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PERA
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New Mexico Magistrate Retirement Fund
Annual Actuarial Valuation
as of June 30, 2021

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October 28, 2021

The Retirement Board
Public Employees Retirement Association
Santa Fe, New Mexico

Members of the Board:

We have conducted the annual actuarial valuation of the New Mexico Magistrate Retirement Fund as of June 30, 2021; the results of the valuation are contained in the following report. The annual valuation is used to determine the sufficiency of the statutory contribution rates and, if necessary, the amount required to fund the annual normal cost and fully amortize the unfunded actuarial accrued liability with annual payments over a 25-year period. The results of this valuation apply to the fiscal year beginning July 1, 2021 and ending June 30, 2022 (FY 2022). Information contained in our report for plan years ending prior to June 30, 2010 is based upon valuations performed by the Fund's prior actuary.

In performing the valuation, we relied on data supplied by the Public Employees Retirement Association (PERA) and performed limited tests on the data for consistency and reasonableness. In determining the Fund's liabilities, future events, such as investment returns, deaths, retirements, etc., are anticipated based upon the set of actuarial assumptions as approved by the Board. There were no assumption changes since the last valuation. The valuation reflects the passage of Senate Bill 122, which provides for a monthly distribution of $100,000 to the Fund until achieving 100% funded status.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: fund experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the adequacy of statutory contributions to fund the plan. The asset values used to determine unfunded liabilities and funded ratios are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

Measuring pension obligations and actuarially determined contributions requires the use of assumptions regarding future economic and demographic experience. Whenever assumptions are made about future events, there is risk that actual experience will differ from expected. Appendix D of this report provides a discussion of the risk considerations for the Fund in compliance with the guidance provided under Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51).

Annual actuarial valuations are performed for the Fund which re-measure the assets and liabilities and compute a new actuarially determined contribution. The Fund also has experience studies performed every four to five years to analyze the discrepancies between actuarial assumptions and actual experience and determine if the actuarial assumptions need to be changed. Annual actuarial valuations and periodic experience studies are practical ways to monitor and reassess risk.

In order to prepare the results in this report, we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise in the future of any adjustments that we believe would be appropriate

This is to certify that the undersigned are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Fund.

Respectfully submitted,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

Bryan Hoge, FSA, EA, FCA, MAAA
Consulting Actuary

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Section I: Board Summary

The table below summarizes the results of the June 30, 2021 actuarial valuation as compared with the prior year.

Table I-1: Comparative Summary of Principal Results

Valuation Date	June 30, 2021	June 30, 2020
Total Annual Payroll	$ 6,106,006	$ 5,914,106
Total Valuation Payroll	$ 6,289,187	$ 6,091,529
Actuarial Accrued Liability (AAL)		
Active and Deferred Vested Members	$ 17,406,822	$ 16,443,088
Retired Members and Survivors	42,948,791	42,147,717
Total	$ 60,355,613	$ 58,590,805
Actuarial Value of Assets (AVA)	$ 32,644,797	$ 31,274,386
Funded Ratio	54.1%	53.4%
Unfunded Actuarial Accrued Liability (UAAL) *(AAL - AVA)*	$ 27,710,816	$ 27,316,419
Calculation of Required Contribution (Fiscal Year Ending)	June 30, 2022	June 30, 2021
Normal Cost		
Retirement	13.03 %	12.60 %
Termination	5.86 %	5.58 %
Pre-Retirement Survivors	0.76 %	0.72 %
Disability	0.00 %	0.00 %
Total Normal Cost	19.65 %	18.90 %
Expected Administrative Expenses	0.50 %	0.50 %
UAAL 25-Year Amortization Rate	28.44 %	28.95 %
Reduction for SB122 Distribution	(19.08)%	(19.70)%
Actuarially Determined Contribution Rate	29.51 %	28.65 %
Actuarially Determined Contribution Amount	$ 1,856,377	$ 1,745,055
Statutory Contribution Rates		
Employer Contribution Rate	15.00 %	15.00 %
Expected Docket Fees	3.44 %	5.97 %
Member Contribution Rate	10.50 %	10.50 %
Total Statutory Rate	28.94 %	31.47 %
Expected Statutory Amount	$ 1,820,091	$ 1,917,004
Amortization Period Based on Statutory Rates	46	29
(Excess)/Deficiency in Statutory Rate	0.57 %	(2.82)%
Deficiency in Expected Statutory Amount	$ 36,286	N/A

Summary of Key Findings

The funding policy for the Fund determines the employer contribution required to satisfy the annual normal cost plus an amount to fully amortize the unfunded actuarial accrued liability (UAAL) over a period not to exceed 25 years. This resulting contribution amount is compared to the expected statutory contribution amount to assess the sufficiency of the statutory contribution. The actuarially determined contribution rate for the Fund in the fiscal year ending June 30, 2022 (FY 2022) is 29.51% of covered payroll.

The total normal cost contribution as a percent of valuation payroll increased from 18.90% to 19.65%. The UAAL increased from $27.3 million to $27.7 million, resulting in a decrease to the annual amortization amount from 28.95% to 28.44% of payroll. The funded ratio has increased from 53.4% to 54.1%. The UAAL and funded ratio are reconciled in Table IV-3. We note the following key findings:

- The Fund experienced an actuarial gain on Fund assets of $521,528 for the plan year related to the 8.95% investment return on the actuarial value of assets, which is more than the assumed rate of return of 7.25%. This represents a 0.8% increase to the funded ratio. Table III-3 provides the calculation of the investment loss for this year.

