authentication is received and authorized by the chief financial officer and a benefit specialist. Incomplete paperwork, for such occasions, would be followed up by a benefit specialist until the transaction was complete or closed. At retirement, a benefit specialist and benefit audit specialist would perform a final check to ensure all data is complete and accurate. Benefit specialists
Risk	Risk that purchase or transfer of prior service is incorrectly allowed or incorrectly rejected.
Control	All requests to purchase or transfer prior service is reviewed by our benefit specialists before official eligibility is established. Any questionable requests are to be taken to the general counsel for assistance. Benefit specialists

B. Changes to Member/Retiree Data

Risk	Risk that prior service credit is incorrectly calculated or recorded in the system.
Control	All prior service credit is reviewed by a benefit specialist before the final service period and/or cost are authenticated. The record is reviewed by a second employee before the service is credited in PensionGold. Benefit specialists
Risk	Risk that a member's service credit balance is inappropriately adjusted or altered.
Control	The most likely detection will occur when a person is preparing to receive a retirement benefit that is being verified by a benefit specialist and benefit audit specialist. Prior to that stage, it is reviewed by a payroll staff person when preparing the new retirements. **It is possible that an MPERS employee could change his/her own service record and/or the service record of any member without a report being generated by the system. Our plan is to create a workflow process such that any deletion of a record in the imaging system (i.e. PCX) will involve at least two MPERS employees.** Benefits auditor
Risk	Risk that retirement plan contribution transfers are accepted from nonqualified plans.
Control	The form used to transfer the service and the liability from other pension funds has been improved to require the transferring plan to certify that they are an eligible plan as required by IRS Code 401(a). General counsel and benefit audit specialist
Risk	Risk that checks/payments for prior service credit are not properly safeguarded, transferred, cashed, and credited appropriately.
Control	Checks are received by the administrative assistant (AA); she logs them, then informs either benefit specialist that checks are received, the benefit specialist reviews the check and PensionGold to ensure the amount is accurate and then tells the AA that the check may be deposited. The chief financial officer is copied on the process but does not handle the check to ensure the segregation of duties. Chief financial officer
Risk	Risk that accounts receivable delinquencies related to prior service purchases are not followed up on to conclusion.
Control	The only two ways members can purchase service are through payroll deductions or lump sum payment. We do not allow payment plans. There is no accounts receivable booked because the members can change their mind at any time and even request a return of their funds. Thus there are no accounts receivable delinquencies. Chief financial officer

B. Changes to Member/Retiree Data

Risk	Risk that changes in marital status and division of benefits orders are not received and/or recorded properly and timely.
Control	Annual benefit statements reflect marital status so a member can review our records for accuracy and initiate a change if necessary. Marital status is generally not important for the system until time for retirement. At retirement, we require members to authenticate marital status and provide proof of marriage documentation, if applicable. DBOs are reviewed by the general counsel before being entered into PensionGold. Any DBOs that require preapproval if preapproval is required are also done by the general counsel. Benefit specialists
Risk	Risk that changes in beneficiaries are not received and/or recorded timely or properly.
Control	Retirement payment beneficiaries are listed on annual benefit statements for review by each member. Members can also log in at any time to review their beneficiaries. It is the responsibility of the member to follow up with necessary changes. Forms received are processed by the next day at MPERS. Payroll staff
Risk	Risk that unauthorized changes are made to beneficiary information for purposes of fraud.
Control	The member's beneficiary is noted on the annual benefit statement. Members can also log in at any time to review their beneficiaries. Most beneficiaries (including 2011 Tier contribution refunds) are spouses. When a member passes away, staff will check to ensure the beneficiary is the member's spouse or authorized beneficiary. We cannot control a fraudulent beneficiary change form submitted for processing. However, to obtain a 2011 Tier refund of contribution form, the former member must contact us to obtain the form. Payroll staff
Risk	Risk that IRS tax levy orders are not received and/or recorded properly and timely.
Control	Official documentation from the IRS for a tax levy on a retiree (this does not apply to actives) is received and routed to the payroll staff for processing to withhold the IRS levy from the retirees benefit. Payroll staff
Risk	Risk that unauthorized changes are made to member data.
Control	Anyone with access to PensionGold is capable of manipulating member data. If inappropriate activity occurred, it would be caught during the retirement verification process by a benefit specialist and/or the benefit audit specialist by discovering the error and observing the system captured data reflecting who last updated the record. The user id is maintained by PensionGold in the "audit log" portion of the system. Benefit specialists and benefit audit specialist
Risk	Risk that employees who are members have improper access to their own files/data.
Control	Anyone with access to PensionGold is capable of manipulating their own records. If they were to do so, the benefit specialist and/or benefit audit specialist would recognize the activity during the retirement verification process. Any additional service credit or payroll credit would be discovered on a payroll reconciliation report. Benefit specialists and benefit audit specialist

C. Maintenance of Member/Retiree Data

Risk	Risk that data is not maintained and backed up properly to maintain data integrity.
Control	When data is entered into PensionGold , it is backed up at LRS and Huber as it is an internet-based computing system. Payroll staff
Risk	Risk that database is not secure from both internal and external threats, compromising data confidentiality.
Control	Our system is secured by user IDs and passwords. Employee passwords must be changed every 90 days. Member passwords must be changed every six months. Access from the outside is verified by access lists and passwords. We have a firewall and use antivirus software that is maintained by Huber. We also use SilverSky to monitor the MPERS website. Assistant executive director
Risk	Risk that the pension system has not established a procedure for guarding sensitive information and reducing the potential for identity theft.
Control	We use passwords and user IDs to limit access to information on our databases. Members pick a user ID and password. We do not put SSNs on correspondence. We will not send correspondence to an address that is not valid. Assistant executive director
Risk	Risk that confidential documents are not shredded.
Control	We rely on staff to put the confidential documents in a locked receptacle. A shredding company brings a truck with a shredder to our office in order to shred the documents from the locked receptacles. All operations staff
Risk	Risk that paper files/records are not secure from fire or other natural disasters.
Control	All member mail is opened and scanned as soon as possible. Our records retention policy should address the concern of paper files. Some paper files are in storage, but the value of those documents is extremely limited. Staff was reminded on 4-20-17 to ensure that all documents containing sensitive data be stored out of sight when not used and especially overnight. Administrative staff and Payroll staff
Risk	Risk that member records are used unethically or illegally by pension system staff.
Control	Personnel policy specifically prohibits the unauthorized or illegal use of member data. Any deviance to such policy could lead to dismissal or legal action. Assistant executive director
Risk	Risk that data is inaccurate.
Control	There are numerous reports that are run to detect inaccurate data. For example, we review the annual valuation reports for inconsistent data. The monthly reconciliation process also ensures accurate payroll and contribution data. Payroll staff

C. Maintenance of Member/Retiree Data

Risk	Risk that member imaged files are not complete and/or are not backed up properly.
Control	All member data is stored in PCX which is updated daily by LRS. Assistant executive director
Risk	Risk that member imaged files cannot be accessed timely when the system is down.
Control	Member files cannot be accessed when the system is down, so to handle this risk, MPERS staff and Huber try to make sure the system is not down. We have a backup generator to power the servers and some phones. The backup generator is tested periodically. Assistant executive director

VI. COMMUNICATIONS WITH MEMBERS

A. Member Statements

Risk	Risk that member statements are inaccurate and/or incomplete.
Control	Programs created for accurate generation of statements have been in place for years. However, payroll staff will spot check statements before they are distributed. Payroll staff
Risk	Risk that members do not receive statements.
Control	Statements are distributed to the members' portal if they have selected electronic delivery of correspondence. If not, paper statements are mailed. Statements are generated each month based on the anniversary of the member's retirement. Active members receive statements in April. Paper copies are put in envelopes that will be returned by the postal service if a bad address is used. The administrative assistant will work to find a better address for returned mail and resend the statement. Payroll staff and administrative assistant
Risk	Risk that someone other than the member receives the statement.
Control	Statements are sent to the address on record as supplied by the member. If members neglect to update their addresses, the concern over the release of sensitive data to an unauthorized recipient is low given that our statements contain very little sensitive data and no member SSN. Payroll staff

B. Retirement Estimates

Risk	Risk that retirement estimates are not accurate/not received.
Control	Programs created for generation of estimates have been in place for years. Subsequently, little, if any, verification is required unless legislative or other changes occur that impact benefit determination or other information included on the estimates. When changes occur, LRS and staff conduct extensive testing before the program is put back into production. Paper estimates are distributed so that they will be returned by the postal service if a bad address is encountered. Upon return, staff will research the bad address until it can be corrected, usually in cooperation with the member's employer if necessary. Payroll staff and administrative staff
Risk	Risk that estimates are provided to a member before service credit history has been recorded and/or audited.
Control	All service data is entered when received and verified before it is finalized in the system. However, members can run estimates 24/7 and the service may be in a state of processing at MPERS and not reflected in the member's online estimate; however, they are only estimates and not legally binding as reflected in the disclaimers on the estimates. Payroll staff
Risk	Risk that estimates are provided to a member before purchased/transferred service has been recorded.
Control	All estimates are marked as just that - estimates. Members can run estimates 24/7 so it would be impossible to ensure all information is included in a member's estimate if MPERS is not aware of missing data or information. Payroll staff

C. Retirement Planning Services

Risk	Risk that members do not receive adequate retirement planning services.
Control	Our benefit specialists are available weekdays from 7:30 a.m. until 4:30 p.m. to assist members with any issues related to the benefits we provide. Our website provides immediate availability for members to access their own data and to utilize numerous calculators associated with retirement planning. In addition, our benefit specialists offer several different educational opportunities throughout the state of Missouri each year. These workshops are: 1) Benefit Basics—this session targets relatively new employees that are trying to learn and understand their benefits and 2) Pre-retirement Planning—these sessions are targeted at those members who are within three to five years of retirement and interested in preparing themselves for the transition into retirement. Benefit specialists

C. Retirement Planning Services

Risk	Risk that retirement alternatives are not adequately presented to potential retirees.
Control	Our benefit specialists are available weekdays from 7:30 a.m. until 4:30 p.m. However, should a member choose not to utilize a specialist when it is time to retire, our process for retiring assures that all members will at least see all available alternatives before electing a plan or payment option. First, a member files an application for retirement verifying several pieces of data that we use to generate an election form and applicable estimates reflecting each available option. This information is sent to each member to review before making a plan and electing a payment option. Benefit specialists also travel to employers to conduct one–on-one counseling sessions. Benefit specialists
Risk	Risk that the staff providing services is not well trained and provides incorrect information to potential retirees.
Control	The benefit specialists and payroll staff are trained on the various aspects of the retirement process when hired. **A training program will be developed in FY 2018 for new operations (benefits) staff.** Assistant executive director

D. Customer Service

Risk	Risk that various forms/methods of communication with members, retirees, and beneficiaries are not coordinated and consistent (e.g., literature, Internet, telephone, email, and office visits).
Control	We use templates for several routine letters. We have also reviewed our handbooks to ensure they are accurate. The Closed Plan Handbook will be reviewed in FY 2018. There is no complete control for ensuring all phone calls are 100% accurate. Benefit specialists
Risk	Risk that system communication, processes, and policies are not customer oriented.
Control	Our mission statement reads “serving those who keep us safe”; therefore, we are forced to balance our efforts to assure we appropriately administer our benefits in compliance with state law, board rules, and legal opinions with minimal bureaucracy. Assistant executive director
Risk	Risk that appeals occur because of inadequate communication among members, employers, the pension system, and third party administrators.
Control	We proactively communicate—by newsletter, individual correspondence, electronic HR updates, conference calls with vendors, and the like—with our members and agents (employers and third party administrators) to minimize the exchange of poor or inaccurate information. Should such an exchange occur and not at the fault of the member, our practice is to make the member whole and make direct contact with the parties involved to make sure a similar event is avoided in the future. Assistant executive director

E. Publications

Risk	Risk that literature, newsletters, or special mailings available to members are incomplete/inaccurate or not in agreement with statutes, rules, other laws, or contract.
Control	All printed handbooks, pamphlets, and the like are qualified by stating that any material conflicting with applicable statute, rule, or contract are superseded by those governing documents. Effective July 2016, all revisions to publications are to be reviewed by a committee prior to publication. Assistant executive director
Risk	Risk that forms cannot be kept up to date and inventoried because of the volume.
Control	Our materials are kept on the website. Some forms must be requested by the member (*i.e.*, 2011 Tier member contribution refund request). Assistant executive director

F. Internet Access to Information

Risk	Risk that information made available on the Internet does not agree with statutes, rules, or contracts.
Control	Individual information is tied directly to our main database which is tested thoroughly before it goes into production. General information, primarily on the banner, listed on the website is reviewed before it is posted. Assistant executive director
Risk	Risk that information on the Internet is incomplete/inaccurate.
Control	The publications are reviewed prior to launch. Any feedback we receive on material published on our website is reviewed, and corrections, if any are required, are made. Assistant executive director
Risk	Risk that customers are not authenticated prior to accessing confidential information or providing confidential information.
Control	Members are required to use the member ID and their password that authorizes and secures their access to personal information. Payroll staff

G. Customer Contact Center

Risk	Risk that information made available does not agree with statutes, rules, or contracts.
Control	Training and information is provided to benefit services personnel to make sure the most current data is exchanged with our members. Non-routine inquiries are generally reviewed by at least two individuals (sometimes with the Assistant Executive Director, Executive Director, and/or General Counsel) before communication is completed. If inaccurate information is provided, it is corrected. Estoppel issues are addressed with legal counsel and resolved in the most prudent manner. Benefit specialists

G. Customer Contact Center

Risk	Risk that information given by operations staff is incomplete/inaccurate.
Control	Numerous resources are available to staff which facilitate communication so as to make the exchange as complete and accurate as possible. We also have performance measures that were completed in FY 2016 that pertain to calls received from members. Benefit specialists and Payroll staff
Risk	Risk that operations staff are not adequately trained.
Control	We encourage continual review of statutes, contracts, handbooks, and the like to maintain and develop staff knowledge. **A training program will be developed in FY 2018 for new operations (benefits) staff.** Benefit specialists
Risk	Risk that callers are not authenticated and confidential information is given or received improperly.
Control	All members are authenticated by requesting demographic data from the caller (*i.e.*, SSN, address, and date of birth). If an employee doubts, for whatever reason, the person on the phone is not who they claim to be, additional information is requested including employer data or a call could be made to the employer. Operations staff
Risk	Risk that system problems prevent operations staff from providing information timely or accurately.
Control	The phone system is set up to run off of our servers. They do go down on occasion, but we contact our vendors to correct the issues to restore service as quickly as possible. We can also put a message on the phones that alerts members to call us back later when service is restored. Assistant executive director
Risk	Risk that operations staff do not provide information timely.
Control	Formal standards are in place for responding to members in all forums, generally, one day. If one or more individuals are not conforming, a follow-up by the assistant executive director would occur to resolve the problem. Assistant executive director

H. Field Presentations/Seminars

Risk	Risk that information does not agree with statutes, rules, or contracts.
Control	Workshop/seminar materials are generally reviewed by at least two individuals prior to use. Assistant executive director
Risk	Risk that field presenters do not receive adequate formal and on-the-job training.
Control	The seminars, currently, are conducted by benefit specialists or a retired benefit specialist that have many years of experice giving seminars. Benefit specialists

H. Field Presentations/Seminars

Risk	Risk that information is inaccurate and/or incomplete.
Control	If inaccurate information is provided, it is corrected. Estoppel issues are addressed with legal counsel and resolved in the most prudent manner. There is a disclaimer provided that anything they hear at the seminar does not take precedence over state law. Benefit specialists
Risk	Risk that presentations are not easily accessible to members, retirees, and beneficiaries.
Control	Presentations are held regularly at locations throughout the state. On August 10, 2016, the assistant executive director reviewed the locations of the seminars as compared to the home locations (county of residence) of our active members. The conclusion was that the locations of the cities were effective and efficient. Assistant executive director
Risk	Risk that customers are not authenticated before confidential information is given or customer information is accepted.
Control	The only confidential information would be the member's address and date of birth since their SSN is not fully displayed. The estimates are individually packaged and members are required to personally check in with the trainer/presenter in order to receive seminar materials. Benefit specialists

I. Unclaimed Benefits

Risk	Risk that pension system does not comply with IRS minimum distribution requirements.
Control	Those inactive members that have not started receiving benefits are contacted approximately six months before they turn 70½ to establish distribution of their benefit. Those inactive members that we have established contact (valid address and phone number) are required to take a retirement benefit. For those members that are not located until after this period, we will pay a retroactive benefit to April 1 of the year following their attainment of age 70½ once they are located and retire. Assistant executive director
Risk	Risk that inactive members who are deceased are not identified.
Control	A death audit is conducted by both the benefit audit specialist and the assistant executive director for all retirees/survivors/2011 Tier members/terminated-vested members to make sure our records are updated accordingly. Benefit audit specialist/assistant executive director
Risk	Risk that system does not effectively pursue contact with lost retirees and/or beneficiaries.
Control	Any benefit recipient that appears to be lost will have the benefit payments suspended until the member is located by a member of the staff. Benefit specialists and staff
Risk	Risk that pension system does not provide a mechanism whereby inactive members or heirs of inactive members/annuitants can search for unclaimed benefits.
Control	Inactive members or their heirs may contact a benefit specialist to discover if a benefit is due. Assistant executive director

I. Unclaimed Benefits

Risk	Risk that pension system does not adequately search for inactive members.
Control	Contact is made with all inactive members two to three months prior to early and normal retirement eligibility and prior to the recipient turning 70½ . PensionGold prepares two reports, one for retirements and one for LTD participants. The benefit audit specialist runs queries for anyone approaching age 70½ to ensure they are contacted about retirement. Any invalid addresses that are identified at this time are investigated by a member of the payroll staff and a letter is sent to the member using the address found in the Missouri driver's license database. Payroll staff and benefit audit specialist
Risk	Risk that pension system does not provide a mechanism whereby inactive members or heirs of inactive members/annuitants can search for unclaimed benefits.
Control	Inactive members or their heirs may contact a benefit specialist any time to discover if a benefit is due. Assistant executive director
Risk	Risk that pension system staff divert unclaimed funds for their own personal use.
Control	Benefits cannot be distributed without a valid application and legitimate proof of age documents. All benefit distributions are verified by a benefit specialist and the benefit audit specialist. 2011 Tier contributions cannot be distributed unless a form is completed and it too is reviewed by two staff members prior to payment. Benefit audit specialist
Risk	Risk that someone steals member's identity and fraudulently claims the account.
Control	For 2011 Tier contributions – a refund request form must be completed and reviewed by two staff members prior to payment. Otherwise, the funds stay in the trust until claimed. For retirees – changes can be made to the retirees EFT form if the retiree has a valid user ID and password in the system and someone wants to change the bank account information. These can be valid or fraudulent changes. The assistant executive director periodically runs reports of changes to EFTs to review for propriety. Assistant executive director

