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STATE OF IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

Actuarial Valuation Report as of July 1, 2022

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ADDENDUM

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October 12, 2022

Board of Trustees
Iowa Peace Officers' Retirement, Accident
and Disability System
215 East 7th Street
Des Moines, IA 50319

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Iowa Peace Officers' Retirement, Accident and Disability System as of July 1, 2022. The purpose of this report is to provide a summary of the funded status of the System as of July 1, 2022 and determine the normal contribution rate as defined in Iowa Code Chapter 97A.8. There have been no changes to the plan provisions or actuarial methods since the prior valuation. The regularly scheduled five-year experience study, covering the period from July 1, 2016 through June 30, 2021, was completed in June of 2022. Based on the findings in the study, the POR actuary recommended changes to the System's actuarial assumptions which were adopted by the POR Board at their July 2022 meeting. These assumption changes, as well as their impact on the current valuation results, are discussed further in the Executive Summary section of this report.

In preparing our report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, statutory provisions, member data and financial information. We found this information to be reasonably consistent and comparable with information provided in prior years. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete, our results may be different and our calculations may need to be revised.

We further certify that all costs, liabilities, rates of interest and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the System.

Nevertheless, the emerging costs will vary from those presented in this report to the extent actual experience differs from that projected by the actuarial assumptions. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix C.

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In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); 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.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. Actuarial computations for purposes of fulfilling financial accounting requirements for the System under Governmental Accounting Standards No. 67 and No. 68 are provided in a separate report.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We respectfully submit the following report and look forward to discussing it with you.

Patrice Beckham

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

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

Aaron J. Chochon, ASA, EA, FCA, MAAA
Associate Actuary

Purpose of the Report

This report presents the results of the July 1, 2022 actuarial valuation of the Iowa Peace Officers' Retirement, Accident and Disability System (POR). The primary purposes of performing the valuation are as follows:

- to determine the normal contribution rate payable by the State under Chapter 97A.8(1)(b) of the Code of Iowa (referred to in this report as the "actuarial contribution rate");
- to evaluate the sufficiency of the statutory contribution rates to fund the System over the long term;
- to satisfy the reporting requirements under Chapter 97 D.5 of the Code of Iowa;
- to assess and disclose the key risks associated with funding the System;
- to disclose asset and liability measures indicating the current funded status of the System as of the valuation date; and
- to analyze and report on trends in System contributions, assets, and liabilities over the past several years.

Given the importance of actuarial assumptions in the valuation process, the Iowa Peace Officers' Retirement, Accident and Disability System performs a comprehensive experience study at least every five years. The purpose of the experience study is to review the current assumptions, in light of actual experience, and determine whether changes are needed to more appropriately model future experience. The regularly scheduled five-year experience study, covering the period from July 1, 2016 through June 30, 2021, was completed in June of 2022. Based on the findings in the study, the POR actuary recommended the following changes to the System's actuarial assumptions which were adopted by the POR Board at their July 2022 meeting:

- Investment return assumption was lowered from 7.00% to 6.50% to more closely reflect the expected return of the POR portfolio, based on information provided by the System's investment consultant. This change is consistent with the general trend of lowering investment return assumptions observed in other public retirement systems in the United States.
- Mortality assumption was changed to the Pub-2010 Safety Mortality Tables, set back 2 years for males and females, projected generationally using Scale MP-2021. For the first time, the Society of Actuaries published mortality tables based solely on public plan data, including a specific table for Public Safety members. The move to this table is expected to more accurately anticipate mortality experience for the System in the future.
- Retirement rates were changed to service-based rates to more closely model the actual experience observed in the study period.
- Termination rates were adjusted to better reflect the actual experience observed in the study period.
- Accidental and ordinary disability rates were adjusted to better reflect the actual experience observed in the study period.
- The merit salary scale was adjusted to better reflect the actual experience.

The new set of actuarial assumptions are intended to better model future experience and, therefore, produce a better estimate of the liability associated with future benefit payments. The actuarial methods were also studied, but there were no changes recommended in the experience study. As a result of the assumption changes, the actuarial accrued liability (AAL) increased by $72.3 million and the actuarial contribution rate increased by 14.69% of pay.

The following table shows a summary of the impact on the current valuation results due to the changes in the actuarial assumptions:

	Prior Assumptions	Current Assumptions	Difference
Actuarial Accrued Liability (AAL)	$812.0	$884.3	$72.3
Actuarial Value of Assets (AVA)	700.7	700.7	0.0
Unfunded AAL (UAAL)	$111.3	$183.7	$72.3
Funded Ratio	86.3%	79.2%	(7.1%)
Normal Cost Rate	30.17%	35.33%	5.16%
Administrative Expenses	0.71%	0.71%	0.00%
UAAL Rate	19.88%	29.41%	9.53%
Actuarial Required Contribution	50.76%	65.45%	14.69%

Note: Numbers may not add due to rounding.

Although the System's funded ratio declined and the unfunded actuarial accrued liability increased, as expected, the assumption changes are a positive factor for the System's funding as actual experience is now expected to be closer to the new set of assumptions, thus avoiding or limiting actuarial losses in the future. This is especially important given the fixed contribution rates used to fund the System.

The valuation results provide a "snapshot" view of the System's financial condition on July 1, 2022. The unfunded actuarial accrued liability (UAAL) increased from $122 million on July 1, 2021 to $184 million on July 1, 2022, primarily due to the assumption changes noted earlier. In addition, there were no changes to the benefit provisions since the last valuation.

The experience of both the System's assets and liabilities impacts the System's funding and the actuarial contribution rate. Experience that is more favorable than anticipated, based on actuarial assumptions, will generally lower the UAAL and the actuarial contribution rate, while experience that is less favorable than expected will generally increase the UAAL and the actuarial contribution rate. The State's actuarial contribution rate increased from 40.47% in last year's valuation to 54.05% this year, given the member contribution rate of 11.40%. The State's actuarial contribution rate exceeds the fixed payroll-related contribution rate for FY 2023 of 37.00% by 17.05%. However, by statute the State is required to make supplemental contributions of $5.0 million per year until the System is at least 85% funded. With the State's supplemental contribution for FY 2023, the contribution shortfall is reduced to 7.17%.

Several key factors impacted the actuarial contribution rate from the last valuation:

- The rate of return on the market value of assets for fiscal year 2022, as provided by the State Treasurer's office, was -21.7%. However, due to the use of an asset smoothing method, only part of the actuarial loss (return below the assumed 7% for FY 2022) on assets for this year is recognized in the current valuation. Coupled with recognition of the current year's portion of the deferred investment experience from prior years, the rate of return on the actuarial value of assets was 7.8%, which is higher than the expected return of 7.0%. This produced an actuarial gain that decreased the UAAL by $5.5 million and lowered the actuarial contribution rate by 0.80% of pay. The market value of assets is now 10.8% lower than the actuarial (smoothed) value of assets, reflecting a net deferred investment loss.

- The statutory contribution rates for fiscal year 2022 were higher than the actuarial contribution rate. As a result, the contribution margin resulted in a decrease in the UAAL of $3.4 million, which decreased the actuarial contribution rate by 0.50% of pay.

- There was a net liability loss of $1.0 million, largely due to mortality and retirement experience that was less favorable than assumed based on the actuarial assumptions. There were actuarial gains for salary and post-retirement escalator increases that were lower than anticipated based on the actuarial assumptions, but they were offset by the losses from other sources. The liability experience increased the UAAL by $1.0 million and the actuarial contribution rate by 0.15% of pay.

A more detailed discussion of actual experience is included later in this section of the report.

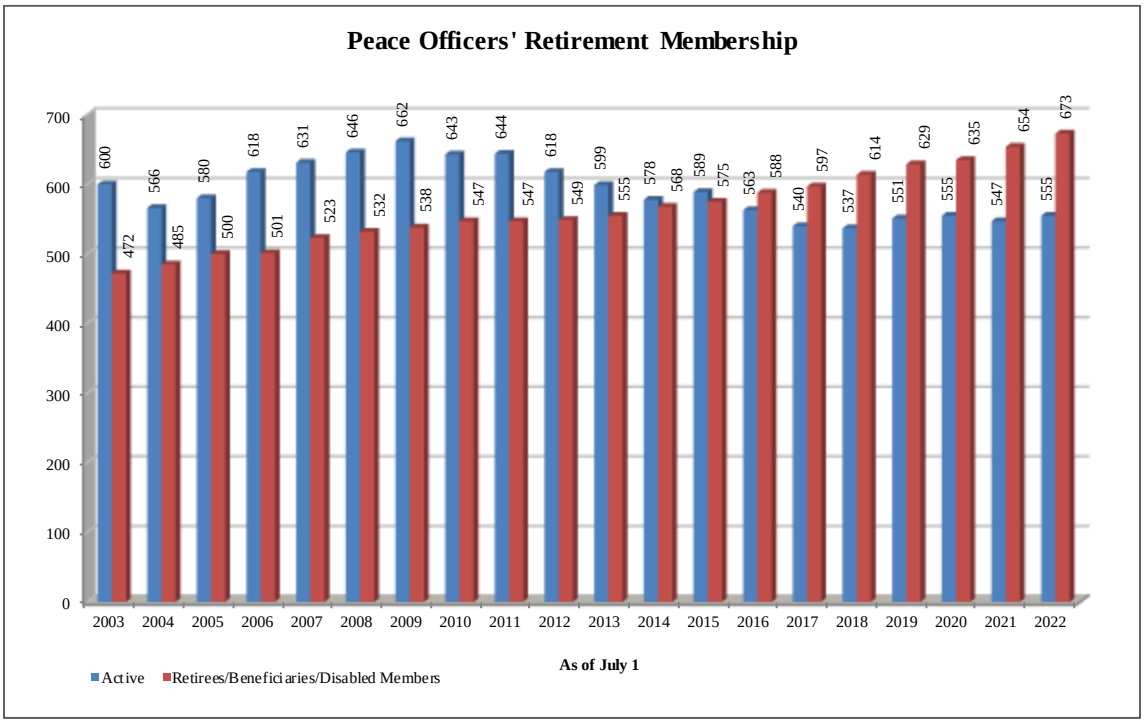
The statutory contribution rate for the State is 37.0% of payroll. In addition, by statute the State makes a supplemental contribution of $5.0 million per year until the System is 85% funded. The supplemental contribution of $5.0 million is an important component of strengthening PORS' long-term funding as it represents an additional funding source of about 10% of payroll.

The deferred investment experience of $76 million will flow through the asset smoothing method over the next four years and is expected to decrease the funded status. However, the actual investment returns in the next few years will also impact the actuarial value of assets and the funded ratio.

Membership

The number of active members increased from 547 in the prior valuation to 555 in the current valuation, an increase of 1.5%. Coupled with the increase in active membership, the total covered payroll increased by 3.0%, slightly above the expected increase of 2.75%. The higher active payroll than expected has a positive impact on the funding of the System because actual contributions into the System are higher than scheduled and the UAAL decreases more than expected.

As the following graph indicates, the number of active members in the System has decreased about 16% since 2009. Over this period, the number of retirees has continually grown to the point where the number of retirees is now larger than the number of actives. This is not necessarily problematic and, in fact, is a key reason for funding retirement systems in advance. Such growth in the number of retirees is expected and factored into the valuation process. However, this demographic characteristic can create a funding challenge because the volatility in investment returns has a greater impact on the actuarial contribution rate due to the size of plan assets compared to active member payroll. See Table 14 for more information.