- The Fund experienced a net loss of $825,033 on Fund liabilities due to non-investment related experience. This represents a 0.7% decrease to the funded ratio.

- The Fund received $1,299,765 more in contributions than expected. This represents a 2.2% increase to the funded ratio.

- Senate Bill 122 provides for a monthly distribution of $100,000 to the Fund until 100% funded. These changes resulted in a decrease of 19.08% to the actuarially determined contribution rate.

Section II of the report provides summarized information on the membership data used in the valuation. Section III covers the Fund's assets and Section IV covers the Fund's liabilities. The results of the valuation are provided in Section V and the accounting information is in Section VI. The appendices provide additional information on A) the Fund members, B) the actuarial assumptions and methods, and C) the summary of the benefit provisions of the Fund. It is important to note that all information contained in this report for periods prior to June 30, 2010 were produced by a prior actuarial consulting firm.

Section II: Membership Data

Data regarding the membership of the Fund for use in the valuation were furnished by PERA. The following table summarizes the membership data as of June 30, 2021 and is compared with that reported for the prior year.

Table II-1: Summary of Membership Data as of June 30, 2021

Group	June 30, 2021	June 30, 2020
Total Active Members	**64**	**62**
Inactive Members		
Deferred Vested	18	19
Other	0	0
Total Inactive Members	**18**	**19**
Retirees		
Service*	84	85
Disabled	2	2
Beneficiaries	25	21
Total Retirees	**111**	**108**
Totals	**193**	**189**

* Includes 4 Co-Payees as of June 30, 2021 and June 30, 2020.

Table II-2: Historical Summary of Active Membership Valuation Data

Valuation Date	Number	Annual Payroll	Annual Average Pay	% Change in Average Pay
6/30/2021	64	$ 6,106,006	$ 95,406	0.02 %
6/30/2020	62	5,914,106	95,389	5.99 %
6/30/2019	65	5,849,795	89,997	(0.00)%
6/30/2018	65	5,849,815	89,997	6.60 %
6/30/2017	65	5,487,517	84,423	0.09 %
6/30/2016	65	5,482,360	84,344	(0.10)%

Table II-3: Deferred Members, Retired Members and Beneficiaries as of June 30, 2021

Group	Number	Total Annual Benefits	Average Annual Benefits	Average Age
Deferred Vested	**18**	**$ 443,868**	**$ 24,659**	**56.06**
Retirees				
Service*	84	3,390,699	40,365	72.33
Disability	2	99,215	49,608	68.99
Survivors	25	842,806	33,712	72.56
Retiree Totals	**111**	**$ 4,332,720**	**$ 39,034**	**72.32**
Total	**129**	**$ 4,776,588**	**$ 37,028**	**70.05**

* Includes 4 Co-Payees.

Section III: Fund Assets

The following tables provide information on the Fund's assets at market value and the development of the actuarial value of assets.

Table III-1: Market Value Reconciliation

	June 30, 2021	June 30, 2020
Beginning of Year Market Value	$ 29,070,669	$ 31,797,388
Audit Adjustment	-	-
Revised Beginning of Year Market Value	$ 29,070,669	$ 31,797,388
Revenues:		
Member Contributions	651,699	650,354
Docket Fees	216,660	363,615
Employer Contributions	930,993	929,071
Appropriations	1,200,000	-
Purchase of Service	-	-
Investment Income		
Interest, dividends, etc.	794,580	600,779
Realized/Unrealized gains (losses)	6,832,245	(916,114)
Security lending	3,959	6,165
Other Income	-	-
Settlement Award		
Total Revenues	$ 10,630,136	$ 1,633,870
Expenditures:		
Benefit Payments	4,293,633	4,204,113
Refunds of Member Contributions	49,849	-
Investment Expenses	168,267	128,148
Administrative Expenses	24,759	28,328
Total Expenditures	$ 4,536,508	$ 4,360,589
End of Year Market Value	$ 35,164,297	$ 29,070,669

The market value rate of return for the plan year is 26.29%. The Fund's cash flow is (4.26)% as a percentage of average market value. A mature system such as the Magistrate Retirement Fund is expected to exhibit negative net cash flow as the number of members receiving benefit payments becomes a larger portion of total membership. We will continue to monitor this in each future valuation.

The actuarial value of assets represents a "smoothed" value developed with the purpose of dampening the impact of market volatility on the assets used in determining valuation results. The actuarial value of assets has been calculated by spreading the recognition of unexpected investment income over four years. The amount of unexpected investment income in each year is the difference between expected actuarial value investment income and actual market value investment income. Table III-2 below provides the calculation of the actuarial value of assets.

Table III-2: Development of Actuarial Value of Assets as of June 30, 2021

1. Actuarial Value Beginning of Year			$ 31,274,386
2. Market Value End of Year			35,164,297
3. Market Value Beginning of Year (with audit adjustment)			$ 29,070,669
4. Cash Flow			
a. Contributions			$ 1,799,352
b. Appropriations			1,200,000
c. Service Purchases			-
d. Benefit Payments and Refunds			(4,343,482)
e. Administrative Expenses			(24,759)
f. Other			-
g. Net			$ (1,368,889)
5. Investment Income			
a. Market Total (2 - 3 - 4g)			$ 7,462,517
b. Assumed Rate			7.25%
c. Amount for Immediate Recognition			2,217,771
d. Amount for Phased-In Recognition			5,244,746
6. Phased-In Recognition of Investment Income			
a. Current Year: 0.25 * 5d			$ 1,311,187
b. First Prior Year (2019/2020)	$ (2,665,822)	x 25%	(666,456)
c. Second Prior Year (2018/2019)	$ (324,596)	x 25%	(81,149)
d. Third Prior Year (2017/2018)	$ (168,212)	x 25%	(42,053)
e. Total Recognized Investment Gain			$ 521,529
7. Audit Adjustment			$ -
8. Actuarial Value (1 + 4g + 5c + 6e + 7)			$ 32,644,797
9. Difference Between Market & Actuarial Values (2 - 8)			2,519,500
10. Rate of Return on Actuarial Value			**8.95 %**
11. Actuarial Value of Assets as a % of Market Value of Assets			**92.84 %**