VII. ALL BENEFITS

Risk	Risk that benefit amount is incorrectly calculated because of: • incomplete/inaccurate data, service credit, and/or final compensation discrepancies • incorrect benefit formula • system errors • human errors • incorrect birthdate (age at retirement) • incorrect leave balance (e.g., sick leave) • benefit changes over time that must be manually calculated
Control	All retirees initiate retirement by providing application and necessary proof documents (age and marriage). These documents are directed payroll staff who review each document for authenticity and completeness. The benefit specialist are directly responsible for validating the benefit by reviewing salary, service, proof documentation, assigning the appropriate formula, sick leave balances, etc. The benefit audit specialist also performs a final audit of each benefit inception to double check the same information and to confirm the benefit is established pursuant to the laws and rules governing our system. If changes occur later that impact the benefit amount, we are obligated pursuant to state law to correct the benefit whether it is or is not in favor of the benefit recipient. Assistant executive director
Risk	Risk that benefits are paid to unauthorized or fictitious persons.
Control	All inceptions are reviewed for validity by payroll staff and then the benefit specialists and then the benefit audit specialist before distributing payments. Assistant executive director
Risk	Risk that benefits are paid to deceased persons.
Control	Monthly death audits are conducted by the benefit audit specialist and the ssistant executive director for all benefit recipients to make sure we are not paying a deceased person. If we suspect a death has occurred, although conclusive evidence is not present, we suspend the benefit until an investigation can be completed. Assistant executive director and benefit audit specialist
Risk	Risk that underpayments/overpayments due members/retirees/beneficiaries are not corrected.
Control	Corrections of errors are discussed with the benefit specialists and the general counsel prior to payment. Benefit specialists are to inform the assistant executive director and/or executive director when issues are found. Benefit specialists
Risk	Risk that benefits are not paid timely.
Control	We have established standards for paying benefits which require us to pay all benefits on time—last working day of the month in which retiring—unless all necessary data is not received within reasonable parameters. Validation of benefit inceptions is the primary responsibility of the benefit audit specialist after reviewing the work of the payroll staff. If an incomplete inception exists, the benefit audit specialist will monitor a benefit specialist to confirm the case is completed as timely as possible. Benefit audit specialist

VII. ALL BENEFITS

Risk	Risk that paper checks are lost or not received timely.
Control	We require all benefit recipients to utilize direct deposit unless they are unable to maintain a bank account. Currently we have less than a dozen annuitants receiving paper checks. Paper checks are mailed the last working day of each month. If a check is lost, a benefit recipient may contact staff and request a replacement. If a check is returned due to a bad address, staff will investigate until the status and location of the recipient is confirmed and the payment distributed. Administrative staff
Risk	Risk that duplicate payments are made– automated and manual systems.
Control	Duplicate member benefits could be made, but would be extremely rare. MPERS uses positive pay which ensures that the payee and amount on the check is what gets cashed. The bank also sends back a file of cleared checks so that the status of the check is noted in PensionGold. So if a member or beneficiary were to claim they lost a check (the most likely occurrence would be a BackDROP check or a $5000 death benefit check) the staff member handling the call could see if the check had indeed been cashed by referring to PensionGold. We make no manual benefit payments as any corrections are made in the next pension payment. Chief financial officer
Risk	Risk that stale dated checks are not followed up on.
Control	A monthly report is generated of retirees with paper checks outstanding for more than four months and followed up on by the payroll staff. In addition, the chief financial officer reviews the entire outstanding check list at the time the monthly bank account reconciliations are performed to determine if any checks have remained outstanding. The member's folder is reviewed to determine the appropriate course of action including placing a stop payment on the check(s). It should be noted that fewer than a dozen retirees still receive a paper check. Chief financial officer and payroll staff
Risk	Risk that stale dated checks are automatically reissued without follow up, resulting in payments to incompetent or deceased persons.
Control	The chief financial officer does not reissue a check unless researched thoroughly. Again, there are less than a dozen retirees getting paper checks. Chief financial officer
Risk	Risk that an employee is allowed to work on calculations of a relative or friend.
Control	Benefit inceptions are assigned to each benefit specialist on a rotating basis. If a conflict of interest exists between the benefit specialist and the applicant, the specialist is expected to notify the other benefit specialist of the conflict so the applicant may be reassigned. Even if a conflict of interest were not mentioned, all inceptions are verified by two people— benefit specialist and audit specialist—which would minimize the risk of manipulating a benefit. Benefit audit specialist

VII. ALL BENEFITS

Risk	Risk that employees intentionally alter a claim in the computer system, resulting in overpaid benefits.
Control	Part of the chief financial officer's reconciliation process is to verify that the amount of benefit dollars that clear the bank account agree (materially) with the amount of benefit payments expected for the particular benefit payment cycle. **We need to ensure that PensionGold is adequately safeguarded such that an employee cannot make changes to retiree payments without the change being discovered. This topic will be discussed with LRS during their April 2017 visit or after their implementation of Responsive Design.** Assistant executive director
Risk	Risk that federal/state tax withholding amounts are incorrect or are not adjusted as conditions change.
Control	Federal tax tables are updated by the chief financial officer as changes to the tables occur. Federal tax withholding is based on the allowances claimed plus any additional amount or a flat amount as specified on the member's W-4. W-4 forms are keyed and verified by payroll staff. An annual notice is placed in the retiree newsletter to all retirees that they can change their withholding at any time by completing a new W-4 form. Chief financial officer
Risk	Risk that incorrect SSN is sent to federal/state tax authorities.
Control	SSNs come directly from SAM II. By the time the member retires, those SSN errors should have been caught and corrected by various tests we conduct. For survivors, we rely on an application to substantiate the SSN. The assistant executive director verifies the validity of SSNs with a match process to the Social Security Administration using Berwyn. Assistant executive director
Risk	Risk that benefit enhancements are not provided timely or accurately.
Control	Any benefit enhancements that are passed by the legislature are applied with oversight from the executive director. All enhancements must be programmed by LRS to ensure PensionGold handles the enhancement accurately. However, the fund must be 80% funded in order to have any benefit enhancements as noted in state law. Assistant executive director
Risk	Risk that inappropriate deductions are taken from benefit payments (e.g., dissolution orders, wage assignments, and elective deductions such as savings bonds or credit unions).
Control	Eligible deductions are identified statutorily. Only qualifying deductions are arranged and set up for benefit recipients. If there is a question as to the validity of a deduction, payroll staff will inquire with general counsel for an opinion. Credit union deductions were eliminated effective 12-31-2016. Payroll staff

VIII. WITHDRAWALS/CASH OUTS

Risk	Risk that cash out is made to the wrong person.
Control	There are no statutory provisions for MPERS to allow "cash outs." The 2011 Tier employees make contributions and they can claim a refund of their contributions after they terminate and wait the requisite 90 days. A form must be completed to obtain the funds. The terminated member must call in to obtain a refund form. The contribution refund is processed and must be reviewed by two different employees. Payroll staff
Risk	Risk that an incorrect amount is paid.
Control	The refund forms are reviewed by two employees before the refund is paid. Payroll staff
Risk	Risk that payee cannot be located if supplemental benefit is to be paid.
Control	Staff will conduct thorough searches for any payee that is owed additional benefits. On some level, the member is responsible for ensuring that the mailing address is kept up to date at MPERS. Supplemental benefits would be paid in the same manner as a current benefit, either EFT or paper check. Administrative staff
Risk	Risk that taxes are not withheld if cash outs are not rolled over to a qualified plan.
Control	Our administration system is programmed so that all contribution refunds withhold 20% federal tax as mandated by law, unless the funds are rolled over to a qualified account. Chief financial officer
Risk	Risk that records are not retained long enough after payment and data is needed if person enrolls again.
Control	All individual records are imaged to PCX and remain there as defined by the record retention policy. These records are backed up on a daily basis. Assistant executive director

IX. DISABILITY RETIREMENT BENEFITS AND ESTIMATES

(Applies to old disability provisions and the current disability plan administered by The Standard)

Risk	Risk that a person is not truly disabled under the provisions of law/contract.
Control	The internally administered disability plan is what we call our "old disability" plan. This plan currently consists of approximately 30 individuals paid directly by MPERS. With the assistance of The Standard, we examined these members to confirm their status as disabled. A thorough review of these claims revealed that these individuals were permanently disabled; therefore, we discontinued doing annual reviews of these recipients. For the LTD recipients, the responsibility for determining whether or not an LTD recipient is disabled or continues to be disabled, lies solely with The Standard. Assistant executive director
Risk	Risk that access to confidential medical information is not restricted as required by law.
Control	Medical information is not received at MPERS; therefore, confidentiality concerns are eliminated. Assistant executive director
Risk	Risk that continuing eligibility is not verified.
Control	Eligibility determinations for old disability benefits is no longer deemed necessary. The Standard is required to conduct continuing eligibility tests for the members under the fully insured plan. Assistant executive director
Risk	Risk that benefit is not offset for applicable income or is not offset timely.
Control	Offsets are applicable to the old disability plan as well as the LTD plan administered by The Standard. Disability recipients are required to inform MPERS of any changes to their income, including changes to the Social Security disability benefits. Generally speaking, it is in the best interest of the member to inform MPERS of the decrease (or stoppage) of their Social Security disability payment as it allows them to collect more (i.e. reduce their offset) from MPERS. For CY2017, the assistant executive director had the benefits auditor submit ALL disability recipients to the Division of Employment Security for a wage verification. This step is not routinely done, but could be a part of the annual process if deemed necessary. The Standard is required to detect income offsets for the fully insured plan. Assistant executive director
Risk	Risk that disability recipients who have reached the age for regular retirement (and are eligible) continue to undergo verification medical exams at a cost to the system (in plans that require verification medical exams).
Control	Medical exams are not required for the old disability plan. Medical exams needed for the LTD program are the responsibility of The Standard. PensionGold is programmed to ensure the LTD participants that are eligible for retirement are included on a report sent to one of the benefit specialists for follow-up. Assistant executive director

X. RETIREMENT BENEFITS

A. Defined Benefit Programs (Ordinary)

Risk	Risk that annuity is based on a combination of incorrect service credit, highest compensation, benefit formula, unused sick leave, and/or age or data that was fraudulently reported.
Control	All benefit inceptions are reviewed by a benefit specialist and reviewed by the benefit audit specialist. Service credit is normally obtained by working in a covered position and having the employer pay the required contribution rate. It would be extremely hard to manufacture service credit. Purchases of service are a greater risk but the time to be included is paid for by the member (or the transferring plan). Transfers of service are signed off by the transferring agency which should reduce that risk greatly. Sick leave is tracked by SAM II and the payroll system for MoDOT. Compensation is reported by the employer and contributions on those salaries must be paid before we accept them. Age (date of birth) is reviewed once a year by the assistant executive director using Berwyn to access the SSA database. Assistant executive director
Risk	Risk that annuity is not recalculated after additional earnings and/or service are reported.
Control	The new retirements are not processed until after the member's last payroll cycle is complete. If corrected earnings or service information is received after the last payroll cycle, the data is scanned to the member's file after review by payroll staff. The payroll staff will determine the implications of such data and correct the benefit accordingly. The benefit audit specialist reviews all such changes for accuracy and appropriateness. Payroll staff
Risk	Risk that annuity is based on named survivor's incorrect date of birth.
Control	Proof of age documentation is required and reviewed by staff on all survivors before the member's benefit can be initiated. Benefit specialists
Risk	Risk that annuity adjustments are incorrect.
Control	All adjustments are reviewed by at least one benefit specialist and a final review by the benefit audit specialist. COLAs are calculated by a benefit specialist, reviewed by the benefit audit specialist, and finally reviewed by the payroll staff with each retirement payroll cycle run. The service project may also result in an annuity amount increasing. Those adjustments are viewed by at least two staff members before the change is finalized. Benefit specialists and payroll staff
Risk	Risk that incorrect benefit changes are made for COLAs, benefit enhancements, or other reasons.
Control	Processes for such changes are predominantly automated functions which have been established and tested over time. If new changes occur, we will inform LRS of the change needed and we will test the changes before they go into production. Assistant executive director

A. Defined Benefit Programs (Ordinary)

Risk	Risk that unauthorized changes are made to retirement benefit payroll within the pension plan or when checks/EFTs are generated.
Control	The chief financial officer conducts reconciliations between what is to be sent out as benefit payments as compared to the outflow from the bank account. The bank account is reconciled monthly. For paper checks, we have positive pay which means that the name, amount, and account must all match before the bank will confirm the check. Changes to EFTs must be reviewed by two people in order for it to take effect. Chief financial officer
Risk	Risk that deductions for insurance premiums and federal/state tax withholding are not processed correctly or are not adjusted when necessary.
Control	All deductions are established by Section 104.1054.2, RSMo., and are generated by member request or by electronic means from data provided by another entity (e.g., MoDOT and Patrol Medical Plan or MCHCP). When benefit payments are generated each month, the system accesses the most recent data to assure current withholdings occur. *For tax withholdings, the chief financial officer double checks what LRS is using for the tax withholding table when it is uploaded in Mid-December. For all changes like these, one staff member keys it in and another approves it. *For insurance premiums the amounts of premiums to deduct from the retirees' benefit payment are received in a file from the medical plan and placed into PensionGold for the monthly benefit payment cycle. The payroll staff sorts out any errors generated during the normal monthly review of the retirement benefits to be paid. Payroll staff and chief financial officer
Risk	Risk that appropriate annuity adjustments are not made upon death of annuitant/named survivor.
Control	Retirees/survivors are entitled to the benefit which is paid the end of the month in which they die. Once notice of death occurs, a benefit specialist receives the data necessary and a payroll staff member processes a death letter which is scanned into the member's file in PCX and records the death in our database. This will terminate the benefit accordingly. If notice is not received, both the benefit audit specialist and the assistant executive director conduct monthly death checks with the Mo Dept. of Health and Senior Services and a vendor that specializes in this service. Payroll staff, benefit audit specialist, and assistant executive director
Risk	Risk that annuity is not terminated timely upon expiration of the guarantee period.
Control	All period certain benefits are established with an end date reflected on the record. These benefits are also verified by a benefit specialist and benefit audit specialist. The system notifies each survivor (including a minor that is about to turn 21 and lose their benefit) by letter at the conclusion of benefits for each receiving survivor(s). The benefit audit specialist also runs a query to keep track of the number of guaranteed payments paid and the number still to be received AFTER the member taking the guaranteed payment option has passed away. Benefit audit specialist

A. Defined Benefit Programs (Ordinary)

Risk	Risk that checks returned to the system are not resolved.
Control	Staff will hold every returned check until such time as the benefit recipient is found and new address is authenticated in writing. There are less than a dozen retirees still receiving paper checks. Administrative staff
Risk	Risk that annuity was terminated in error because of inaccurate report of death.
Control	Typically sound evidence is received whenever a death occurs; however, if sound evidence is not available we will suspend a benefit until a more thorough investigation can be concluded. If death is false, a benefit specialist would reinitiate the benefit and request a supplemental check for benefits owed during the investigation. Benefit specialist
Risk	Risk that suspended annuity is not resumed after contact has been made with lost retiree or a retiree that wished to have their benefit suspended.
Control	Administrative staff communicates with the benefit specialist who will resume benefit payments. If for some reason this did not occur, presumably, a benefit recipient would contact us about the error. A report of suspended benefits can be queried out of PensionGold by the benefit audit specialist for review at any time. Benefit audit specialists and administrative staff
Risk	Risk that initial or corrected information reported to federal/state tax authorities is not accurate, causing penalties for the system and over/under tax payments for retirees.
Control	The chief financial officer verifies tax withholding deposits against the monthly retiree benefit payment reports, and adjustments are made for any benefits issued or cancelled prior to month end. The chief financial officer verifies the YTD benefit information maintained in PensionGold against the accumulated monthly YTD amounts prior to issuance of the annual 1099-Rs. The chief financial officer waits until March to submit the total 1099-R file to the IRS in case there are errors noted by the members so that chief financial officer does not have to send an amended file back to the IRS. For staff payroll (and the old LTD recipients) the W-2 information is reported quarterly to the IRS. Chief financial officer
Risk	Risk that annual tax information is not sent in a timely fashion to federal/state tax authorities.
Control	The time schedules for annual federal and state tax reporting requirements are reviewed each December. Reports are sent ASAP to avoid any unexpected delays. Chief financial officer
Risk	Risk that retiree will work for a covered employer as a full-time benefit eligible employee without being reported as benefit eligible, resulting in overpaid benefits.
Control	We rely on the HR staff for each employer to understand the rules on eligible employees. The ERS reporting system will find employees coded as full-time retirement eligible and produce an error code if they are actually retired. In addition, we receive a monthly report from MOSERS to ensure that our retirees are not working in a benefit eligible position covered by MOSERS. We will suspend their benefits if such a member is found. Payroll staff

A. Defined Benefit Programs (Ordinary)

Risk	Risk that military or other allowable purchased service is not correctly determined or based upon fraudulent records.
Control	All requests for acquiring service require the submission of an application and supporting documentation that is either confirmed by a previous employer or an official document noting the service. In all cases, each inquiry is completed and reviewed by two different individuals. GRS prices the actuarial cost of service to be purchased by terminated vested members. PensionGold does the pricing for active members. Benefit specialists
Risk	Risk that purchased service was completed using ineligible funds.
Control	All purchased service is paid for with cash, by qualified rollover in lump sum, or by payroll deduction from SAM II. Rollovers are verified by the transferring entity and validate the eligibility of such funds by confirming the source. The risk of using "ineligible funds" is practically nil. Chief financial officer