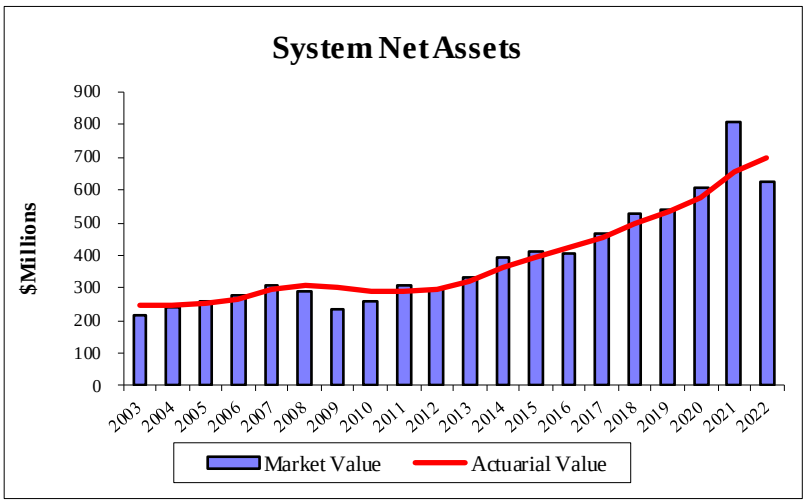
Assets

As of July 1, 2022, the System had total funds, on a market value basis, of $625.1 million. This is a decrease of $182.5 million from last year's market value of $807.6 million. The market value of assets is not used directly in the calculation of the funded status or the actuarial contribution rate. The System uses an asset valuation method to smooth the effects of market fluctuations. The actuarial value of assets spreads the difference between the actual return and the expected return (based on the actuarial assumption) on the market value of assets evenly over five years. See Tables 3 and 4 for a detailed development of the actuarial value of assets. The components of the change in the asset values are shown in the following table:

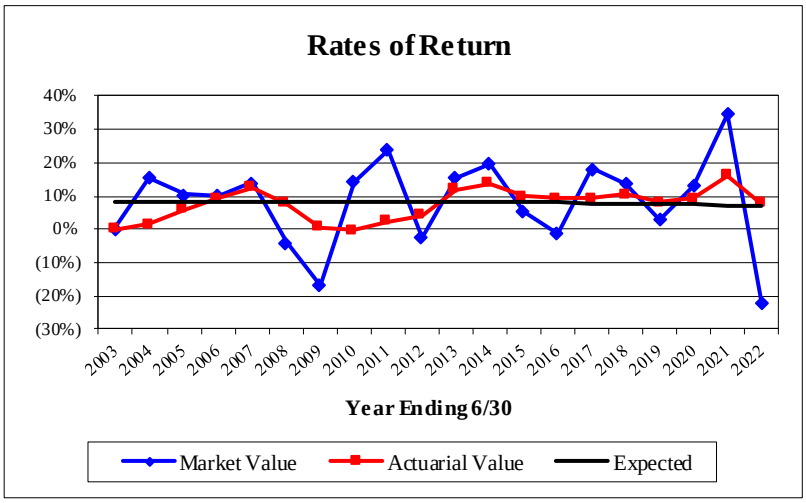
	Market Value	Actuarial Value
Net Assets, July 1, 2021	$807,593,863	$658,081,471
• Member Contributions	6,055,840	6,055,840
• Employer Contributions	18,057,085	18,057,085
• Supplemental State Appropriations	5,000,000	5,000,000
• Benefit Payments	(37,440,028)	(37,440,028)
• Administrative Expenses	(350,264)	(350,264)
• Investment Income	(173,853,365)	51,253,886
Net Assets, July 1, 2022	$625,063,131	$700,657,990

The net rate of return on the market value of assets for FY 2022, as provided by the System, was -21.7%. Measured on the actuarial value of assets, the rate of return was 7.8% which resulted in an actuarial gain of $5.5 million.

The market value of assets is currently $75.6 million, or 10.8%, lower than the actuarial value of assets. This deferred asset loss will be recognized over the next four years, resulting in an increase in the actuarial contribution rate, unless offset by favorable experience in future years.



During this period, the actuarial value of assets has been both above and below the market value of assets, which is expected when using an asset smoothing method.



Rates of return on the market value of assets have been extremely volatile, while the return on the actuarial value of assets has been more stable. This illustrates the advantage of using an asset smoothing method.

System Liabilities

The actuarial accrued liability is that portion of the present value of future benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and asset values at the same date is referred to as the unfunded actuarial accrued liability (UAAL). The unfunded actuarial accrued liability will be reduced if the employer's contributions exceed the employer's normal cost for the year, after allowing for interest on the previous balance of the unfunded actuarial accrued liability. Benefit improvements, experience gains and losses, and changes in actuarial assumptions and methods will also impact the total actuarial accrued liability (AAL) and the unfunded portion thereof.

The unfunded actuarial accrued liability as of July 1, 2022 is as follows:

Actuarial Accrued Liability	$884,315,607
Actuarial Value of Assets	700,657,990
Unfunded Actuarial Accrued Liability	$183,657,617

See Table 7 for the detailed development of the actuarial accrued liability and the unfunded actuarial accrued liability.

Factors influencing the UAAL from year to year include actual experience versus that expected based on the actuarial assumptions (for both assets and the actuarial accrued liability), changes in actuarial assumptions, procedures or methods and any changes in benefit provisions. The impact of the assumption changes was discussed earlier. The actual experience measured in this valuation is that which occurred during the prior plan year (FY 2022). There was a $5.5 million experience gain on the actuarial value of assets and a $1.0 million net experience loss on the actuarial accrued liability, primarily due to mortality and retirement experience that was less favorable than assumed based on the actuarial assumptions. The combined result of both asset and liability experience was a decrease in the UAAL of $4.5 million.

Between July 1, 2021 and July 1, 2022, the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

	$ millions
Unfunded Actuarial Accrued Liability, July 1, 2021	$122.1
· effect of contributions above the actuarial rate	(3.4)
· expected decrease due to amortization method	(2.2)
· investment experience	(5.5)
· liability experience*	1.0
· assumption changes	72.3
· other experience	(0.6)
Unfunded Actuarial Accrued Liability, July 1, 2022	$183.7

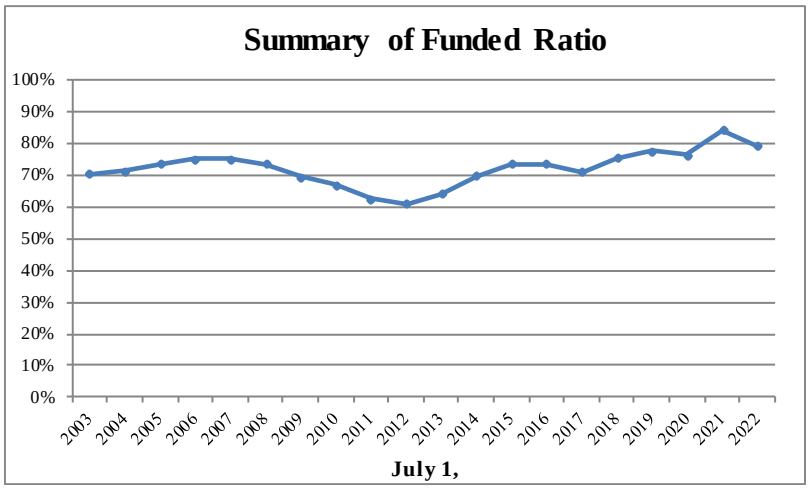
* Liability loss is about 0.1% of total actuarial accrued liability.

An evaluation of the unfunded actuarial accrued liability on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the unfunded actuarial accrued liability and the progress made in its funding is to track the funded status, the ratio of the actuarial value of assets to the actuarial accrued liability. The funded status information, on both an actuarial and a market value basis, is shown on the following table (in millions). Note that the funded ratio does not indicate whether the System has sufficient funds to settle all current obligations, nor is it necessarily indicative of the need for future funding.

	7/1/2018	7/1/2019	7/1/2020	7/1/2021	7/1/2022
Using Actuarial Value of Assets:					
Funded Ratio	75.4%	77.5%	76.4%	84.4%	79.2%
Unfunded Actuarial Accrued Liability (UAAL)	$162	$154	$177	$122	$184
Using Market Value of Assets:					
Funded Ratio	80.3%	78.8%	80.5%	103.5%	70.7%
Unfunded Actuarial Accrued Liability (UAAL)	$130	$145	$147	($27)	$259

Note: assumptions were changed in the 2020 and 2022 valuations.

The funded status of the System over the last 20 years is shown in the following graph. Due to the asset smoothing method, the impact of the Great Recession was not fully recognized until the 2012 valuation at which point the funded ratio was 61%. Since that time, strong investment returns and increasing contributions have strengthened the funded status of the System.



Contribution Rates

Under the Entry Age Normal cost method, the actuarial contribution rate consists of:

- a "normal cost" for the portion of projected liabilities allocated by the actuarial cost method to service of members during the current year;
- an "administrative expense" for the expenses expected to be paid from the trust for the year; and
- an "unfunded actuarial accrued liability contribution" for the excess of the actuarial accrued liability over the actuarial value of assets.

The UAAL is funded using a "layered" approach with new pieces of UAAL amortized as a level-percent of payroll over a closed 20-year period, beginning with the July 1, 2018 valuation. The legacy UAAL (amount as of July 1, 2017) continues to be amortized on its existing schedule (16 years remaining).

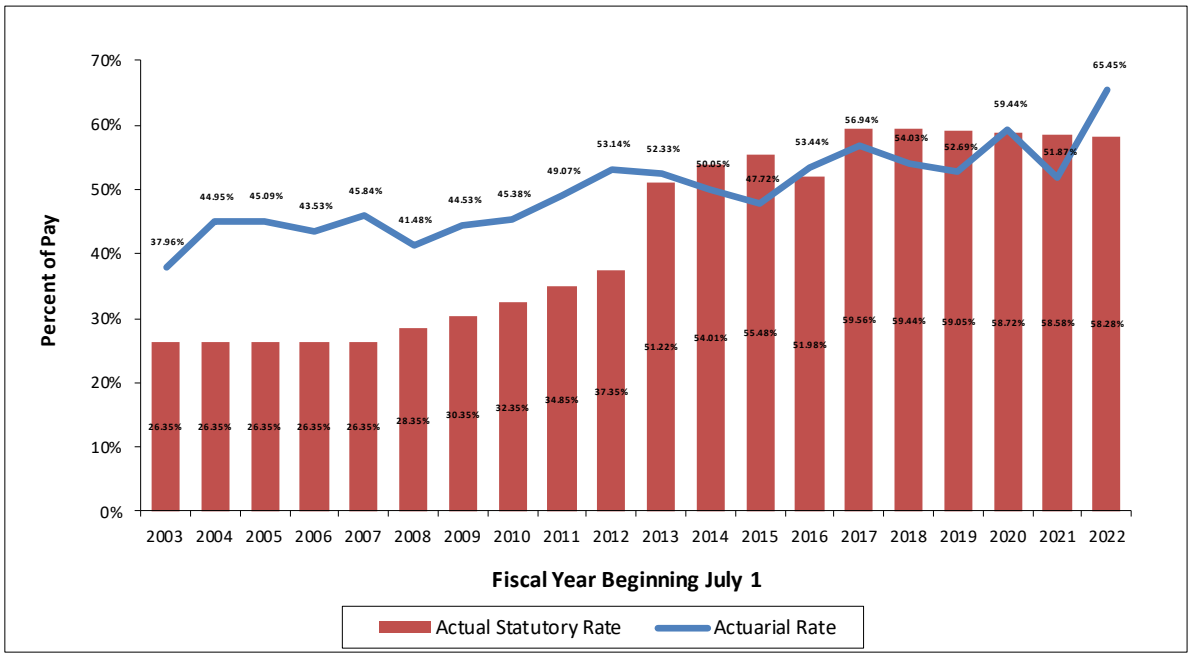
The total actuarial contribution rate for the Plan Year beginning July 1, 2022 is 65.45% of covered payroll. Based on the member contribution rate of 11.40%, the State's portion of the actuarial contribution rate is 54.05%. The sources of change are shown in the following table. The largest factor in the change in the actuarial contribution rate from the prior valuation is the change to the actuarial assumptions, as shown in the following table.

