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IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Actuarial Valuation Report
as of June 30, 2023

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Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

October 31, 2023

Investment Board
Iowa Public Employees' Retirement System
7401 Register Drive
Des Moines, IA 50321

Re: June 30, 2023 Actuarial Valuation Report

Dear Investment Board Members:

At your request, we have performed an actuarial valuation of the Iowa Public Employees' Retirement System (IPERS or System) as of June 30, 2023, to measure the assets and liabilities of the System, determine the funded status, and set the Required Contribution Rate for fiscal year 2025 based on the results of the valuation and IPERS' Contribution Rate Funding Policy. The major findings of the valuation are contained in this report which reflects the benefit provisions in place on June 30, 2023. There have been no changes to the benefit provisions, actuarial assumptions or methods since last year's valuation.

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, benefit provisions as defined in state statutes, member census data and financial information. While not verifying the data at its source, the actuary performed tests for consistency and reasonableness. 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.

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 necessary results. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the 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.

We certify that all costs, liabilities, 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. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of potential results is not presented herein.

The actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System and have been made on a basis consistent with our understanding of the System's funding requirements and goals and the plan provisions described in Appendix B of this report. 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. In particular, actuarial computations for purposes of fulfilling financial reporting requirements for the System under Governmental Accounting Standards Board Statements No. 67 and No. 68 are presented in separate reports.

The consultants who worked on this assignment are pension actuaries with significant public plan experience. In addition, the signing actuaries are independent of the System and the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

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 this valuation was prepared in accordance with standards of practice promulgated by the Actuarial Standards Board. The actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonable based on the actual experience of the System. 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 A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Brent A. Banister, PhD, FSA, EA, FCA, MAAA
Chief Actuary

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

INTRODUCTION

This report presents the results of the June 30, 2023, actuarial valuation of the Iowa Public Employees' Retirement System (IPERS). The primary purposes of performing the valuation are as follows:

- to determine the Actuarial Contribution Rate (ACR) and the Required Contribution Rate (RCR) for the Regular membership, Sheriffs and Deputies, and the Protection Occupation group (all public safety members other than Sheriffs and Deputies) in accordance with IPERS' Contribution Rate Funding Policy (described in Appendix E),
- to evaluate the funded status of the System and disclose various asset and liability measures as of June 30, 2023,
- to determine the actuarial experience of the System since the last valuation,
- to assess and disclose the key risks associated with funding the System, and
- to analyze and report on trends in System contributions, assets, and liabilities over the past several years.

The actuarial valuation results provide a "snapshot" view of the System's financial condition on June 30, 2023. There have been no changes to the plan provisions, actuarial assumptions, or methods since last year's valuation. The valuation results reflect net unfavorable experience for the past plan year as demonstrated by an unfunded actuarial liability (UAL) that was larger than expected. The total UAL on June 30, 2023, for all three membership groups covered by IPERS, is $4.707 billion while the expected UAL was $4.390 billion. The unfavorable experience was the net result of an experience gain of $65 million on the actuarial value of assets and an experience loss of $382 million on System liabilities. The most significant contributor to the unfavorable liability experience was salary increases that were larger than expected, based on the actuarial assumptions. The actuarial loss from adverse experience was partially offset by the additional contributions of $147 million resulting from Required Contribution Rates that were higher than the Actuarial Contribution Rates for the year.

Based on the Contribution Rate Funding Policy and the valuation results, the Required Contribution Rate for Regular members remains unchanged at 15.73% of pay. The Required Contribution Rate also remains the same for Protection Occupation and Sheriffs and Deputies. **The Required Contribution Rate is above the Actuarial Contribution Rate for all three groups, resulting in a contribution margin, as shown in the following table.**

Contribution Rate for FY 2025	Regular Membership	Sheriffs and Deputies	Protection Occupation
1. Normal Cost Rate	10.62%	16.80%	15.34%
2. Amortization of UAL	3.27%	0.00%	0.00%
3. Actuarial Contribution Rate	13.89%	16.80%	15.34%
4. Required Contribution Rate	15.73%	17.02%	15.52%
5. Shortfall/(Margin) (3) – (4)	(1.84%)	(0.22%)	(0.18%)
6. Employee Contribution Rate	6.29%	8.51%	6.21%
7. Employer Contribution Rate (4) - (6)	9.44%	8.51%	9.31%
8. Unfunded Actuarial Liability ($M)	$4,795	($24)	($64)
9. Funded Ratio	88.76%	102.60%	102.96%

Further details on the June 30, 2023, valuation results can be found in the following sections of this Executive Summary.

EXPERIENCE FOR THE PRIOR PLAN YEAR

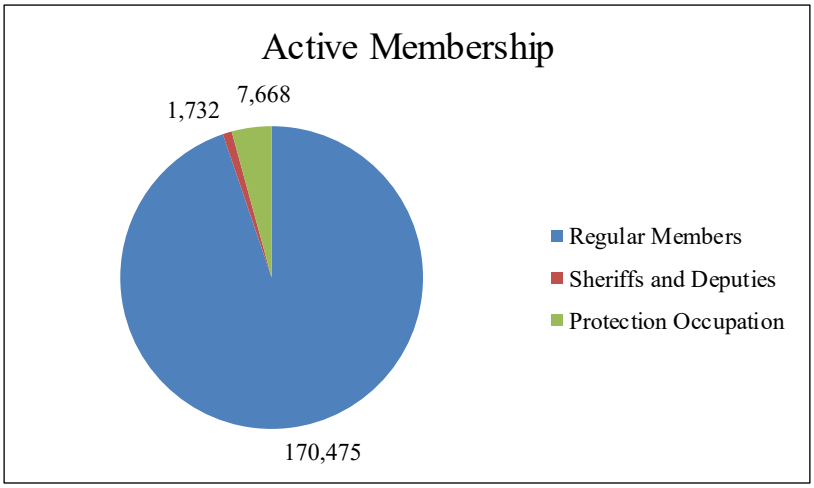
Numerous factors contributed to the change in the System's assets, liabilities and the Actuarial Contribution Rate between the June 30, 2022, and June 30, 2023, valuations. The components are examined in the following discussion.

MEMBERSHIP

IPERS has three membership groups:

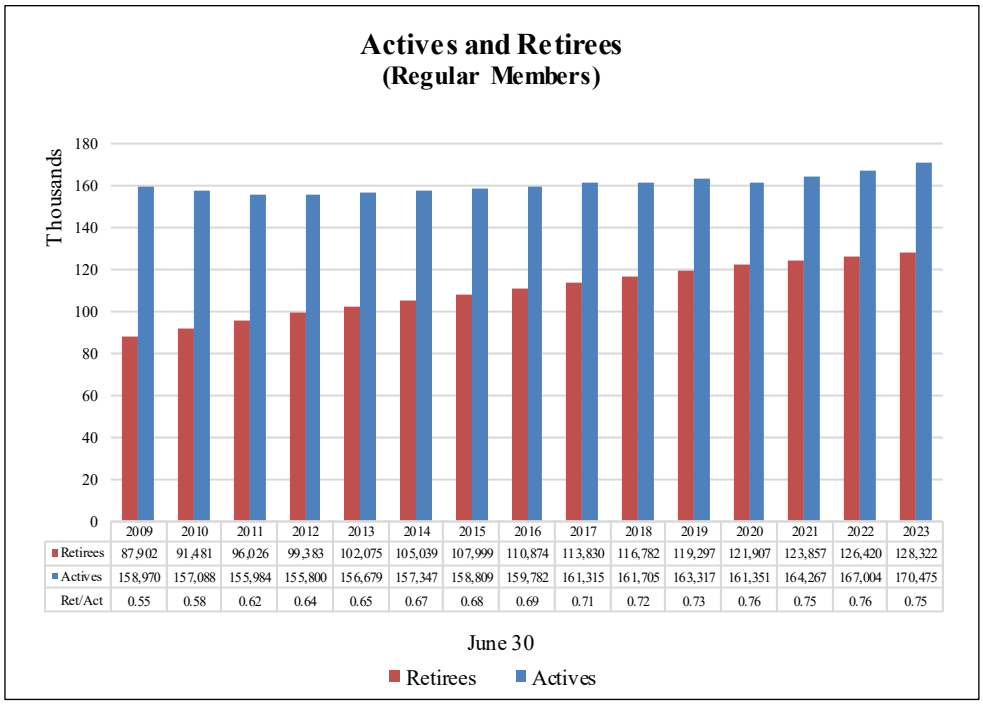
- Regular,
- Sheriffs and Deputies, and
- Protection Occupation.

Each membership group has a different benefit structure and contribution rate (both employee and employer). Note that the split of the Required Contribution Rate for the Sheriffs and Deputies group is 50% employee/50% employer while the split for the Regular members and Protection Occupation group is 40% employee/60% employer. A breakdown of the active membership by group, as of June 30, 2023, is shown below. The Regular members represent about 95% of the total actives.



There were 170,475 active Regular members in the 2023 valuation compared to 167,004 in the 2022 valuation, a 2.1% increase. When the number of active members increases, it usually has a favorable impact on the Actuarial Contribution Rate. The unfunded actuarial liability is amortized assuming future covered payroll will increase in accordance with the assumption (currently 3.25% per year). If covered payroll increases more than assumed, the dollar amount of the UAL payment is divided by a higher dollar amount of covered payroll, resulting in a lower UAL contribution rate. As a result, there is a corresponding lower Actuarial Contribution Rate. Due to the increase in the active membership since the 2022 valuation and larger salary increases than expected, covered payroll in the 2023 valuation, including covered payroll for retired reemployed members, increased by 6.6% which was higher than the assumed increase of 3.25%. As a result, the UAL contribution rate is lower, as is the Actuarial Contribution Rate.

The following graph shows the number of members receiving a benefit (retired reemployed members are only counted as retirees) compared to the number of active members for the Regular membership over the past 15 valuations. The number of active members in the Regular membership group has remained relatively stable for the past 15 years. In contrast, the number of members receiving a benefit has steadily increased. As a result, the ratio of retirees to actives has increased materially over this period. This is common for very mature retirement systems and is one of the reasons for accumulating assets by funding the benefits in advance. However, the relationship between the number of retirees/beneficiaries and the number of active members (which impacts covered payroll on which contributions are paid) can create some pressure on the Actuarial Contribution Rate. For more discussion, please see Exhibit 22 in Section VI of this report.