B. BackDROP

Risk	Risk that BackDROP payment option is not being administered in compliance with state law, rule, or regulation.
Control	All payment options, including BackDROP, are verified by a benefit specialist and the benefit audit specialist and reviewed by the assistant executive director before distribution, to affirm that the payment complies with applicable law or rule. Administrative issues are resolved by consultation with the assistant executive director and/or general counsel. Any checks over $25,000 are signed by the executive director and assistant executive director. Benefit specialists and assistant executive director
Risk	Risk that proper tax withholding is not taken if BackDROP is withdrawn and not rolled over to a qualified plan.
Control	All cash lump sums have 20% federal tax withheld which is programmed into PensionGold. There is a PIR to have LRS program PensionGold to automatically withhold the 20% from payments of BackDROPs made over three annual installments. Currently, this is to be done manually. Chief financial officer
Risk	Risk that BackDROP program is not accounted for properly in the audited financial statements.
Control	All benefit amounts reported in the financial statements are audited by MPERS' external auditors. There is no requirement to separately list BackDROP payments apart from all benefits paid out. Starting with the FY 2016 CAFR, we list out the BackDROP payments from the annuity benefit payments. Chief financial officer

XI. DEATH/SURVIVOR BENEFITS

Risk	Risk that death of retiree/survivor is not received/recorded promptly, resulting in overpayments.
Control	A death audit is conducted by both the benefit audit specialist and the assistant executive director for all retirees/survivors/2011 Tier members/terminated-vested members to make sure our records are updated accordingly. Benefit audit specialist/assistant executive director
Risk	Risk that death of active/vested member is not received/recorded promptly, resulting in delay of death/survivor benefits.
Control	Typically, both the employers and survivors are prompt in notifying MPERS of active member deaths. Monthly death audits also help find deaths of active members. The death benefit is an additional incentive for family members to promptly report the deaths of annuitants. Benefit audit specialist and assistant executive director
Risk	Risk that a living benefit recipient is reported deceased, thus terminating annuity in error.
Control	Before terminating a payment we have to be reasonably sure the recipient is deceased. If such an error occurs, a benefit specialist will apologize in writing and be sure the payment is re-established accordingly. Benefit specialists
Risk	Risk that deaths of annuitants living outside the U.S. are not identified.
Control	There are no reliable databases to conduct a death search on annuitants outside of the U.S. In lieu of a typical death search, we send out correspondence annually to all recipients living outside the U.S. that requires a signed affidavit indicating the recipient is still living if over a certain age. If an affidavit is not received within acceptable parameters, the benefit is suspended. Administrative staff
Risk	Risk that some or all beneficiaries cannot be located.
Control	Pursuit of any potential beneficiary is left open until staff have exhausted all leads. If closed cases arise at a later date due to contact from beneficiary or a new lead, we will pay the survivor benefit (no interest) retroactive to the member's date of death. Administrative staff
Risk	Risk that named beneficiary (*i.e.*, member's spouse) is deceased and the member's benefit is not "popped up" due to the beneficiary's death.
Control	Named beneficiaries are included in the monthly death audit files. Benefit audit specialist and assistant executive director

XI. DEATH/SURVIVOR BENEFITS

Risk	Risk that unclaimed benefits are paid out to unauthorized individuals.
Control	Survivor benefits are not paid until a valid application and proof documents are received and authenticated by a benefit specialist and the benefit audit specialist. Final payments are resolved by protocol established in law. Benefit specialists

XII. ACTUARY

A. Assumptions

Risk	Risk that actuarial assumptions are not realistic.
Control	Approximately every five years, staff acquires the services of an independent actuary to perform an actuarial audit. The audit findings are shared with the board of trustees to determine what, if any, action is necessary. Experience studies are conducted every five years. Executive director
Risk	Risk that actuarial assumptions are made on erroneous/inaccurate data.
Control	The benefit audit specialist queries the data prior to providing it to the actuary for valuation purposes. The assistant executive director also conducts tests on the data prior to submission to the actuary. During this process, numerous edits are reviewed to be sure the data is as accurate as possible. Upon receipt, the actuary also cleans the data to identify and correct any errors. Benefit audit specialist and assistant executive director
Risk	Risk that political pressure is exerted to modify assumptions that do not reflect reality.
Control	Although the Board is susceptible to political pressure, it makes decisions independent of our elected officials. If a decision were considered inappropriate, the executive director, general counsel, and consulting actuary would be obligated to voice the concern. Executive director and general counsel
Risk	Risk that mortality tables are not updated as appropriate.
Control	We rely on the actuarial firm and any actuarial audits to ensure the appropriate mortality tables are used. Assistant executive director

B. Assets/Liabilities

Risk	Risk that actuarial assets and liabilities are not matched (asset-liability study).
Control	The retained actuary is responsible for reviewing the actuarial value of assets and the associated liabilities for beneficiary payments. They have free reign to discuss the issues with the board each September. A formal asset-liability study is conducted by the investment staff /asset consultant and the actuarial firm periodically. An experience study is conducted every five years by the retained actuary. Executive director

C. Actuarial Computer Program (Algorithm)

Risk	Risk that actuarial computer program (algorithm) is incorrect.
Control	This risk is generally for those pension funds with internal actuaries. However, GRS is audited by other actuarial firms on a near continuous basis. Executive director
Risk	Risk that actuarial models have not been properly updated to reflect changes in benefit formulas.
Control	This risk is generally for those pension funds with internal actuaries. However, GRS is audited by other actuarial firms on a near continuous basis. Executive director
Risk	Risk that actuarial models do not conform to, or are not updated for, applicable laws and/or changes in the laws.
Control	MPERS informs GRS of any changes to the plan via legislation enacted. Unless the plan is 80% funded, no new benefit enhancements can be made. Executive director
Risk	Risk that actuarial reduction factors for those retiring before normal retirement age are not accurate.
Control	These are provided by state law (both Closed Plan and Year 2000 Plan) and were tested by staff when implemented in PensionGold. The benefit audit specialist will test these by doing invididual calculations (via spreadsheet) to ensure the amount is accurate. Benefit audit specialist
Risk	Risk that programming does not correctly analyze data.
Control	That risk is borne by GRS and they are subject to periodic actuarial audits. Assistant executive director

D. Data

Risk	Risk that data transmitted to the actuary is incomplete/erroneous.
Control	The data file is edited and reviewed for accuracy before it is sent to the actuary. The actuary runs tests for completeness before using the data. Benefit audit specialist and assistant executive director
Risk	Risk that contribution data used is based upon payroll data rather than cash received.
Control	The cash received (*i.e.*, wired to MPERS account at Central Bank) is balanced each month by the chief financial officer as compared to the contribution data received from the employers as worked by the payroll staff. The contribution amount must agree with the bank receipts which also must agree with the payroll (payroll x contribution rate = cash). Chief financial officer
Risk	Risk that data exceptions or errors noted by the actuary are not researched/corrected timely.
Control	When questions about the data are received, they are immediately reviewed by the executive director, assistant executive director, and benefit audit specialist. Assistant executive director

D. Data

Risk	Risk that programming does not correctly analyze data.
Control	PensionGold is a database and not necessarily designed for analyzing actuarial data. The actuary is responsible for ensuring LRS programming is analyzing the data appropriately. LRS is audited by other actuarial firms to ensure the systems are operating as intended. Assistant executive director

E. Employer Contribution Rates

Risk	Risk that employer contribution rates are not accurate due to program or data errors.
Control	The payroll staff ensure the contributions received are accurate. What we expect to receive based on the current headcount of members equals the headcount x the appropriate contribution rate. Payroll staff

F. Second Opinion

Risk	Risks that problems are not identified because a complete second actuarial determination is not performed periodically.
Control	Approximately every five years, an independent actuary is hired to perform an actuarial audit. This audit either affirms or disputes the validity of the retained actuary's performance. Executive director

G. Employer Contract Changes—Costs of Providing Estimates of Potential Changes to the Benefit Structure

Risk	Risk that the state is overcharged or undercharged for the cost to produce an estimate of the effects of changing benefits.
Control	This risk is generally about fiscal notes. MPERS pays out of its own budget any actuarial costs incurred for the actuary to value any legislative changes to the plan. The MPERS budget is a function of reallocating a small portion of the trust fund for administrative purposes. The budget is approved by the board which is primarily made up of the top leaders of each employer. Executive director

XIII. COMMUNICATION WITH EMPLOYERS

A. Employer Responsibilities

Risk	Risk that covered employer staff are not adequately trained for their responsibilities.
Control	We conduct a conference for human resource related staff to provide training and education regarding the benefits we provide. We also maintain an HR specific portion on our website for our employers' human resources staff. This site includes additional training and education material to keep these individuals informed. Finally, we send out monthly HR updates. Benefit specialists

B. Member Services

Risk	Risk that inadequate information is transmitted to the employers on benefit plans, changes, and services available (e.g., brochures, internet access, telephone services, and walk-in opportunities).
Control	Between our HR website, procedures manual, HR conference, and miscellaneous contact, we provide the information necessary to keep employers informed. HR Connection (the monthly update for HR personnel) that is distributed, is reviewed by at least two MPERS employees to assure accuracy. Executive director and assistant executive director

C. Contribution Rates

Risk	Risk that employers are not given adequate notice of anticipated changes in employer contribution rates and reasonable estimates of the magnitude of changes.
Control	Each September, MPERS' Board of Trustees certifies the contribution rates applicable to our plans for the following fiscal year. Once approved, the executive director informs, in writing, the director of MoDOT and the superintendent of the Highway Patrol of the new rates. Executive director and executive assistant
Risk	Risk that employers are not given adequate reasons for changes in employer contribution rates.
Control	Information utilized to determine the contribution rates of any MPERS plan is readily available once provided by our actuary. Executive director
Risk	Risk that employer does not update programs for contribution rate changes, resulting in inaccurate contributions.
Control	The records supervisor balances records each month to confirm that contributions match salary reported. Any discrepancies are reported to the employer and corrected accordingly. Payroll staff

D. Employer Contract Amendments

Risk	Risk that employer contract amendments do not conform to applicable federal/state laws.
Control	These contracts are not commonplace at MPERS. If we were to get a contract, the general counsel would review it. General counsel

XIV. CONTRACTING WITH SUPPLIERS OF GOODS AND SERVICES

A. Operations Contracts (Ordinary)

Risk	Risk that object of contract is not adequately defined.
Control	All contracts are reviewed by the general counsel. General counsel
Risk	Risk that contract terms are not complete or adequate for the project/tasks required.
Control	If a contract falls short of the requirements included in an RFP, the contract will either be amended or discontinued with a search for another provider being initiated. General counsel
Risk	Risk that bid procedures are not properly followed.
Control	We do not have to follow the state's bidding procedures, but MPERS does have procedures annotated in internal policy. Any large projects will be subject to bid per those procedures. It is up to the project manager (generally done by a committee of executive staff) to ensure the MPERS bidding procedures are followed. Assistant executive director
Risk	Risk that the contracting process is difficult to comply with, increasing the potential for non-compliance and making it difficult for business units to meet their objectives.
Control	We do not have to follow the state's bidding procedures, but MPERS does have procedures annotated in internal policy. Any large projects will be subject to bid per those procedures. It is up to the project manager (generally done by a committee of executive staff) to ensure the MPERS bidding procedures are followed. Assistant executive director
Risk	Risk that adequate due diligence is not performed for major suppliers before hiring.
Control	This is not commonplace at MPERS. The largest vendors are LRS (which was vetted over 10 years ago) and the actuary (which is subject to a 5-year bidding cycle). Any large projects would be overseen by the assistant executive director and the executive director. Assistant executive director

Risk	Risk that financial status of major suppliers is not monitored through review of audited financial statements, popular press articles, and internet searches.
Control	This is not commonplace at MPERS. The largest vendors are LRS (which was vetted over 10 years ago) and the actuary (which is subject to a 5-year bidding cycle). Any large projects would be overseen by the assistant executive director and the executive director. Any concerns about the finanacial situation of a contractor or potential contractor would be the subject of the RFP process. LRS is a private entity and not subject to publically available financial statements. Assistant executive director
Risk	Risk that contractor does not do adequate background history check for all hires who work on the contract.
Control	This is not commonplace at MPERS. The largest vendors are LRS (which was vetted over 10 years ago) and the actuary (which is subject to a 5-year bidding cycle). Any large projects would be overseen by the assistant executive director and the executive director. Any concerns about the contractors staff would be the subject of the RFP process. Assistant executive director

B. Third-party Administrator (TPA) Contracts

Risk	Risk that adequate due diligence is not performed on TPA applicants.
Control	The only TPA at MPERS is The Standard for the LTD program. The program is reviewed about every two to three years. Executive director
Risk	Risk that contract provisions are inadequate.
Control	Contract is reviewed during the due diligence visit. Executive director
Risk	Risk that TPA does not understand its fiduciary duty.
Control	This would be apparent during the due diligence visit. Executive director
Risk	Risk that pension fund management does not appropriately monitor the TPAs.
Control	This would be apparent during the due diligence visit. Executive director
Risk	Risk that an annual SAE 16, Type II, audit is not performed by the TPA's auditor, transmitted to the pension plan, and reviewed by the pension plan staff.
Control	This report would be reviewed during the due diligence visit. Executive director
Risk	Risk that TPA's audited financial statements are not received/reviewed by pension plan staff.
Control	Any financial statement review would be conducted during the due diligence visit. Executive director

B. Third-party Administrator (TPA) Contracts

Risk	Risk that contract does not contain an audit clause.
Control	MPERS has no internal auditor thus this risk is not meaningful.
Risk	Risk that TPA has a conflict of interest.
Control	This would be discussed during the due diligence visit. Executive director
Risk	Risk that TPA destroys records that should be maintained.
Control	The Standard would be at risk for destroying documents. Executive director

XV. BUSINESS CONTINUITY PLANNING

Risk	Risk that there are no business continuity plans to continue operations in event of disaster.
Control	A disaster recovery plan has been adopted and every executive level staff was asked to bring a paper copy to their home. Assistant executive director
Risk	Risk that the disaster plan does not adequately address important issues such as utility supply, travel requirements, hot site location, etc.
Control	The plan covers the areas noted in the risk portion. Assistant executive director and general counsel
Risk	Risk that business continuity plan is not tested or periodically reviewed and updated
Control	The disaster recovery plan, like all other policies and procedures, is evaluated and tested on a periodic basis. Disaster recovery plan testing is included in the Business Plan when necessary. Assistant executive director and general counsel
Risk	Risk that external service providers do not have business continuity plans.
Control	Our major external service provider is LRS. LRS is undergoing a SSAE-16 audit which will be finalized in the fall of 2017. After the first one is complete, they will have it audited each year. The SSAE-16 audit report (called a SOC 1) will cover business continuity plans. Assistant executive director

XVI. DEPOSITING CASH

Risk	Risk that there are no comprehensive policies and procedures for receiving and depositing cash, checks, and electronic forms of payment.
Control	The policy and procedures for deposits has been documented in writing as it is part of the internal control procedures memos that are subject to annual audit and reviewed each year and updated when necessary. Chief financial officer

XVI. DEPOSITING CASH

Risk	Risk that there is inadequate separation of duties for receiving and recording cash receipts.
Control	For all intents and purposes – MPERS receives no cash receipts. The only cash receipts are the occasional sales of MPERS used property sales. There are many individuals involved in the property sales process. Chief financial officer
Risk	Risk that payments of employer and/or member contributions are incorrect.
Control	PensionGold will monitor employer and member contributions to ensure that what was expected to be received was actually received. This payroll reconciliation process is reviewed by the external auditors and is noted earlier in this document. Payroll staff and chief financial officer
Risk	Risk that contributions received are not credited to the correct accounts.
Control	PensionGold will monitor employer and member contributions to ensure that what was expected to be received was actually received. This payroll reconciliation process is reviewed by the external auditors and is noted earlier in this document. Payroll staff and chief financial officer
Risk	Risk that employer and member contributions are not received timely or at all.
Control	Contributions are expected with each pay cycle. If contributions do not match the pay reported, we contact the employer for immediate correction. The vast majority of contributions come from the state's SAM II system via direct deposit and is received when due. Payroll staff and chief financial officer
Risk	Risk that pension system staff does not follow up with employers when contributions are not received.
Control	The chief financial officer reconciles the monthly payments deposited with Central Bank using PensionGold payroll reconciliation process. If late payments were noted, staff would notify the employers. The payments are made through the SAM II payroll system which generally means that when the employers make their bi-monthly payroll, the contributions to MPERS are made as a part of the payroll process. There are no employers that need to submit payments outside the SAM II payroll process. Payroll staff and chief financial officer
Risk	Risk that payments are not deposited the same day as received.
Control	MPERS receives all contribution dollars via direct deposit. Chief financial officer
Risk	Risk that investment division/agency is not notified of cash deposits.
Control	The contribution dollars from both employers are deposited with Central Bank to pay the month's benefits to retirees. The dollars are not invested by the investment staff. Chief financial officer

XVI. DEPOSITING CASH

Risk	Risk that cash will be embezzled.
Control	MPERS receives no cash of any significance. Frauds that could occur would be in the areas of: expense account fraud, wire fraud, kickback schemes, fraudulent invoice schemes, check modification schemes (after the check is signed but prior to mailing), etc. Cash embezzlement is unlikely to occur at MPERS. Assistant executive director

XVII. MANAGERIAL ACCOUNTING AND REPORTING

Risk	Risk that pension plan is costly and inefficient because the true costs of various processes are not known.
Control	MPERS will, on occasion, compare its total operating budget to similar sized pension funds. This is typically done during the annual budgeting process. The assistant executive director compared the administrative expenditures of nine peer pension funds (as identified in 2012 by CEM) to MPERS and found we ranked third least expensive. Assistant executive director
Risk	Risk that pension plan creates processes that are costly and inefficient because the true costs are unknown.
Control	Management is responsible for ensuring that all processes are developed with costs vs. benefit/service levels in mind. However, the "true costs" of any particular change (operational or otherwise) is hard to quantify. Assistant executive director
Risk	Risk that costs relevant to various processes are grouped and inappropriately hidden in general classifications such as overhead and administration.
Control	This risk does not appear relevant to a pension fund the size of MPERS. Assistant executive director
Risk	Risk that the pension plan does not have an activity-based cost accounting system that tracks the costs of various processes.
Control	Given our size and few staff resources, an activity-based cost accounting system is not necessary. Assistant executive director
Risk	Risk that the pension plan does not have staff that are knowledgeable and current in cost/managerial accounting and GASB requirements.
Control	Given our size and few staff resources, an activity-based cost accounting system is not necessary. Assistant executive director