	Plan Year Beginning July 1, 2022	Plan Year Beginning July 1, 2021
Prior year total contribution rate	51.87%	59.44%
· change due to asset (gains)/losses	(0.80%)	(7.78%)
· change due to liability experience	0.15%	(0.29%)
· change due to other actuarial experience	(0.04%)	0.48%
· change due to assumption changes	14.69%	0.00%
· change due to actual contribution rate (above)/below the actuarial rate	(0.50%)	0.05%
· change in normal cost rate	0.08%	(0.03%)
Current year total actuarial contribution rate	65.45%	51.87%
Members' contribution rate	(11.40%)	(11.40%)
State's actuarial contribution rate	54.05%	40.47%

Contributions to the System are made by both the members and the State. Historically, members contributed 9.35% of pay, but the member contribution rate increased to 9.85% for FY 2012, 10.35% for FY 2013, 10.85% for FY 2014 and to an ultimate rate of 11.35% in FY 2015 (changed to 11.40% in conjunction with a benefit change by the 2014 legislature). The State's contribution rate was 17.00% of pay for many years, but began increasing 2.00% per year commencing July 1, 2008. In 2010, the Legislature passed a bill that continued the 2.00% annual increase with an ultimate contribution rate of 37.00% for FY 2018 and thereafter until the normal contribution rate is less than 37.00%. It also provided for a supplemental State appropriation of $5.0 million per year beginning July 1, 2013 (originally July 1, 2012 but extended by the 2012 legislature) and ending June 30 of the fiscal year during which the System's funded ratio is at least 85%. However, HF 2459 in the 2016 session reduced the supplemental contribution for FY 2017 to $2.5 million. The supplemental contribution returned to $5.0 million for FY 2019 and is expected to remain at that level.

Projected results over the next 20 years, which reflect all assumptions being met in every year, indicate that the supplemental contributions of $5.0 million from the State will continue to be needed. However, actual experience will undoubtedly unfold differently than assumed, especially from year to year, and is therefore expected to impact these projections, perhaps significantly. The State's fixed contribution rate of 37.00% and the supplemental contributions of $5.0 million payable until the funded ratio is 85%, along with the member contribution rate of 11.40%, are expected to maintain the System's funded status between 70-80% if all actuarial assumptions, including a 6.50% return, are met in the future.

The following graph shows the total actuarial contribution rate compared to the actual contribution rate in each year.



Following an eleven-year period in which actual statutory contributions to the System were significantly less than the actuarial contribution rate, the contribution shortfall has been largely eliminated in the last ten valuations, with a contribution margin occurring in six of the last ten valuations. Retirement systems that are funded with fixed contribution rates typically oscillate between rates that are above and then below the actuarial contribution rate. The pattern observed for POR in recent years is not unexpected or unusual.

Summary

The System's funded ratio decreased from 84% to 79%, primarily due to the impact of the assumption changes which included lowering the investment return assumption from 7.0% to 6.5%. On a market value of assets basis, the System's funded ratio declined from 104% to 71% as a result of the FY 2022 return of -21.7%.

Given the use of an asset smoothing method, the most significant impact on the July 1, 2022 actuarial valuation was the new set of actuarial assumptions adopted as a result of the five-year experience study performed in 2022, as scheduled. The new set of assumptions is intended to better model future experience and, therefore, produce a better estimate of the liability associated with future benefit payments. Over the past ten years, the actuarial assumptions have been significantly strengthened, in particular the investment return assumption. As a result, there is now a higher probability that actual returns in the future will meet or exceed the assumptions which should reduce the amount and frequency of future actuarial investment losses.

Although the combined contribution rate for members and the State is 48.40% of pay, which is well above the System's normal cost rate of 35.33%, the increase in the UAAL from the new assumptions and the FY 2022 investment experience resulted in a situation where current

contributions do not move the System's funded ratio significantly over the next ten to twenty years. However, future investment experience will have a significant impact the System's funding progress just as the FY 2022 had a significant impact. We will continue to monitor the actuarial metrics in the valuation and evaluate the System's long-term funding in future valuations.

The State's actuarial contribution rate for FY 2022 was 40.47%, while the State's statutory fixed contribution rate was only 37.00% of covered payroll. However, the $5.0 million supplemental contribution by the State for FY 2022 represented about 10% of payroll so the total expected State contribution for FY 2022 was 47.18%. This resulted in a higher contribution rate (6.71% of payroll), or $3.4 million. The supplemental contribution of $5.0 million remains in place for FY 2023 and reduces the contribution shortfall for FY 2023. If all actuarial assumptions are met, the System's funded ratio is expected to remain under 85% in the near future and the supplemental contribution of $5 million will be needed.

The long-term financial health of this, and all retirement systems, is heavily dependent on two key items: (1) future investment returns and (2) contributions to the System. Over the past five years, the actual dollar amount of investment return, in total, was less than the expected return on a market basis and, as a result, the System has $75.6 million in net deferred asset losses that will be recognized in the actuarial value of assets over the next four years. In addition, total contributions have been at or above the actuarial contribution rate in six of the past last ten years, which has improved the System's funding. The impact of increased contributions since 2010 on the System's long-term funding is starting to be reflected in an improved funded status.

A typical retirement plan faces many different risks. 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, year to year, as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. Actuarial Standard of Practice Number 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. Risk evaluation is an important part of managing a defined benefit plan. Please see Section 5 of this report for an in-depth discussion of the specific risks facing the Iowa Peace Officers' Retirement, Accident and Disability System.

A summary of key data elements and valuation results as of July 1, 2022 and July 1, 2021 is presented on the following page. More detail on each of these elements can be found in the following Sections of this report.

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

SUMMARY OF PRINCIPAL RESULTS

	July 1, 2022 Valuation	July 1, 2021 Valuation	% Change
PARTICIPANT DATA			
Number of			
Active Members	555	547	1.5
Retirees/Beneficiaries/Disabled Members	673	654	2.9
Inactive Vested Members	42	41	2.4
Inactive Nonvested Members	9	6	50.0
Total Members	1,279	1,248	2.5
Projected Annual Salaries of Active Members	$ 50,602,707	$ 49,109,332	3.0
Average Annual Projected Salary	$ 91,176	$ 89,779	1.6
Average Annual Benefit for Retired Members, Disabled Members and Beneficiaries	$ 57,541	$ 55,847	3.0
ASSETS AND LIABILITIES			
Total Actuarial Accrued Liability	$884,315,607	$780,150,277	13.4
Actuarial Value of Assets	700,657,990	658,081,471	6.5
Unfunded Actuarial Accrued Liability	$183,657,617	$122,068,806	50.5
Funded Ratio (Actuarial Value of Assets)	79.2%	84.4%	(6.2)
Market Value of Assets	$625,063,131	$807,593,863	(22.6)
Funded Ratio (Market Value of Assets)	70.7%	103.5%	(31.7)
CONTRIBUTION RATES			
Normal Cost Rate	35.33%	30.09%	17.4
Administrative Expenses	0.71%	0.59%	20.3
Amortization of Unfunded Actuarial Accrued Liability (Level Percent of Payroll)	29.41%	21.19%	38.8
Actuarial Required Contribution Rate	65.45%	51.87%	26.2
Member Contribution Rate	(11.40%)	(11.40%)	0.0
Employer Actuarial Required Contribution Rate	54.05%	40.47%	33.6
Statutory State Fixed Contribution Rate	(37.00%)	(37.00%)	0.0
State Supplemental Contribution*	(9.88%)	(10.18%)	(2.9)
Contribution Shortfall/(Margin)	7.17%	(6.71%)	(206.9)

* The supplemental contribution is $5 million annually until the System is at least 85% funded.

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is July 1, 2022. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System, which are generally in excess of assets. The actuarial process leads to a method of determining the contributions needed by members and the employer in the future to balance the System assets and liabilities.

Market Value of Assets

The current market value represents the "snapshot" or "cash-out" value of System assets as of the valuation date. In addition, market values of assets provide a basis for measuring investment performance from time to time. At July 1, 2022, the market value of assets for the Retirement System was $625.1 million. Table 1 is a comparison, at market values, of System assets as of July 1, 2021 and July 1, 2022, in total and by investment category. Table 2 summarizes the change in the market value of assets from July 1, 2021 to July 1, 2022.

Actuarial Value of Assets

The market value of assets, representing a "cash-out" value of System assets, is not the best measure of the System's ongoing ability to meet its obligations. To arrive at a suitable value for the actuarial valuation, a technique for determining the actuarial value of assets is used which dampens swings in the market value while still indirectly recognizing market values. The actuarial value of assets is equal to the market value of assets less a five-year phase-in of the excess (shortfall) between expected investment return (based on the actuarial assumption) and actual investment return.

Tables 3 and 4 show the development of the actuarial value of assets (AVA) as of the valuation date.

TABLE 1

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

ANALYSIS OF NET ASSETS AT MARKET VALUE

	July 1, 2022			July 1, 2021		
	Amount	**% of Total**		**Amount**	**% of Total**	
Pooled Cash	$ 4,769,793	0.7	%	$ 3,041,297	0.4	%
Receivables	3,610,000	0.6		2,279,162	0.3	
Common Stocks	401,679,201	62.5		592,239,346	71.6	
Securities on Loan	32,675,613	5.1		36,477,477	4.4	
Bonds	110,347,686	17.2		123,533,427	14.9	
Real Estate	90,084,755	13.9		69,905,996	8.4	
Subtotal	$643,167,048	100.0	%	$827,476,705	100.0	%
Payables	(18,103,917)			(19,882,842)		
NET ASSETS	$625,063,131			$807,593,863		

TABLE 2

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

SUMMARY OF FUND ACTIVITY
(Market Value)

1.	**NET ASSETS ON JULY 1, 2021**	**$ 807,593,863**
2.	**CONTRIBUTIONS**	
	a. Member Contributions	6,055,840
	b. Employer Contributions	18,057,085
	c. Supplemental State Appropriations	5,000,000
	d. Total Contributions	**$ 29,112,925**
3.	**BENEFIT PAYMENTS**	37,440,028
4.	**ADMINISTRATIVE EXPENSE**	350,264
5.	**NET INVESTMENT INCOME**	(173,853,365)
6.	**NET ASSETS ON JULY 1, 2022**	**$ 625,063,131**
	(1) + (2d) - (3) - (4) + (5)	

TABLE 3

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF ASSETS

		Plan Year Ending				
		2022	**2021**	**2020**	**2019**	**2018**
1.	Market value of assets, beginning of year	$807,593,863	$604,572,836	$539,362,237	$528,781,898	$468,300,420
2.	Contributions during year					
	a. Member	6,055,840	5,457,794	5,534,579	5,485,452	5,123,936
	b. Employer	23,057,085	22,711,497	22,364,425	21,840,234	21,498,155
	c. Total	29,112,925	28,169,291	27,899,004	27,325,686	26,622,091
3.	Benefits and expenses paid during year	37,790,292	35,370,239	33,671,901	32,642,634	30,966,019
4.	Expected rate of return on assets	7.00%	7.00%	7.50%	7.50%	7.50%
5.	Expected net investment income*					
	a. Market value of assets, beginning of year	56,531,570	42,320,099	40,452,168	39,658,642	35,122,532
	b. Contributions	1,001,719	969,250	1,027,299	1,006,188	980,280
	c. Benefits and expenses	(1,300,290)	(1,217,021)	(1,239,869)	(1,201,969)	(1,140,233)
	d. Total	56,232,999	42,072,328	40,239,598	39,462,861	34,962,579
6.	Expected Value of Assets (1) + (2c) - (3) + (5d)	855,149,495	639,444,216	573,828,938	562,927,811	498,919,071
7.	Market value of assets, end of year	625,063,131	807,593,863	604,572,836	539,362,237	528,781,898
8.	Excess (shortfall) of investment income for Year (7) - (6)	(230,086,364)	168,149,647	30,743,898	(23,565,574)	29,862,827

TABLE 4

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	Plan Year Ending June 30	
	2022	**2021**
Item		
1. Excess (Shortfall) of investment income for current and previous 3 years		
a. Current year	($230,086,364)	$168,149,647
b. One year ago	168,149,647	30,743,898
c. Two years ago	30,743,898	(23,565,574)
d. Three years ago	(23,565,574)	29,862,827
2. Deferral of excess (shortfall) of investment income		
a. Current year (80%)	(184,069,091)	134,519,718
b. One year ago (60%)	100,889,788	18,446,339
c. Two years ago (40%)	12,297,559	(9,426,230)
d. Three years ago (20%)	(4,713,115)	5,972,565
e. Total	($75,594,859)	$149,512,392
3. Market value of plan net assets, end of year	$625,063,131	$807,593,863
4. Actuarial value of plan assets, end of year (3) - (2e)	$700,657,990	$658,081,471
5. Actuarial value divided by market value	112.1%	81.5%