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Retirees	87,902	91,481	96,026	99,383	102,075	105,039	107,999	110,874	113,830	116,782	119,297	121,907	123,857	126,420	128,322
Actives	158,970	157,088	155,984	155,800	156,679	157,347	158,809	159,782	161,315	161,705	163,317	161,351	164,267	167,004	170,475
Ret/Act	0.55	0.58	0.62	0.64	0.65	0.67	0.68	0.69	0.71	0.72	0.73	0.76	0.75	0.76	0.75

Although the ratio of retirees to actives is different for the Sheriffs and Deputies and Protection Occupation groups, the same increasing trend is evident in all three membership groups (see Exhibit 25).

ASSETS

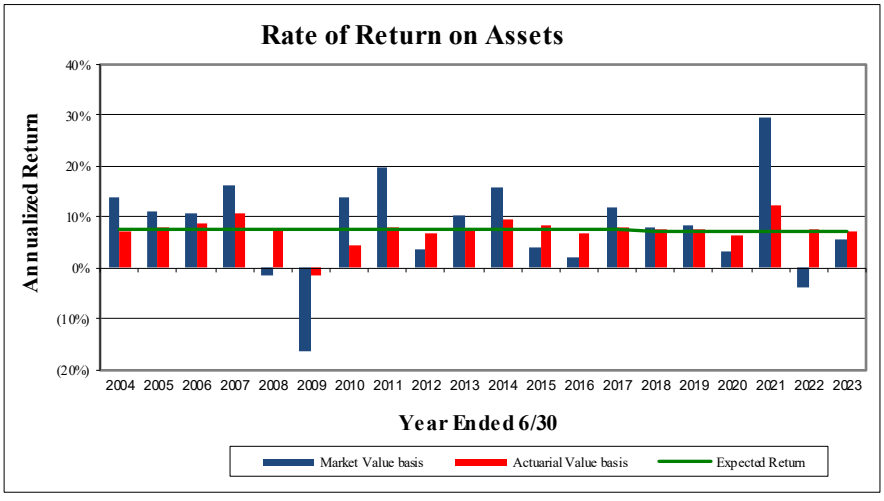
As of June 30, 2023, the System (all membership groups) had total net assets of $41.206 billion, when measured on a market value (or "fair value") basis. This was an increase of $1.020 billion from the prior year.

The market value of assets is not used directly in the calculation of the unfunded actuarial liability and the Actuarial Contribution Rates. An asset valuation method that smoothes the effect of market fluctuations is used to determine the value of assets used in the valuation. This amount, called the "actuarial value of assets", is equal to the expected asset value, based on the actuarial value in the prior valuation, net cash flows, and the assumed rate of return (7.0%), plus 25% of the difference between the actual market value and the expected asset value. After applying the asset valuation method, the resulting value must be no less than 80%

of market value and no more than 120% of market value (referred to as a "corridor"). The corridor rarely applies and did not impact the determination of the actuarial value of assets in this valuation. The actuarial value of assets as of June 30, 2023, was $41.013 billion, an increase of $1.658 billion from the prior valuation. The components of the change in the asset values are shown in the following table.

		Market Value ($M)		Actuarial Value ($M)
Adjusted Net Assets, June 30, 2022	**$**	**40,192**	**$**	**39,354**
• Employer and Member Contributions	+	1,511	+	1,511
• Benefit Payments and Refunds	-	2,634	-	2,634
• Expected Investment Income, Net of Expenses (Based on 7.0% Assumption)	+	2,775	+	2,717
• Actuarial Gain/(Loss) on Investment Return	+	(638)	+	65
Net Assets, June 30, 2023 Before FED Transfer	**$**	**41,206**	**$**	**41,013**
• FED Transfer	+	0	+	0
Net Assets, June 30, 2023 After FED Transfer	**$**	**41,206**	**$**	**41,013**
• Application of Corridor		N/A	+	0
Final Net Assets, June 30, 2023	**$**	**41,206**	**$**	**41,013**

The rate of return on a market value basis, as reported by IPERS, was 5.41%. Due to the combined impact of the unfavorable investment experience during FY 2023 and the deferred investment experience, the net rate of return, measured on the actuarial value of assets, was 7.17%. Since this return exceeded the investment return assumption of 7.00%, it generated an actuarial gain of $65 million.



Rates of return on the actuarial value of assets are much smoother than market value returns, illustrating the advantage of using an asset smoothing method.

Please see Exhibits 2 and 3 in Section II of this report for a summary of the market and actuarial value of assets by group (Regular, Sheriffs and Deputies, and Protection Occupation group) as of June 30, 2023.

In last year's valuation, there was a deferred (unrecognized) investment gain (market value exceeded actuarial value) of $832 million. Due to the rate of return of 5.41% for FY 2023, the deferred investment

gain has decreased to $194 million. The deferred investment gain will be recognized in the smoothing method in future years, but may be offset by actual investment experience if less favorable than assumed. For example, a return of 6.7% on the market value of assets for FY 2024 would eliminate the deferred investment gain and result in a return of 7.0% on the actuarial value of assets.

LIABILITIES

The actuarial liability is that portion of the present value of future benefits that will not be paid by the future normal costs for active members. The difference between this liability and the actuarial value of assets at the same date is called the unfunded actuarial liability. The dollar amount of the UAL will be reduced if the contributions to the System exceed the normal cost for the year plus interest on the prior year's UAL, assuming that all actuarial assumptions are met.

The unfunded actuarial liability by group, as of June 30, 2023, is shown in the following table:

($ Millions)	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
Actuarial Liability	$42,651	$910	$2,159	$45,720
Actuarial Value of Assets	37,856	934	2,223	41,013
Unfunded Actuarial Liability*	$4,795	($24)	($64)	$4,707
Funded Ratio	88.76%	102.60%	102.96%	89.70%

* May not add due to rounding.

See Exhibit 7 in Section III of the report for the detailed development of the unfunded actuarial liability for each group.

Changes in the UAL occur for various reasons. The net increase in the UAL from June 30, 2022, to June 30, 2023 was $92 million, largely due to the unfavorable liability experience. The components of the net change in the UAL are shown in the following table (in millions):

Unfunded Actuarial Liability, June 30, 2022	**$**	**4,615**
• Expected decrease from amortization method		(1)
• Expected decrease from contributions above actuarial rate		(147)
• Investment experience		(65)
• Liability experience*		382
• Other		(77)
Unfunded Actuarial Liability, June 30, 2023	**$**	**4,707**
• FED transfer for favorable experience		0
Unfunded Actuarial Liability, June 30, 2023	**$**	**4,707**

* Liability experience is 0.84% of the expected actuarial liability.

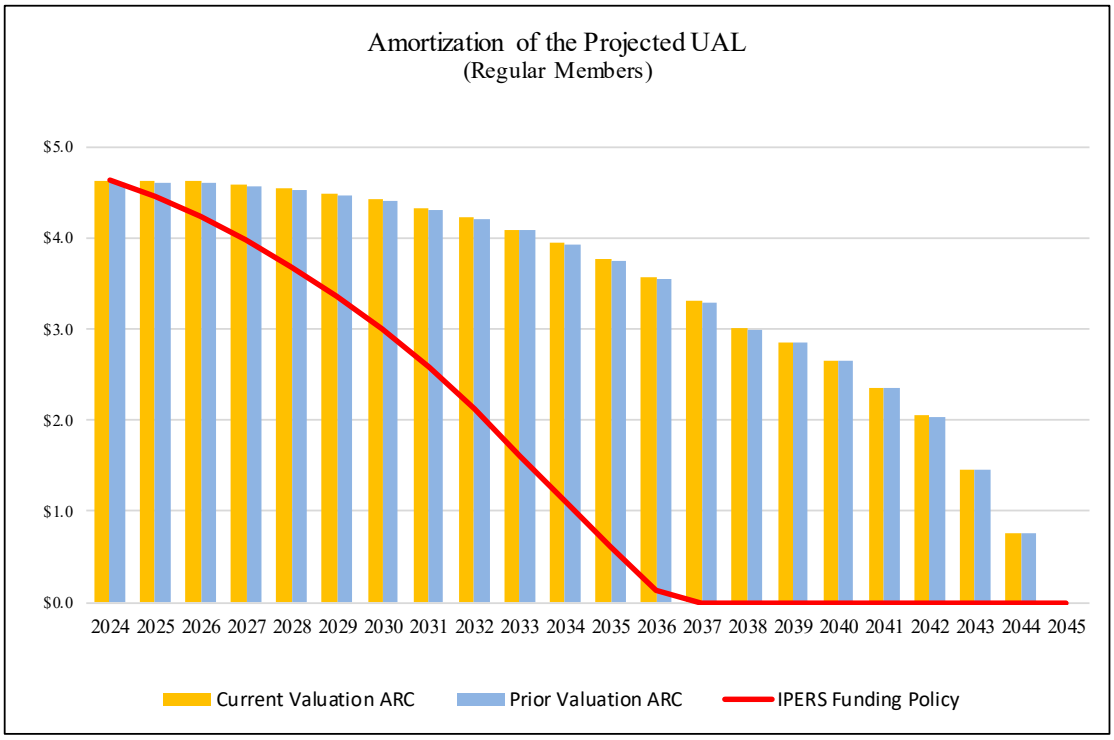
As can be observed above, various factors impacted the amount of the UAL as of June 30, 2023. Actuarial gains (losses), which result from actual experience that is more (less) favorable than anticipated based on the actuarial assumptions, are reflected in the UAL. They are measured as the difference between the expected

unfunded actuarial liability and the actual unfunded actuarial liability, after taking into account any changes due to actuarial assumptions and methods or benefit provision changes. Overall, the System experienced a net actuarial loss of $317 million which may be explained by considering the separate experience of assets and liabilities. As discussed earlier, there was a $65 million actuarial gain on the actuarial value of assets and a net actuarial loss of $382 million from demographic experience that was less favorable than anticipated by the actuarial assumptions. While there are various components of demographic experience, the most significant source of actuarial loss was salary increases that were larger than expected, based on actuarial assumptions. The actuarial loss from adverse experience was partially offset by the additional contributions of $147 million resulting from Required Contribution Rates that were higher than the Actuarial Contribution Rates for the year.