XVIII. FINANCIAL ACCOUNTING & REPORTING BY MANAGEMENT

Risk	Risk that financial statements, both interim and year end, do not provide useful information for the various groups of users.
Control	Annual reports are produced in accordance with GAAP and audited by an external CPA firm. In addition, the annual report is produced to conform to the guidelines established by the GFOA for their certificate of achievement program, a nationally recognized standard in financial reporting. Semi-annual financial reports are prepared by the chief financial officer and provided to the board during the February meeting. Chief financial officer
Risk	Risk that financial information is not relevant and reliable.
Control	All financial information is reviewed to ensure it is reliable. The relevance of the information is set by GASB. Chief financial officer
Risk	Risk that financial statements do not fully disclose all material items.
Control	An independent audit firm audits annual financial statements. Chief financial officer

XVIII. FINANCIAL ACCOUNTING & REPORTING BY MANAGEMENT

Risk	Risk that financial statements do not disclose sufficient detail (statements, footnotes, and required supplementary information) to permit analysis and understanding of each area.
Control	The annual report is submitted to the GFOA certificate of achievement program each year and all recommendations are incorporated the following year. Chief financial officer
Risk	Risk that financial statements are not organized and formatted to permit analysis and understanding.
Control	The annual report is submitted to the GFOA certificate of achievement program each year and all recommendations are incorporated following year. Chief financial officer
Risk	Risk that financial statements have material errors and/or irregularities.
Control	An independent audit firm audits the annual financial statements. Chief financial officer
Risk	Risk that financial statements do not conform to generally accepted accounting principles (GAAP/GASB).
Control	An independent audit firm audits the annual financial statements. Chief financial officer

XVIII. FINANCIAL ACCOUNTING & REPORTING BY MANAGEMENT

Risk	Risk that financial statements are not fully informative because they present only the minimum disclosures required by GAAP/GASB
Control	The annual financial statements are audited by an independent audit firm and submitted to the GFOA certificate of achievement program each year, which provides for an independent evaluation of the disclosures presented in the financial statements. Chief financial officer
Risk	Risk that management's discussion and analysis does not explain the reasons behind the numbers and the changes in these numbers from prior periods (e.g., transparency).
Control	Each change in number from one year to the next is researched and analyzed according to the type of the account involved and all material items noted. This is audited by the external financial statement firm each year. Chief financial officer
Risk	Risk that financial statements are not provided in a timely manner for auditing.
Control	The chief financial officer works diligently to ensure that the financial statements are prepared and available to the auditors as scheduled. Chief financial officer

XIX. EXTERNAL AUDIT RISKS

Risk	Risk that external audit firm is not independent.
Control	MPERS bids for external audit services every four years. Request for proposals (RFP) are sent to audit firms. Recommendations are presented to the audit committee for approval. Chief financial officer
Risk	Risk that external audit firm does not have sufficient knowledge of public pension plan in order to perform a proper audit (deficient knowledge of the industry).
Control	RFPs from each audit firm are reviewed to determine if the audit partner and the audit staff have adequate knowledge. Chief financial officer
Risk	Risk that persons (engagement partner, manager, and onsite supervisor) assigned to the audit do not have sufficient experience and knowledge of the public pension plan.
Control	RFPs from each audit firm are reviewed to determine if the audit partner and the audit staff have adequate knowledge. Chief financial officer

XIX. EXTERNAL AUDIT RISKS

Risk	Risk that the external auditor has a conflict of interest.
Control	This is reviewed during the RFP review phase. MPERS may never know if a partner or audit staff has a conflict of interest. But given that an external firm is conducting the audit of a public pension fund, they firm should have each auditor assigned to the audit complete a "conflict of interest" statement affirming that they have no conflicts with any MPERS employee. Chief financial officer
Risk	Risk that audit firm does not have access to adequate actuarial staff to evaluate actuarial information.
Control	The current CPA firm uses an actuarial firm when conducting the audit. Chief financial officer
Risk	Risk that firm does not have a CPA license required by the state in which audit occurs.
Control	The audit RFP review committee will review the RFPs to ensure the firm maintains a state CPA license. The RFP requires this. Chief financial officer
Risk	Risk that key personnel (engagement partner, manager, and onsite supervisor) assigned to the audit do not have the CPA license.
Control	This is required by the RFP and reviewed by the committee. Chief financial officer
Risk	Risk that external auditors do not perform enough work to support their conclusion/opinion (may result from low-balling when bidding the contract).
Control	This risk is always present; however, the audit firm should be periodically peer reviewed and the peer review report provided during the RFP phase for selecting the future audit firm. Chief financial officer

XX. INTERNAL AUDIT RISKS

Risk	Risk that there is no internal auditor.
Control	MPERS maintains a staff of 16 employees. It is not costeffective to maintain a full-time internal auditor. However, MPERS is starting an enterprise risk management (ERM) process that should serve essentially the same oversight function. The ERM process will be championed by the assistant executive director who was a career government auditor. Assistant executive director
Risk	Risk that the internal audit function is not organizationally independent of operations (improper reporting structure).
Control	MPERS maintains a staff of 16 employees. It is not costeffective to maintain a full-time internal auditor. However, MPERS is starting an enterprise risk management (ERM) process that should serve essentially the same oversight function. The ERM process will be championed by the assistant executive director who was a career government auditor. Assistant executive director

XX. INTERNAL AUDIT RISKS

Risk	Risk that internal auditors do not have an effective working relationship with the board of trustees, management, and/or staff.
Control	MPERS maintains a staff of 16 employees. It is not costeffective to maintain a full-time internal auditor. However, MPERS is starting an enterprise risk management (ERM) process that should serve essentially the same oversight function. The ERM process will be championed by the assistant executive director who was a career government auditor. Assistant executive director
Risk	Risk that internal audit management and/or staff do not have sufficient expertise/training in auditing public pension systems.
Control	MPERS maintains a staff of 16 employees. It is not costeffective to maintain a full-time internal auditor. However, MPERS is starting an enterprise risk management (ERM) process that should serve essentially the same oversight function. The ERM process will be championed by the assistant executive director who was a career government auditor. Assistant executive director
Risk	Risk that internal audit plan is not risk based, is inadequate, and/or is not updated.
Control	MPERS maintains a staff of 16 employees. It is not costeffective to maintain a full-time internal auditor. However, MPERS is starting an enterprise risk management (ERM) process that should serve essentially the same oversight function. The ERM process will be championed by the assistant executive director who was a career government auditor. Assistant executive director
Risk	Risk that internal audits are not performed in accordance with Standards for the Professional Practice of Internal Auditing (SPPIA).
Control	MPERS maintains a staff of 16 employees. It is not costeffective to maintain a full-time internal auditor. However, MPERS is starting an enterprise risk management (ERM) process that should serve essentially the same oversight function. The ERM process will be championed by the assistant executive director who was a career government auditor. Assistant executive director
Risk	Risk that internal auditors have a strained relationship with pension system management and staff and do not communicate adequately with auditees in order to obtain their support for corrective risk mitigation strategies.
Control	Strained relationships with management is a hallmark of the internal audit profession. The internal auditors are not expected to be the cheerleaders for staff. Their role is to be on the lookout for risks and problems. With that said, there is no full-time internal audit staff at MPERS. Assistant executive director
Risk	Risk that internal audit function is not, or is not perceived as, adding value to system.
Control	Not applicable at MPERS. Assistant executive director

XX. INTERNAL AUDIT RISKS

Risk	Risk that internal audit staff are not encouraged to obtain appropriate profession certifications, such as the CIA, CISA, CPA, CFE, CIDA, CGFM, CMA, CGAP, CFM, or other relevant certifications.
Control	Not applicable at MPERS. Assistant executive director
Risk	Risk that internal audit staff are not encouraged to participate in relevant professional societies and to obtain continuing professional education.
Control	Not applicable at MPERS. Assistant executive director
Risk	Risk that internal audit work papers are not retained for a sufficient period of time.
Control	Not applicable at MPERS. Assistant executive director

XXI. CONSULTANTS

Risk	Risk that the contract manager does not have sufficient experience and expertise to manage the consultant contract appropriately.
Control	The various staff members that oversee a contract are encouraged and expected to consult with the general counsel whenever a contract question comes to the forefront. Various staff
Risk	Risk that the contract manager does not hold consultants accountable for contracted deliverables.
Control	Each staff member that manages a contract is accountable for the contractual relationships within their areas of responsibility. Various staff
Risk	Risk that the designated contract manager is not the appropriate person to manage the consultant contract (e.g., project manager managing the oversight consultant's contract or consultant managing another consultant's contract).
Control	Given the small staff size at MPERS, this risk is not easily avoided. However, when necessary, we apply a team approach to this effort to be sure we oversee contractual relationships effectively and efficiently. Various staff
Risk	Risk that consultant does not have adequate skills or expertise in the area of hire.
Control	RFP process clearly identifies the skills and expertise required. If consultant cannot clearly substantiate credentials, the consultant would not be selected. Various staff

XXI. CONSULTANTS

Risk	Risk that consultant does not transfer knowledge to pension plan staff or that staff does not acquire knowledge from the consultant, resulting in consultant's continued presence.
Control	If the contractor was hired to specifically transfer knowledge, then appropriate measures would be taken during the RFP process and during the actual field work by the contractor. This risk does not appear to be relevant for the operations of MPERS. Various staff
Risk	Risk that the pension system hires consultants to perform work that could be done by competent pension system staff.
Control	The executive director and the assistant executive director would review this concern before signing the contract. Given the size of our operations budget, MPERS operates very efficiently with existing staff doing the majority of the work and does not overly rely on contracted help other than "summer help." Executive director and assistant executive director
Risk	Risk that contract with consultant does not include all provisions to ensure that the consultant is an independent contractor under applicable laws and U.S. Department of Labor definitions.
Control	The assistant executive director will review contract language before it is signed. Regardless of the contract language, status of independent contractor is a factual issue. Assistant executive director

XXII. INFORMATION SYSTEMS ACQUISITION AND DEVELOPMENT

Risk	Risk that project goals do not support the mission and strategic plan of the pension system.
Control	Each new project or change to PensionGold is approved by the executive director after input by operations staff. Executive director
Risk	Risk that pension plan does not have information systems policy that includes the entire system development life cycle (SDLC).
Control	The major IT system is outsourced to LRS. It is up to LRS to maintain PensionGold at useable levels. If it fails, we can seek a new provider. Assistant executive director
Risk	Risk that the process for system acquisition or development is not monitored by an individual or oversight committee.
Control	Each project or change to PensionGold is approved by the executive director after input by operations staff. Executive director

XXII. INFORMATION SYSTEMS ACQUISITION AND DEVELOPMENT

Risk	Risk that projects are not formally approved prior to initiation and resource allocation.
Control	Each project or change to PensionGold is approved by the executive director after input by operations staff. Executive director
Risk	Risk that project is not adequately scoped, defined, and justified.
Control	Each project or change to PensionGold is approved by the executive director after input by operations staff. Executive director
Risk	Risk that systems development life cycle process is inadequately managed.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that pension plan staff/manager does not have the technical expertise to effectively manage the project.
Control	MPERS relies on LRS or Huber for information technology expertise when required. Assistant executive director
Risk	Risk that a formal project management process is not used. Formal project management includes project methodology and plans, project tools, realistic project milestones, and project deliverables that enable project manager to efficiently manage, control, and direct the project. Project management also includes management of risk, issues, and scope changes; a criticality assessment of the project; and management and oversight appropriate to the criticality level.
Control	Each project or change to PensionGold is approved by the executive director after input by operations staff. Executive director
Risk	Risk that formal development standards are not followed.
Control	Each project or change to PensionGold is approved by the executive director after input by operations staff. Executive director
Risk	Risk that project roles and responsibilities are not clearly defined.
Control	This risk is borne by LRS. Assistant executive director
Risk	Risk that project tools are not used in a consistent manner.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that test plans and test data are not adequate.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director

XXII. INFORMATION SYSTEMS ACQUISITION AND DEVELOPMENT

Risk	Risk that acceptance testing is not done or the test period is shortened to meet deadlines.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that volume and stress testing is not performed.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that system acceptance criteria is not identified, documented, evaluated, or approved.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that appropriate personnel are not consulted throughout the project, such as those responsible for disaster recovery, security, and telecommunications.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that security and audit functions are not built into the system.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that user requirements or business objectives are not met.
Control	Each project or change is tested by operations staff before LRS releases the final version. Assistant executive director
Risk	Risk that inadequate resources are available to maintain the system.
Control	The PensionGold system is owned by LRS. The risk is borne by LRS. Assistant executive director
Risk	Risk that ongoing maintenance costs have not been included in cost-benefit analysis or that management does not fully realize future costs to maintain the system.
Control	The PensionGold system is owned by LRS. The risk is borne by LRS. Assistant executive director

XXIII. INFORMATION SECURITY

Risk	Risk that pension plan does not have or will not develop a system of information security controls to maintain the integrity, confidentiality, and availability of pension system data.
Control	MPERS has an Information Security Committee that meets as needed. Various staff
Risk	Risk that management may not adequately communicate information security requirements to staff.
Control	MPERS has an Information Security Committee that meets as needed. Various staff
Risk	Risk that information security can be breached by knowledgeable programmers/users.
Control	Passwords are changed every 90 days, and members must change their passwords every 180 days to access the online self-service portal (myMPERS.org). Assistant executive director
Risk	Risk that management may not adequately enforce information security controls.
Control	MPERS has an Information Security Committee that meets as needed. Various staff
Risk	Risk that individuals inside/outside pension plan could bypass information security controls.
Control	Staff is asked not to share passwords. There is always a risk that our system can be hacked. We use SilverSky to help protect the system from outside attack. Huber maintains our firewall. Assistant executive director

XXIV. LEGAL SERVICES

Risk	Risk of misinterpreting statutory provisions.
Control	Staff is well versed in seeking opinions from general counsel. Various staff
Risk	Risk that pension plan does not have adequate legal counsel in-house (legal counsel with training and expertise in laws and litigation affecting public pension systems).
Control	The general counsel is a member of the Missouri Bar and must obtain continuing professional education to continue to be a member of the Missouri Bar. General counsel is expected to defer to outside counsel when the legal scope of review is outside the expertise of the in-house counsel. Executive director
Risk	Risk that pension plan does not obtain adequate help from outside counsel when necessary.
Control	General counsel should use outside counsel as necessary. Executive director is notified when outside counsel is used. General counsel

XXIV. LEGAL SERVICES

Risk	Risk that legal office does not provide adequate advice and consultation in the areas of membership, benefit entitlement, fiduciary responsibility, ethics, contracting, public records, open meetings, and investments (securities, real estate, and alternative investments) and does not provide adequate advice in drafting legislation, regulations, and policies.
Control	General counsel will seek legal opinions from outside counsel in the event of possible litigation or if general counsel lacks expertise in a given area of law. General counsel
Risk	Risk that legal office does not provide adequate representation in court cases other legal actions.
Control	General counsel will monitor representation by outside counsel in all litigation. General counsel

End of Risk Portion

Appendix A – Risks Outside of Our Control

Note: These risks are outside of our immediate control but should be noted in a risk document to help ensure that ALL known risks are documented.

Risk	Risk that statutory language is difficult to interpret.
Control	We have a diligent legislative tracking process in place to help ensure the board and management are aware of upcoming and pending legislative/governing body actions. We also accommodate any requests for assistance with the drafting of legislation for consideration by the legislature. General counsel is also utilized when complex language is not easily understood. We will also engage our legislative lobbyist when necessary to ensure our point of view is provided to the bill's sponsor.
Risk	Risk that the plan is complicated, making the system expensive to administer and increasing inherent risks.
Control	All proposed legislation is reviewed by an internal legislative workgroup. Problems are communicated through the draft and submission of fiscal notes, reflecting the actuarial impact to the plan along with the amount of time, money, and constraints involved with the implementation of proposed legislation.

Risk	Risk that knowledge is not transferred to new legislators when there is turnover.
Control	The new legislators are provided some training on the MPERS defined benefit plan during their orientation as two of the MPERS board members are representatives and senators. The executive director provides a presentation to the House Pension Committee to ensure the members have a basic understanding of the MPERS plan. This is done every two years.

Risk	Risk that board members do not select a qualified executive director.
Control	Our governance policy establishes the actions necessary to maintain authority over system operations. Position description forms are also maintained to identify direct duties and responsibilities of all positions. These documents are utilized for recruitment and for new hire training.

Risk	Risk that elected or appointed board members do not participate in scheduled meetings.
Control	Board members are required to attend scheduled meetings. Poor attendance may result in termination from the board.

Risk	Risk that "throw away" legislation results in unnecessary cost in the form of fiscal notes.
Control	We provide educational opportunities periodically for legislators so they have a better understanding of the cost behind fiscal notes. This risk is outside of our control.

Risk that survivor reduction factors are set by law, therefore, not easily changed by actuarial review.
We do not see that as a risk. However, for the Closed Plan, the reduction factors are set by the board. They have not changed in many years.

Appendix A – Risks Outside of Our Control

Risk that consultant hiring practices do not include a thorough background check of both resident and non-resident foreign staff.
I am not sure that this item represents a risk for MPERS. MPERS has no legal obligation with regard to this item since the consultant is an independent contractor.

Risk that consultant has employees who engaged in inappropriate activities before hire and/or during employment, including criminal activity, unethical conduct, and identity theft.
This appears to be outside of MPERS' control and not something we would even be aware of if it did occur.

Risk	Risk that contract employees engaged in inappropriate activities before hire and/or during employment, including criminal activity, unethical conduct, and identity theft.
Control	Not applicable to MPERS as we cannot control employees of The Standard.

Risk that consultant has a conflict of interest or political connections.
Specific disclosures are part of the RFP process to determine if any conflicts exist. However, much of this would go without our knowledge.

Risk that SDLC does not have a formal quality assurance process.
That is a risk borne by LRS.
Risk that project implementation does not follow a body of standards.
That is a risk borne by LRS.

Risk that payments are not in compliance with IRS regulations for automatic distributions relating to defined contribution plans.
This risk is not applicable to MPERS until such time as there is a DC component to our plan.