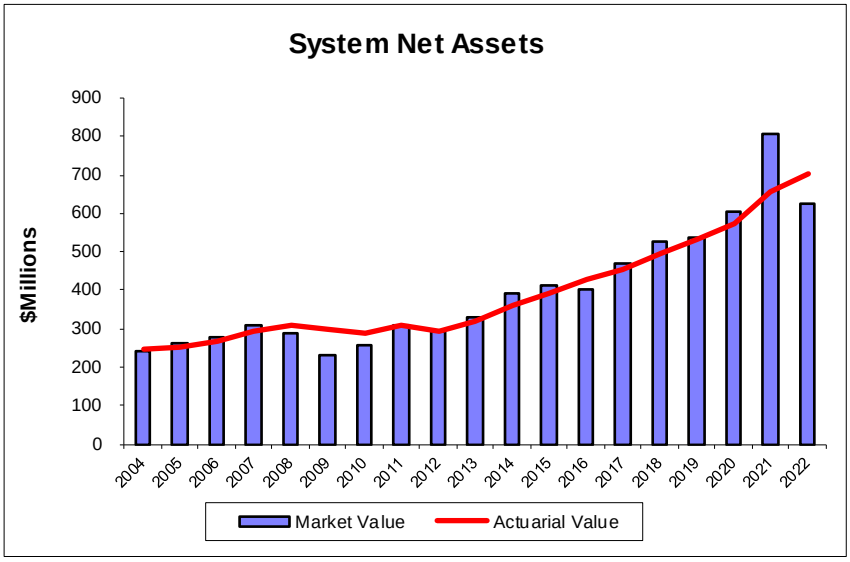
TABLE 5

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

HISTORICAL COMPARISON

Value As of	Market Value of Net Assets	Rate of Return (MVA)*	Actuarial Value of Assets	Estimated Rate of Return (AVA)
July 1, 2008	$290,306,257	(3.8%)	$307,291,608	7.8%
July 1, 2009	233,187,738	(16.9%)	300,262,337	0.6%
July 1, 2010	256,873,773	14.4%	290,558,596	(0.2%)
July 1, 2011	308,607,733	24.1%	309,330,330	2.5%
July 1, 2012	292,823,296	(2.5%)	292,909,884	4.3%
July 1, 2013	329,920,144	15.5%	319,441,635	11.9%
July 1, 2014	392,194,960	19.9%	360,063,755	13.7%
July 1, 2015	410,598,719	5.5%	392,989,970	10.0%
July 1, 2016	403,084,512	(1.2%)	426,398,446	9.2%
July 1, 2017	468,300,420	18.4%	453,128,907	9.2%
July 1, 2018	528,781,898	13.8%	496,503,424	10.6%
July 1, 2019	539,362,237	3.0%	530,900,116	8.1%
July 1, 2020	604,572,836	13.2%	573,716,266	9.2%
July 1, 2021	807,593,863	34.8%	658,081,471	16.1%
July 1, 2022	625,063,131	(21.7%)	700,657,990	7.8%

* Time-weighted rate of return, as reported by the System.



In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, July 1, 2022. In this section, the discussion will focus on the commitments of the System, which are referred to as its liabilities.

Table 6 contains an analysis of the actuarial present value of all future benefits (PVFB) for contributing members, inactive members, retirees and their beneficiaries. The analysis is provided for each group.

The liabilities summarized in Table 6 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes measures of both benefits already earned and future benefits expected to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and for the lives of the surviving beneficiaries.

The actuarial assumptions used to determine liabilities are based on the results of an Experience Study completed in July 2022. This current set of assumptions, as adopted by the Board, is shown in Appendix C and was first used in the July 1, 2022 valuation. The Board's election to change the actuarial cost method from Aggregate to Entry Age Normal was first reflected in the July 1, 2008 valuation.

Actuarial Liabilities

A fundamental principle in financing the liabilities of a retirement program is that the cost of its benefits should be related to the period in which benefits are earned, rather than to the period of benefit distribution. An actuarial cost method is a mathematical technique that allocates the present value of future benefits into annual costs. In order to do this allocation, it is necessary for the funding method to "breakdown" the present value of future benefits into two components:

(1) that which is attributable to the past and

(2) that which is attributable to the future.

Actuarial terminology calls the part attributable to the past the "past service liability" or the "actuarial accrued liability". The portion allocated to the future is known as the present value of future normal costs, with the specific piece of it allocated to the current year being called the "normal cost". Table 7 contains the calculation of actuarial accrued liability.

TABLE 6

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

PRESENT VALUE OF FUTURE BENEFITS
AS OF JULY 1, 2022

1.	Active employees	
	a. Retirement Benefit	$489,299,770
	b. Withdrawal Benefit	2,247,151
	c. Pre-Retirement Death Benefit	5,011,342
	d. Disability Benefit	40,192,890
	e. Total	$536,751,153
2.	Inactive Vested Members	7,799,181
3.	Inactive Nonvested Members	187,712
4.	Disability Retirees	72,736,898
5.	Retirees and Beneficiaries	459,334,221
6.	Total Present Value of Future Benefits (1e) + (2) + (3) + (4) + (5)	$1,076,809,165

TABLE 7

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

ACTUARIAL ACCRUED LIABILITY
AS OF JULY 1, 2022

1.	Present Value of Future Benefits for Active Members		
	a. Retirement Benefit	$489,299,770	
	b. Withdrawal Benefit	2,247,151	
	c. Pre-Retirement Death Benefit	5,011,342	
	d. Disability Benefit	40,192,890	
	e. Total		$536,751,153
2.	Present Value of Future Normal Costs		
	a. Retirement Benefit	$156,255,596	
	b. Withdrawal Benefit	3,831,700	
	c. Pre-Retirement Death Benefit	4,065,209	
	d. Disability Benefit	28,341,053	
	e. Total		192,493,558
3.	Present Value of Future Benefits for Inactive Members		540,058,012
4.	Total Actuarial Accrued Liability (1e) - (2e) + (3)		$884,315,607
5.	Actuarial Value of Assets		700,657,990
6.	Unfunded Actuarial Accrued Liability (4) - (5)		$183,657,617

TABLE 8

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM CALCULATION OF ACTUARIAL GAIN/(LOSS)

The actuarial gain/(loss) is comprised of both the liability gain/(loss) and the actuarial asset gain/(loss). Each of these represents the difference between the expected and actual values as of July 1, 2022.

1.	Expected actuarial accrued liability		
	a. Actuarial accrued liability at July 1, 2021	$	780,150,277
	b. Normal cost for year ending June 30, 2022		13,930,952
	c. Benefit payments for fiscal year ending June 30, 2022		(37,440,028)
	d. Interest on (a), (b), and (c)		54,297,448
	e. Assumption changes		72,348,995
	f. Expected actuarial accrued liability at July 1, 2022	$	883,287,644
2.	Actuarial accrued liability at July 1, 2022	$	884,315,607
3.	Actuarial accrued liability gain/(loss) (1f) - (2)	$	(1,027,963)
4.	Expected actuarial value of assets		
	a. Actuarial value of assets at July 1, 2021	$	658,081,471
	b. Contributions for fiscal year ending June 30, 2022		29,112,925
	c. Benefit payments and administrative expenses for fiscal year ending June 30, 2022		(37,790,292)
	d. Interest on (a), (b), and (c)		45,767,132
	e. Expected actuarial value of assets at July 1, 2022	$	695,171,236
5.	Actuarial value of assets at July 1, 2022	$	700,657,990
6.	Actuarial value of assets gain/(loss) (5) - (4e)	$	5,486,754
7.	Net actuarial gain/(loss) (3) + (6)	$	4,458,791

TABLE 9

ACTUARIAL GAIN/(LOSS) BY SOURCE

The purpose of conducting an actuarial valuation of a retirement plan is to estimate the costs and liabilities for the benefits expected to be paid from the plan, to determine the annual level of contribution for the current plan year that should be made to support these benefits and, finally, to analyze the plan's experience. The costs and liabilities of this retirement plan depend not only upon the benefit formula and plan provisions but also upon factors such as the investment return on the Fund, mortality rates among active and retired members, withdrawal and retirement rates among active members, rates at which salaries increase and the rate at which the cost of living increases.

The actuarial assumptions employed as to these and other contingencies in the current valuation are set forth in Appendix C of this report.

Since the overall results of the valuation will reflect the choice of assumptions made, periodic studies of the various components of the plan's experience are conducted in which the experience for each component is analyzed in relation to the assumption used for that component (called an experience study). This summary is not intended to be an actual "experience study" but rather an analysis of sources of gain and loss in the past plan year.

Gain/(Loss) By Source

The System experienced a net actuarial loss on liabilities of $1,028,000 during the plan year ended June 30, 2022 and an actuarial gain on assets of $5,487,000. The net actuarial gain was $4,459,000. The major components of this net actuarial experience gain are shown below:

Liability Sources		**Gain/(Loss)**
Salary Increases	$	2,352,000
Retirements		(1,193,000)
Terminations		446,000
Disabilities		(315,000)
Deaths		(981,000)
New Entrants/Rehires		(2,126,000)
Postretirement Escalator		1,316,000
Miscellaneous		(527,000)
Total Liability Gain/(Loss)	$	(1,028,000)
Asset Gain/(Loss)	$	5,487,000
Net Actuarial Gain/(Loss)	$	4,459,000

TABLE 10

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

ACTUARIAL BALANCE SHEET
AS OF JULY 1, 2022

ASSETS

Actuarial value of assets		$700,657,990
Present value of future normal costs		192,493,558
Unfunded actuarial accrued liability		183,657,617
Total Net Assets		$1,076,809,165

LIABILITIES

Present Value of Future Benefits		
Retired Members, Disabled Members and Beneficiaries		$532,071,119
Active Members		
Retirement	$489,299,770	
Withdrawal	2,247,151	
Death	5,011,342	
Disability	40,192,890	
Total		536,751,153
Inactive Members		7,986,893
Total Liabilities		$1,076,809,165

The previous two sections were devoted to a discussion of the assets and liabilities of the System. A comparison of Tables 4 and 6 indicates that current assets fall short of meeting the present value of future benefits (total liability). This is expected in all but a fully closed down fund, where no further contributions are anticipated.

In an active system, there will almost always be a difference between the actuarial value of assets and total liabilities. This deficiency has to be made up by future contributions and investment returns. An actuarial valuation sets out a schedule of future contributions that will deal with this deficiency in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. Under an actuarial cost method, the contributions required to meet the difference between current assets and current liabilities are allocated each year between three elements: (1) the normal cost, (2) administrative expenses and (3) the payment on the unfunded actuarial accrued liability.

The term "fully funded" is often applied to a system in which contributions at the normal cost rate are sufficient to pay for the benefits of existing employees as well as for those of new employees. More often than not, systems are not fully funded, either because of past benefit improvements that have not been completely funded and/or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial accrued liability (UAAL) exists.

Description of Rate Components

Effective with the July 1, 2008 valuation, the actuarial cost method used by the System changed from Aggregate to the traditional Entry Age Normal (EAN) – level percent of pay cost method. Under the EAN cost method, the actuarial present value of each member's projected benefit is allocated on a level basis over the member's compensation between the entry age of the member and the assumed exit ages. The portion of the actuarial present value allocated to the valuation year is called the normal cost. The actuarial present value of benefits allocated to prior years of service is called the actuarial accrued liability. The unfunded actuarial accrued liability represents the difference between the actuarial accrued liability and the actuarial value of assets as of the valuation date. The unfunded actuarial accrued liability is calculated each year and reflects experience gains/losses.