The actuarial value of assets represents a "smoothed" value developed with the purpose of dampening the impact of market volatility on the assets used in determining valuation results. The actuarial value of assets has been calculated by spreading the recognition of unexpected investment income over four years. The amount of unexpected investment income in each year is the difference between expected actuarial value investment income and actual market value investment income. Table III-3 provides the calculation of the gain or loss due to the investment experience on the actuarial value of assets for the year ended June 30, 2021 (based on the 7.25% assumed rate of return in effect for the prior valuation).

Table III-3: Actuarial Investment Gain (Loss) for the Year Ended June 30, 2021

1. Beginning of Year Actuarial Value of Assets (AVA)	$ 31,274,386
2. Employee and Employer Contributions	1,799,352
3. Appropriations	1,200,000
4. Benefit Payments	(4,343,482)
5. Administrative Expenses	(24,759)
6. Other	-
7. Interest [1 x 7.25% + (2 + 3 + 4 + 5 + 6) x 7.25% x 0.5]	2,217,771
8. Expected End of Year AVA	32,123,268
9. Actual End of Year AVA	32,644,797
10. Actuarial Investment Gain (Loss) (9- 8)	**$ 521,529**

Section IV: Fund Liabilities

The total actuarial present value of benefits is the value as of the valuation date of all future benefits expected to be paid to current members of the Fund. An actuarial cost method allocates each individual's present value of benefits to past and future years of service. The actuarial accrued liability includes the portion of the active member present value of benefits allocated to past service as well as the entire present value of benefits for retirees, beneficiaries and inactive members. The portion of the actuarial present value allocated to the future service of active members is called the present value of future normal costs. Table IV-1 presents the calculation and allocation of the actuarial present value of benefits.

Table IV-1: Allocation of the Actuarial Present Value of Benefits as of June 30, 2021

	Actuarial Accrued Liability	Present Value of Future Normal Cost	Actuarial Present Value of Benefits
Active Members			
Service Retirement	$ 12,596,386	$ 4,046,552	$ 16,642,938
Termination Benefits	1,331,762	2,038,452	3,370,214
Survivor Benefits	302,257	234,039	536,296
Disability Retirement	-	-	-
Total for Active Members	$ 14,230,405	$ 6,319,043	$ 20,549,448
Inactive Members	$ 3,176,417		$ 3,176,417
Retirees and Beneficiaries			
Service Retirements	$ 34,649,506		$ 34,649,506
Beneficiaries	7,099,130		7,099,130
Disability Retirements	1,200,155		1,200,155
Total for Retirees and Beneficiaries	$ 42,948,791		$ 42,948,791
Total	**$ 60,355,613**	**$ 6,319,043**	**$ 66,674,656**

Section IV: Fund Liabilities

Under the valuation funding method, an unfunded actuarial accrued liability (UAAL) exists to the extent that the actuarial accrued liability exceeds the actuarial value of assets as presented in Section III. The calculation of the UAAL and Funded Ratio as of the valuation date is shown in Table IV-2.

Table IV-2: Calculation of the Unfunded Actuarial Accrued Liability and Funded Ratio

	June 30, 2021	June 30, 2020
1. Actuarial Accrued Liability	60,355,613	58,590,805
2. Actuarial Value of Assets	32,644,797	31,274,386
3. Unfunded Actuarial Accrued Liability (1 - 2)	27,710,816	27,316,419
Funded Ratio (2 / 1)	54.1%	53.4%

Although the terminology used to describe the excess of the Fund's actuarial accrued liability over the Fund's actuarial value of assets is call the "unfunded" actuarial accrued liability, the actuarially determined contribution in the valuation includes an annual amortization payment required to fully amortize the UAAL within 25 years.

The funded ratio is the ratio of the actuarial value of assets to the actuarial accrued liability (Table IV-1) as of the valuation date. As of June 30, 2021, the funded ratio of the Fund is 54.1% as compared to a ratio of 53.4% as of June 30, 2020. The ratio is a commonly used measure of the funding progress and can be useful in reviewing the historical trend of a Fund's funding progress. Such a review should also consider the impact to this measure over the historical period due to changes to fund benefits, changes to the actuarial assumptions and methods, and the significant impact that investment experience can have on the ratio over short-term periods. We caution that no single "point in time" measure can provide a universal basis for comparing one plan's funded status to another.

The calculation of the Fund's actuarial assets and liabilities requires the use of several assumptions concerning the future experience of the Fund and its members. In each annual valuation, the latest year of actual experience is compared to that expected by the prior valuation. The differences are actuarial gains and losses which decrease or increase the UAAL. Table IV-3 provides the reconciliation of the UAAL.