IPERS' UAL is amortized with payments that are determined as a level percentage of covered payroll, a methodology commonly used by public plans. Because covered payroll is expected to increase each year, the dollar amounts of the UAL payments also increase in each future year. As a result, in the early years of the amortization schedule the dollar amount of contributions may be less than the interest on the UAL (particularly when the amortization period is longer), resulting in an increase in the dollar amount of UAL. Currently, IPERS is contributing more than the normal cost plus interest on the UAL, so the dollar amount of UAL will decrease if all assumptions are met. The graph on the following page illustrates the outstanding balance of the projected UAL ($ in billions) for Regular members over the remainder of the amortization period if the Actuarial Contribution Rate is paid each year and all assumptions are met (gold columns). The blue columns show the outstanding balance of the projected UAL in the prior valuation assuming all assumptions are met. There is a one-year lag from the valuation date to the date the contribution rate becomes effective, so while there are 21 payments remaining in the graph, the UAL isn't eliminated until 22 years after the current valuation date.

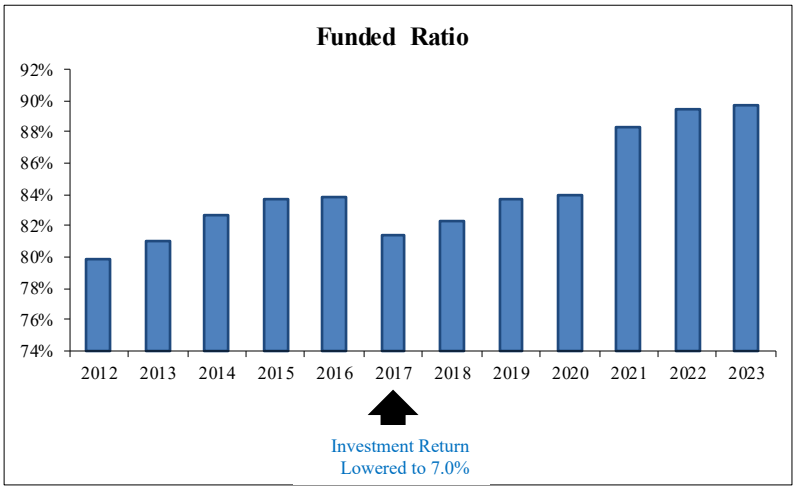
Under the current amortization method, the dollar amount of UAL declines slowly for a few years and then reduces more substantially each year. Note that given IPERS' Contribution Rate Funding Policy, the Required Contribution Rate is currently greater than the Actuarial Contribution Rate. This resulted in an additional contribution of $147 million during FY 2023, which reduced the amount of the UAL. Current valuation results indicate that the Required Contribution Rate exceeds the Actuarial Contribution Rate by 1.84% of pay which will reduce the UAL at a faster rate than if the Actuarial Contribution Rate was contributed. The red line in the graph on the following page represents the outstanding balance of the projected UAL reflecting the IPERS funding policy. However, the 2023 valuation projection model has not yet been produced, so the red line results are based on the June 30, 2022 valuation projection model reflecting the FY 2023 asset return. If all assumptions are met, the funding policy is expected to reduce the time to fund the UAL from 21 years to around 13 years.

The System's funding policy will continue to impact the outstanding balance of the UAL in future valuations and is expected to help the Regular membership reach full funding status more quickly than the amortization schedule (gold columns). In addition, recognition of the deferred investment gains through the asset smoothing method in the future (absent offsetting investment losses) could also impact the actual rate of decline in the UAL compared to these projections. Future investment returns will continue to heavily influence the System's funding status and projected full funding date.



An evaluation of the unfunded actuarial 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 liability, and the progress made in its funding, is to track the funded ratio, the ratio of the actuarial value of assets to the actuarial liability. The funded status information for the entire System is shown in the following table (in millions).

	6/30/2019	6/30/2020	6/30/2021	6/30/2022	6/30/2023
Funded Ratio (Actuarial Value)	83.7%	84.0%	88.3%	89.5%	89.7%
Unfunded Actuarial Liability ($M)	$6,477	$6,587	$4,960	$4,615	$4,707



The funded ratio over this timeframe has typically remained between 80% and 84%, although an exceptionally strong investment return led to a sharp improvement in 2021 and after. Note the decrease in 2017 resulted from lowering the investment return assumption from 7.5% to 7.0%.

Although IPERS has an unfunded actuarial liability, the funded ratio of 89.7% (actuarial assets divided by actuarial liability) marks the highest funded ratio for the System since the Great Recession and represents a positive trend. In addition, since the Contribution Rate Funding Policy was adopted, the actual contribution rate each year has met or exceeded the full actuarial contribution rate. This Funding Policy provides that the scheduled contribution dollars to eventually eliminate the unfunded actuarial liability over time will be made and the funded ratio should improve if all actuarial assumptions are met.

Measures of the funded ratio presented in this report are not an indication of the System's ability to settle its current obligations, nor, on their own, are they an indication of the need for future funding. In addition, please note that due to the use of an asset smoothing method the funded ratio, based on the market value of assets, may differ from the funded ratio based on the actuarial value of assets (shown above).

CONTRIBUTION RATE

Under the Entry Age Normal cost method, the Actuarial Contribution Rate consists of two components:

- a "normal cost" for the portion of projected liability allocated by the actuarial cost method to the service of active members during the year following the valuation date;
- an "unfunded actuarial liability contribution" for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

This valuation is used to determine the contribution rates that will be effective July 1, 2024, for the fiscal year ending June 30, 2025. Prior to the 2011 valuation, Regular members (about 95% of the active membership) contributed according to fixed contribution rates set in statute. Beginning with the 2011 valuation (which set contribution rates for FY 2013), IPERS was given the statutory authority to set the Required Contribution Rate for Regular members, subject to a maximum change of 1.00% per year. **Based on IPERS' Contribution Rate Funding Policy, the Required Contribution Rate for Regular members in this valuation (which sets the contribution rate for FY 2025) will remain unchanged from the prior valuation.**

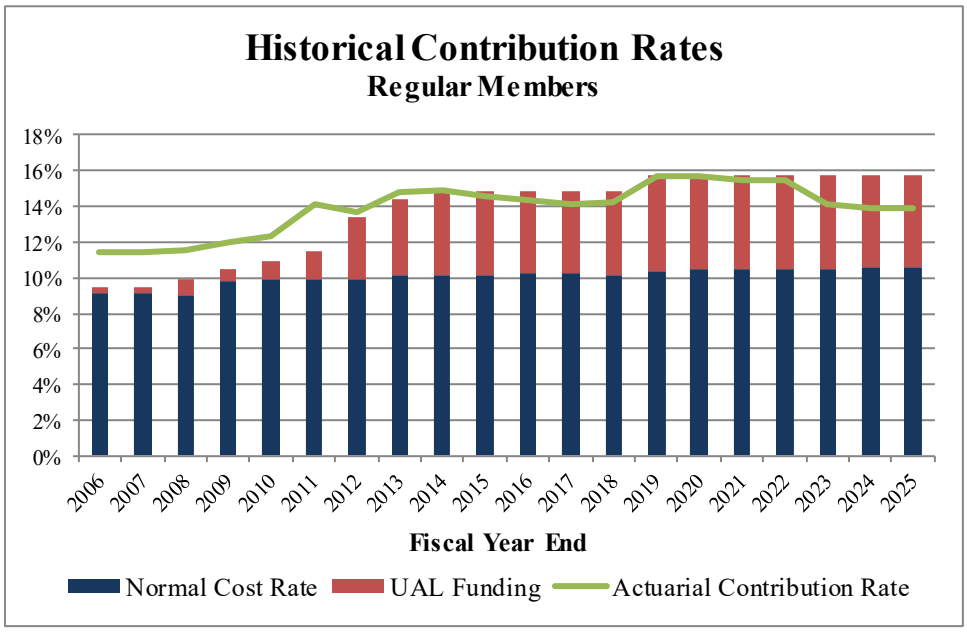
The remaining 5% of the active members, the Sheriffs and Deputies and the Protection Occupation groups, have historically contributed at the Actuarial Contribution Rate, which was subject to change each year. These groups now contribute based on the same funding policy as is used for the Regular members (without the 1% cap). According to the Contribution Rate Funding Policy, if the Actuarial Contribution Rate is less than the previous Required Contribution Rate by 0.50% or more, then the Required Contribution Rate shall be lowered by 0.50% provided the funded ratio of the membership group is 95% or higher. The current valuation results show that the Actuarial Contribution Rate has increased by 0.02% for the Sheriffs and Deputies group and 0.03% for the Protection Occupation group. As a result, the Actuarial Contribution Rate for FY 2025 is now 0.22% below the FY 2024 Required Contribution Rate for Sheriffs and Deputies, and 0.18% below the FY 2024 Required Contribution Rate for Protection Occupation. While both groups also have a funded ratio greater than 95%, the difference between the Required Contribution Rate and the Actuarial Contribution Rate is not greater than 0.50%. **Therefore, the FY 2025 Required Contribution Rate for the Sheriffs and Deputies group and the Protection Occupation group will remain unchanged.** Based on the results of this valuation, the Required Contribution Rate is greater than the Actuarial Contribution Rate for all three groups.

See Exhibit 14 in Section IV for the development of these contribution rates which are summarized in the following table.

Contribution Rate for FY 2025	Regular Membership	Sheriffs & Deputies	Protection Occupation
1. Actuarial Contribution Rate	13.89%	16.80%	15.34%
2. Required Contribution Rate	15.73%	17.02%	15.52%
3. Employee Contribution Rate	6.29%	8.51%	6.21%
4. Employer Contribution Rate (2) – (3)	9.44%	8.51%	9.31%
5. Shortfall/(Margin) (1) – (2)	(1.84%)	(0.22%)	(0.18%)

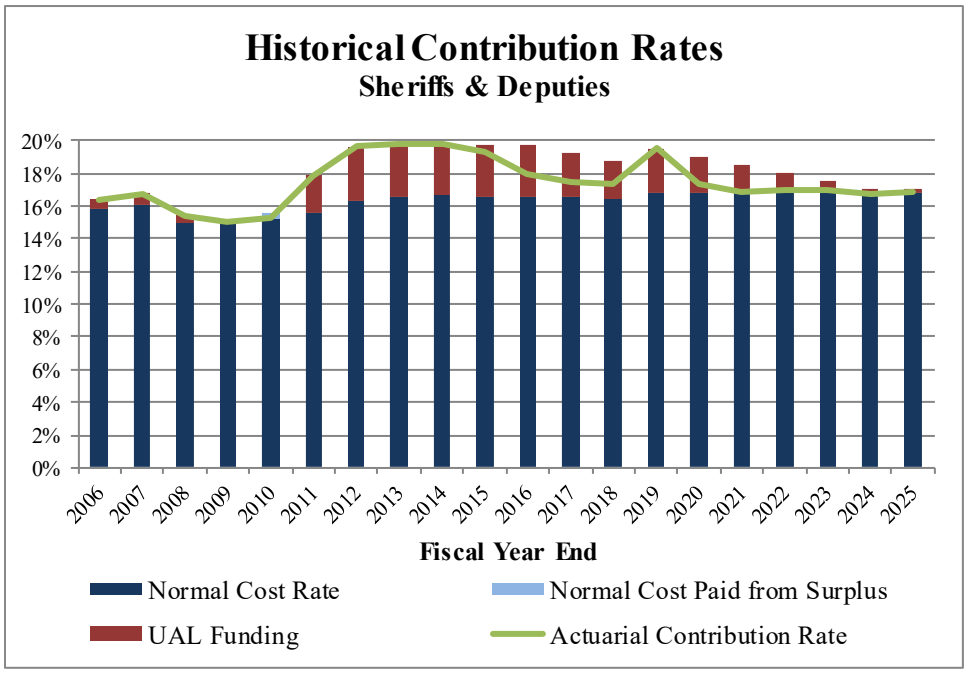
The Actuarial Contribution Rate is determined based on the snapshot of the System taken on the valuation date, June 30, 2023, and applies only for the fiscal year beginning July 1, 2024. The Actuarial Contribution Rate in future years will change each year as the deferred actuarial investment experience is recognized and other experience (both investment and demographic) impacts the System. The Required Contribution Rate will be set in each future year based on the Actuarial Contribution Rate for that year and the Contribution Rate Funding Policy.