The Board has elected to amortize the legacy unfunded actuarial accrued liability as of July 1, 2017 as a level-percent of payroll, over a closed 30-year period beginning July 1, 2008. New layers of unfunded actuarial accrued liability are created on each actuarial valuation date and amortized, as a level-percent of payroll, over a closed 20-year period. Changes in the unfunded actuarial accrued liability that are created by a change in assumptions or changes in benefit structure will be amortized over a reasonable time period as selected by the Board after consultation with their actuary.

Contribution Rate Summary

The normal cost rate is developed in Table 11. Table 12 develops the contribution rate for amortization of the unfunded actuarial accrued liability. Table 13 develops the total actuarial contribution rate.

TABLE 11

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

NORMAL COST RATE
AS OF JULY 1, 2022

1.	Normal Cost		% of Pay
	a. Retirement Benefit	$13,850,734	28.71%
	b. Withdrawal Benefit	326,765	0.68%
	c. Pre-Retirement Death Benefit	354,535	0.73%
	d. Disability Benefit	2,512,540	5.21%
	e. Total	$17,044,574	35.33%
2.	Expected Payroll in FY23 for Current Actives	$48,239,454	
3.	Normal Cost Rate [(1e)/(2)]	35.33%	

TABLE 12

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

UNFUNDED ACTUARIAL ACCRUED LIABILITY CONTRIBUTION RATE AS OF JULY 1, 2022

Amortization Bases	Original Amount	July 1, 2022 Remaining Payments	Date of Last Payment	Outstanding Balance as of July 1, 2022	Annual Contribution*
2017 UAAL Base	$ 182,759,035	16	7/1/2037	$ 176,151,857	$ 14,665,180
2018 Experience Base	(20,775,216)	16	7/1/2037	(20,024,141)	(1,667,071)
2019 Experience Base	(7,599,217)	17	7/1/2038	(7,414,452)	(590,434)
2020 Assumption Change Base	42,755,186	18	7/1/2039	42,088,154	3,216,651
2020 Experience Base	(18,319,662)	18	7/1/2039	(18,033,854)	(1,378,264)
2021 Experience Base	(53,264,638)	19	7/1/2040	(52,917,339)	(3,893,057)
2022 Assumption Change Base	72,348,995	20	7/1/2041	72,348,995	5,137,280
2022 Experience Base	(8,541,603)	20	7/1/2041	(8,541,603)	(606,513)
Total				**$ 183,657,617**	**$ 14,883,772**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$	14,883,772
2. Projected Payroll for Plan Year Ending June 30, 2023	$	50,602,707
3. UAAL Amortization Payment Rate		29.41%

TABLE 13

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

ACTUARIAL CONTRIBUTION RATE
FOR FISCAL YEAR ENDING JUNE 30, 2023

1.	Total Normal Cost Rate	35.33%
2.	Administrative Expenses	0.71%
3.	Amortization of UAAL*	29.41%
4.	Total Actuarial Contribution Rate (1) + (2) + (3)	65.45%
5.	Member Contribution Rate	(11.40%)
6.	State Actuarial Contribution Rate (4) + (5)	54.05%

*Amortization of UAAL is as a level percent of payroll assuming a 2.75% annual increase in payroll.

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 July 1, 2019 actuarial valuation for the State of Iowa Peace Officers' Retirement, Accident and Disability System (System).

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If plan assets are depleted, benefits may not be paid which could create legal and litigation risk or the plan could become "pay as you go". 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.

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.

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

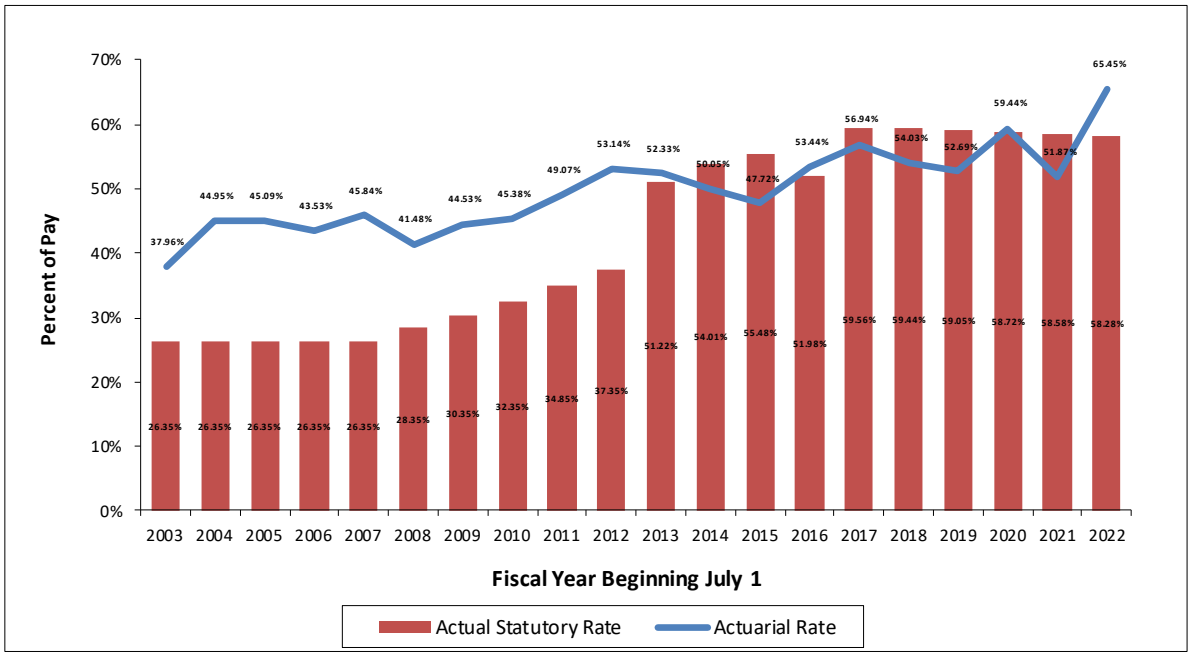
- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay and
- external risks such as the regulatory and political environment.

Although the last two are real risks to the funding of the System, ASOP 51 does not require the actuary to opine on these particular risks so no discussion is included here.

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. Fixed contribution rates to the POR System are made by both the members and the State which tends to create more risk than a system whose funding policy requires that the actuarial contribution rate be made each year. In addition, a supplemental annual State contribution of $5.0 million is required to be made until the System's funded ratio is at least 85%. However, in FY 2017, the additional contribution amount was reduced to $2.5 million, so there is some risk that the supplemental contributions could be reduced, suspended, or removed prematurely. The supplemental contribution is a significant element in the ability of the POR System to reach full funding in a reasonable period of time. Therefore, it is critical that the System receive such supplemental contributions. For example, if the

State did not contribute the additional $5.0 million in fiscal year 2023, which currently equates to 9.88% of pay, the contribution shortfall would be increased to 17.05%.

Given the changes that were made legislatively in 2010 and implemented over the next few years, the statutory contribution rate has exceeded the actuarial rate in six of the last ten valuations. When this occurs, it results in more rapid reduction in the unfunded actuarial accrued liability than scheduled and improvement in the System's funded status.



The most significant risk factor for the Iowa Peace Officers' Retirement, Accident and Disability System is investment return because of the volatility of returns and the size of plan assets compared to payroll (see Table 14). The impact of investment risk is exacerbated by the System's funding policy which includes fixed contribution rates for both members and the State. When actual investment experience is lower than the assumed return, the contributions to the System do not automatically adjust to compensate for the loss of investment income. The delay in responding to adverse economic experience because of the need for legislation can result in a significant reduction in the System's funded status before corrective action occurs.

A key demographic risk for all retirement systems, including the State of Iowa Peace Officers' Retirement, Accident and Disability System, 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 larger 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 we experienced with the COVID-19 pandemic. This kind of event would also be 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.

Finally, the unfunded actuarial accrued liability is amortized as a level percentage of payroll. The underlying assumption used in developing the payment schedule assumes an increasing payroll over time which is dependent on a stable employment level, i.e., active member count remains the same. However, the number of active members in the System has decreased significantly since 2009. To the extent this trend continues, covered payroll will be lower than expected which will result in fewer contribution dollars and slower funding progress.

The following exhibits summarize some historical information that helps indicate how certain key risk metrics have changed over time. Many are due to the natural maturation of the retirement system.

TABLE 14

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

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	Estimated Plan Year Payroll	Asset Volatility Ratio	Increase in ACR with a Return 10% Lower than Assumed*
7/1/2003	$215,254,539	$33,019,306	6.52	4.63%
7/1/2004	242,279,998	32,519,722	7.45	5.29%
7/1/2005	260,104,910	33,336,856	7.80	5.54%
7/1/2006	278,940,737	36,231,639	7.70	5.47%
7/1/2007	310,459,530	37,268,060	8.33	5.91%
7/1/2008	290,306,257	40,829,801	7.11	5.05%
7/1/2009	233,187,738	41,862,395	5.57	3.96%
7/1/2010	256,873,773	41,954,599	6.12	4.35%
7/1/2011	308,607,733	43,493,715	7.10	5.04%
7/1/2012	292,823,296	43,902,429	6.67	4.74%
7/1/2013	329,920,144	43,984,577	7.50	5.33%
7/1/2014	392,194,960	43,070,315	9.11	6.47%
7/1/2015	410,598,719	45,128,506	9.10	6.46%
7/1/2016	403,084,512	44,775,765	9.00	6.39%
7/1/2017	468,300,420	44,820,732	10.45	7.42%
7/1/2018	528,781,898	45,276,379	11.68	8.29%
7/1/2019	539,362,237	46,955,334	11.49	8.16%
7/1/2020	604,572,836	48,452,696	12.48	8.86%
7/1/2021	807,593,863	49,109,332	16.44	11.67%
7/1/2022	625,063,131	50,602,707	12.35	8.77%

Note: Years prior to the 6/30/2010 were provided by the prior actuary.

*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 at July 1, 2022 are 12.35 times larger than payroll, so underperforming the investment return assumption by 10.00% (i.e., earn -3.50% for one year) is equivalent to an actuarial loss of $62 million or 124% of payroll. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the UAAL, this illustrates the significant risk associated with volatile investment returns.

TABLE 15

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

HISTORICAL CASH FLOWS

Plans with negative cash flows tend to experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. The difference must be funded by investment income so typically negative cash flows of more than 5% can be problematic. Furthermore, 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.