Table IV-3: Reconciliation of the UAAL

	UAAL	Funded Ratio
1. Beginning of Year	**$ 27,316,419**	**53.4 %**
2. Normal Cost	1,151,145	
3. Expected Contributions	(1,745,055)	
4. Other Income/Expense	24,759	
5. Interest [(1 x 7.25%) + (2 + 3 + 4) x 7.25% x 0.5]	1,959,809	
6. Expected End of Year	$ 28,707,077	51.8 %
7. Actuarial Experience (Gain) / Loss		
Contribution Shortfall/(Surplus) (with interest)	$ (1,299,765)	2.2 %
Investment Experience	(521,529)	0.8 %
Liability Experience	825,033	(0.7)%
Total Actuarial Experience (Gain) / Loss	$ (996,261)	
8. End of Year Prior to Plan/Assumption Changes (6 + 7)	$ 27,710,816	54.1 %
9. Plan changes	-	
10. Change in Actuarial Assumptions	-	0.0 %
11. Actual End of Year (8 + 9 + 10)	**$ 27,710,816**	**54.1 %**

Section V: Actuarial Funding Calculation

Section IV of this report presented the Fund's actuarial accrued liability as the portion of the present value of benefits allocated to past years of service. The portion of the active members' present value of benefits allocated to future years of service is funded through annual normal cost contributions comprised of both active member and employer contributions.

The employer's actuarially determined contribution rate is the percentage of valuation payroll necessary to fund the annual normal cost and fully amortize the UAAL over 25 years. The amount calculated is expected to remain constant over the remaining amortization period and is provided in Table V-1.

Table V-1: Calculation of Actuarially Determined Contribution Rate

	June 30, 2021	June 30, 2020
1. Total Valuation Payroll	$ 6,289,187	$ 6,091,529
2. Present Value of Future Benefits	66,674,656	64,691,794
3. Present Value of Future Normal Costs	6,319,043	6,100,989
4. Actuarial Accrued Liability (2 - 3)	$ 60,355,613	$ 58,590,805
5. Actuarial Value of Assets	32,644,797	31,274,386
6. Unfunded Actuarial Accrued Liability (UAAL) (4 - 5)	$ 27,710,816	$ 27,316,419
7. UAAL Amortization Payment (25 year funding)	$ 1,788,913	$ 1,763,452
a. Amortization Payment as a Percent of Payroll (7 / 1)	28.44%	28.95%
8. Total Normal Cost	$ 1,236,018	$ 1,151,145
a. Normal Cost as a Percent of Payroll (8 / 1)	19.65%	18.90%
9. Expected Administrative Expenses	$ 31,446	$ 30,458
a. Administrative Expenses as a Percent of Payroll (9 / 1)	0.50%	0.50%
10. Reduction for SB122 Distribution	$ 1,200,000	$ 1,200,000
a. as a Percent of Payroll (10 / 1)	19.08%	19.70%
11. Actuarially Determined Contribution (ADC)	$ 1,856,377	$ 1,745,055
a. ADC Rate (7a + 8a + 9a - 10a)	29.51%	28.65%
12. Expected Statutory Contribution Rates		
a. Employer Contribution Rate	15.00%	15.00%
b. Expected Docket Fees as a Percent of Payroll	3.44%	5.97%
c. Member Contribution Rate	10.50%	10.50%
d. Total Statutory Contribution Rate (a + b + c)	28.94%	31.47%
13. (Excess)/Shortfall of Statutory Rates (11a - 12d)	0.57%	(2.82)%

Section VI: Additional Disclosure Information

The tables provided in this section present information relevant for the annual financial reporting of the Fund. GASB Statement No. 67 required disclosure information will be provided in a separate supplemental report. Additional disclosure information is provided below.

Table VI-1: Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Plan Assets (a)	Actuarial Accrued Liability Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Annual Payroll (c)	UAAL as a Percentage of Annual Payroll ((b – a) / c)
6/30/2021	$32,644,797	$60,355,613	$27,710,816	54.1 %	$6,106,006	453.8 %
6/30/2020	31,274,386	58,590,805	27,316,419	53.4 %	5,914,106	461.9 %
6/30/2019	31,882,687	58,723,077	26,840,390	54.3 %	5,849,795	458.8 %
6/30/2018	32,331,750	58,099,481	25,767,731	55.6 %	5,849,815	440.5 %
6/30/2017	33,162,734	54,087,066	20,924,332	61.3 %	5,487,517	381.3 %
6/30/2016	33,059,864	53,546,860	20,486,996	61.7 %	5,482,360	373.7 %
6/30/2015	32,803,715	52,580,762	19,777,047	62.4 %	5,065,798	390.4 %
6/30/2014	32,970,978	51,140,415	18,169,437	64.5 %	3,515,567	516.8 %
6/30/2013	31,813,605	54,498,646	22,685,041	58.4 %	3,136,834	723.2 %
6/30/2012	30,878,948	58,037,075	27,158,127	53.2 %	3,213,712	845.1 %

Table VI-2: Solvency Test

	Aggregate Accrued Liabilities For				Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
Valuation Date	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Actuarial Value of Assets	(1)	(2)	(3)
6/30/2021	$ 5,566,695	$ 46,125,208	$ 8,663,710	$32,644,797	100.00%	58.71%	0.00%
6/30/2020	5,068,019	45,542,311	7,980,475	31,274,386	100.00	57.54	0.00
6/30/2019	4,992,710	45,004,313	8,726,054	31,882,687	100.00	59.75	0.00
6/30/2018	4,681,462	41,973,554	11,444,465	32,331,750	100.00	65.88	0.00
6/30/2017	4,156,427	40,691,805	9,238,834	33,162,734	100.00	71.28	0.00
6/30/2016	3,654,856	41,202,695	8,689,309	33,059,864	100.00	71.37	0.00