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Tab 3

INVESTMENT RISK POLICY

MPERS Investment Statement of Key Risk and Practices to Address Those Risks

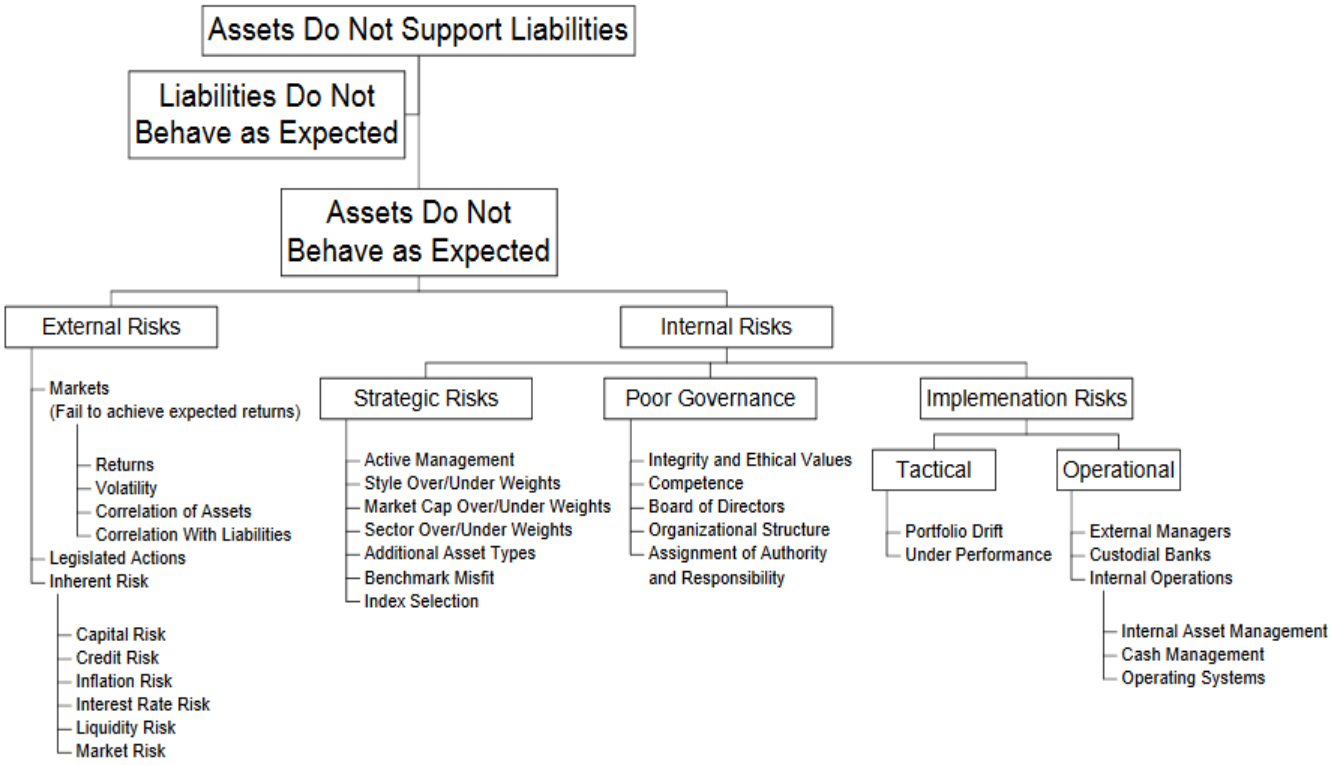
INTRODUCTION

MPERS faces a number of risks in undertaking necessary investment activities. Some risks, such as market volatility, are generally unavoidable. Some risks, such as investing in capital markets to the far right on the Capital Market Line, are knowingly assumed and are necessary to implement certain investment policies. Other risks, such as legal exposure to some forms of liability, are unnecessary and avoidable.

Identifying and managing these risks is important to the fiduciaries of MPERS. This appendix addresses the issues of investment risk that are faced by individual public pension plans and identifies common practices and procedures used to address those risks. Finally, the document states what procedures, processes, or policies MPERS specifically have in place to address the particular risk area. The risk areas and common practices and procedures were taken from a national document entitled *"Public Pension Systems – Statements of Key Risk and Common Practices to Address Those Risks."* This document was written by a committee of public pension system Chief Investment Officers (CIO) and Internal Auditors and has been endorsed by the Association of Public Pension Fund Auditors, the National Association of State Retirement Administrators, and the National Council on Teacher Retirement.

This document takes a "top down" or tiered approach to identifying investment risks within public pension systems. The broadest and most significant risk (or primary risk) is stated first and then the subordinate risks are identified in order of decreasing importance until some level of immateriality is reached. The risks identified at the top "tier" are universal within the public pension system universe and, as we work our way down, become less common. The following chart outlines the key risks identified in this document and subsequently in this appendix:

KEY RISK FRAMEWORK



ASSETS DO NOT SUPPORT LIABILITIES

The primary risk to defined benefit public pension plans is that the assets will not support the liabilities. After all, *the underlying purpose of any defined benefit pension system is to pay current and future benefits to its members*. These benefit obligations cannot be met without the appropriate level of available assets. All other investment risks associated with a public plan are ultimately just a sub-category of this primary risk.

Two major sub-categories of risk fall directly below the primary risk identified above. The first is that the liabilities of the pension fund will not behave as expected, and the second is that the assets will not behave as expected. Numerous factors, ranging from capital market volatility to demographic changes to policy changes that increase benefits, can cause the assets and liabilities of a pension system to behave unexpectedly. Without proper planning and management, these unexpected behaviors may ultimately affect whether or not a public pension plan's assets will support its liabilities.

POINTS OF FOCUS FOR ACTION

There are three basic procedures at the highest level to address and manage the risk of assets not supporting liabilities.

- **Actuarial reviews**: Reviews periodically performed by an actuary mainly to evaluate the trends of the liability components of the system and their relationship to existing assets. It should be noted that while not yet a common practice, it is becoming increasingly more common for public pension systems to hire an additional independent actuary to review or audit the work performed by the original actuary (actuarial audits).

  MPERS' Action*: A qualified independent actuary firm performs an actuarial review annually. In addition, a separate independent actuary periodically reviews (audits) the work of the retained actuary.*

- **Asset/liability studies**: Studies generally performed periodically to identify changes in the relationships between the assets and liabilities of a pension fund.

  MPERS' Action*: The MPERS Governance Policy requires staff to perform a formal asset allocation/liability study no less often than every five years and report the results of the study to the Board (Investment Policy: Section X – Asset/Liability Study). The actuary, as noted in the actuarial report, also updates cash flow projections necessary to meet expected benefit payments annually. The projections are monitored closely to ensure the portfolio is composed in a manner that, along with contributions, will generate sufficient cash to fund the projections in the most effective and efficient manner.*

- **Asset Allocation Reviews**: Models generally constructed by the System's investment staff and/or investment consultant and approved by the Board of Trustees to achieve diversification among asset classes in the most appropriate way to provide the best opportunity for producing sufficient returns to meet the expected liabilities. In many instances, the asset allocation exercise is part of a comprehensive asset/liability study.

***MPERS' Action**: With the assistance of the external investment consultant and investment staff, the Board has established an asset allocation policy and strategic mix to ensure diversification of assets. The policy and strategy mixes are documented in the Governance Policy (Investment Policy: Section XII – Assumed Rate of Return & Asset Allocation). Staff continually monitors the System's asset allocation and with support of the general consultant, makes recommendations for changes when prudent. Staff evaluates the asset allocation mix each year after the consultant releases its return expectations and a report of the evaluation is presented to the Board.*

ASSETS DO NOT BEHAVE AS EXPECTED

Simply stated, this is the risk that the return needed to meet the liabilities is not produced due to unexpected long-term behavior of the capital markets. This unexpected behavior could result from a wide variety of factors, ranging from internal operational issues to external market forces.

In fact, all the investment risks that could have a material effect on a public pension plan stem from assets not behaving as expected or planned. Therefore, all the risks identified in the remainder of this document focus on risks that can cause assets not to behave as expected.

The specific risk that may ultimately cause assets to not behave as expected could be placed into two general categories: external and internal influences.

EXTERNAL RISKS

Capital Markets Fail to Achieve Expected Returns

With the assumption that public pension plans are long-term investors and employ standard asset allocation software to build a diversified portfolio of assets, this risk is not that the actual annual returns of any given asset class will not meet the actuarial assumed investment return. This particular risk is intrinsic to the assets themselves and mitigated by using such factors as expected volatility and correlation in diversifying the portfolio. In fact, it is assumed that all classes of assets will perform significantly differently than expectations over particular periods.

Instead, this is the risk that the long-term behavior of one or more of the asset types turns out to be significantly different than expected due to unforeseen market, economic, or political factors. These deviations from expectations may result from any or all of the following:

- The long term returns of the asset type.
- The long term volatility of the asset type.
- The asset type's correlation or behavior in relation to other asset types.
- The behavior of the entire asset allocation in relation to the liabilities of the plan.

Failures in base assumptions, over time, can result in significant under funding of the system.

POINTS OF FOCUS FOR ACTION

There are three primary vehicles to address these risks.

- **Asset Allocation Reviews**: Periodic asset allocation reviews take a prospective approach to managing market risk by examining the appropriateness of the set of assumptions that are being used in the allocation model.

MPERS' Action*: The MPERS Governance Policy requires staff with the assistance of the general consultant to perform a formal asset allocation and liability review no less often than every five years and report the results of the study to the Board (Investment Policy: Section X – Asset/Liability Study). The results of these studies establish an asset allocation policy and strategic ranges which are expected to generate returns in excess of the real return required to pay the current future liabilities while minimizing risk. Staff continually monitors the System's asset allocation and with support of the general consultant and makes recommendations for changes when prudent. At least annually, once the general consultant releases its return expectations, the asset allocation mix is evaluated and presented to the Board.*

- **Long-term Performance Measurement**: This is conducted for each asset type and the portfolio as a whole. Performance measurement can be referred to as a retrospective approach to managing the risk because it evaluates the historical returns and volatility of each asset type, as well as the historical correlation among the asset types. By evaluating the historical performance numbers, market trends may be identified which could help the plan sponsor avoid long-term unexpected market behavior.

  MPERS' Action*: MPERS' custodial bank calculates monthly performance by manager, asset class and for the total plan. The returns are reconciled by the investment staff. On a quarterly basis, the general consultant prepares an Investment Summary, which provides return information, return attribution, risk statistics, and peer comparisons for the portfolio as well as the benchmarks as detailed in the Governance Policy. The Investment Summary is reported to the Board and is provided as part of the board meeting materials.*

- **Periodic Actuarial Reviews**: These studies track the actual behavior of the assets as matched against the actual behavior of the liabilities and quantify the ongoing differences of the impact of any unexpected behavior. If unfavorable trends develop, then the asset allocation or other factors affecting the future behavior of the system (e.g., contribution rates) can be adjusted.

  MPERS' Action*: A qualified independent actuary performs an actuarial review annually. In addition, a separate independent actuary periodically reviews (audits) the work of the retained actuary.*

Inherent Risks

All investments are subject to one or more types of inherent risk. It is expected and necessary to assume risk in order to generate the assumed returns. Some of the risks present in various types of investment vehicles are:

- Credit Risk - The risk that an issuer or other counterparty to an investment will not make scheduled payments.
- Inflation Risk - The risk that the investment will return below the rate of inflation.
- Interest Rate Risk - The risk that changes in interest rates will decrease values.
- Liquidity Risk - The risk that the investment cannot be readily converted to cash at prevailing or assumed prices.
- Market Risk - The risk that adverse market shifts will cause losses.

POINTS OF FOCUS FOR ACTION

As indicated, these risks are inherently present and are usually knowingly assumed when investing. Usually, they cannot be avoided; however, one way to mitigate these risks is by utilizing the principle of diversification. This way, for example, if one company or industry falters, the threat to the overall fund will be minimized.

MPERS' Action*: The MPERS Governance Policy requires staff with the assistance of the general consultant to perform a formal asset allocation and liability review no less often than every five years and report the results of the study to the Board (Investment Policy: Section X – Asset/Liability Study). The results of these studies establish an asset allocation policy and strategic ranges which are expected to generate returns in excess of the real return required to pay the current future liabilities while minimizing risk. Staff continuously monitors the System's asset allocation and with support of the general consultant and recommends changes when prudent. At least annually, once the general consultant releases its return expectations, the asset allocation mix is evaluated and presented to the Board.*

Legislated Actions

A public pension system is predicated on assumptions regarding long-term rates of return and the application of present value concepts to promised future benefits. Any change to the realization or fulfillment of these assumptions by virtue of legislated action may substantially impact the financial health and economic viability of the system. Examples include laws that limit what type of assets public pension systems may own and legislation that increases benefit formulas without considering available assets.

Another example that could seriously affect the assets of a system is legislation that artificially increases the interest rate assumption, with the intended effect of a reduced contribution from the employer.

A shortage in the expected contributions can obviously upset the balance between assets and liabilities and ultimately cause a system to be under funded. The added risk of this type of legislation is that it would most likely require a higher level of investment risk be taken in order to support the new assumptions.

The key risk in any of these examples is that a radical change is made without understanding the effects on the program being changed, with the attendant risks of trend chasing, confusion, and lack of long-term focus.

POINTS OF FOCUS FOR ACTION

Sudden adverse legislative changes are sometimes unavoidable; however, certain steps can be taken to minimize the likelihood that such situations will occur.

Investment Policy: A well-organized and documented investment policy that has been approved by an appropriate governing body is key to avoiding sudden and frequent overhauls of the investment program by various political bodies. An unorganized and haphazardly executed investment program will likely find itself subject to periodic overhauls initiated by outside sources as it experiences intermittent periods of poor performance.

MPERS' Action*: MPERS' Governance Policies are approved by the Board of Trustees and provide the basis for investment procedures. The Governance Policies dictate specific investment limitations while outlining the authority and responsibilities of both the Board and the investment staff. The MPERS Investment Policy, while consistent with the mandates of the Governance Policies, provides additional details of how the overall investment program is implemented and monitored.*

Education: Educating legislative members and constituents about the system is also an effective mechanism for managing this risk. The more knowledgeable these groups are about the key investment concepts employed by a public pension system the less likely they are to pursue adverse changes that may negatively affect the investment plan. This education is often accomplished through regular communications from the System. In addition, other educational materials, such as the investment policy and strategy of the system, are often made available.

MPERS' Action*: MPERS provides each new board member with the Board Reference Manual at the new trustee orientation. At that time, the new board member meets with the executive director, assistant executive director, CIO, general counsel, and CFO. The manual outlines the organizational structure of MPERS and identifies the responsibilities and functions of the Board. The Board is provided with continuing education on various topics from the general consultant and internal investment staff at Board meetings throughout the year. A board workshop is presented annually and investment topics are a significant agenda item.*

Approximately every two years the executive director appears before the House Pension's Committee to provide an overview of MPERS. The executive director may also speak to individual state representatives or senators on an as needed basis.

Legislative Liaison: Most public pension systems have some sort of monitoring and communication process in place to keep in touch with proposed legislation or other actions that may affect the System's assets. Early awareness and effective communication enables the System to educate the public and lawmakers on the potential effects of the legislation before its passage.

***MPERS' Action**: MPERS employs a consultant whose responsibility during the legislative session is to track proposed legislation affecting MPERS. This consultant also serves as a liaison between MPERS and members of the legislature.*

The Board has adopted a governance policy pertaining to legislation. In summary, the policy acknowledges the following:

1. *The Board acknowledges its responsibility to perform its duties for the exclusive purposes of providing benefits to MPERS' participants and beneficiaries and that this duty takes precedence over any other duty.*
2. *The staff will review all proposed legislative provisions and provide technical comments and fiscal information to the sponsor and the appropriate legislative oversight agencies. Staff will inform the Board of legislative or administrative policy or issue under consideration that could affect MPERS.*
3. *With the assistance and recommendation of staff, the Board may formally support, oppose, or remain neutral on individual legislative bills.*

INTERNAL RISKS

Strategic Risks

Strategic decisions, as they pertain to public pension plans, can be defined as decisions, usually made by the Board (in MPERS case the strategic decisions have been delegated to staff within Board approved ranges), to move away from underlying policy benchmarks. For example, assume a pension fund employs a simplified asset allocation model of 50% domestic equities, 35% fixed income, and 15% international equities and adopts the Russell 3000, Barclays Bond Aggregate, and EAFE, respectively, as the policy benchmarks for this base allocation. This fund could meet its asset allocation objective and policy benchmarks by simply indexing the appropriate percentage of all its funds into the Russell 3000, the Barclays Bond Aggregate, and EAFE.

Using this strategy, the risk of not achieving the policy benchmark returns less transaction costs, would be minimal, almost non-existent. However, any decision to move away from this strategy increases the risk that returns will not meet the returns of the policy benchmark, which may ultimately result in assets not meeting the expected long-term performance assumptions. Examples include decisions to overweight or underweight particular styles (e.g., a bias toward value or growth styles in U.S. equities), market capitalization (e.g., overweighting small capitalization stocks), sectors or regions (e.g., underweight a particular country in an international equity portfolio), and broad asset classes, within acceptable ranges. Despite the risk involved in moving away from policy benchmarks, MPERS has elected to deviate from the policy for the simple reason that it believes the rewards of achieving incremental return exceed the incremental risk of performing below benchmark returns.

Another issue is a potential flaw in the underlying benchmarks themselves. No benchmark is a perfect reflection of the underlying general market. Even the S&P 500, often used as a reflection of large cap U.S. stocks, has substantial internationally generated profits. The choice of a particular small cap U.S. index can result in widely different returns over periods of time, such as differences in the performance of the S&P 600 and the Russell 2000 (common small capitalization U.S. benchmarks). Potential problems in this area are magnified as the indices being used to replicate markets which are less liquid and more inefficient (such as international emerging markets) or are uninvestable benchmark (such as private market index) are utilized. While over longer periods of time these differences in performance may become less significant; they are an area of potential concern over shorter time periods.