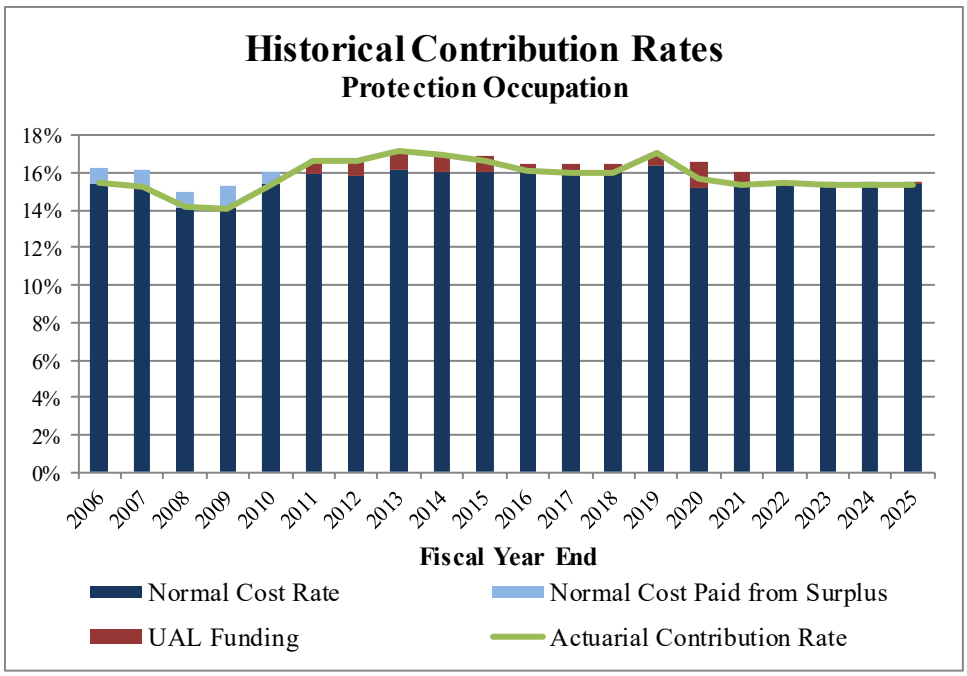
In 2006 and 2010, legislation was passed that increased the statutory contribution rate for Regular members. Beginning with the 2011 valuation (which applied to FY 2013), the Investment Board was given the authority to set the Required Contribution Rate for Regular members subject to certain statutory limitations. A historical summary of the actual contribution rate, split between the normal cost and the remaining amount available to fund the UAL, and the Actuarial Contribution Rate is shown in the following graph.



At the beginning of this time period, the actual contribution rates were less than the Actuarial Contribution Rate and a very small portion of the total contribution rate was available to fund the UAL. Recent changes have significantly increased this portion, providing more progress toward eliminating the UAL.

As shown in the following graphs, the Sheriffs and Deputies group and the Protection Occupation group have historically contributed the full Actuarial Contribution Rate. During the 20-year period shown, both groups have contributed the full Actuarial Contribution Rate every year (sometimes using surplus to fund part of the normal cost rate) and have contributed more than the ACR in 10 of the past 11 years, due to the Contribution Rate Funding Policy. As a result, the current valuation results show that both groups have a very strong funded ratio (102.60% for Sheriffs and Deputies, and 102.96% for Protection Occupation).





SUMMARY

The investment return on the market value of assets for FY 2023 was 5.41%, as reported by IPERS. This unfavorable investment experience, combined with unrecognized investment gains in last year's valuation, led to an investment return on the actuarial value of assets of 7.17%. Since that return is above the assumed investment return of 7.00%, there was an experience gain on the actuarial value of assets of $65 million. This was more than offset by an experience loss on the System's liabilities of $382 million. The System's total experience for FY 2023 was a net experience loss of $317 million, resulting in a larger unfunded actuarial liability than was expected. This was partially offset by additional contributions of $147 million resulting from Required Contribution Rates above the Actuarial Contribution Rates.

For each membership group, the Actuarial Contribution Rate consists of the normal cost and an amortization payment (not less than zero) of the group's unfunded actuarial liability. The normal cost may only be offset by a negative amortization payment after a membership group has attained a funded ratio of 110% or greater for three consecutive years. The following table summarizes the change to the Actuarial Contribution Rate as well as the Required Contribution Rate, based on the current valuation results.

	2023 Valuation (FY 2025)	2022 Valuation (FY 2024)	Change
Regular Members			
Actuarial Contribution Rate	13.89%	13.96%	(0.07%)
Required Contribution Rate	15.73%	15.73%	0.00%
Sheriffs & Deputies			
Actuarial Contribution Rate	16.80%	16.78%	0.02%
Required Contribution Rate	17.02%	17.02%	0.00%
Protection Occupation			
Actuarial Contribution Rate	15.34%	15.31%	0.03%
Required Contribution Rate	15.52%	15.52%	0.00%

As illustrated above, the Required Contribution Rate remained the same for all three groups. **The Required Contribution Rate remains higher than the Actuarial Contribution Rate for FY 2025 for all three membership groups.**

The Actuarial Contribution Rate is determined based on the snapshot of the System taken on the valuation date, June 30, 2023, and applies only for the fiscal year beginning July 1, 2024. The Actuarial Contribution Rate in the future will change each year as the deferred actuarial investment experience is recognized and as other experience (both investment and demographic) impacts the System. While the Required Contribution Rate can vary each year, the annual change to the rate for Regular members is limited by statute to 1.0% and the Contribution Rate Funding Policy also limits the decrease in the rate. Therefore, depending on actual experience in future years, the Required Contribution Rate may vary from the Actuarial Contribution Rate.

As mentioned earlier, the System utilizes an asset smoothing method in the valuation process. While this is a common procedure for public retirement systems, it is important to identify the potential impact of the deferred investment experience, particularly if deferred investment losses exist. The asset smoothing method impacts only the timing of when the actual market experience is recognized in the valuation process. As a result of the smoothing of actual returns, there is currently a deferred investment gain of $194 million. The key valuation results, using both actuarial and market value of assets, are shown below:

Actuarial Contribution Rate*	**Actuarial Value**	**Market Value**
Regular Members		
Normal Cost	10.62%	10.62%
UAL Contribution	3.27%	3.13%
Total Contribution	13.89%	13.75%
UAL ($M)	$4,795	$4,614
Funded Ratio	88.76%	89.18%
Sheriffs & Deputies		
Normal Cost	16.80%	16.80%
UAL Contribution	(0.89%)	(0.89%)
Total Contribution	15.91%	15.91%
UAL ($M)	($24)	($24)
Funded Ratio	102.60%	102.60%
Protection Occupation		
Normal Cost	15.34%	15.34%
UAL Contribution	(0.76%)	(0.91%)
Total Contribution	14.58%	14.43%
UAL ($M)	($64)	($77)
Funded Ratio	102.96%	103.56%

* Actuarial Contribution Rate is calculated prior to the application of the Contribution Rate Funding Policy which determines the Required Contribution Rate.

The long-term financial health of IPERS is heavily dependent on two key items: (1) future investment returns and (2) systematic contributions to the System at the full actuarially determined rate. Given the System's current funded status, the Actuarial Contribution Rate, and the Required Contribution Rate, the System's funded ratio is expected to improve over the long term, assuming all actuarial assumptions are met in the future and contributions are made according to the current Contribution Rate Funding Policy.

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 as anticipated by the assumptions each year 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 from the actuarial assumptions.

Risk evaluation is an important part of managing any defined benefit plan. A separate Risk Study was prepared for the Iowa Public Employees' Retirement System in March 2019 that included a comprehensive evaluation of the various risks facing the System, using both qualitative and quantitative analysis. The findings and conclusions of the report were presented to the Investment Board on March 22, 2019. The Risk Report included various types of quantitative analysis including stress tests, sensitivity analysis, and stochastic modeling. A brief discussion of certain key risks is included in Section VI of this report, but for a more comprehensive discussion please see the full Risk Report, dated March 2019. While the Risk Report was based on the 2018 valuation, we believe that the key findings and analysis remain relevant.

We conclude this executive summary by presenting comparative statistics and actuarial information on both the June 30, 2023, and June 30, 2022, valuations. All figures shown include the Regular membership, Sheriffs and Deputies, and the Protection Occupation group.

SUMMARY OF HISTORICAL CHANGE IN IPERS UNFUNDED ACTUARIAL LIABILITY

($Millions)	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
Unfunded Actuarial Liability (BOY[1])	1,255	1,867	2,176	2,289	2,507	2,266	2,665	4,895	4,931	5,682	5,916
• **Expected Change**											
– **From Amortization Method**	24	36	42	22	49	44	52	95	96	110	115
– **Contributions different than Actuarial Rate**	61	87	103	125	118	127	140	248	218	65	21
• **Investment Experience**	402	75	(89)	(235)	(622)	5	1,903	666	(66)	168	(15)
• **Liability and Other Experience**	125	82	57	242	187	214	135	(185)	(17)	(109)	(250)
• **Benefit Enhancements**	0	29	0	0	0	6	0	(674)	0	0	0
• **Change in Assumptions/Methods**	0	0	0	64	27	3	0	(114)	417	0	0
• **Change in Actuarial Software**	0	0	0	0	0	0	0	0	103	0	0
• **FED Transfer**	0	0	0	0	0	0	0	0	0	0	0
Unfunded Actuarial Liability (EOY[2])	1,867	2,176	2,289	2,507	2,266	2,665	4,895	4,931	5,682	5,916	5,787

1 = Beginning of Year
2 = End of Year

Note: The amounts shown in each year are not additive because they are calculated on each valuation date and, therefore, represent a value at a different point in time.