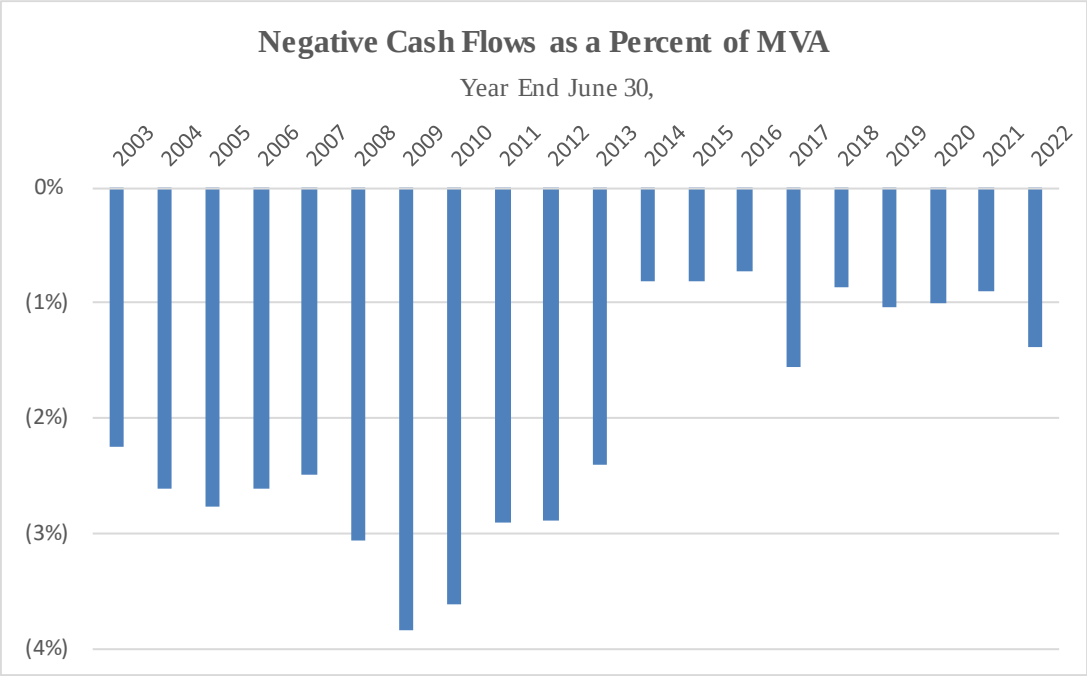
Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/2003	$215,254,539	$8,587,098	$13,429,545	($4,842,447)	(2.25%)
6/30/2004	242,279,998	8,528,821	14,857,619	(6,328,798)	(2.61%)
6/30/2005	260,104,910	8,436,691	15,618,315	(7,181,624)	(2.76%)
6/30/2006	278,940,737	8,964,288	16,255,846	(7,291,558)	(2.61%)
6/30/2007	310,459,530	9,880,794	17,624,000	(7,743,206)	(2.49%)
6/30/2008	290,306,257	10,397,547	19,298,912	(8,901,365)	(3.07%)
6/30/2009	233,187,738	11,780,463	20,745,505	(8,965,042)	(3.84%)
6/30/2010	256,873,773	12,276,818	21,574,361	(9,297,543)	(3.62%)
6/30/2011	308,607,733	13,398,058	22,370,844	(8,972,786)	(2.91%)
6/30/2012	292,823,296	15,071,125	23,541,992	(8,470,867)	(2.89%)
6/30/2013	329,920,144	16,289,757	24,251,618	(7,961,861)	(2.41%)
6/30/2014	392,194,960	22,470,013	25,631,006	(3,160,993)	(0.81%)
6/30/2015	410,598,719	23,592,219	26,910,083	(3,317,864)	(0.81%)
6/30/2016	403,084,512	25,598,997	28,531,524	(2,932,527)	(0.73%)
6/30/2017	468,300,420	22,327,060	29,599,101	(7,272,041)	(1.55%)
6/30/2018	528,781,898	26,622,091	31,199,043	(4,576,952)	(0.87%)
6/30/2019	539,362,237	27,325,686	32,892,072	(5,566,386)	(1.03%)
6/30/2020	604,572,836	27,899,004	33,907,310	(6,008,306)	(0.99%)
6/30/2021	807,593,863	28,169,291	35,370,239	(7,200,948)	(0.89%)
6/30/2022	625,063,131	29,112,925	37,790,292	(8,677,367)	(1.39%)

Note: Years prior to the 6/30/2010 were provided by the prior actuary.

TABLE 15

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

HISTORICAL CASH FLOWS
(continued)



The reduction in negative cash flows coincides with increases in the contribution rate, as well as the introduction of the supplemental State contributions. Historically, members contributed 9.35% of pay, but the member contribution rate increased to 9.85% for FY 2012, 10.35% for FY 2013, 10.85% for FY 2014 and to an ultimate rate of 11.35% in FY 2015 (changed to 11.40% in conjunction with a benefit change by the 2014 legislature). The State's contribution rate was 17.00% of pay for many years, but began increasing 2.00% per year commencing July 1, 2008. In 2010, the Legislature passed a bill that continued the 2.00% annual increase with an ultimate contribution rate of 37.00% for FY 2018 and thereafter until the normal contribution rate is less than 37.00%. It also provided for a supplemental State appropriation of $5.0 million per year beginning July 1, 2013 (originally July 1, 2012, but extended by the 2012 legislature) and ending June 30 of the fiscal year during which the System's funded ratio is at least 85%. However, HF 2459 in the 2016 session reduced the supplemental contribution for FY 2017 to $2.5 million. The supplemental contribution returned to $5.0 million for FY 2019 and is expected to remain at that level until the System is at least 85% funded. When the State supplemental contribution stops, the magnitude of the negative cash flows will increase.

TABLE 16

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

LIABILITY MATURITY MEASUREMENTS

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system because it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs.

Year End	Retiree Liability (a)	Total Actuarial Accrued Liability (b)	Retiree Percentage (a) / (b)
6/30/2008	$247,585,666	$417,176,049	59.3%
6/30/2009	254,721,456	432,894,495	58.8%
6/30/2010	252,596,545	433,402,131	58.3%
6/30/2011	265,218,811	461,594,916	57.5%
6/30/2012	272,401,805	480,157,072	56.7%
6/30/2013	280,492,644	498,468,989	56.3%
6/30/2014	297,967,737	515,859,721	57.8%
6/30/2015	305,590,517	534,626,780	57.2%
6/30/2016	328,089,443	578,388,848	56.7%
6/30/2017	368,319,757	636,058,890	57.9%
6/30/2018	387,738,398	658,487,243	58.9%
6/30/2019	410,196,806	684,752,489	59.9%
6/30/2020	439,895,461	751,076,556	58.6%
6/30/2021	467,834,786	780,150,277	60.0%
6/30/2022	532,071,119	884,315,607	60.2%

Note: Years prior to the 6/30/2010 were provided by the prior actuary.

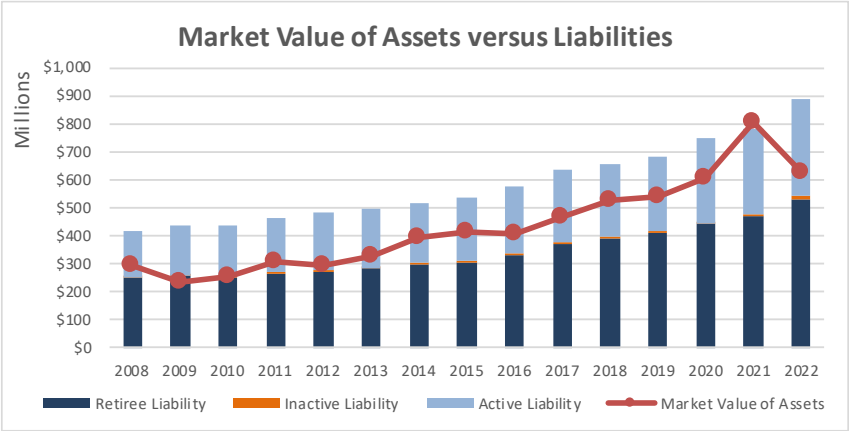


TABLE 17

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

HISTORICAL MEMBER STATISTICS

The underlying assumption used in developing the payment schedule for the unfunded actuarial accrued liability assumes an increasing payroll over time which is dependent on a stable employment level, i.e., active member count remains the same. However, the number of active members in the System has decreased significantly since 2009. Over the last 20 years, the average increase in covered payroll has been 2.3% compared to expected growth of 2.75% to 4.00%. Lower payroll growth results in lower contributions, including payments on the unfunded actuarial accrued liability, so there is slower funding progress.

Valuation Date June 30,	Number	Projected Payroll	Actual Payroll Increase	Expected Payroll Increase
2003	600	$33,019,306		
2004	566	32,519,722	(1.51%)	4.00%
2005	580	33,336,856	2.51%	4.00%
2006	618	36,231,639	8.68%	4.00%
2007	631	37,268,060	2.86%	4.00%
2008	646	40,829,801	9.56%	4.00%
2009	662	41,862,395	2.53%	4.00%
2010	643	41,954,599	0.22%	4.00%
2011	644	43,493,715	3.67%	4.00%
2012	618	43,902,429	0.94%	3.75%
2013	599	43,984,577	0.19%	3.75%
2014	578	43,070,315	(2.08%)	3.75%
2015	589	45,128,506	4.78%	3.75%
2016	563	44,775,765	(0.78%)	3.00%
2017	540	44,820,732	0.10%	3.00%
2018	537	45,276,379	1.02%	3.00%
2019	551	46,955,334	3.71%	3.00%
2020	555	48,452,696	3.19%	3.00%
2021	547	49,109,332	1.36%	2.75%
2022	555	50,602,707	3.04%	2.75%

Note: Years prior to 6/30/2010 were provided by prior actuary.

TABLE 17

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

HISTORICAL MEMBER STATISTICS
(continued)

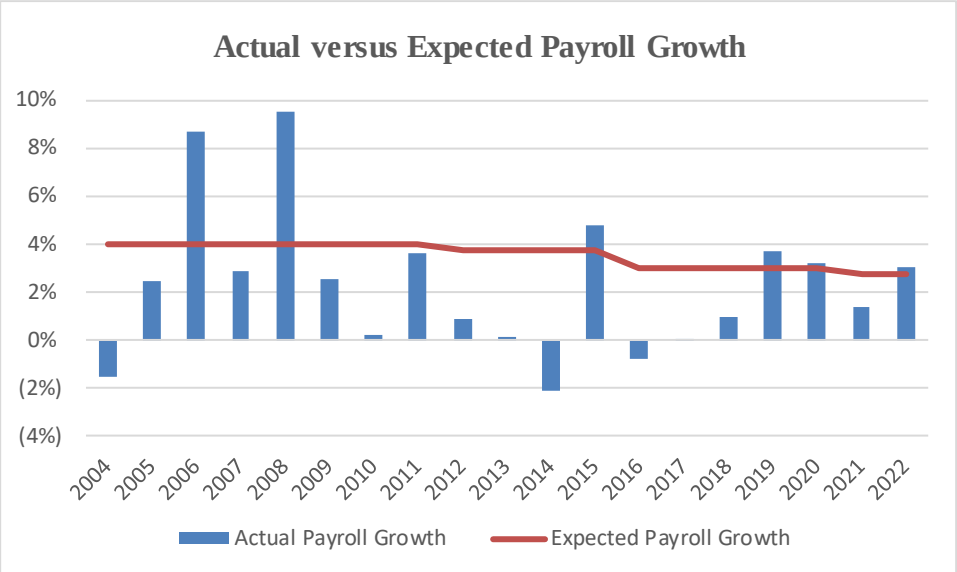


TABLE 18

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS ($ in thousands)

This exhibit compares the key July 1, 2022 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions are unchanged for purposes of this analysis.

Investment Return Assumption	**6.00%**	**6.25%**	**6.50%**	**6.75%**	**7.00%**
Contribution Rates					
Normal Cost	40.65%	37.89%	35.33%	32.97%	30.79%
Administrative Expenses	0.71%	0.71%	0.71%	0.71%	0.71%
Unfunded Actuarial Accrued Liability	36.72%	33.04%	29.41%	25.84%	22.31%
Member Contributions	(11.40%)	(11.40%)	(11.40%)	(11.40%)	(11.40%)
Employer Actuarial Required Contribution	66.68%	60.24%	54.05%	48.12%	42.41%
Statutory State Fixed Contribution Rate	(37.00%)	(37.00%)	(37.00%)	(37.00%)	(37.00%)
State Supplemental Contribution	(9.88%)	(9.88%)	(9.88%)	(9.88%)	(9.88%)
Contribution Shortfall/(Margin)	19.80%	13.36%	7.17%	1.24%	(4.47%)
Actuarial Accrued Liability	$946,242	$914,453	$884,316	$855,723	$828,575
Actuarial Value of Assets	700,658	700,658	700,658	700,658	700,658
Unfunded Actuarial Accrued Liability	$245,584	$213,795	$183,658	$155,065	$127,917
Funded Ratio	74.1%	76.6%	79.2%	81.9%	84.6%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.
Numbers may not add due to rounding.

In this section, we have included some exhibits that reflect the historical funding of the System (reflecting some information formerly disclosed under GASB 25) and the expected benefit payments for the next 30 years.