Table VI-3: Schedule of Retirants Added to and Removed from Rolls

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2021	6	$ 273,918	3	$ 128,573	111	$ 4,332,720	3.47%	$ 39,034
6/30/2020	7	321,327	4	143,286	108	4,187,375	4.44%	38,772
6/30/2019	6	255,565	5	146,339	105	4,009,334	2.80%	38,184
6/30/2018	4	127,328	2	117,673	104	3,900,108	0.25%	37,501
6/30/2017	8	188,602	6	191,813	102	3,890,453	-0.08%	38,142
6/30/2016	4	93,126	6	211,449	100	3,893,664	-2.95%	38,937

Table VI-4: Summary of Actuarial Methods and Assumptions

Valuation Date	June 30, 2021
Actuarial cost method	Entry Age Normal
Amortization method	Level Percent of Payroll, Open
Payroll Growth Rate	3.00%
Remaining amortization period	25 years
Asset valuation method	4-year Smoothed Market
Actuarial assumptions:	
Investment rate of return*	7.25%
Administrative expenses	0.50% of payroll
Projected salary increases*	3.25% Annually
Post-Retirement Benefit Increases	0.67% compounded annually
* Includes inflation at 2.50%	

Table A-1: Schedule of Active Participant Data as of June 30, 2021

Nearest Age	Completed Years of Service								
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total	Payroll
30 to 34	1	0	0	0	0	0	0	1	$ 95,306
35 to 39	4	0	0	1	0	0	0	5	$ 477,818
40 to 44	1	1	0	0	1	0	0	3	$ 287,206
45 to 49	6	2	1	2	0	1	0	12	$ 1,143,667
50 to 54	1	0	1	0	0	2	0	4	$ 381,222
55 to 59	6	1	1	1	1	3	0	13	$ 1,238,973
60	0	1	0	0	1	0	0	2	$ 190,611
61	1	0	0	0	0	0	0	1	$ 95,306
62	1	1	0	0	0	0	0	2	$ 191,901
63	2	0	0	0	0	0	0	2	$ 191,901
64	2	0	2	0	0	0	0	4	$ 381,222
65	0	1	0	0	0	0	0	1	$ 95,306
66	3	1	1	0	0	0	0	5	$ 476,528
67	1	0	0	0	1	0	0	2	$ 191,901
68	1	0	0	0	1	0	0	2	$ 190,611
69	0	0	0	1	0	0	0	1	$ 95,306
70	0	0	0	1	0	0	0	1	$ 95,306
71	1	0	0	0	0	0	0	1	$ 95,306
72	0	0	0	0	0	0	0	0	$ -
73	0	0	0	0	0	0	0	0	$ -
74	1	0	0	0	0	0	0	1	$ 95,306
75	0	0	0	0	0	0	0	0	$ -
76	0	0	0	0	0	0	0	0	$ -
77	1	0	0	0	0	0	0	1	$ 95,306
78	0	0	0	0	0	0	0	0	$ -
79	0	0	0	0	0	0	0	0	$ -
80 & Over	0	0	0	0	0	0	0	0	$ -
Total	33	8	6	6	5	6	0	64	$ 6,106,006

Average Age: 56.00
Average Service: 9.47

Table A-2: Number of Annual Retirement Allowances of Benefit Recipients as of June 30, 2021

Type of Pension	Number	Total Annual Benefits	Average Annual Pension
Normal Retirement Pensions			
Two Life 75% Survivor Pension:			
Retired Member Recipient	80	$ 3,341,807	$ 41,773
Survivor Recipient	23	$ 762,994	$ 33,174
Co-Payee Recipient	4	$ 48,893	$ 12,223
Total Normal Retirement Pensions	**107**	**$ 4,153,694**	**$ 38,820**
Disability Retirement Pensions			
Duty Disability	0	N/A	N/A
Non-Duty Disability	2	$ 99,214	$ 49,607
Survivor Recipient	0	N/A	N/A
Co-Payee Recipient	0	N/A	N/A
Total Disability Retirement Pensions	**2**	**$ 99,214**	**$ 49,607**
Pre-Retirement Survivor Pensions			
Survivor Spouse Recipient	2	$ 79,812	$ 39,906
Survivor Child Recipient	0	N/A	N/A
Total Pre-Retirement Survivor Pensions	**2**	**$ 79,812**	**$ 39,906**
Total Pensions Being Paid	**111**	**$ 4,332,720**	**$ 39,034**

Table A-3: Distribution of Participants Receiving Benefits as of June 30, 2021

Attained Age	Retired Member*		Disabled Member		Survivor Beneficiaries		Totals	
	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions
Under 40	0	$0	0	$0	1	$ 24,196	1	$ 24,196
40 to 44	0	0	0	0	1	48,209	1	48,209
45 to 49	0	0	0	0	1	38,925	1	38,925
50 to 54	2	40,045	0	0	0	0	2	40,045
55 to 59	7	263,263	0	0	1	17,067	8	280,330
60 to 64	5	164,524	0	0	2	71,469	7	235,993
65 to 69	18	729,214	1	61,096	4	108,421	23	898,731
70 to 74	19	859,524	1	38,120	2	86,064	22	983,708
75 to 79	21	766,804	0	0	2	92,781	23	859,585
80 to 84	4	161,560	0	0	5	154,443	9	316,003
85 to 89	4	235,585	0	0	4	139,186	8	374,771
90 to 94	4	170,180	0	0	2	62,045	6	232,225
95 to 99	0	0	0	0	0	0	0	0
100 & Over	0	0	0	0	0	0	0	0
Total	**84**	**$ 3,390,699**	**2**	**$ 99,215**	**25**	**$ 842,806**	**111**	**$ 4,332,720**

*Includes 4 Co-Payees.