SUMMARY OF HISTORICAL CHANGE IN IPERS UNFUNDED ACTUARIAL LIABILITY (continued)

($Millions)	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Unfunded Actuarial Liability (BOY[1])	5,787	5,544	5,455	5,586	6,968	6,815	6,477	6,587	4,960	4,615
• **Expected Change**										
– **From Amortization Method**	99	72	54	52	185	43	14	12	(95)	(1)
– **Contributions different than Actuarial Rate**	0	(20)	(38)	(58)	(57)	0	(8)	(30)	(20)	(147)
• **Investment Experience**	(527)	(171)	236	(102)	(162)	(229)	146	(1,768)	(277)	(65)
• **Liability and Other Experience**	(29)	30	(121)	57	(154)	(152)	(42)	159	90	305
• **Benefit Enhancements**	0	0	0	0	0	0	0	0	0	0
• **Change in Assumptions/Methods**	215	0	0	1,433	35	0	0	0	(43)	0
• **Change in Actuarial Software**	0	0	0	0	0	0	0	0	0	0
• **FED Transfer**	(1)	0	0	0	0	0	0	0	0	0
Unfunded Actuarial Liability (EOY[2])	5,544	5,455	5,586	6,968	6,815	6,477	6,587	4,960	4,615	4,707

1 = Beginning of Year
2 = End of Year

Note: The amounts shown in each year are not additive because they are calculated on each valuation date and, therefore, represent a value at a different point in time.

IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
PRINCIPAL RESULTS

	June 30, 2023	June 30, 2022	% Chg
SYSTEM MEMBERSHIP			
1. Active Membership			
- Number of Members (excluding Retired/Reemployed)			
i) Regular	170,475	167,004	2.1
ii) Sheriffs & Deputies	1,732	1,724	0.5
iii) Protection Occupation	7,668	7,419	3.4
iv) Total	179,875	176,147	2.1
- Projected Payroll for Upcoming Fiscal Year	$9,891M	$9,279M	6.6
- Average Projected Salary	$54,987	$52,680	4.4
2. Inactive Membership			
- Number Not in Pay Status	89,034	83,557	6.6
- Number of Retirees/Beneficiaries	133,575	131,420	1.6
- Average Annual Benefit	$19,115	$18,713	2.1
ASSETS AND LIABILITIES			
1. Net Assets (excluding FED reserve)			
- Market Value	$41,206M	$40,186M	2.5
- Actuarial Value	41,013M	39,354M	4.2
2. Present Value of Future Benefits			
- Retired Members	$24,939M	$24,154M	3.2
- Inactive Members	1,440M	1,317M	9.3
- Active Members	29,070M	27,589M	5.4
- Total Present Value of Future Benefits*	$55,449M	$53,060M	4.5
3. Actuarial Liability*	$45,720M	$43,970M	4.0
4. Unfunded Actuarial Liability	$4,707M	$4,615M	2.0
5. Funded Ratio			
a. Actuarial Value Assets/Actuarial Liability	89.70%	89.50%	0.2
b. Market Value Assets/Actuarial Liability	90.13%	91.40%	(1.4)
SYSTEM CONTRIBUTIONS			
Required Contribution Rate, Regular Members**	15.73%	15.73%	0.0
Employer Contribution Rate	9.44%	9.44%	0.0
Employee Contribution Rate	6.29%	6.29%	0.0
Total Actuarial Contribution Rate	13.89%	13.96%	(0.5)
Contribution Rate Shortfall/(Margin)	(1.84%)	(1.77%)	4.0

Note: Totals may not add due to rounding
M = ($)Millions

* Difference between measures is the Present Value of Future Normal Costs
** Contribution rates for Sheriffs and Deputies are 8.51% for employers, 8.51% for employees
Contribution rates for Protection Occupation are 9.31% for employers, 6.21% for employees

SECTION II

SYSTEM ASSETS

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In this section, the values assigned to the assets held by the System are presented. These assets are valued on two different bases: the market value and the actuarial value.

Market Value of Net Assets

For certain accounting statement purposes, System assets are valued at current market prices. These values represent the "snapshot" of the fair value of System assets as of the valuation date.

Actuarial Value of Net Assets

The market value of assets may not necessarily be 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 volatility in the market value while still indirectly recognizing market value. The specific technique follows:

Step 1: Determine the expected value of plan assets at the current valuation date using the actuarial assumption for investment return on the prior actuarial value of assets and the actual receipts and disbursements of the fund for the previous 12 months.

Step 2: Subtract the expected value determined in Step 1 from the total market value of the Fund at the current valuation date.

Step 3: Multiply the difference between market and expected values determined in Step 2 by 25%.

Step 4: Add the expected value of Step 1 and the product of Step 3 to determine the actuarial value of assets.

Step 5: Verify the preliminary actuarial value of assets in Step 4 is not more than 120% of the market value of assets, nor less than 80% of the market value. If it is, adjust the actuarial value of assets so it falls within the 80% - 120% corridor.

EXHIBIT 1

ANALYSIS OF NET ASSETS AT MARKET VALUES

($ Millions)

	June 30, 2023		June 30, 2022	
	Amount	% of Total	Amount	% of Total
Cash & Equivalents	$ 496	1.2%	$ 385	1.0%
Capital Assets, Receivables and Payables	(69)	(0.2)	(1,093)	(2.7)
Domestic Equity	8,555	20.8	7,844	19.5
International Equity	8,610	20.9	8,258	20.5
Fixed Income	10,191	24.7	10,484	26.1
Private Real Assets	3,257	7.9	3,555	8.8
Private Equity/Debt	10,043	24.4	10,111	25.2
Securities Lending Collateral Pool	123	0.3	642	1.6
TOTAL NET ASSETS	$ 41,206	100.0%	$ 40,186	100.0%
FED Reserve (Before current year transfer)	0		0	
Current Year FED Transfer Payable	0		0	
Net Retirement System Assets	$ 41,206		$ 40,186	

EXHIBIT 2

SUMMARY OF FUND ACTIVITY
(Market Value)

	Regular Membership	Sheriffs & Deputies	Protection Occupation	FED Reserve	Total
NET RETIREMENT SYSTEM ASSETS ON JUNE 30, 2022	$37,115,609,381	$908,454,027	$2,162,328,881	$0	$40,186,392,289
ASSET ADJUSTMENT	6,050,322	(5,541,739)	4,665,387	0	5,173,970
ADJUSTED NET ASSETS ON JUNE 30, 2022	$37,121,659,703	$902,912,288	$2,166,994,268	$0	$40,191,566,259
REVENUE					
Employer contributions	845,637,735	12,822,804	42,556,001	0	901,016,540
Member contributions	563,930,745	12,823,261	28,386,742	0	605,140,748
Service purchase	5,137,442	56,866	71,083	0	5,265,391
Investment income	2,050,010,171	50,030,453	120,167,280	0	2,220,207,904
Total Revenue	$3,464,716,093	$75,733,384	$191,181,106	$0	$3,731,630,583
DISBURSEMENTS					
Benefit payments	2,409,206,514	44,616,957	107,963,865	0	2,561,787,336
Member refunds	63,713,500	1,043,841	7,356,814	0	72,114,155
Administrative expenses	13,328,793	111,052	506,255	0	13,946,100
Investment expenses	63,742,875	1,555,644	3,736,473	0	69,034,992
Total Disbursements	$2,549,991,682	$47,327,494	$119,563,407	$0	$2,716,882,583
PRELIMINARY NET ASSETS ON JUNE 30, 2023	$38,036,384,114	$931,318,178	$2,238,611,967	$0	$41,206,314,259
TRANSFERS					
Membership changes	472,643	2,547,267	(3,019,910)	0	0
FED Reserve	0	0	0	0	0
ADJUSTED NET ASSETS ON JUNE 30, 2023	$38,036,856,757	$933,865,445	$2,235,592,057	$0	$41,206,314,259

EXHIBIT 3

ACTUARIAL VALUE OF NET ASSETS

	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
1. Actuarial Value of Assets as of June 30, 2022	$36,345,895,362	$889,635,045	$2,118,701,972	$39,354,232,379
2. Actual Receipts/Disbursements				
a. Contributions	1,414,705,922	25,702,931	71,013,826	1,511,422,679
b. Benefit Payments and Refunds	2,472,920,014	45,660,798	115,320,679	2,633,901,491
c. Net Change	(1,058,214,092)	(19,957,867)	(44,306,853)	(1,122,478,812)
3. Expected Value of Assets as of June 30, 2023 [(1) x 1.07] + [(2c) x $(1.07)^{.5}$]	37,795,482,869	931,264,920	2,221,179,745	40,947,927,534
4. Preliminary Market Value of Assets as of June 30, 2023	38,036,384,114	931,318,178	2,238,611,967	41,206,314,259
5. Difference Between Market and Expected Values (4) - (3)	240,901,245	53,258	17,432,222	258,386,725
6. Preliminary Actuarial Value of Assets as of June 30, 2023 (3) + [(5) x 25%]	37,855,708,180	931,278,235	2,225,537,801	41,012,524,216
7. Transfers				
a. Membership changes	470,421	2,535,287	(3,005,708)	0
b. FED Reserve	0	0	0	0
8. Initial Actuarial Value of Assets as of June 30, 2023	$37,856,178,601	$933,813,522	$2,222,532,093	$41,012,524,216
9. Determination of Corridor				
a. 80% of Market Value of Assets	30,429,485,406	747,092,356	1,788,473,646	32,965,051,408
b. 120% of Market Value of Assets	45,644,228,108	1,120,638,534	2,682,710,468	49,447,577,110
10. Final Actuarial Value of Assets as of June 30, 2023 (8), but not less than (9a), nor greater than (9b)	$37,856,178,601	$933,813,522	$2,222,532,093	$41,012,524,216

EXHIBIT 4

HISTORICAL COMPARISON (ACTUARIAL AND MARKET)

Value as of June 30	Actuarial Value of Net Assets (AVA)	Market Value of Net Assets (MVA)	AVA/MVA
2004	16,951,942,539	16,726,227,853	101%
2005	17,951,490,071	18,224,067,613	99%
2006	19,144,036,519	19,847,676,903	96%
2007	20,759,628,415	22,624,387,015	92%
2008	21,857,423,183	21,844,112,206	100%
2009	21,123,979,941	17,603,316,618	120%
2010	21,537,458,560	19,538,971,423	110%
2011	22,575,309,199	22,772,344,651	99%
2012	23,530,094,461	23,024,773,746	102%
2013	24,711,096,187	24,756,663,715	100%
2014	26,460,428,085	28,038,549,893	94%
2015	27,915,379,103	28,429,834,829	98%
2016	29,033,696,587	28,326,433,656	102%
2017	30,472,423,914	30,779,116,326	99%
2018	31,827,755,864	32,314,588,595	98%
2019	33,324,327,606	34,010,680,731	98%
2020	34,485,656,745	34,047,692,112	101%
2021	37,584,987,296	42,889,875,682	88%
2022	39,354,232,379	40,186,392,289	98%
2023	41,012,524,216	41,206,314,259	100%

Values are for all three membership groups, but exclude the Favorable Experience Dividend Reserve Account.