TABLE 19

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (P/R) (c)	UAAL as a Percentage of Covered P/R [(b-a)/(c)]
7/1/2008	$307,193,608	$417,176,049	$109,982,441	73.64%	$ 40,829,801	269.37%
7/1/2009	300,262,337	432,894,495	132,632,158	69.36%	41,862,395	316.83%
7/1/2010	290,558,596	433,402,131	142,843,535	67.04%	41,954,599	340.47%
7/1/2011	288,851,354	461,594,916	172,743,562	62.58%	43,493,715	397.17%
7/1/2012	292,909,884	480,157,072	187,247,188	61.00%	43,902,429	426.51%
7/1/2013	319,441,635	498,468,989	179,027,354	64.08%	43,984,577	407.02%
7/1/2014	360,063,755	515,859,721	155,795,966	69.80%	43,070,315	361.72%
7/1/2015	392,989,970	534,626,780	141,636,810	73.51%	45,128,506	313.85%
7/1/2016	426,398,446	578,388,848	151,990,402	73.72%	44,775,765	339.45%
7/1/2017	453,128,907	636,058,890	182,929,983	71.24%	44,820,732	408.14%
7/1/2018	496,503,424	658,487,243	161,983,819	75.40%	45,276,379	357.77%
7/1/2019	530,900,116	684,752,489	153,852,373	77.53%	46,955,334	327.66%
7/1/2020	573,716,266	751,076,556	177,360,290	76.39%	48,452,696	366.05%
7/1/2021	658,081,471	780,150,277	122,068,806	84.35%	49,109,332	248.57%
7/1/2022	700,657,990	884,315,607	183,657,617	79.23%	50,602,707	362.94%

Note: Results for valuations prior to 2010 were prepared by the prior actuary.

TABLE 20

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ending	Annual Required Contribution	Actual Employer Contribution	Percentage of ARC Contribution
6/30/2006	$12,231,109	$5,817,819	47.57%
6/30/2007	12,592,216	6,262,951	49.74%
6/30/2008	14,373,922	6,696,538	46.59%
6/30/2009	13,356,536	7,898,356	59.13%
6/30/2010	14,237,049	8,498,523	59.69%
6/30/2011	14,966,571	9,554,014	63.84%
6/30/2012	16,623,087	10,741,204	64.62%
6/30/2013	18,665,412	11,777,661	63.10%
6/30/2014	18,186,973	17,715,097	97.41%
6/30/2015	16,957,075	18,600,759	109.69%
6/30/2016	17,080,573	20,519,243	120.13%
6/30/2017	17,745,858	17,274,144	97.34%
6/30/2018	20,306,108	21,498,155	105.87%
6/30/2019	19,402,680	21,840,234	112.56%
6/30/2020	19,377,760	22,364,425	115.41%
6/30/2021	22,996,225	22,711,497	98.76%
6/30/2022	19,750,547	23,057,085	116.74%

Note: Actual covered payroll imputed using employer contributions, net of any state supplemental appropriations.

TABLE 21

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

PROJECTED BENEFIT PAYMENTS

Fiscal Year End	Actives at 7/1/2022	Inactives at 7/1/2022	Total
2023	$ 552,000	$38,719,000	$39,271,000
2024	1,400,000	39,038,000	40,438,000
2025	2,685,000	39,331,000	42,016,000
2026	5,174,000	39,612,000	44,786,000
2027	8,489,000	39,907,000	48,396,000
2028	11,050,000	40,146,000	51,196,000
2029	13,845,000	40,269,000	54,114,000
2030	16,867,000	40,273,000	57,140,000
2031	20,558,000	40,319,000	60,877,000
2032	23,275,000	40,219,000	63,494,000
2033	25,304,000	40,111,000	65,415,000
2034	27,528,000	39,870,000	67,398,000
2035	29,099,000	39,577,000	68,676,000
2036	30,670,000	39,194,000	69,864,000
2037	32,874,000	38,781,000	71,655,000
2038	36,914,000	38,318,000	75,232,000
2039	42,751,000	37,773,000	80,524,000
2040	46,309,000	37,173,000	83,482,000
2041	49,181,000	36,505,000	85,686,000
2042	51,772,000	35,783,000	87,555,000
2043	54,179,000	35,004,000	89,183,000
2044	56,804,000	34,178,000	90,982,000
2045	58,871,000	33,293,000	92,164,000
2046	61,166,000	32,357,000	93,523,000
2047	63,832,000	31,369,000	95,201,000
2048	67,058,000	30,330,000	97,388,000
2049	70,101,000	29,240,000	99,341,000
2050	73,647,000	28,097,000	101,744,000
2051	76,982,000	26,902,000	103,884,000
2052	81,061,000	25,655,000	106,716,000

Note: Cash flows are the expected future non-discounted payments to current members. These numbers exclude refund payouts to current nonvested inactives and assume future retirees elect the normal form of payment and future withdrawals elect refunds according to valuation assumptions.

APPENDIX A

SYSTEM MEMBERSHIP

INFORMATION

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

RECONCILIATION OF MEMBER STATUS
FROM JULY 1, 2021 TO JULY 1, 2022

	Active Members	Inactive Vested	Inactive Nonvested	Retired Members	Disabled Members	Spouses Receiving Benefits	Children Receiving Benefits	Total
Members as of July 1, 2021	547	41	6	431	90	129	4	1,248
Service Retirement	(23)	0	0	23	0	0	0	0
Disabled Retirement	(3)	0	0	0	3	0	0	0
Refunded	0	(2)	0	0	0	0	0	(2)
Terminated with a Refund Due	(3)	0	3	0	0	0	0	0
Terminated Vested	(3)	3	0	0	0	0	0	0
Returned to Active Status	0	0	0	0	0	0	0	0
Deceased without a Beneficiary	0	0	0	(4)	0	(6)	0	(10)
Deceased with a Beneficiary	(1)	0	0	(7)	(1)	9	4	4
Benefits Ended	0	0	0	0	0	0	(2)	(2)
New Hires	41	0	0	0	0	0	0	41
Adjustments	0	0	0	0	0	0	0	0
Members as of July 1, 2022	555	42	9	443	92	132	6	1,279

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

AGE AND SERVICE DISTRIBUTION FOR ACTIVE PARTICIPANTS AS OF JULY 1, 2022

	Years of Service																	
	0 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 & over		Total	
Age	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary
Under 25	22	55,803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	55,803
25-29	40	64,782	15	72,988	0	0	0	0	0	0	0	0	0	0	0	0	55	67,020
30-34	30	67,533	22	76,278	9	87,248	0	0	0	0	0	0	0	0	0	0	61	73,596
35-39	14	69,187	11	79,977	27	84,684	34	95,197	0	0	0	0	0	0	0	0	86	85,715
40-44	1	71,562	2	71,698	9	91,005	52	98,021	16	103,877	0	0	0	0	0	0	80	97,414
45-49	1	66,092	0	0	0	0	23	99,386	51	101,734	36	107,925	0	0	0	0	111	102,934
50-54	0	0	0	0	2	96,769	9	97,174	18	102,896	79	105,983	6	107,415	0	0	114	104,714
55-59	0	0	0	0	0	0	1	99,452	0	0	18	102,726	5	105,697	0	0	24	103,208
60 & over	0	0	0	0	0	0	0	0	0	0	2	97,421	0	0	0	0	2	97,421
Totals	108	64,363	50	75,922	47	86,900	119	97,426	85	102,383	135	105,940	11	106,634	0	0	555	91,176

Average Age: 41.6
Average Years of Service: 16.2

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

ANALYSIS OF INACTIVE PARTICIPANTS
AS OF JULY 1, 2022

Number of Participants

Age	Service Retirement	Accidental Disability	Ordinary Disability	Vested Retirement	Child Beneficiary	Contingent Beneficiary	Inactive Vested	Total
Under 40	0	2	0	0	6	1	5	14
40 to 44	0	1	1	0	0	0	8	10
45 to 49	0	4	0	0	0	0	12	16
50 to 54	2	11	0	0	0	2	16	31
55 to 59	78	13	0	4	0	4	1	100
60 to 64	74	7	1	5	0	3	0	90
65 to 69	58	6	1	3	0	8	0	76
70 to 74	66	9	4	3	0	17	0	99
75 to 79	53	11	3	6	0	26	0	99
80 to 84	44	10	0	5	0	26	0	85
85 to 89	32	6	1	1	0	33	0	73
90 to 94	8	1	0	0	0	9	0	18
95 to 99	1	0	0	0	0	3	0	4
100 & over	0	0	0	0	0	0	0	0
Totals	416	81	11	27	6	132	42	715

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

ANALYSIS OF INACTIVE PARTICIPANTS
AS OF JULY 1, 2022

Average Annual Benefits of Participants

Age	Service Retirement	Accidental Disability	Ordinary Disability	Vested Retirement	Child Beneficiary	Contingent Beneficiary	Inactive Vested
Under 40	0	45,250	0	0	5,532	44,149	9,966
40 to 44	0	52,629	39,664	0	0	0	12,292
45 to 49	0	47,172	0	0	0	0	25,921
50 to 54	72,183	56,363	0	0	0	40,916	23,670
55 to 59	77,480	56,931	0	17,946	0	41,091	16,150
60 to 64	79,355	62,945	43,224	21,534	0	22,860	0
65 to 69	76,766	49,498	41,321	28,852	0	38,361	0
70 to 74	74,793	55,301	51,220	11,657	0	37,050	0
75 to 79	65,303	50,897	53,507	10,994	0	29,257	0
80 to 84	58,215	50,169	0	14,815	0	26,634	0
85 to 89	51,114	51,360	37,814	6,350	0	24,777	0
90 to 94	41,636	46,804	0	0	0	26,053	0
95 to 99	59,340	0	0	0	0	24,212	0
100 & over	0	0	0	0	0	0	0
Totals	70,912	53,626	47,948	16,569	5,532	29,345	20,335

APPENDIX B

SUMMARY OF PLAN PROVISIONS

Chapter 97A of the Iowa code sets out the benefit provisions of the Iowa Peace Officers' Retirement, Accident and Disability System, which are briefly summarized as follows:

Retirement Benefit

Eligibility — Age 55 with 22 years of service.

Average Final Compensation — Average of the member's regular compensation, including longevity and per diem, during the high three (3) years of service.

Monthly Annuity — The sum of (1) and (2):

(1) a. For retirement prior to July 1, 1990, 50% of average final compensation at retirement. Average final compensation equals average of highest three years of compensation.

b. For retirement after June 30, 1990 and before July 1, 1992, 54% of average final compensation at retirement.

c. For retirement after June 30, 1992 and before July 1, 1993, 56% of average final compensation at retirement.

d. For retirement after June 30, 1993 and before July 1, 1994, 58% of average final compensation at retirement.

e. For retirement after June 30, 1994, and before July 1, 2000, 60% of average final compensation at retirement.

f. For retirement after July 1, 2000, 60.5% of average final compensation at retirement.

(2) For members who do not withdraw member contributions:

a. For retirement after June 30, 1990 and before July 1, 1991, 0.3% of average final compensation for each year of service over 22 years (up to 8 years). Service after age 55 is excluded.

b. For retirement after June 30, 1991 and before October 16, 1992, 0.6% of average final compensation for each year of service over 22 years (up to 8 years). Service after age 55 is excluded.

c. For retirement after October 15, 1992 and before July 1, 1996, 0.6% of average final compensation for each year of service over 22 years (up to 8 years).

d. For retirement after June 30, 1996, 1.5% of average final compensation for each year of service over 22 years (up to 8 years).

e. For retirement after June 30, 1998, 1.5% of average final compensation for each year of service over 22 years (up to 10 years).

f. For retirement after June 30, 2000, 2.75% of average final compensation for each year of service over 22 years (up to 10 years).

Early Retirement Benefit

Eligibility Effective July 1, 1996, age 50 (but not age 55) with 22 years of service.

Monthly Annuity The benefit provided as a retirement benefit actuarially reduced for commencement prior to age 55.

Deferred Vested Benefit

Eligibility Four years of service.

Monthly Annuity At age 55. The benefit provided as a retirement benefit at termination times a service ratio. The service ratio equals service at termination divided by 22 (not greater than 1.0).

Ordinary Disability Benefit

Eligibility None.

Benefit

(1) If service at disability is greater than or equal to 5 years, the greater of 50% of average final compensation at disability or the benefit amount calculated under a service retirement.

(2) If service at disability is less than 5 years, 25% of average final compensation at disability.

Accidental Disability Benefit

Eligibility None.

Benefit

(1) For retirement prior to July 1, 1990, 66-2/3% of average final compensation at disability.