Table A-4: Distribution of Retirees by Years of Service at Retirement (not including Disabled Members, Beneficiaries, and Co-Payees)

	Years of Credited Service at Retirement							
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total
Average Monthly Benefit*	$ 1,569	$ 3,122	$ 4,354	$ 4,241	$ 3,325	$ 4,398	$ 2,470	$ 3,488
Average Final Average Salary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Retirees*	10	20	17	16	6	3	2	74

*Does not include 6 retirees with missing years of service at retirement.

Table A-5: Distribution of Recent Retiree Ages at Retirement (not including Disabled Members, Beneficiaries, and Co-Payees)

	2015-16 Retirees	2016-17 Retirees	2017-18 Retirees	2018-19 Retirees	2019-20 Retirees	2020-21 Retirees	All Current Retirees
Number	2	2	0	3	5	2	80
Average Monthly Benefit at Retirement	$ 1,115	$ 5,029	N/A	$ 4,256	$ 5,461	$ 3,670	$ 3,223
Average Age at Retirement	63.08	60.04	N/A	63.64	62.60	60.79	60.77

Table A-6: Status Reconciliation

	Active Members	Terminated Members	Pension Recipients			Total
			Service Retired*	Disability Retired	All Beneficiaries	
June 30, 2020	**62**	**19**	**85**	**2**	**21**	**189**
Increase (Decrease) From:						0
Service Retirement	(1)	(1)	2			0
Disability Retirement						0
Deaths	(1)		(3)			(4)
Survivors					4	4
Co-Payee						0
Other Terminations	(1)					(1)
Vested Terminations						0
Refund of Contributions						0
New Entrants/Rehires	5	(1)				4
Data Adjustments		1				1
June 30, 2021	**64**	**18**	**84**	**2**	**25**	**193**

*Includes 4 Co-Payees at 6/30/2021 and 6/30/2020.

Actuarial Cost Methods Used for the Valuation

An actuarial cost method is a procedure for allocating the actuarial present value of benefits and expenses to time periods. The method used for this valuation is known as the individual entry-age actuarial cost method and has the following characteristics:

(i) The annual normal costs for each individual active magistrate are sufficient to accumulate the value of the magistrate's pension at the time of retirement.
(ii) Each annual normal cost is a constant percentage of the magistrate's year-by-year projected compensation.

The individual entry-age actuarial cost method allocates the actuarial present value of each magistrate's projected benefits on a level basis over the magistrate's compensation between the entry-age of the magistrate and the expected exit ages. Expected administrative expenses of 0.50% of payroll is included in the calculation of the annual contribution requirement.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future costs is called the actuarial accrued liability. Deducting actuarial value of assets from the actuarial accrued liability determines the unfunded actuarial accrued liability. The unfunded actuarial accrued liability was amortized as a level percent of payroll over 25 years to determine the computed contribution for fiscal integrity. This period is consistent with the policy established by the Retirement Board in October 1996.

Active magistrate payroll was projected to increase 3.00% per year for the purpose of determining the contribution needed to amortize the unfunded actuarial accrued liability.

The actuarial value of assets used for funding purposes is derived as follows: prior year actuarial value of assets is increased by contributions and expected investment income and reduced by refunds, benefit payments and expenses. To this amount 25% of the difference between expected and actual investment income for each of the previous four years is added. As of June 30, 2012, the actuarial value is no longer limited in the degree it can vary from market value by use of a 20% corridor. This change was recommended in the latest experience study and is consistent with the asset valuation method used in the other PERA plans.

Actuarial Assumptions Used for the Valuation

Economic Assumptions (effective with June 30, 2018 valuation, unless otherwise noted)

Assumed Rate of Investment Return. 7.25%, net of investment expenses.

Price Inflation. 2.50% per annum, compounded annually.

Real Investment Return. 4.75% per annum compounded annually.

Payroll Growth. 3.00% per year.

Salary Increases (effective with June 30, 2020 valuation). Annual salaries of active members are assumed to increase at an annual rate of 3.25% per year.

Administrative Expenses. 0.50% of payroll.

Demographic Assumptions (effective with June 30, 2017 valuation)

Rates of Retirement. These rates are used to measure the probability of an eligible magistrate retiring at the indicated ages.

Ages	Active Magistrates Retiring Within the Year Following Attainment of Indicated Ages
45-59	30 %
60-65	35
66-69	30
70	100

A member was assumed to be eligible for normal retirement after attaining 24 years of service, regardless of age; age 60 with 15 years of service; or age 65 with 5 (8 if initially became a member on or after July 1, 2014) or more years of service, provided that the member had a minimum of 5 or 8 years of service under the Magistrate Retirement Fund.

Rates of Disability. Beginning with the June 30, 2008 valuation there are assumed to be no future disabled retirees.

Rates of Separation from Active Membership. The rates are used to measure probabilities of active members terminating that status for a reason other than disability or death. The rates do not apply to magistrates who are eligible for retirement.

Ages	Percent of Active Magistrate Separating Within the Next Year
20	4.00 %
25	4.00
30	4.50
35	5.00
40	5.50
45	6.00
50	6.50
55	7.00
60	7.50

Mortality Assumption (effective with June 30, 2018 valuation). RPH-2014 Blue Collar mortality table with female ages set forward one year. Future improvement in mortality rates is assumed using 60% of the MP-2017 projection scale generationally.