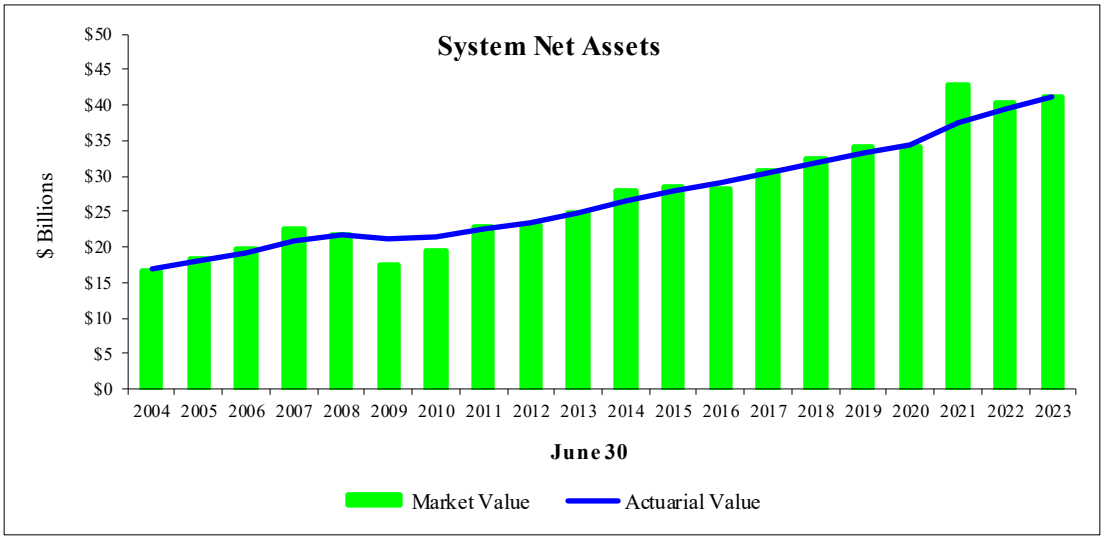

EXHIBIT 5

SUMMARY OF FAVORABLE EXPERIENCE DIVIDEND RESERVE

1. Initial Market Value of FED Reserve as of June 30, 2023	$	0
2. Transfer to Membership Groups		0
3. Final Value of FED Reserve as of June 30, 2023 (1) - (2)	$	0

SECTION III

SYSTEM LIABILITIES

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SECTION III

SYSTEM 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. There are several methods used to allocate the cost of benefits to members' working lifetimes. These mathematical techniques are called actuarial cost methods.

The method used for this valuation is referred to as the "entry age normal" actuarial cost method. In general, under this method, a contribution that is a level percent of rates of pay is determined for each member, which if paid from date of hire to retirement date, will finance all future benefit payments. The level percent of pay that is developed is called the **"normal cost"**. The sum of the individual normal cost dollar amounts is divided by expected covered payroll of current actives to determine the normal cost rate for the System.

The actuarial liability is that portion of the present value of future benefits (PVFB) that will not be paid by the normal costs in future years. The difference between this liability and the actuarial value of assets as of the same date is referred to as the **unfunded actuarial liability (UAL).** If contributions exceed the normal cost for the year, after allowing for interest on the previous balance of the UAL, this liability will be reduced. Benefit changes, experience gains and losses, and changes in actuarial assumptions or procedures will also have an effect on the total actuarial liability and on the portion of it that is unfunded.

The UAL is projected to the following year to reflect the time lag from the valuation date to the date the contribution rates are effective and is then amortized according to the Actuarial Amortization Method adopted by the Investment Board.

Effective with the June 30, 2008, valuation, a transfer of assets is performed as of June 30th for all employees whose membership group changed since the prior valuation. The purpose behind the transfer is to better match the assets and liabilities for each membership group by having both the assets and liabilities for each member reside in their current membership group. When employees move between membership groups, an asset transfer for valuation purposes is made based on the funded ratio of their former group prior to the transfer. The asset transfer calculation is determined by multiplying the actuarial liability of the employee transferring by the funded ratio of their former group just prior to the transfer. The asset values after the transfers and the liabilities for the employees reside in their current membership group and are used to prepare the final valuation results.

A summary of the number of employees who transferred is shown below:

From	To		
	Regular	Sheriffs and Deputies	Protection Occupation
Regular		16	319
Sheriffs and Deputies	14		29
Protection Occupation	288	67	

The impact on the UAL from the transfer is shown below:

Regular	Sheriffs and Deputies	Protection Occupation
($4,305,455)	$523,874	$1,484,126

EXHIBIT 6

NET IMPACT OF MEMBER TRANSFERS DURING FY 2023

	Regular Members	Sheriffs/ Deputies	Protection Occupation
Preliminary Actuarial Liability	$42,654,188,259	$907,484,706	$2,160,603,929
Net Effect of Transfers	(3,100,102)	2,689,942	(1,887,295)
Final Actuarial Liability	$42,651,088,157	$910,174,648	$2,158,716,634
Preliminary Actuarial Value of Assets*	$37,854,973,248	$931,647,454	$2,225,903,514
Net Effect of Transfers	1,205,353	2,166,068	(3,371,421)
Final Actuarial Value of Assets	$37,856,178,601	$933,813,522	$2,222,532,093
Preliminary Unfunded Actuarial Liability	$4,799,215,011	($24,162,748)	($65,299,585)
Net Effect of Transfers	(4,305,455)	523,874	1,484,126
Final Unfunded Actuarial Liability	$4,794,909,556	($23,638,874)	($63,815,459)
Preliminary Funded Ratio	88.75%	102.66%	103.02%
Final Funded Ratio	88.76%	102.60%	102.96%

* Reflects asset transfers shown in the System's financial statements, but not the transfer amounts based on membership changes during the prior year calculated by the Actuary. The amounts disclosed in the System's assets statements were: ($738,405) for Regular Members, $370,964 for Sheriffs and Deputies, and $367,441 for Protection Occupation. These transfer amounts reflected in the Preliminary Actuarial Value of Assets are adjusted based on the ratio of the Preliminary Actuarial Value of Assets to the Preliminary Market Value of Assets, or: ($734,932) for Regular Members, $369,219 for Sheriffs and Deputies, and $365,713 for Protection Occupation.

EXHIBIT 7

PRESENT VALUE OF FUTURE BENEFITS
as of June 30, 2023

The actuarial present value of future benefits represents the current value of benefits expected to ultimately be earned by the current members of the System as of the valuation date.

	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
Active Members				
Retirement benefits	$24,586,474,339	$629,468,995	$1,334,113,948	$26,550,057,282
Death benefits	217,950,589	7,089,224	20,678,139	245,717,952
Termination benefits	1,508,425,433	32,007,050	203,509,391	1,743,941,874
Disability benefits	446,576,758	20,637,974	62,867,397	530,082,129
Inactive Members				
Vested members	1,139,110,033	16,485,330	90,781,095	1,246,376,458
Nonvested members	188,578,021	517,744	4,893,021	193,988,786
Retired Members and Beneficiaries	23,332,893,647	473,879,475	1,131,899,456	24,938,672,578
Total Present Value of Future Benefits	$51,420,008,820	$1,180,085,792	$2,848,742,447	$55,448,837,059

EXHIBIT 8

UNFUNDED ACTUARIAL LIABILITY
as of June 30, 2023

	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
1. Present Value of Future Benefits	$51,420,008,820	$1,180,085,792	$2,848,742,447	$55,448,837,059
2. Present Value of Future Normal Costs	8,768,920,663	269,911,144	690,025,813	9,728,857,620
3. Actuarial Liability (1) - (2)	$42,651,088,157	$910,174,648	$2,158,716,634	$45,719,979,439
4. Actuarial Value of Net Assets	37,856,178,601	933,813,522	2,222,532,093	41,012,524,216
5. Unfunded Actuarial Liability (3) - (4)	$4,794,909,556	($23,638,874)	($63,815,459)	$4,707,455,223
6. Funded Ratio (4) / (3)	88.76%	102.60%	102.96%	89.70%

EXHIBIT 9

CALCULATION OF ACTUARIAL (GAIN)/LOSS AND ANY TRANSFER TO THE FAVORABLE EXPERIENCE DIVIDEND RESERVE
Based on the June 30, 2023 Actuarial Valuation

The Favorable Experience Dividend (FED) reserve account was created by legislation in 1998. The main purpose of the account is to help offset the negative impact of postretirement inflation for members who retired after June 30, 1990. The law provided that a portion of the favorable actuarial experience, if any, in subsequent years would be transferred to the FED reserve. Legislation passed in 2000 capped the FED reserve at ten years of expected payouts at the maximum level. Further legislation in 2006 prohibited further transfers to the FED until the System has no remaining UAL. The System currently has an UAL so no transfer is to be made this year.