(2) For retirement after June 30, 1990 and before July 1, 1998, 60% of average final compensation at disability. If the service amount at disability is greater than or equal to 22 years, the greater of 60% of average final compensation at disability or the benefit amount calculated under a service retirement.

(3) For retirement after July 1, 1998, the greater of 60% of average final compensation at disability or the benefit amount calculated under a service retirement.

Ordinary Death Benefit

Eligibility

For member in service: None.
For member not in service: Four years of service.

Benefit

(1) A lump sum equal to 50% of compensation during the last year of employment, or

(2) A pension based on 40% of average final compensation but not less than 25% of compensation paid to an active member having the rank of senior patrol officer of the state patrol. For members not in service, benefit is multiplied by the ratio of service at termination to 22 years (not greater than 1.0).

(3) Additional benefit for members in service of 6% of compensation payable to an active member having the rank of senior patrol officer of the state patrol for each child.

Payment Date

(1) For members in service: Immediately upon death of member.

(2) For member not in service: Payable when member would have been age 55. If there are children of the member, payable commencing at the member's death until children reach age 18 or 22. Pension resumes when member would have been age 55.

Accidental Death Benefit

Eligibility

In actual performance of duty.

Benefit

(1) 50% of average final compensation payable to surviving spouse, children or dependent parents.

(2) If there is not surviving spouse, children or dependent parents, or if accidental death occurs while not in the actual performance of duty, an Ordinary Death Benefit is payable.

(3) Additional benefit for members in service of 6% of compensation payable to an active member having the rank of senior patrol officer of the state patrol, for each child.

(4) If the death meets specified criteria, a lump sum of $100,000 payable to surviving spouse, children, dependent parents, or estate.

Death After Retirement

Benefit

(1) 50% of retirement allowance of retired member but not less than 25% of compensation paid to an active member having the rank of senior patrol officer of the state patrol.

(2) Additional benefit of 6% of compensation payable to an active member having the rank of senior patrol officer of the state patrol, for each child.

Adjustments to Pensions

Each July 1 and January 1, if applicable, the following adjustments are made: Monthly earnable compensation payable to an active member, of the same rank and position in the salary scale as was held by the retired or deceased member at the time of the member's retirement or death, for July of the current year less that of the preceding July, times the following percentages:

(1) 40% for members receiving a service retirement allowance and for beneficiaries receiving an accidental death benefit.

(2) 40% for members with five or more years of membership who are receiving an ordinary disability benefit.

(3) 40% for member receiving an accidental disability benefit.

(4) 24% for members with less than five years of membership who are receiving an ordinary disability benefit and for beneficiaries receiving an ordinary death benefit.

(5) 50% of the amount which would have been added to the benefit of the retired member, for surviving spouses, but not less than 25% of the monthly earnable compensation paid to an active member having the rank of senior patrol officer.

Additionally, the following amounts will be added to a member or beneficiary monthly pension as follows:

Years Since Retired*	Amount
0-4	$15
5-9	20
10-14	25
15-19	30
20 or more	35

*Measured in whole years.

There was a change in the way the flat escalator was applied effective July 1, 2010. Prior to 2010, the amount increased for each year after retirement.

Surviving children's pensions are adjusted each July to equal 6% of monthly earnable compensation payable to an active member having the rank of senior patrol officer of the state patrol.

No pension adjustments are granted to members who retired with less than 22 years of membership.

State Contributions

For FY 2018 and thereafter, the State will contribute the lesser of 37% of payroll or the normal contribution rate, as defined in Chapter 97 A.8. Prior to FY 2018, the State had been making scheduled increases to its contribution rate of 2% of pay per year for ten years. The State also provides for a supplemental appropriation of $5 million per year beginning July 1, 2013 (originally July 1, 2012 but extended by the 2012 legislature) and ending June 30 of the fiscal year during which the System's funded ratio is at least 85%. For FY 2017, the supplemental contribution was reduced to $2.5 million, but it returned to $5.0 million for FY 2018 and thereafter.

Member Contributions

The following percentage of earnable compensation will be paid as member contributions:

Period	Member Contribution Rate
January 1, 1995 - June 30, 1995	8.35%
July 1, 1995 – June 20, 2011	9.35%
July 1, 2011 – June 30, 2012	9.85%
July 1, 2012 – June 30, 2013	10.35%
July 1, 2013 – June 30, 2014	10.85%
July 1, 2014 forward*	11.40%

*Beginning July 1, 2020, members contribute 11.35% of compensation plus an additional 0.05% to finance disability benefits for duty-related cancer and infectious diseases. The additional 0.05% contribution is subject to review every five years.

Withdrawal of Member Contributions

Effective July 1, 1990, members who terminate service, other than by death or disability, can elect to withdraw their accumulated contributions with interest in lieu of any benefits to which the member may be entitled from the System.

Transfers With Statewide Fire and Police Retirement System

Beginning July 1, 1996, vested members of an eligible retirement system who terminate employment and, within one year, commences covered employment under another eligible retirement system, may elect to transfer the average accrued benefit or the refund liability earned from the former system to the current system. Once such transfer is completed, service under the former system shall be treated as membership service under the current system.

APPENDIX C

ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Cost Method

Liabilities and contributions shown in this report are computed using the Individual Entry Age method of funding.

Sometimes called "funding method," this is a particular technique used by actuaries for establishing the amount of the annual actuarial cost of pension System benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily the annual contribution to the System is comprised of (1) the normal cost and (2) an amortization payment on the unfunded actuarial accrued liability.

Under the Entry Age Actuarial Cost Method, the **Normal Cost** is computed as the level percentage of pay which, if paid from the earliest time each member would have been eligible to join the System if it then existed (thus, entry age) until his retirement or termination, would accumulate with interest at the rate assumed in the valuation to a fund sufficient to pay all benefits under the System.

The **Actuarial Accrued Liability** under this method at any point in time is the theoretical amount of the fund that would have accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The **Unfunded Actuarial Accrued Liability (UAAL)** is the excess of the actuarial accrued liability over the actuarial value of System assets on the valuation date.

Under this method experience gains or losses, i.e. decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

UAAL Amortization Method

The Board has elected to amortize the legacy unfunded actuarial accrued liability as of July 1, 2017 as a level-percent of payroll, over a closed 30-year period beginning July 1, 2008. New layers of unfunded actuarial accrued liability will be created on each actuarial valuation date and will be amortized, as a level-percent of payroll, over a closed 20-year period. Changes in the unfunded actuarial accrued liability that are created by a change in assumptions or changes in benefit structure will be amortized over a reasonable time period, as selected by the Board after consultation with their actuary. If the System's funded ratio reaches or exceeds 100%, all amortization bases will be eliminated and the surplus (actuarial assets minus actuarial liability) will be amortized over an open 30-year period.

Asset Valuation Method

The System uses an asset valuation method to smooth the effects of market fluctuations. The actuarial value of assets spreads the difference between the actual return and the expected return (based on the actuarial assumption of 6.50%, effective July 1, 2022) evenly over five years.

Actuarial Assumptions

Investment Return: 6.50% per year, net of investment expenses.

Price Inflation: 2.50% per year.

Payroll Growth: 2.75% per year, including price inflation.

Active Members:

1. Ordinary death rates

   Pub-2010 Safety Employees Median Mortality Table, set back 2 years for males and females, projected generationally using Scale MP-2021.

2. Accidental death rate

   8.5 deaths per 10,000 exposed for one year.
   80% of deaths are assumed to be accidental.

3. Disability rates

Age	Accidental Disability	Ordinary Disability
20	0.029%	0.007%
25	0.101%	0.025%
30	0.173%	0.043%
35	0.245%	0.061%
40	0.328%	0.082%
45	0.464%	0.116%
50	0.664%	0.166%

   80% of disabilities are assumed to be accidental.

4. Withdrawal rates

   The following table is used:

Service	Rate
0-3	4.00%
4	3.25%
5	2.75%
6	2.00%
7-10	1.50%
11	1.00%
12	0.75%
13	0.50%
14-19	0.25%
20	0.00%

5. Retirement age

Service	Probability of Retirement
22-27	6%
28	15%
29	15%
30	20%
31	60%
32	100%

No early retirements are assumed.

Inactive vested members are assumed to begin receiving benefits at age 55.

6. Salary scale

Year	Increase
1	8.50%
5	7.50%
10	7.50%
15	4.50%
20+	4.00%

7. Post-retirement adjustments — Same as for retired members.

Retired Members and Other Beneficiaries:

1. Mortality rates - Service retirees — Pub-2010 Safety Retirees Median Mortality Table, set back 2 years for males and females, projected generationally using Scale MP-2021.

2. Mortality rates - Beneficiaries — Pub-2010 Contingent Survivors Mortality Table, set back 2 years for males and females, projected generationally using Scale MP-2021.

3. Mortality rates - Disabled retirees — Pub-2010 Safety Disabled Retirees Mortality Table, set back 2 years for males and females, projected generationally using Scale MP-2021.

4. Annual readjustment of pensions — Wages for the same rank are assumed to increase 3.50%.

Dependency Ratios:

1. Ordinary death benefit	Alternate benefits payable to widow and minor children in 90% of cases.
2. Pension to spouse and children of deceased pensioned member	In 90% of cases, with 1 child per member.

Interest Credited to Member Contributions:	4.00% per year.
Marriage Assumption:	90% married, with males 4 years older than females.
Administrative Expenses:	Based on actual amount for the prior year increased with inflation.

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM CERTIFICATION

We have prepared an actuarial valuation of the Iowa Peace Officers' Retirement, Accident and Disability System as of July 1, 2022, for the fiscal year ending June 30, 2023. The results of the valuation are set forth in this addendum, which reflects the benefit provisions in effect on July 1, 2022.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

The results in this Addendum have been prepared for the sole purpose of providing the information required under Chapter 97 D.5 of the Iowa code. Calculations are based on the following prescribed methods:

Actuarial cost method: Entry Age Normal
Amortization method: Level-percent of payroll
Amortization period: 30 years, open period

All other assumptions, methodologies, and System provisions used are consistent with those used in the regular July 1, 2022 valuation for the Iowa Peace Officers' Retirement, Accident and Disability System.

The results shown in this Addendum may not be consistent with those in the regular July 1, 2022 valuation. The July 1, 2022 valuation results were determined in accordance with generally accepted actuarial principles and practices that are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying opinion and supporting recommendations of the American Academy of Actuaries. The results shown in this Addendum are not necessarily based on the methodologies adopted by the System.

We are available to answer any questions on the material contained in this report, or to provide explanations or further details as may be appropriate.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

Patrice Beckham

Patrice A. Beckham, FSA, EA, FCA, MAAA — October 12, 2022 Date

Bryan K. Hoge, FSA, EA, FCA, MAAA — October 12, 2022 Date

IOWA PEACE OFFICERS' RETIREMENT, ACCIDENT AND DISABILITY SYSTEM

SUMMARY OF VALUATION RESULTS UNDER PRESCRIBED METHODOLOGY

This addendum report has been prepared to present the results of a valuation of the Iowa Peace Officers' Retirement, Accident and Disability System as of July 1, 2022, based on the prescribed methodology under current statutes and regulations issued thereunder.

The unfunded actuarial accrued liability has been amortized as a level-percent of payroll over 30 years. The payroll growth assumption used was 2.75%.

A summary of principal valuation results from the current and the prior valuation follows.

	Actuarial Valuation as of	
	July 1, 2022	**July 1, 2021**
Summary of Costs		
Normal cost	35.33%	30.09%
Administrative Expenses	0.71%	0.59%
UAAL amortization	20.02%	14.52%
Total	56.06%	45.20%
Less Employee Contribution Rate	(11.40%)	(11.40%)
State Required Contribution	44.66%	33.80%
Funded Status		
Actuarial accrued liability	$884,315,607	$780,150,277
Actuarial value of assets	700,657,990	658,081,471
Unfunded actuarial accrued liability	$183,657,617	$122,068,806
Funded Ratio	79.23%	84.35%
Asset Values		
Market value of assets (MVA)	$625,063,131	$807,593,863
Actuarial value of assets (AVA)	700,657,990	658,081,471
MVA/AVA	89.21%	122.72%