POINTS OF FOCUS FOR ACTION

Manage the Risk: Ultimately, most systems choose to accept the risk associated with strategic decisions. Managing this risk begins with clearly defining the policy benchmarks established for the fund and the acceptable level of deviation from these established benchmarks. Some Systems establish benchmarks at the strategic level as well as the policy level. Again, using the Russell 3000 as a policy benchmark, a fund may strategically decide to own a disproportionate number of value stocks in their portfolio and therefore, decide to incorporate a tailor-made benchmark to reflect their decision to be overweight with value stocks. Benchmarks may be further defined at the specific manager level. Regardless of the number of benchmarks established on different levels, they normally are clearly defined and should ultimately roll up into the overall policy benchmarks.

MPERS' Actions*: MPERS establishes benchmarks at the policy, composite and individual manager level. The policy benchmark is a composite benchmark of indices that is weighted at the midpoint of the allowable sub-asset allocation ranges. The policy benchmarks and policy weights are approved by the Board.*

Long-term Performance: Monitoring the long-term performance of the strategic decisions is another way Systems manage the risk that the strategies will not provide the anticipated returns for the System.

The impact of strategic decisions usually only becomes apparent over a period of years. Individual annual returns for strategies may be volatile when compared to the returns of the underlying asset class or policy benchmarks. For example, a decision to overweight small cap equities may underperform the general equity market for several years in a row. A long-term performance measurement system can monitor these return variances or risks by simply tracking the impact of these particular strategies over time and comparing them to the alternative of investing in the broad asset class or policy benchmark. Performance is usually calculated by a pension fund's custodian bank, analysis of performance is normally conducted by the external consultant and/or staff in formal periodic reports to the board.

MPERS' Action*: MPERS' custodial bank calculates performance monthly that is reviewed by and reconciled by the investment staff. The general consultant prepares an Investment Summary, which provides return information, return attribution, risk statistics, and peer comparisons for the portfolio as well as the benchmarks as detailed in the governance policy. The Investment Summary is reported to the Board and is provided as part of the board meeting materials.*

Poor Governance

Governance risk, in this context, refers to the risk that the board, staff, or agents of a public pension system will, either intentionally or unintentionally through their management actions or lack thereof, cause the assets to underperforms expectations. Agents of a public pension system include external consultants, money managers, auditors, actuaries, and legal counsel.

Characteristics of poor governance may include incompetence, poorly or improperly defined roles, poor communications, failure to meet fiduciary responsibilities, lack of ethical standards, and inconsistency.

POINTS OF FOCUS FOR ACTION

The focus here is the control environment, which is the foundation for the entire internal control system within the organization. The control environment defines the character of the organization and affects the attitudes of all individuals. It consists of several elements including: integrity and ethical values, competence, a qualified board of directors and executive staff, a rational organizational structure, and proper assignment of authority and responsibility. Without this foundation, other components of the control system often fail.

Integrity and Ethical Values

Public pension plans develop and adopt their own code of ethics to address the need for ethical standards within the organization.

MPERS' Actions*: MPERS Governance Policy addresses ethics for board members (Trustee Code of Conduct and Conflicts of Interest) and is applied in conjunction with Missouri state law. The Trustee Code of Conduct and Conflict of Interest policy is provided to new board members at the trustee orientation and each board member will receive a copy of the policy on an annual basis. Each board member is required to acknowledge and confirm in writing receipt of the policy and confirmation that he or she has reviewed said policy. Missouri state law provides examples of general laws proscribing conflicts of interest (Sections 105.452 and 105.454, RSMo). Section 105.667, RSMo is specifically applicable to the System trustees and employees that requires forfeiture of System benefits if found guilty of a plan/work-related felony.*

The Employee Handbook also addresses ethics for MPERS' employees. Policy 28.0 Conduct and Conflict of Interest is applied in conjunction with Missouri state law and details areas such as use of information, self-dealing and limitation on gifts. Employee Handbook Policy 29.0 Personal Trading Policy requires all executive staff and investment staff to comply with the CFA Institute Code of Ethics and Standards of Professional Conduct.

Fiduciary Responsibility*:* Good governance of public pension systems also includes the understanding of fiduciary responsibilities by boards, staff, and agents of the system. For most boards, fiduciary responsibilities are defined and imposed through state laws and regulations pertaining to the system (including direct or indirect references to trust law).

Mission statements, plan documents, and other internal documents may further define the fiduciary responsibility of the board. Many times the fiduciary responsibility of staff members and agents are also defined and imposed in state laws and regulations and other methods similar to the boards'. Staff's fiduciary responsibilities may also be defined through written policies and guidelines approved by the board. In the case of agents to the system, their fiduciary responsibilities are normally defined and acknowledged in writing. This is usually accomplished through contracts and written agreements between the system and its agents.

MPERS' Actions*: The fiduciary responsibility of MPERS' board members is specifically addressed in Section 105.688, RSMo. This statute requires board members to act as investment fiduciaries in administering the System's assets and goes on to further identify the specific considerations the board members should take before making investment decisions. MPERS has developed and adopted a Governance Policy and various administrative rules to establish processes and policies for adhering to the law, ensuring compliance with policies, facilitating communication, facilitating efficient board function, and defining responsibilities of all parties. The Governance Policy requires that the Board act solely in the best interest of the beneficiaries of the trust; make decisions with care, skill, prudence, and diligence; and to follow plan documents (the law). The Governance Policy is provided to new board members at the new trustee orientation.*

Section 104.1069.2, RSMo, gives the Board authority to delegate fiduciary responsibility to MPERS staff. Specifically, the relative portion of the statute reads, "[t]rustees of a board may delegate to employees of the system, or to an agent, functions that a prudent trustee acting in a like capacity and familiar with those matters could properly delegate." Within the Executive Director and the Chief Investment Officer Charters of the Governance Policy, MPERS' Board has delegated a portion of the fiduciary responsibility to the executive director and the chief investment officer.

The fiduciary responsibility of MPERS' agents is defined in contracts and written agreements. All investment managers must sign an Investment Management Agreement that contains language acknowledging the manager's fiduciary responsibility to MPERS. The external investment consultant and custody bank contracts also contain similar clauses.

Competence

Hiring Practices*:* Methods used to help ensure a competent staff includes establishing good hiring practices, conducting effective periodic evaluations, and providing an attractive working environment. Most public pension systems operate under public rules and personnel policies or have their own defined standards and procedures.

MPERS' Actions*: MPERS' Board is responsible for hiring the executive director in the Governance Policy (Executive and Emergency Succession). MPERS' Board has delegated the hiring of staff, including executive staff, to the executive director. These practices include establishing specific job descriptions for each position and clearly identifying education, skill and experience requirements for each position which are detailed in the Employee Handbook. New employees are required to undergo a probationary period of either six months for non-executive staff or one year for executive staff. Performance appraisals of investment staff are conducted annually within the department by the CIO. Performance appraisals of the CIO are conducted by the executive director periodically. MPERS conducts a salary survey every five years to ensure that the salary of all positions is in line with the market.*

***Training**:* Another method to help ensure the competency of staff and trustees is to provide an appropriate orientation for new board members and staff and continuing education for all board members and staff. New board members are often initially educated through an orientation process and receive on-going education by attending appropriate conferences and seminars. In addition, the investment staff and agents of the system may use portions of board meetings to further educate the board on investment related issues.

***MPERS' Action**: MPERS conducts a trustee orientation for all new trustees. At that time, MPERS provides the trustee with Board Reference Manual and the Governance Policy and the executive team makes introductions and conducts presentations. The Board Reference Manual outlines the organizational structure of MPERS, identifies the responsibilities and functions of the Board. The Board is provided with continuing education by receiving periodic presentations by the general consultant and internal investment staff on various investment topics at board meetings. A board workshop is presented annually and investment topics are a significant agenda item. Additionally, the Board is provided with opportunities to attend conferences and seminars related to investments. A website is maintained specifically for board members and the general MPERS website is continually updated with investment information.*

MPERS encourages staff to continue their education by offering reimbursement up to 100% of tuition for courses taken that relate to the employee's career development. The specifics of the educational assistance plan can be found in the Employee Handbook. In addition, the policy offers financial assistance to staff members who wish to obtain career-related certifications and licenses and will pay for job-related professional dues and memberships.

Staff members are also encouraged to attend seminars and conferences to further enhance their professional development.

***Outside Experts**:* Another method of managing the risk of poor governance is by hiring outside experts. Most systems rely on outside experts such as actuaries, attorneys, auditors, authorities on governance issues, and consultants, when necessary.

A structured and methodical evaluation process, often involving the advice of consultants, is often used to ensure the competency of agents hired by public pension systems. In addition, other agents of the same profession may be hired to periodically review the work of the agent retained by the public pension system.

***MPERS' Actions**: MPERS utilizes the following outside experts to help manage investment-related risks:*

- *Actuaries*
- *Attorneys*
- *Auditors*
- *Investment Consultants*
- *Money Managers*
- *Custodial Bank*

The performance of the actuaries, auditors and money managers is periodically reviewed by staff and outside parties to ensure satisfaction. The attorneys, investment consultants and custodial bank are subject to periodic re-bidding of their contracts that would entail a review of any past performance by any incumbent third-party provider.

Board of Directors

Good governance of a public pension system usually begins with a competent governing board. The governing statute or other authority establishing the public pension system usually sets the criteria for the selection of most public pension boards.

***MPERS' Actions**: Missouri Revised Statues defines MPERS' Board in Section 104.160.*

Organizational Structures

Organizational structures will vary among public pension systems, depending upon their approach (e.g., whether investments are managed externally, internally or a combination of both). Regardless of the approach, the structure should be clearly defined and key positions identified.

***MPERS' Actions**: MPERS clearly defines the organizational structure and the roles and responsibilities of all parties involved in the investments program in the Investment Policy and more generally in the Governance Policy.*

Assignment of Authority and Responsibility

***Written Policy**:* Another practice used to reduce the risk of poor governance is the development and adoption of written policy statements. For example, investment policy statements often address some or all of the following issue:

Legal and Statutory Framework
- Sole Interest of Beneficiaries, Prudence Standards, Fiduciary Duty

Investment Goals
- General Return Goals, Specific Risk and Return Objectives, Risk Tolerance, Identification of Liabilities, Asset Allocation Procedures and Principles, Allocations, Limits, and Rebalancing

Investment Structure
- Overall Standards, Direct Board Responsibilities, Delegated Board Functions, Employees, Consultants, Advisors, Asset Managers, Custodians and other Support Groups, Standards for Selection, Fees, Procedure for Selection, Monitoring and Review Procedures, Risk Controls, Policies, and Procedures

Asset Class Policies
- Objectives, Allowable Investments, Prohibited Activities, Styles, Benchmarks, Derivatives

Other Policies
- Proxy Voting, Ethics, Disclosures, Soft Dollars, Securities Lending, Personnel, etc.

Written and approved policy statements serve as an educational tool for new investment staff and board members and help ensure seamless transitions during staff and board turnover. In addition, having written and approved policy statements in place helps prevent sudden inappropriate changes to the investment plan in reaction to temporary or transient events.

***MPERS' Actions**: MPERS' Investment Policy, Investment Committee Charter, and Chief Investment Officer and Executive Director Charters as found in the Board Governance Policy address most of the issues listed above, as well as additional topics such as Anti-Terrorism, Conduct and Placement Agent Fees and Economic and Socially Targeted Investments policies.*

Certain topics listed above are not explicitly address in the policy, such as rebalancing and risk controls and risk tolerance; however, the policy addresses these topics within the framework of other policies. Rebalancing is at the CIO's discretion as long as the fund is within the set asset allocation target bands. MPERS does not employ a 'risk budget'; however, risk is a product of the asset allocation set by the Board.

MPERS' Governance Policy has been formally approved and adopted by the Board and all revisions are also approved by the Board.

Implementation Risk

This is the risk that policies and procedures may not be implemented properly. Public pension systems may develop and adopt the ideal asset/liability mix, asset allocation model, and investment policies and strategies, but if staff or agents of the system do not effectively implement the mix and strategies, then assets may ultimately not support the liabilities generated. Causes of ineffective implementation fall into two general categories: *tactical failure* and *operational failure*. Implementation risk and common practices to address the risk are discussed below in terms of these two general categories.

Tactical Failure

Two general sources of tactical failure may prevent a system from achieving the benefits that would accrue from following its long-term investment strategy. First is the risk that the actual allocation of assets does not conform to the policy asset mix (portfolio drift). Second is the risk that the actual return experienced through investment in specific assets does not meet the returns of the asset classes of which they are a part (under performance).

Portfolio Drift

For various reasons, a public pension system may not follow the underlying asset allocation defined in its investment plan. For example, a system's policy asset allocation is 50% U.S. equities, 25% international equities, and 25% diversification pool. Due to market movements (for example, a significant stock market decline), the assets may shift to 40% U.S. equities, 15% international equities, and 45% diversification pool. Particularly after a significant change in the market, a fund may remain in this overweight to the diversification pool position for a prolonged period and, as a result, realize returns far below that expected from the policy asset allocation.

POINTS OF FOCUS FOR ACTION

The primary discipline used here is the process of rebalancing. For example, many systems incorporate ranges around an expressed policy asset allocation that, when violated, will trigger either a direct reallocation of assets to more closely align with the policy asset allocation or trigger a review of conditions to determine whether a rebalancing of assets should occur. As part of this process, most systems will include a direct comparison of the actual allocation with the policy allocation, with associated ranges, in the formal board reports.

MPERS' Action*: With assistance of the general consultant and staff, MPERS' Board has established an asset allocation that takes both risk and return into consideration. Each asset class has ranges to which the chief investment officer has been delegated responsibility of allocating within those ranges to sub-asset classes and further to each underlying investment manager. MPERS does not have a formal rebalancing program; however, staff continually monitors the asset allocation and the decision to rebalance is delegated to the chief investment officer. In some cases MPERS will use nontraditional assets such as futures and swaps, for rebalancing.*

Under Performance

Three types of tactical decisions may cause the actual returns of specific assets to underperform the asset class of which they are a part. First, as discussed above, strategic decisions may be undertaken; second, the actual allocation of assets to managers or accounts may not reflect the strategic allocations, which creates a misfit between the individual account benchmarks and the overall strategic objective, and third, the managers may underperform the asset class.

Strategic Decisions: The risks associated with strategic decisions discussed above may be the result of decisions to:

- Add asset types not included in the underlying asset classes (e.g., private equity, private debt, or emerging markets).
- Tilt the characteristics of an asset class (e.g., more or less small capitalization stocks).
- Take actions to try to reduce risk (e.g., hedging international currency risk).

Manager Misfit: The system may hire the wrong manager or type of manager to fulfill a particular segment of the asset allocation strategy. For example, a manager is hired to implement a strategic decision of overweighting small value stocks and the manager turns out to be a small growth manager. Another example would be where a manager is given a particular benchmark and that benchmark does not reflect the segment of the asset allocation strategy for which it was intended (i.e. benchmark misfit).

Manager under Performance: The external or internal managers hired by the system to actively attempt to gain returns higher than those available by passively investing in the markets themselves may underperform the asset class. The actual returns could be significantly different, and lower, than those in the general market due to the manager's investment decisions. A public pension system may hire three general types of managers to manage funds: managers of publicly traded securities, managers of private equity and debt, and managers of derivative securities.

Managers of Publicly Traded Securities

Public pension systems often hire active managers (both on-staff and outside institutions) to manage publicly traded securities. These managers are hired to outperform the alternative passive investment. This adds another level of potential disparity, and risk, in achieving the desired long-term returns: the difference in performance and results of the active managers from that achieved by the passive alternative investment in that asset type. In particular, it could lead to substantial under performance over a period from that contemplated by the underlying investment strategy.

This risk could arise in four ways: First, the active managers could be true to their style or discipline, but the results of that style or discipline could have unintended consequences (such as performance significantly different than the benchmark used for that manager). Second, the actual benchmark used, when combined with other similar managers or accounts, does not fit the profile of the overall strategic objective or benchmark for that portion of the fund. Third, managers could drift from their particular style when making individual investment decisions and thereby, achieve returns that are different, and lower, than that of the benchmark they were assigned. A fourth way is through operational failure and is discussed later.

Unlike the long-term nature of the asset allocation and strategic policy risks, the impact on the value of the portfolio because of adverse events due to an individual manager's investment activities can occur relatively quickly, sometimes in a matter of days or weeks. Unusual market conditions could invalidate a manager's underlying assumptions by which they choose stocks, bonds, or other individual investments. This "quicker" pace of adverse valuation consequences usually affects only those managers who deal in the public markets, with its liquidity and daily pricing. Private investment portfolios usually have a more leisurely period for recognizing changes in valuation, as discussed in the next section.

Managers of Private Equity and Debt

Investments in private equities, debt, real estate, and private commercial mortgages will most likely go awry at a slower pace. This usually happens over periods of months, not days, since the underlying investments in companies or properties are not valued as frequently.

Managers of Derivative Securities

Typically, public pension systems do not have significant exposure to derivative instruments that could swiftly change the risk profile of the fund. Many derivative exposures are simple and direct substitutes for the underlying instrument. For example, the use of certain futures and forwards markets, such as the S&P 500 Futures Market, is practically interchangeable for holdings in the underlying security or securities. As a result, the risk management procedures for managers with publicly traded portfolios would suffice for tracking those positions if they could materially impact the portfolio.

The concern is with exotic instruments that have express or hidden leverage features or significant elements of optionality. These features could make the standard characteristic measurements (such as duration, beta, etc.) inapplicable for large market moves or, through express or implied leverage; result in a cascading effect from relatively small or marginal market moves. The task for a public pension system is to determine if those types of instruments are in the portfolio and, if they are, whether the aggregate exposure to the overall portfolio is such that additional and more detailed tracking mechanisms and other risk control measures are required.

POINTS OF FOCUS FOR ACTION

Concentrate on hiring quality managers and then monitoring three factors: people, process, and performance. Monitoring should occur on an ongoing basis or through separate periodic evaluations.

Due Diligence in Hiring: As it relates to portfolio managers, risk management begins with the good hiring practices. Most public pension systems have a formalized due diligence process in place to determine external manager candidates that will incorporate the desired investment styles and disciplines to meet the objectives of the System's strategies. This process often includes the use of an independent investment consultant to assist in the search for managers that meet the criteria established by the system. The same prudence is usually exercised by public pension systems when hiring staff to manage funds internally.