Sample Mortality Rates (Base Rates)								
Pre-Commencement			Post-Commencement			Post-Commencement		
Age	Male	Female	Age	Male	Female	Age	Male	Female
25	0.000733	0.000244	35	0.001793	0.001169	80	0.053460	0.042932
30	0.000717	0.000317	40	0.002156	0.001611	85	0.088524	0.072752
35	0.000797	0.000417	45	0.003275	0.002671	90	0.146859	0.125111
40	0.000958	0.000598	50	0.005604	0.004235	95	0.223428	0.197901
45	0.001455	0.001013	55	0.007342	0.005165	100	0.313988	0.291040
50	0.002490	0.001685	60	0.009893	0.006890	105	Disabled retirees use the same assumption as healthy lives.	
55	0.004071	0.002510	65	0.014089	0.010092	110		
60	0.006743	0.003606	70	0.021101	0.016038	115		
65	0.011612	0.005456	75	0.032952	0.026199	120		

Miscellaneous and Technical Assumptions

Marriage Assumption:	All members are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. At retirement, 87% of members are assumed to be married for purposes of valuing death after retirement benefits.
Pay Increase Timing:	Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Decrement Timing:	Decrements of all types are assumed to occur at the beginning of year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Withdrawal decrements do not operate during retirement eligibility.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report and the actual payroll payable at the time contributions are made.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.

Definitions of Technical Terms

Accrued Service. Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability. The difference between the actuarial present value of future benefit payments and the actuarial present value of future normal costs. Also referred to as "accrued liability" or "prior service liability."

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefit payments" between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial valuation cost method."

Actuarial Equivalent. A single amount or series of amounts of equal actuarial present value to another single amount or series of amounts, computed on the basis of appropriate actuarial experience estimates.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment. Also referred to as "present value."

Amortization. Paying off an interest-discounted amount with periodic payments of interest and principal – as opposed to paying off with a lump sum payment.

Experience Gain (Loss). The difference between actual actuarial costs and anticipated actuarial costs – during the period between two valuation dates.

Normal Cost. The actuarial cost allocated to the current year by the actuarial cost method.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and the funding value of assets. Sometimes referred to as the "unfunded accrued liability."

Membership

Includes all magistrates. Magistrates that received HJC/HB 216 exemptions prior to July 1, 2014 do not become members until the exemptions expire.

Voluntary Retirement

A magistrate may voluntarily retire: (1) at age 65 with 5 (8 if initially became a member on or after July 1, 2014) or more years of service; (2) at age 60 with 15 or more years of service; or (3) at any age with 24 or more years of service. Magistrates with one or more years of service in PERA, ERA or JRA may combine service credits to satisfy these voluntary retirement conditions.

Final Average Salary

For service credit earned before June 30, 2014, the salary received during the last 1 year in office prior to retirement. For service credit earned on or after July 1, 2014, the average salary received for the highest 5 year consecutive period.

Retirement Pension

Annual pension for service prior to 7/1/2014 is equal to:

75% of final average salary (FAS) x 5% x (years of service prior to 7/1/2014 (not exceeding 15) plus 5)

Maximum is 75% of FAS (15 or more years of service). For service credit earned on or after July 1, 2014, 3.5% of five year final average salary with a maximum of 85% of five year final average salary. For magistrates whose initial membership is on or after July 1, 2014, annual pension is 3.0% of five year final average salary for each year of service with a maximum of 85% of five year final average salary.

Total benefit is limited to 85% of five year final average salary.

Survivor's Pension – Retired Magistrates

The surviving spouse of a retired magistrate whose initial membership is prior to July 1, 2014 receives a pension of 75% of the magistrate's pension until death. Pension is payable to deceased magistrate's minor and dependent children if there is no eligible surviving spouse. For a magistrate whose initial membership is on or after July 1, 2014, any benefit the surviving spouse receives depends on the payment form elected by the magistrate at retirement.

Survivor's Pension – Active Magistrates

Applicable if magistrate had 5 (8 if initially became a member on or after July 1, 2014) or more years of service. The surviving spouse of a magistrate whose initial membership is prior to July 1, 2014 would receive 75% of magistrate's vested pension until death. The surviving spouse of a magistrate whose initial membership is on or after July 1, 2014 would receive the greater of 30% of final average salary or the accrued normal retirement pension under the 100% joint and survivor payment form. Pension is payable to deceased magistrate's minor and dependent children if there is no eligible surviving spouse.

Disability

Applicable if magistrate has 5 (8 if initially became a member on or after July 1, 2014) or more years of service and becomes incapacitated to perform duties of office. Magistrate would receive vested pension. Service requirement is waived if the disability is duty-related.

Deferred Retirement Pension (Vested Retirement)

If magistrate service terminates after 5 (8 if initially became a member on or after July 1, 2014) years of service, the magistrate and spouse retain entitlement to benefits of the fund.

Annual pension for service prior to 7/1/2014 is equal to:

75% of final average salary (FAS) x 5% x (years of service prior to 7/1/2014 (not exceeding 15) plus 5)

Maximum is 75% of FAS (15 or more years of service). For service credit earned on or after July 1, 2014, 3.5% of five year final average salary with a maximum of 85% of 5 year final average salary. For magistrates whose initial membership is on or after July 1, 2014, annual pension is 3.0% of five year final average salary for each year of service with a maximum of 85% of five year final average salary.

Total benefit is limited to 85% of five year final average salary.

Payment of the magistrate's pension commences at age 60 if the magistrate has 15 or more years of service or at age 65 if the magistrate has 5 (8 if initially became a member on or after July 1, 2014) or more years of service but less than 15 years of service.