1. June 30, 2022 Unfunded Actuarial Liability	$	4,615,482,227
2. Normal Cost for year ending June 30, 2023		945,586,515
3. Employer and Employee Contributions*		1,506,157,288
4. Change due to membership transfers		(2,297,455)
5. Change due to FED transfer		0
6. Expected Unfunded Actuarial Liability as of June 30, 2023 $[(1) + (2)] * 1.07 - (3) * (1.07)^{.5} + (4) + (5)$		4,390,064,886
7. Actual Unfunded Actuarial Liability as of June 30, 2023		4,707,455,223
8. (Gain)/loss (7) - (6)		317,390,337
9. Portion of gain to transfer to FED		N/A
10. Amount of Actuarial Value of Assets to transfer to FED	$	0
11. Market value of FED transfer	$	0

* Does not include service purchases

EXHIBIT 10

ACTUARIAL (GAIN)/LOSS BY GROUP
Based on the June 30, 2023 Actuarial Valuation

	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
1. Expected Actuarial Liability				
a. Actuarial Liability at June 30, 2022	$41,090,755,292	$849,677,745	$2,029,281,569	$43,969,714,606
b. Normal Cost for FY 2023	862,124,546	22,073,497	61,388,472	945,586,515
c. Benefit Payments for FY 2023	(2,472,920,014)	(45,660,798)	(115,320,679)	(2,633,901,491)
d. Interest on (a), (b), and (c) at 7.0%	2,851,613,250	59,451,488	142,378,944	3,053,443,682
e. Transfers and Service Purchases	2,214,109	2,748,765	(1,813,766)	3,149,108
f. Expected Actuarial Liability as of June 30, 2023	$42,333,787,183	$888,290,697	$2,115,914,540	$45,337,992,420
2. Actuarial Liability at June 30, 2023	$42,651,088,157	$910,174,648	$2,158,716,634	$45,719,979,439
3. Actuarial Liability (Gain)/Loss (2) - (1f)	$317,300,974	$21,883,951	$42,802,094	$381,987,019
4. Expected Actuarial Value of Assets				
a. Actuarial Value of Assets at June 30, 2022	$36,345,895,362	$889,635,045	$2,118,701,972	$39,354,232,379
b. Contributions for FY 2023	1,414,705,922	25,702,931	71,013,826	1,511,422,679
c. Benefit Payments for FY 2023	(2,472,920,014)	(45,660,798)	(115,320,679)	(2,633,901,491)
d. Interest on (a), (b), and (c) at 7.0%	2,507,801,599	61,587,742	146,784,626	2,716,173,967
e. Transfers	470,421	2,535,287	(3,005,708)	0
f. Expected Actuarial Value of Assets as of June 30, 2023	$37,795,953,290	$933,800,207	$2,218,174,037	$40,947,927,534
5. Actuarial Value of Assets at June 30, 2023	$37,856,178,601	$933,813,522	$2,222,532,093	$41,012,524,216
6. Actuarial Value of Assets (Gain)/Loss (4f) - (5)	($60,225,311)	($13,315)	($4,358,056)	($64,596,682)
7. Net Actuarial (Gain)/Loss (3) + (6)	$257,075,663	$21,870,636	$38,444,038	$317,390,337

SECTION IV

SYSTEM CONTRIBUTIONS

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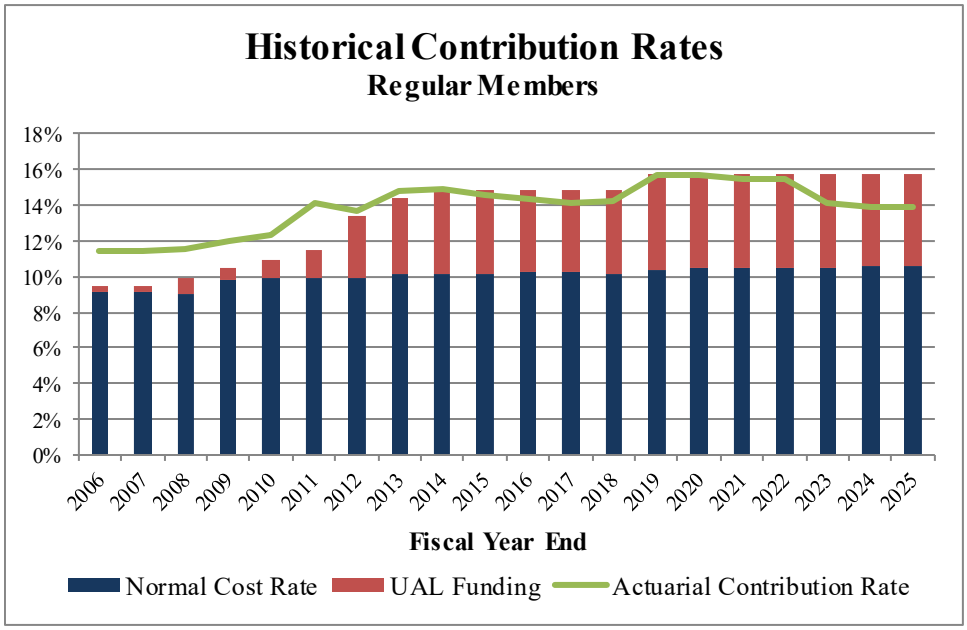
Under the actuarial funding method described in Appendix C, the actuarial contribution rate consists of two elements:

(1) the normal cost rate and
(2) the contribution rate to amortize the unfunded actuarial liability as a level percent of payroll.

This contribution rate development balances contribution stability, assigning costs to each generation as a level percent of payroll, and benefit security, accumulating assets to pay benefits before they are due. The unfunded actuarial liability represents the difference between the portion of the present value of future benefits allocated to service credited prior to the valuation date by the actuarial cost method and the actuarial value of assets as of that date.

In 2006 and 2010, legislation was passed that increased the statutory contribution rate for Regular members. Beginning with the 2011 valuation (applicable for contributions for FY 2013), the Investment Board was given the authority to set the Required Contribution Rate for Regular members subject to certain statutory limitations. A historical summary of the actual contribution rate and the actuarial contribution rate is shown in the graph below:



Effective with the June 30, 2008, valuation, a transfer of assets is performed on June 30th for all split service members (those members with service in more than one membership group) whose membership group changed since the prior valuation. In addition, IPERS also transfers assets for certain split service members who have not changed groups since the last valuation. As a result, all assets and liabilities for each member reside in their current membership group. When members move between membership groups, an asset transfer for valuation purposes is made based on the funded ratio of their former group prior to the transfer. The asset transfer calculation is determined by multiplying the actuarial liability of the members transferring by the funded ratio of their former group just prior to the transfer. The asset values after the transfers and the liabilities for the members reside in their current membership group and are used to prepare the final valuation results.

EXHIBIT 11

ACTUARIAL BALANCE SHEET
as of June 30, 2023

	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
ASSETS				
Actuarial value of assets	$37,856,178,601	$933,813,522	$2,222,532,093	$41,012,524,216
Present value of future normal costs	8,768,920,663	269,911,144	690,025,813	9,728,857,620
Present value of future contributions to amortize unfunded actuarial liability	4,794,909,556	(23,638,874)	(63,815,459)	4,707,455,223
Total Net Assets	$51,420,008,820	$1,180,085,792	$2,848,742,447	$55,448,837,059
LIABILITIES				
Present Value of Future Benefits:				
Retired Members and Beneficiaries	$23,332,893,647	$473,879,475	$1,131,899,456	$24,938,672,578
Active Members	26,759,427,119	689,203,243	1,621,168,875	29,069,799,237
Inactive Members	1,327,688,054	17,003,074	95,674,116	1,440,365,244
Total Liabilities	$51,420,008,820	$1,180,085,792	$2,848,742,447	$55,448,837,059

EXHIBIT 12

PROJECTED UNFUNDED ACTUARIAL LIABILITY ON JUNE 30, 2024

	Regular Membership	Sheriffs & Deputies	Protection Occupation
1. FYE 2024 Required Contribution Rate	15.73%	17.02%	15.52%
2. Normal Cost Rate	10.62%	16.80%	15.34%
3. Contribution Rate Applied to Fund the UAL for FYE 2024 (1) - (2)	5.11%	0.22%	0.18%
4. Unfunded Actuarial Liability/(Surplus) on June 30, 2023	$ 4,794,909,556	$ (23,638,874)	$ (63,815,459)
5. Projected Payroll for FYE 2024	$ 9,398,832,997	$ 154,305,295	$ 486,271,281
6. Projected UAL on June 30, 2024 [(4) x 1.07] - [(3) x (5) x $1.07^{.5}$]	$ 4,633,747,351	$ (25,644,747)	$ (69,187,946)

EXHIBIT 13

UAL AMORTIZATION BASES
REGULAR MEMBERS

We believe the layered amortization policy, with new bases amortized over 20 years and the remainder of the legacy base over 21 years, complies with Actuarial Standard of Practice Number 4. This policy will fully amortize the individual, as well as the total, unfunded actuarial accrued liability within a reasonable timeframe and/or reduce the amount of the UAL by a reasonable amount within a sufficiently short period.

Amortization Bases	Original Amount	Remaining Payments*	Projected July 1, 2024 Balance	Annual Payment**
2014 Initial UAL	$ 5,592,056,086	21	$ 6,099,030,956	$ 419,357,085
2015 Experience	(193,648,198)	12	(172,904,367)	(17,998,804)
2016 Experience	21,763,596	13	19,930,639	1,947,017
2017 Experience	(158,062,524)	14	(147,597,681)	(13,610,398)
2017 Assumption Changes	1,435,708,789	14	1,340,654,843	123,625,559
2018 Experience	(310,129,854)	15	(295,655,145)	(25,863,984)
2018 Assumption Changes	75,130,979	15	71,624,386	6,265,719
2019 Experience	(384,733,612)	16	(372,824,248)	(31,075,771)
2020 Experience	67,832,112	17	66,562,107	5,306,487
2021 Experience	(1,670,503,783)	18	(1,654,347,495)	(126,569,520)
2022 Experience	(351,647,258)	19	(350,410,178)	(25,804,702)
2022 Assumption Changes	9,926,473	19	9,891,552	728,428
2023 Experience	19,791,982	20	19,791,982	1,406,665
Total			**$ 4,633,747,351**	**$ 317,713,781**

* Payments begin July 1, 2024.

** Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$ 317,713,781
2. Projected Payroll for FYE 2024	$ 9,398,832,997
3. Projected Payroll for FYE 2025: (2) x 1.0325	$ 9,704,295,069
4. UAL Amortization Payment Rate: (1) / (3)	3.27%

Note: Based on the Actuarial Amortization Method, adopted by the Investment Board, annual net experience gains/losses are amortized over a new, closed 20-year period.

EXHIBIT 14

UAL AMORTIZATION BASES
SHERIFFS & DEPUTIES

We believe the layered amortization policy, with surplus assets amortized over an open 30-year period, complies with Actuarial Standard of Practice Number 4.