The hiring process also usually includes the development of a contract that includes guidelines for the management of the specific portfolio. The guidelines usually include language that addresses:

- The objective of the portfolio;
- The benchmark the portfolio will be measured against;
- The desired characteristics of the portfolio; and
- The allowable and possibly prohibited investments for the portfolio.

Guidelines help to ensure that the managers adhere to the strategy and discipline for which they were hired. For internally managed portfolios, while there may not be a written contract involved, guidelines are usually documented and approved by members of the management team or the board.

MPERS' Actions*: MPERS' Board has delegated the hiring of external investment managers to staff (Section 104.1069, RSMo). In order to hire a new investment manager, there must be written approval from the chief investment officer, executive director and an investment consultant (general or a specialty). MPERS' Governance Policy (Investment Policy: Manager Hiring and Termination Policy) outlines the criteria that staff uses when hiring investment managers. The overall objectives of the policy are to ensure that decisions are being made in a full disclosure environment characterized by objective evaluation and proper documentation and that ultimately all decisions are being made solely in the best interest of the plan participants and beneficiaries. Specific criteria for hiring managers and the manager search process are detailed in the policy.*

Upon selection, the manager is required to sign either a general investment management agreement, limited partnership agreement, group trust agreement or guidelines of a commingled investment vehicle; depending the structure of the mandate, which outlines the manager's general fiduciary duties regarding the relationship with MPERS. In addition, specific operational guidelines are developed that identify (i) the objective of the portfolio, (ii) the benchmark that the manager will be measured against, (iii) the desired characteristics of the portfolio, and (iv) the allowable and prohibited investments.

These guidelines are signed by both parties and become part of the contract. Similar guidelines for each internally managed portfolio and are detailed in the Investment Policy.

People: Many Systems also meet face-to-face on a periodic basis with the external management team. These meetings are generally conducted by internal staff, the external asset consultant or both. These meetings provide the System with a better understanding of the day-to-day operations of the external manager and the manager's business continuity, including resources and staff turnover. In addition, portfolio theory is often discussed to reassure the system that the manager is still a proper fit for the management niche for which they were originally hired.

MPERS Actions*: MPERS' investment staff conducts due diligence meetings at least once per year with each external management team either in-person, via telephone or some other electronic medium to review performance, investment activity and to ensure the firm is adhering to the guidelines of the agreement. Each due diligence meeting is documented and saved for MPERS' records. The only exceptions are for portfolios that are being liquidated/redeemed or if there are side pockets of less than $1 million where no meetings are required. A memo of compliance to this policy is provided to the Board each year as required by the CIO Charter.*

Monitoring the Process: Once the hiring process is complete, a key risk management practice is to ensure that a manager is performing in accordance with a desired style or discipline (the reason they were hired in the first place). Also, systems will normally put measurement systems in place to assure that the style or discipline is having the expected result (performance in relationship to a benchmark or passive investment alternative).

A public pension system's investment consultant or staff, independent of the portfolio management function, usually tracks a manager's adherence to the guidelines on a periodic basis. Further, they may provide the board with a formal report identifying discrepancies in the portfolios and reasons for, or actions relating to, those discrepancies. The compliance monitoring can be accomplished with special software designed to generate exception reports when a portfolio violates an established guideline or manually by periodically examining portfolio characteristics and trading activity for compliance with guidelines.

MPERS' Actions*: The CIO assigns the internal staff to monitor the process of each external manager; however, due diligence meetings are conducted by all staff members. The team will periodically review the holdings of the manager to ensure that the characteristics of the portfolio and style of the manager is in compliance with the operational guidelines. The required annual due diligence meetings allow internal staff an opportunity to question and examine the manager's adherence to the established guidelines and review the performance. The due diligence notes identify any discrepancies in the portfolio and the reasons for, or actions related to, those discrepancies.*

Monitoring Performance: Even if a manager's portfolio adheres to the guidelines and style expected, the individual securities chosen could underperform the market or sector for which manager was hired. This risk is typically tracked separately, and reasons for under performance are monitored, identified, and discussed with corrective action taken if necessary. This is usually done prospectively (the manager anticipates future events that could impact the style or discipline) and retroactively (analyzes reasons for present and past under performance to determine if the manager is still competent in implementing that discipline).

The retroactive check is accomplished through performance monitoring. In addition to the performance reports generated by the manager, on a regular basis staff and/or the asset consultant may produce their own set of reports for monitoring performance to aid in determining the reasons for over performance or under performance.

Formal reports to the board may include such items as performance compared to market benchmarks, the analysis of the performance (attribution analysis), and a comparison to similar managers (peer analysis).

These types of reports should help the board guard against terminating managers simply because their style was "out of favor."

MPERS' Actions*: Retroactive checks are accomplished through performance monitoring. Performance reports that compare each manager's performance to their established benchmarks are prepared at least monthly by MPERS' custodial bank and are reconciled by staff. Quarterly the general consultant prepares and publishes the Investment Summary, which includes manager returns on a quarterly and yearly basis. Manager returns are compared to the appropriate benchmark return. Manager performance reports are reviewed by the internal staff assigned to the specific portfolios and reported to the CIO whenever necessary. Additionally, investment staff tracks performance returns and other statistical data.*

Tactical Failure Summary

Sound hiring practices, periodic compliance monitoring, and continuous performance analysis are usually sufficient to prevent actions by individual managers that may cause material impacts to the overall risk profile of the portfolio. In combination, these practices collectively ensure that the characteristics and performance of the overall portfolio, both as a whole and in its individual parts, will perform in a manner that comports with that expected by the strategic policies adopted by the board.

As a result of MPERS performing these types of checks, it is unlikely that its portfolio performance will drift too far from the expected returns without the deviation being identified by one of the independent checks in place. Such a deviation must be reflected in one or all of the following: the characteristics of the holdings, the reaction of those holdings to market movements or deviations from peers with similar mandates.

Operational Failure

The risk of operational failure is not primarily concerned with investment strategy or tactics, but management and operational issues used in the implementation process of the strategy or tactic. Operational failures often result from a breakdown in systems, procedures, personnel, or processes. One common approach to avoiding potential operational failure is for the management of public pension systems to implement procedures that ensure achievement of the following control objectives (as identified by General Standard 300, *Standards for the Professional Practice of Internal Auditing*):

1) The reliability and integrity of information.
2) Compliance with established policies, procedures, laws, and regulations.
3) The safeguarding of assets.
4) The economical and efficient use of resources.
5) The accomplishment of established objectives and goals for operations and programs.

Operational failure can occur in three major areas within a public pension system: external managers, custodial banks, and internal operations. A consistent approach should be taken for managing and

monitoring each of these relationships. The assumption is not made, for example, that internal managers generate less risk simply because they are part of the organization.
On the other hand, it should not be assumed that external managers and custodians pose less risk because they are reputable industry experts. Things can go wrong in any environment, and, as a result, pension systems address risk through a systematic and steady approach.

External Managers

The management of operational risk associated with external managers focuses on activities by the manager that change the assets held in their account, primarily buying or selling securities. Assuming the controls of the custodial bank are functioning properly (an assumption addressed later), then the operational failure of the external manager can basically only be the result of three actions:

- A security is inappropriately sold;
- A security is inappropriately purchased; or
- An intended sale or purchase of a security is not accomplished.

These actions are all the result of the manager not complying with the guidelines and strategies set forth by the public pension system.

The possibility always exists that an external manager, either intentionally or unintentionally, will not adhere to the guidelines or strategy for which they were hired. As discussed above, an adequate monitoring process should mitigate the risk of noncompliance by the manager; however, for the monitoring process to be effective, the data monitored must be timely, available, and accurate. Therefore, an operational risk associated with external managers is that timely and reliable information is not available or that the information is inaccurate. Obviously, if a system is monitoring inaccurate or dated holdings and trade data, then the risk of not detecting the noncompliance features of the actual portfolio increases. Generally, the longer a portfolio is allowed to be out of compliance with the established guidelines and strategies, then the more likely the returns of the portfolio will not live up to expectations.

POINTS OF FOCUS FOR ACTION

Separation of Authority from Custody: The legal custody of a public pension system's assets is usually maintained through a custodial bank. Securities are held at the custodial bank in the custodian's name on the public pension system's behalf. Managers do not have direct control over those assets and must perform their activities through the custodial accounts. When a security is purchased or sold, the custodian must receive instructions from the manager to receive or deliver the security (usually on a "delivery vs. payment" basis). Therefore, it is very difficult for the manager to obtain more funds than authorized by the System. Consequently, each external manager creates a limited amount of operational risk with regard to the overall public pension system because they only have access to the funds assigned them by the System.

If, for example, an external manager's building is destroyed and all records and capabilities are lost, the public pension system still has all of its securities under separate control. In addition, public pension systems can, at any time, "freeze" an external manager's account and prevent future access by the manager, which is often done upon termination of a manager. All that is lost is the opportunity cost of the added value that may have come from future decisions by the manager. Opportunity cost concerns

can be limited by immediately transferring the securities to another manager's account, which is also frequently done upon the termination of a manager.
Finally, an external manager does not have the ability to move cash and securities out of the pension system's account to another destination, either within that custodian's system or outside the system. A manager only has control over the movement of securities and cash within the account.

An attempt or request for this unauthorized type of movement should automatically trigger a request by the custodian for independent authorization from both the external manager's and public pension system's staff.

MPERS' Actions*: A master custodian maintains the legal custody of MPERS' assets. The bank holds the securities in its name on the behalf of MPERS. Managers do not have direct control over MPERS' assets and must perform their activities through the custodial accounts. The custodian must receive instructions from each manager when a security is purchased or sold and the manager will only receive funds into its account at the direction of MPERS. Therefore, the custodial bank is aware of every transaction by the manager and makes the transactions readily available to MPERS through an online accounting system. With this easily accessible information, MPERS' staff is able to determine compliance in a timely and accurate manner. In addition, the manager cannot receive more funds than authorized by MPERS.*

Reconciliation: The accuracy of the holdings and transactions is usually assured through a monthly reconciliation of the data by the external manager and custodian or by the pension system from data provided from the external manager and the custodian. The reconciliation process helps to ensure the integrity and timeliness of the data used by the System during the monitoring process.

MPERS' Actions*: Monthly reconciliations of transactions and holdings are performed between the external manager and custodian.*

Due Diligence: Public pension systems also manage the risk of external manager operational failure by incorporating good hiring practices and conducting periodic due diligence reviews as discussed above.

During the hiring process the System should take steps to ensure the external manager has adequate resources and qualified personnel to enable them to disseminate timely and accurate information. The on-going due diligence reviews help the System identify significant changes in the manager's organizational structure, ownership, personnel, or available resources that may affect future operational performance.

MPERS' Actions*: MPERS has established hiring procedures and ongoing due diligence reviews that address the concerns listed above. (See additional discussion on MPERS' hiring procedures and due diligence reviews above.)*

Custodial Banks

A system must be in place to ensure that the assets of a public pension system are maintained safely, securely, and with the appropriate legal protection. This task falls primarily to custodial banks. Therefore, a key component of managing operational risk by public pension systems is the quality of the custodial system. The custodial system needs to be accurate and provide staff the ability to access holdings, pricing, and transaction information on a regular and timely basis.

POINTS OF FOCUS FOR ACTION

Again, a key to obtaining quality reliable service from a custodial bank begins with the hiring process. While there are noted exceptions, the majority of public pension systems control the selection of their custodian.

In those cases, most employ some fashion of structured due diligence process when selecting their custodial bank, which could include the use of an independent external consultant. The process, in many cases will be similar to that used to select external managers.

MPERS' Actions*: MPERS completed a search for a new custodian in 2013. The general consultant assisted staff in this search process. The search involved issuing a formal request for proposal and reviewing proposals submitted by various custodial banks. In addition, several meetings between MPERS' staff and the general consultant were held to help ensure MPERS of the quality of the candidates.*

In essence, public pension systems rely on three basic mechanisms to assure the continued viability of the custodial operation once the hiring process is complete. The first is a comprehensive annual financial examination of the custodial records conducted by an independent accounting and/or auditing firm. The second is thorough process of monthly reconciliation that generally takes place between the individual portfolio managers and the custodian. The third is through the periodic use of the System and its key components by internal staff.

Independent Audit: The financial statements of virtually all public pension systems are audited annually by an independent auditor. These audits are usually conducted by either a state government's audit agency or an independent certified public accounting firm hired by the system. Because the Custodial bank plays such a material role in the operations of the System, the auditors must obtain a certain level of assurance that custodial operations are sufficient.

The auditor can obtain this level of assurance by physically reviewing and testing the controls and procedures of the custodian's operations or by obtaining an independent report of such testing. The independent report should be prepared in accordance with the Auditing Standards Board Statement on Standards for Attestation Engagements No. 16 and it is labeled "Service Organization Control Report" or SOC1. This report was formerly known as a "Report on the Processing of Transactions by Service Organizations" which was commonly known as a SAS 70 report.

Because of the expense involved with physically reviewing and testing the controls and procedures of the custodian's operations, most auditors opt to obtain a SSAE-16 report for the custodian. It is important to note that a SSAE-16 report that only contains descriptions of the policies and procedures at the custodial bank and the auditor's assessment as to whether such policies and procedures are suitably designed is not sufficient to reduce the pension system auditor's assessment of control risk. However, a SSAE-16 report that also states that the policies and procedures were tested, and that they were operating effectively to achieve the related control objectives during the period is expressly designed to reduce the assessment of control risk by users of the custodial system.

MPERS' Actions*: MPERS' external auditors receive a copy of the custodial bank's SSAE-16 or SOC1 report each year. Because the MPERS' fiscal year is closed using first quarter cash flow adjusted values, the custodial bank may also include a "bridge letter."*

Reconciliation: The second ongoing check of the reliability of the custodial systems is the requirement that each portfolio manager and custodian reconcile the account positions on a monthly basis. This procedure involves the comparison of the custodian's security positions, prices, and valuations with the same information as recorded by each manager. Any discrepancies are duly noted and resolved on a timely basis. Differences in pricing sources may sometimes be allowed once identified, but there is usually no tolerance for any difference in the size of the position (or units held).

Many public pension systems often withhold payment for asset managers or custodial services if either party fails to perform its reconciliation function on a timely basis. This monthly reconciliation function is usually monitored independently by the public pension system's internal staff.

The reconciliation process helps to assure that any material breakdown in the custodial system between annual audits will be identified on a timely basis. Corporate governance actions (stock splits, dividends, interest, warrants, etc.) will also be monitored through the valuation and unit holding comparisons.

MPERS' Actions*: Monthly reconciliations of transactions and holdings are performed between external managers and the custodian. However, for internally managed accounts, MPERS' staff does not conduct monthly reconciliations in the same manner as for our external managers. MPERS reviews the buys and sells of the internally managed portfolio as trades occur and as Northern Trust inputs those trades onto its trading platform. The fund's custodial bank also reviews the trades for approval so there is duel coverage on buys and sells. Additional checks on the internally managed accounts occur during the yearly fixed income review conducted by staff and during the annual GASB 72 review conducted by Northern Trust. MPERS has hired Northern Trust to do an in-depth review of all holdings in order to comply with the GASB 72 guidelines. This process entails acquiring trading information and pricing from various third-party sources.*

A more robust reconciliation process for internally managed accounts would require the hiring of additional staff and purchasing of additional software systems which would be very costly to the System. It has been determined at this time that our processes are sufficient for our needs.

Periodic Reviews: In many cases, where sufficient internal staff is available, many public pension systems also perform periodic reviews of the portfolios and transactions on a periodic basis. The potential benefit of this is to serve as a third check on the reliability and accuracy of the custodial system. These reviews often validate the accuracy of account valuations, currency positions, and periodic transactions.

A significant breakdown in the custodial system should be revealed in this type of review and most significant errors in record keeping, corporate governance, and pricing should also be captured. To accomplish the periodic reviews, the data provided by the custodian should possess certain qualities to enable pension staff to perform their operating, reporting, and compliance functions. The necessary qualities include:

- The data must be relevant to the needs of the pension system staff.
- The data must be current, timely, and accessible to pension system staff.
- The data must be complete and accurate.

***MPERS' Actions**: In addition to external manager reconciliations, MPERS performs monthly performance reconciliations, whereby each account, the cash flows and the returns are reviewed for accuracy. If there are discrepancies, they are resolved prior to closing the account books for the month.*

Internal Operations

Thus far, we have addressed the operational risks associated with external agents, but the internal operations of a system also exposed to operational risk. Such operational risk is present in areas of internal asset management, cash management, and operating systems to protect data integrity.

Internal Asset Management: Most of the operational risks of internal management are the same as if the assets were being managed externally. These risks include cash movements in and out of the portfolios and compliance with the portfolio's intended strategy. However, some additional concerns are brought about by the practice of internal management. First, the monthly reconciliation process between external managers and the custodian is no longer naturally present and, thus, a process to help ensure data integrity is lost. Second, a layer of oversight may be eliminated with internal management since the investment officers who were responsible for monitoring the compliance of the external managers may now be managing internal portfolios and obviously cannot monitor the compliance of their own portfolio. It is necessary to address these additional concerns when implementing procedures to internally manage assets.

Cash Management: Another internal operational risk involves cash management. Cash management involves the movement of cash between accounts, or into and out of the portfolio either for distribution to beneficiaries or to fund external asset managers at the appropriate level. The risk is that unauthorized movements of cash will be made or that inappropriate amounts of cash will be distributed.

Operating Systems: Finally, there is the risk that the internal operating systems necessary to support the investment activity, for both internally and externally managed assets, will fail. For example, a communication link often exists between the pension system and custodian, which allows the pension system instant access to portfolio data. Internal computer systems may go down or the building in which the public pension system is located may suffer a catastrophe.

POINTS OF FOCUS FOR ACTION

As stated above, the operational risks of internal asset management are similar to the risks of external management; therefore, many of the risk management practices are similar. Hiring practices are again important. A system must diligently pursue competent individuals to ensure the fund is managed in accordance with the intended strategy. In addition, operational guidelines are put in place for each individual internally managed portfolio.

Accounting System: A public pension system with internal asset management usually implements its own investment accounting system to accomplish the task of reconciling monthly investment data with the custodial bank. The investment accounting software tracks all positions and transactions of an internally managed portfolio and the data can be reconciled with the monthly activity reported by the custodial bank. In addition, standard reports should be issued pursuant to a fixed distribution list to facilitate ongoing monitoring.