Cost-of-Living Increases

Effective July 1, 2014, there will be no COLA increases for 2014 and 2015. Starting July 1, 2016, annual 2% COLA increases will be subject to PERA's certification based on the Fund's current year and projected next year funded ratio being equal to or greater than 100%. At a minimum, a 2% COLA increase will be granted every third year. COLA increases are subject to the following eligibility periods:

- If member retires prior to July 1, 2014, COLA is payable after retirement has been in effect for at least 2 full calendar years.
- If member retires on or after July 1, 2014 but prior to July 1, 2015, COLA is payable after retirement has been in effect for at least 3 full calendar years.
- If member retires on or after July 1, 2015 but prior to July 1, 2017, COLA is payable after retirement has been in effect for at least 4 full calendar years.
- If member retires on or after July 1, 2016, COLA is payable after retirement has been in effect for at least 7 full calendar years.

If retired on account of disability or if at least age 65, the above waiting period is reduced to 1 full calendar year.

Member Contributions

Members contribute 10.5% of salary beginning July 1, 2014

Refund of Magistrate's Contributions

If a magistrate leaves service or dies and no pension becomes payable, the accumulated contributions are refunded or paid to the designated beneficiary.

Public Payments

$25.00 from each civil action docket fee and $10 from each civil jury fee paid in the magistrate court. Statutory employer contributions are 15% of salary.

Appendix D: Risk Considerations

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, was first applicable for the June 30, 2019 actuarial valuation.

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- external risks such as the regulatory and political environment.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates. The following discussion includes a few exhibits which summarize some historical information to help indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.

The investment return on assets is the most obvious risk – and usually the primary risk – to funding a pension plan. To illustrate the magnitude of this risk, the following chart shows the Asset Volatility Ratio (AVR), defined as the fair value of assets divided by covered payroll.

HISTORICAL ASSET VOLATILITY RATIOS

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions.

Actuarial Valuation Date	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ACR with a Return 10% Lower than Assumed*
6/30/2011	$ 33,198,106	$ 3,405,121	9.75	3.90%
6/30/2012	$ 30,852,254	$ 3,213,712	9.6	3.84%
6/30/2013	$ 32,439,317	$ 3,136,834	10.34	4.14%
6/30/2014	$ 35,184,910	$ 3,515,567	10.01	4.00%
6/30/2015	$ 33,187,494	$ 5,065,798	6.55	2.62%
6/30/2016	$ 31,038,048	$ 5,482,360	5.66	2.26%
6/30/2017	$ 32,225,122	$ 5,487,517	5.87	2.35%
6/30/2018	$ 32,092,452	$ 5,849,815	5.49	2.20%
6/30/2019	$ 31,797,388	$ 5,849,795	5.44	2.18%
6/30/2020	$ 29,070,669	$ 5,914,106	4.92	1.97%
6/30/2021	$ 35,164,297	$ 6,106,006	5.76	2.30%

*The impact of asset smoothing is not reflected in the impact on the Actuarial Contribution Rate (ACR). Current year assumptions are used for all years shown.

The assets as of June 30, 2021 are about 5.8 times the amount of covered payroll. Consequently, underperforming the investment return assumption by 10.00% (i.e., earn -2.75% for one year) is equivalent to about 58% of payroll. While the actual impact of this experience in the first year is mitigated by the asset smoothing method and amortization of the UAL, this table illustrates the risk associated with volatile investment returns. Such an event in one year would be expected to increase the actuarial contribution rate by 2.30% of payroll.

HISTORICAL CASH FLOWS

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. This is a metric the investment consultants usually focus on when evaluating the asset allocation. The maturity of the system is the main contributor to the situation.

Actuarial Valuation Date	Market Value of Assets	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/2011	$ 33,198,106	1,257,878	3,011,024	(1,753,146)	-2.54%
6/30/2012	$ 30,852,254	1,025,909	3,218,401	(2,192,492)	-4.03%
6/30/2013	$ 32,439,317	1,158,405	3,432,647	(2,274,242)	-4.09%
6/30/2014	$ 35,184,910	1,059,164	3,729,633	(2,670,469)	-4.45%
6/30/2015	$ 33,187,494	1,426,244	4,002,751	(2,576,507)	-4.16%
6/30/2016	$ 31,038,048	1,867,096	3,988,241	(2,121,145)	-4.83%
6/30/2017	$ 32,225,122	1,885,718	3,988,281	(2,102,563)	-4.48%
6/30/2018	$ 32,092,452	1,812,207	4,027,290	(2,215,083)	-4.71%
6/30/2019	$ 31,797,388	1,875,825	4,109,379	(2,233,554)	-5.57%
6/30/2020	$ 29,070,669	1,943,040	4,232,441	(2,289,401)	-7.88%
6/30/2021	$ 35,164,297	2,999,352	4,368,241	(1,368,889)	-3.89%

Appendix D: Risk Considerations

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. Historically, the Fund has been funded with fixed contribution rates by both employees and the employer. In 2020, Senate Bill 122 implemented a monthly distribution of $100,000 to the Fund until achieving 100% funded status. However, the combined statutory contribution rates have failed to meet the actuarial required contribution in each of the past ten years, when looking to fund the System over 25 years. We would note that with the adoption of SB 122 the Fund is expected to be fully funded in the future, if all assumptions are met.

Funding a retirement system with fixed contribution rates creates some unique funding challenges. Given the extreme volatility associated with the underlying investments of the portfolio, wide variations in the actual return on the market value of assets is expected. However, when it occurs it can change the long-term funding outlook from positive to negative or vice versa. By the time a trend has been identified, it is possible for the funded status of the System to have seriously declined, requiring more substantive resources to compensate for the investment losses

A key demographic risk for all retirement systems is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience over time and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, as experienced with the COVID-19 pandemic. This type of event is also significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.