***MPERS' Actions**: MPERS uses a combination of Bloomberg services and Excel spreadsheets as a double check for accuracy of the custodial records for internally managed accounts on an as-needed basis when discrepancies are noted with the custodian's records.*

MPERS reviews the buys and sells of the internally managed portfolio as trades occur and as Northern Trust inputs those trades onto its trading platform. The fund's custodial bank also reviews trades for approval so there is duel coverage on buys and sells. Additional checks on the internally managed accounts occur during the yearly fixed income review conducted by staff and during the annual GASB 72 review conducted by Northern Trust.

MPERS has hired Northern Trust to do an in-depth review of all holdings in order to comply with the GASB 72 guidelines. This process entails acquiring trading information and pricing from various third-party sources.

A more robust reconciliation process for internally managed assets would require the hiring of additional staff and purchasing of additional software systems which would be very costly to the System. It has been determined at this time that our processes are sufficient for our needs.

Segregation of Duties: To successfully implement the investment accounting process, the pension system normally segregates duties between the management of the portfolio and the record keeping or accounting function associated with the portfolio. Basically, this means that the individual responsible for making trading decisions for the portfolio is not responsible for affirming the trades or entering the trade data into the accounting system. In addition, the portfolio manager under this approach is not involved in the monthly reconciliation process between the internal investment accounting system and the custodial system.

The separation of duties can also reduce the risk associated with cash management. The individual responsible for managing an internal portfolio typically does not also have the authority to transfer funds from the custodial accounts. Often two signatures (one from fiscal services and one from non-asset manager investment staff) are required to initiate cash movement from the custodian. In addition, the custodian will often be required to contact an additional staff member, perhaps the chief investment officer or chief financial officer, before completing the cash movement request.

***MPERS' Actions**: The CIO is charged with the responsible sourcing of ideas in the internally managed fixed income, cash collateral and natural resources portfolio at MPERS. The CIO is the portfolio manager and sources all trades, makes the trades with the trader/brokerage and affirms the trades with the custodial bank.*

Independent Oversight: To address the potential lack of independent oversight, public pension systems often assign individuals who are independent of the portfolio management function to monitor the portfolio for compliance with established guidelines. An external investment consultant, an internal audit group, other staff (e.g., compliance officer), or a combination can perform the monitoring function.

***MPERS' Actions**: MPERS has established compliance and oversight procedures for the internally managed fixed income, cash collateral and natural resources portfolios. Those policies are found in the Investment Policy Section VIII – Internal Fixed Income Policy and Investment Policy Section XIII – MPERS' Strategic Natural Resources Policy. Various staff members are responsible for these portfolios. The CIO is the portfolio manager on all internally managed assets.*

Business Continuity Plan: The risk associated with the internal operating systems of a public pension system may be limited because the "official" holdings and books of records are usually maintained off site at custodial banks. Nonetheless, public pension systems usually take steps to minimize the chances of failed internal operating systems. Regular back-ups of important internal data are usually performed and stored off site to preserve the data. In addition, a back-up connection line to the custodial bank and other essential communication links are often installed to ensure reliable data is available at all times. Finally, most pension plans develop some sort of disaster recovery plan to ensure the operating systems can be up and running as soon as possible in the unlikely event of a total breakdown in computer systems, building malfunctions, and other catastrophes.

MPERS' Actions*: MPERS' official holdings and book of record are maintained offsite at its custodial bank. MPERS has developed a system-wide disaster recovery plan.*

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Fab 4

ERM POLICY

ERM POLICY AND PLANNING

Purpose: The purpose of this document is to outline the enterprise risk management policy for MPERS as well as provide some planning information.

Scope: MPERS-wide

Date: July 20, 2017

Policy Statement

The enterprise risk management (ERM) policy is that MPERS will instigate an ERM program, including the creation of an ERM committee, to ensure that risks are monitored appropriately, embraced when it is to our advantage, and mitigated when necessary to achieve our objectives.

Definition

Every ERM policy should include a definition, consequently the COSO[1] definition of ERM is as follows:

> *Enterprise risk management is a process, effected by an entity's board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within the risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.*

As alluded to in the definition of ERM, the ultimate goal for MPERS is to try to identify potential harmful events and manage our risks in order to achieve our primary objective which is to sustain the pension system for our members in order to pay their earned benefits.

COSO provided a list of common questions and answers regarding ERM. It may be found as Appendix A. The Q&A offers good information for those not familiar with ERM activities.

[1] The ***C**ommittee **O**f **S**ponsoring **O**rganizations of the Treadway Commission*, (www.coso.org) includes representatives from the American Accounting Association, American Institute of Certified Public Accountant, Financial Executives International, Institute of Management Accountants, and Institute of Internal Auditors.

Background

The following background information was parsed from COSO's white paper titled *"Embracing Enterprise Risk Management"* and seems appropriate to include here to give context to the readers of this document:

Any entity that is currently operational has some form of risk management activities in place. However, these risk management activities are often ad hoc, informal and uncoordinated. And, they are often focused on operational or compliance-related risks and fail to focus systematically on strategic and emerging risks, which are most likely to affect an organization's success. As a result, they fall short of constituting a complete, robust risk management process. In addition, existing risk management activities often lack transparency. Transparency about how enterprise-wide risks are managed is increasingly being sought by directors and senior management, as well as various external parties seeking to understand an organization's risk management activities. What's more, existing risk management processes often are not providing boards and senior management with an enterprise-wide view of risks, especially, emerging risks.

This leads to the question of "Where do we start?" Answering this question can be a major challenge for organizations where the perceived complexity of ERM or a lack of understanding of its strategic benefits may be barriers. At the same time, organizational pressures to reduce costs may prompt some decision makers to look at risk management as something that can be deferred or viewed as a lower priority, thereby setting the stage for unmanaged risk exposures that could seriously threaten the viability of the organization.

Keys to Success

The COSO white paper provides seven keys to successful implementation of an ERM process. Those keys are also helpful to readers of this policy/planning document and have been summarized below:

1. Support from the top is a necessity

An ERM initiative must be enterprise wide and viewed as an important and strategic effort. Support from the board and senior management is needed to get the right focus, resources, and attention.

2. Build ERM using incremental steps

Smaller organizations have achieved ERM successes by taking incremental, step-by-step approach to enhancing their risk management capabilities to provide a more enterprise-wide view over time rather than undertaking one massive launch effort. By doing so, entities are able to a) identify and implement key practices to achieve immediate, tangible results, b) provide an opportunity to change and further tailor the ERM process, and c) facilitate the identification and evaluation of benefits at each step.

3. Focus initially on a small number of top risks

For an organization just starting out, it might make sense to identify a small number of critical risks that can be managed and then evolve from there. This allows the organization to develop related processes such as monitoring and reporting specific risks.
An alternative method may be to focus on a few top risks in just one critical business unit. Once comfort is achieved in that one business unit, the process can be expanded across the enterprise.

4. Leverage existing resources

Many organizations often discover that they have the personnel on their existing staffs with the knowledge and capabilities relating to risks and risk management. Some have appointed a management committee to bring together a wide array of personnel who collectively have sufficient knowledge of the organization's core business model, related risks, and risk management practices to start the ERM process.

5. Build on existing risk management activities

Any organization has some form of risk management activity in place already. By leveraging, aligning and subsequently enhancing these existing risk related activities, the organization can achieve immediate and tangible benefits. However, it must be recognized that existing activities do not constitute ERM (i.e. fall short of a holistic view of all risks facing the entity).

6. Embed ERM into the business fabric of the organization

ERM cannot be viewed or implemented as a stand-alone staff function or unit outside of the organization's core business processes. Assuming there is no dedicated staff for ERM purposes, some organizations, for example, have expanded their strategic plans and budgeting processes to include the identification and discussion of the risks related to their plans and budgets.

7. Provide ongoing ERM updates and continuing education for directors and senior management

ERM practices, processes, and information continue to evolve which necessitates keeping all parties well informed of new trends or improvements to the process.

Plans

The COSO white paper noted above also provides seven steps for implementing an ERM program. Those seven steps and how MPERS intends to implement those seven steps is noted below:

1. Seek board and senior management leadership, involvement and oversight

The board and senior management set the tone for the organization's risk culture. Their involvement, leadership, and oversight are essential for the success of any ERM effort.

The MPERS Audit Committee will be briefed on ERM activities during their next meeting. The executive director fully supports the ERM initiative. The assistant executive director (AED) is championing ERM for MPERS.

2. Select a strong leader to drive the ERM initiative

It is critical that the risk leader have sufficient stature and be at an appropriate senior management level in the organization to have a rich strategic perspective of the organization and its risks and to be viewed as a peer by other members of senior management. Attributes of effective ERM leaders are broad knowledge of the business and its core strategies, strong relationships with directors and executive management, strong communication and facilitation skills, knowledge of the organization's risks, and broad acceptance and credibility across the organization.

The AED is the champion for the ERM initiative at MPERS. The AED has over 29 years of auditing experience with 15 years of that experience in a public pension plan.

3. Establish a management risk committee or working group

Typically, the organization's ERM leader, as described in step 2 above, would head this committee and use it as a principle forum for implementation of ERM. The committee should have some of the top management because it provides them with the opportunity to share their insights about the types of risks that could impede the organization's ability to achieve its business objectives, which will be important information during the initial risk assessment.

MPERS will create two ERM committees to start, one for operations and one for investments. Then the committees will merge into one ERM committee. Both committees will contain staff with good working knowledge of their subject areas of expertise.

4. Conduct the initial enterprise-wide risk assessment and develop an action plan

In many ways, this step is the heart of the initial ERM process and the focus is to gain understanding and agreement on the organization's top risks and how they are managed. While any organization faces many risks, the starting point is to get a manageable list of what are collectively seen as the most significant risks.

The AED will meeting with management to conduct an initial enterprise-wide risk assessment in the summer of 2017. The AED has already asked operations staff to come up with their top five risks. An action plan will be the logical next step after the risk assessment.

5. Inventory the existing risk management practices

During the initial risk assessment, the organization should take an inventory of its current risk management practices to determine the area of strength to build upon and the areas of weakness to improve. Oftentimes previous risk management activities are focused on existing operations and compliance risks, as opposed to significant external, emerging or strategic risks. The creation of a baseline will also aid in showing progress as the ERM process matures.

This will be done during the initial risk assessment as suggested by COSO.

6. Develop your initial risk reporting

The organization needs to develop its initial approach to risk reporting including its communication processes, target audiences, and reporting formats. Organizations should start by keeping things simple, clear, and concise.

The AED will work with the executive director to come up with a plan for communicating the ERM activities to staff and an appropriate summary of activities for the Audit Committee and/or Board.

7. Develop the next phase of action plans and ongoing communications

The implementation of ERM is an evolutionary process that takes time to develop. In the spirit of continual improvement, once the initial ERM action plan has been completed, the working group or risk leader should conduct a critical assessment of the accomplishments to date and develop a series of action plans for the next stage of implementation. Above all, staff should keep in mind the benefits of taking small, incremental steps on the path toward full ERM rather than attempting to implement the complete ERM framework all at once. The goal is to keep the momentum for ERM that will continue to expand and deepen the organization's ERM capabilities on a continual basis.

The AED will ensure the ERM activity can be sustained well into the future years.

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Detailed Planning Items

As noted above, the risks will be divided and monitored by the two main departments of MPERS; Operations and Investments. Eventually the ERM program will evolve to where one risk committee covers both operations and investments or "enterprise-wide."

The operations ERM committee will consist of the assistant executive director, the general counsel, the benefits auditor, a benefit specialist, and a payroll specialist.

The investments ERM committee will consist of the full investments staff, the assistant executive director, and the general counsel.

Other members of the staff will be invited, when appropriate, to attend the Operations ERM committee discussions.

It is anticipated that the ERM committees will meet quarterly once the members are comfortable with the ERM process. The finer details of how risks are identified, categorized, reviewed, and mitigated will be under the domain of each ERM committee.
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The proposed plan to implement the ERM process, which is subject to revision at any time as the process matures, is outlined below:

Date	Topic	Staff Involved
Summer 2016	Start the ERM process by researching materials found at https://erm.ncsu.edu/ and COSO.	Greg
Sept 2016	Attend ERM Peer Group conference to get an understanding of what other public pension funds are doing with ERM.	Greg
Fall 2016 to Spring 2017	Prepare responses to the risks identified in the APPFA Operations Risk document.	Greg and operations staff
Summer 2017	Prepare responses to the risks identified in the APPFA Investments Risk document.	Tinisha, Greg and investments staff
Summer 2017	Ask operations staff to document top five risks and analyze the responses by inputting them into a risk matrix.	Greg and operations staff
June 2017	Finalize the ERM Policy.	Greg and Scott
July 2017	Create an ERM committee for Operations	Greg (chair), Greta, Jamie, Bev, and Tammy
August 2017	Operations ERM committee members meet and review ERM processes and policies, etc. Interview key management using questions found in Appendix B.	Greg and Operations ERM committee
Fall 2017	Create an ERM committee for Investments	Greg, Greta and all investments staff
To Be Determined	ERM policy/process discussed with the MPERS Audit Committee and then the full board	Scott and Greg
Winter 2017 to Spring 2018	ERM committees to be fully functioning and reviewing risks on a quarterly basis.	ERM committee members
June 2018	ERM committees merged into one ERM committee	Scott and Greg

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Appendix A – Frequently Asked ERM Questions[2]

• ***"Do I need to appoint a Chief Risk Officer?"***
No, COSO has observed that many organizations have started ERM using existing staff and appointing one of their key, senior level personnel as the leader of the initiative. For example, some organizations have used their Chief Audit Executive or their CFO to begin the process. Regardless of title, the person selected to lead the ERM initiative must have the stature, authority and senior management leadership skills to be a true leader for ERM. Some organizations then develop their ERM processes to a point that they believe a dedicated Chief Risk Officer is needed. However, organizations don't have to create a CRO position in order to get started, nor does a more mature ERM process necessarily require a dedicated CRO.

• ***"Do I need to form a functional ERM unit?"***

No, many organizations have started ERM using management committees, working groups or existing personnel. Working groups or committees can take the lead in developing the organization's initial approach to ERM or to conduct an initial risk assessment as part of their existing duties. For smaller organizations, in particular, a separate risk management unit may not be necessary. Again, ERM as defined by COSO is a process not a functional unit. Whether a functional risk unit is needed ultimately depends on the complexity of the organization and the breadth and depth of its ERM processes.

• ***"What's wrong with just continuing my current, informal risk activities? Don't they constitute ERM?"***

While you want to leverage existing, informal risk management activities, these activities often lack both transparency and an enterprise-wide view or application. Accordingly, they are unable to address risk in a portfolio manner, including aggregation of risk. In addition, existing, informal risk activities are more likely to be performed on an *ad hoc* basis and done separately; therefore, these informal risk activities lack the consistency of approach and communications required by ERM processes. Thus, an organization's current, informal risk processes probably do not constitute true ERM. Increasingly, boards and other stakeholders, including rating agencies and regulators, are looking for ERM processes that are transparent, systematic and repeatable and that produce an enterprise-wide view.

• ***"What role does the board play in ERM?"***

The board is ultimately responsible for overseeing the ERM process, which is typically driven by management. The board's oversight responsibilities often involve using various board committees to oversee risks related to their areas of responsibility. In the end, effective engagement, involvement, and communications with the board is critical to ERM success. More specific guidance for boards is contained in the COSO thought paper, *Effective Enterprise Risk Oversight: The Role of the Board of Directors*.

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[2] From the COSO document *"Embracing Enterprise Risk Management – Practical Approaches for Getting Started"*

• ***"Do I have to implement the complete COSO Enterprise Risk Management - Integrated Framework to conduct ERM activities?"***

COSO's *Enterprise Risk Management - Integrated Framework* notes that an entity may find it useful to discuss sub-sets of one or more of its objective categories to facilitate communications on a narrower topic. This approach can help an entity build its understanding of ERM and risk components on a step by step or incremental basis, staying within the context of the COSO ERM Framework. As noted in this paper, many organizations are taking a step-by-step approach to ERM to facilitate building their understanding and experience with components of ERM. While this "starting small" approach to ERM adoption has significant merit, care must be taken to maintain momentum. If an organization loses momentum and only implements a few initial ERM steps, it will fall short of having an adequate ERM process. See Appendix A for additional information about the COSO *Enterprise Risk Management - Integrated Framework.*

• ***"Do I need to use quantitative models and metrics in starting ERM?"***

The use of quantitative models and metrics may ultimately be useful in a more robust ERM environment, but they are not needed to launch an ERM effort. What's more, some types of risks, strategic or emerging risks, for example, may not lend themselves to quantification at all. Many organizations start their ERM process by simply listing or identifying what management and the board believe to be their top risks and then reviewing how those risks are managed and monitored. Depending on the size and complexity of the organization, quantitative modeling may, in the long run, prove helpful and even necessary to address certain types of risks, such as some financial and market risks. However, the quantification of all risks is not a goal. Management and the board need to first develop a solid understanding of ERM processes, approaches, and tools and then ensure that the organization's risk processes and tools are appropriate for the nature and scope of their specific risks and risk profile.

Appendix B – Risk Assessment Questions[3]

Outlined below are some example questions that could be used in an interview with a senior executive or director during the risk assessment process. These questions are representative of the types of questions that could be asked to help identify the organization's most significant strategic or emerging risks.

- What are your primary business objectives or strategies?
- What are the key components of enabling your business strategy or objectives?
- What internal factors or events could impede or derail each of these key components?
- What events external to the organization could impede or derail each of the key components?
- What are the three most significant risk events that concern you regarding the organization's ability to achieve business objectives?
- Where should the organization enhance its risk management processes to have maximum benefit and impact on its ability to achieve business objectives?
- What types of catastrophic risks does the organization face? How prepared is the organization to handle them, if they occur?
- Can you identify any significant risks or exposures to third parties (vendors, service providers, alliance partners, etc) that concern you?
- What financial market risks do you believe are or will be significant?
- What current or developing legal/regulatory/governmental events or risks might be significant to the success of the business?
- Are you concerned about any emerging risks or events? If so, what are they?
- What risks are competitors identifying in their regulatory reports that we have not been addressing in our risk analysis?

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[3] See footnote 2
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