Amortization Bases	Original Amount	Remaining Payments*	Projected July 1, 2024 Balance	Annual Payment**
2023 Initial UAL	(25,644,747)	30	(25,644,747)	(1,414,872)
Total			**$ (25,644,747)**	**$ (1,414,872)**

* Payments begin July 1, 2024.

** Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	(1,414,872)
2. Projected Payroll for FYE 2024	$	154,305,295
3. Projected Payroll for FYE 2025 (2) x 1.0325	$	159,320,217
4. UAL Amortization Payment Rate (1) / (3)		(0.89%)

Note: Based on the Actuarial Amortization Method, adopted by the Investment Board, once a group has a surplus the prior amortization bases will be eliminated and the surplus will be amortized over an open 30-year period.

EXHIBIT 15

UAL AMORTIZATION BASES
PROTECTION OCCUPATION

We believe the layered amortization policy, with surplus assets amortized over an open 30-year period, complies with Actuarial Standard of Practice Number 4.

Amortization Bases	Original Amount	Remaining Payments*	Projected July 1, 2024 Balance	Annual Payment**
2023 Initial UAL	(69,187,946)	30	(69,187,946)	(3,817,239)
Total			**$ (69,187,946)**	**$ (3,817,239)**

* Payments begin July 1, 2024.

** Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	(3,817,239)
2. Projected Payroll for FYE 2024	$	486,271,281
3. Projected Payroll for FYE 2025 (2) x 1.0325	$	502,075,098
4. UAL Amortization Payment Rate (1) / (3)		(0.76%)

Note: Based on the Actuarial Amortization Method, adopted by the Investment Board, once a group has a surplus the prior amortization bases will be eliminated and the surplus will be amortized over an open 30-year period.

EXHIBIT 16

ANALYSIS OF CONTRIBUTION RATE

The actuarial cost method used to determine the required level of annual contributions by the employees and the employers to support the expected benefits is the Entry Age Normal Cost Method. Under this method, the total cost is comprised of the normal cost rate and the unfunded actuarial liability payment. The payment to amortize the unfunded actuarial liability is determined as a level percentage of payroll, based on the Actuarial Amortization Method, adopted by the Investment Board. This method was revised by the Investment Board in September 2013 (see Appendix C). The contribution rate developed in this exhibit is based on the Funding Policy and the June 30, 2023 actuarial valuation and applies to the fiscal year beginning July 1, 2024 and ending June 30, 2025.

	Regular Membership	Sheriffs & Deputies	Protection Occupation
1. Normal Cost Rate	10.62%	16.80%	15.34%
2. UAL Contribution Rate for FY 2025	3.27%	(0.89%)	(0.76%)
3. Funded Ratio as of June 30, 2023	88.8%	102.6%	103.0%
Funded Ratio as of June 30, 2022	88.5%	104.7%	104.4%
Funded Ratio as of June 30, 2021	87.3%	102.7%	103.1%
4. UAL Contribution Rate Applicable for FY 2025* (2) if positive	3.27%	0.00%	0.00%
5. Actuarial Contribution Rate for FY 2025 (1) + (4)	13.89%	16.80%	15.34%
6. Required Contribution Rate for FY 2024	15.73%	17.02%	15.52%
7. Required Contribution Rate for FY 2025**	15.73%	17.02%	15.52%
Employer Contribution Rate	9.44%	8.51%	9.31%
Employee Contribution Rate	6.29%	8.51%	6.21%

* The UAL Contribution Rate is allowed to be negative only if the funded ratio was at least 110% in each of the past three years.

** The Required Contribution Rate is the Actuarial Contribution Rate, but not more than 1% greater than the prior year's Required Contribution Rate for Regular Members, nor lower than the prior year's Required Contribution Rate unless the difference is at least 0.50% and the funded ratio is at least 95%, in which case the Required Contribution Rate is the prior year's Required Contribution Rate less 0.50% for all groups.

EXHIBIT 17

UNFUNDED ACTUARIAL LIABILITY AMORTIZATION SCHEDULE REGULAR MEMBERS

This schedule illustrates the theoretical funding of the UAL over the remaining amortization period assuming all assumptions are met in the future (no experience gains or losses) and the Actuarial Contribution Rate (rather than the Required Contribution Rate) is contributed in future years. As a result, the years to full funding shown here will vary from the number of years disclosed in the Executive Summary of this report.

Fiscal Year Ending June 30	Projected Active Member Payroll	Unfunded Actuarial Liability (BOY)	Annual Contributions	
			Dollars	% of Payroll
	----------$ in millions----------			
2025	9,704	4,634	318	3.27
2026	10,020	4,629	328	3.27
2027	10,345	4,614	339	3.27
2028	10,682	4,587	350	3.27
2029	11,029	4,546	361	3.27
2030	11,387	4,491	373	3.27
2031	11,757	4,420	385	3.27
2032	12,139	4,331	397	3.27
2033	12,534	4,223	410	3.27
2034	12,941	4,094	424	3.27
2035	13,362	3,942	437	3.27
2036	13,796	3,766	452	3.27
2037	14,244	3,562	493	3.46
2038	14,707	3,302	506	3.44
2039	15,185	3,010	350	2.31
2040	15,679	2,858	393	2.51
2041	16,188	2,652	458	2.83
2042	16,715	2,364	464	2.77
2043	17,258	2,050	704	4.08
2044	17,819	1,465	773	4.34
2045	18,398	769	795	4.32
2046	18,996	0	0	0.00

Note that the outstanding balance of the UAL begins to decline immediately, slowly at first and then more rapidly over time. This pattern is due to use of the level percent of payroll amortization methodology where the dollar amount of the UAL payment increases with expected payroll in future years. The current valuation results for the Sheriffs & Deputies and Protection Occupation groups have a negative UAL, which will be amortized over an open 30-year period. Consequently, no table is displayed.

SECTION V

HISTORICAL FUNDING AND OTHER INFORMATION

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In this section, we provide some historical information regarding the funding progress of the System. These exhibits retain some of the information that used to be required for accounting purposes and are included because they provide relevant information on the System's historical funding.

EXHIBIT 18

SUMMARY OF VALUATION MEMBERSHIP

	June 30, 2023	June 30, 2022
Active Employees:		
Vested	98,371	97,948
Not yet vested	81,504	78,199
Total active employees	179,875	176,147
Retirees and beneficiaries currently receiving benefits*	133,575	131,420
Inactive vested members entitled to benefits but not yet receiving them	26,317	25,734
Inactive, nonvested members entitled to a refund of contributions**	62,717	57,823

* Retired/reemployed members are included in retiree counts, but not the active or inactive counts. Counts are 8,412 for 2023 and 8,520 for 2022.

** Includes deceased vested inactive members with employee contributions still held by the System.

EXHIBIT 19

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Net Actuarial Value of Assets (a)	Actuarial Liability (AL) (b)	Unfunded AL (UAL) (b-a)	Funded Ratio (a/b)	Actual Covered Payroll (P/R)* (c)	UAL as a Percentage of Covered P/R [(b-a)/c]
6/30/04	$16,951,942,539	$19,128,410,606	2,176,468,067	88.62%	$5,072,027,906	42.91%
6/30/05	17,951,490,071	20,240,098,667	2,288,608,596	88.69%	5,236,860,886	43.70%
6/30/06	19,144,036,519	21,651,122,419	2,507,085,900	88.42%	5,523,863,321	45.39%
6/30/07	20,759,628,415	23,026,113,782	2,266,485,367	90.16%	5,781,706,199	39.20%
6/30/08	21,857,423,183	24,522,216,589	2,664,793,406	89.13%	6,131,445,367	43.46%
6/30/09	21,123,979,941	26,018,593,823	4,894,613,882	81.19%	6,438,643,124	76.02%
6/30/10	21,537,458,560	26,468,419,650	4,930,961,090	81.37%	6,571,182,005	75.04%
6/30/11	22,575,309,199	28,257,080,114	5,681,770,915	79.89%	6,574,872,719	86.42%
6/30/12	23,530,094,461	29,446,197,486	5,916,103,025	79.91%	6,786,158,720	87.18%
6/30/13	24,711,096,187	30,498,342,320	5,787,246,133	81.02%	6,880,131,134	84.12%
6/30/14	26,460,428,085	32,004,456,088	5,544,028,003	82.68%	7,099,277,280	78.09%
6/30/15	27,915,379,103	33,370,318,731	5,454,939,628	83.65%	7,326,348,141	74.46%
6/30/16	29,033,696,587	34,619,749,147	5,586,052,560	83.86%	7,556,515,720	73.92%
6/30/17	30,472,423,914	37,440,382,029	6,967,958,115	81.39%	7,863,160,443	88.62%
6/30/18	31,827,755,864	38,642,833,653	6,815,077,789	82.36%	7,983,219,527	85.37%
6/30/19	33,324,327,606	39,801,338,797	6,477,011,191	83.73%	8,151,043,468	79.46%
6/30/20	34,485,656,745	41,072,427,540	6,586,770,795	83.96%	8,391,856,350	78.49%
6/30/21	37,584,987,296	42,544,648,750	4,959,661,454	88.34%	8,648,783,536	57.35%
6/30/22	39,354,232,379	43,969,714,606	4,615,482,227	89.50%	9,018,019,950	51.18%
6/30/23	41,012,524,216	45,719,979,439	4,707,455,223	89.70%	9,588,339,000	49.10%

* Covered payroll amount provided by the System.
Note: Includes all three membership groups.

EXHIBIT 20

SCHEDULE OF EMPLOYER CONTRIBUTIONS

The Employer Actuarial Contribution Rate (ACR) is determined as a rate of pay as part of the annual valuation. The dollar amounts displayed in this table are based on analysis by IPERS each year to consider the actual contributions received (using the actual contribution rate in effect) and then determining what the ACR amount would have been on the same payroll.

	Actuarial Contribution Rate (ACR)				Percentage of ACR Contributed			
Fiscal Year Ending	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
6/30/04	$309,006,609	$5,489,797	$14,263,836	$328,760,242	90.3%	100.0%	100.0%	90.9%
6/30/05	341,552,685	6,236,611	15,391,729	363,181,025	84.7%	100.0%	100.0%	85.6%
6/30/06	364,424,911	6,228,675	16,888,833	387,542,419	82.7%	100.0%	100.0%	83.8%
6/30/07	387,578,925	6,577,652	17,723,013	411,879,590	82.2%	100.0%	100.0%	83.3%
6/30/08	408,882,080	6,301,171	17,644,966	432,828,217	96.4%	100.0%	100.0%	87.2%
6/30/09	441,951,764	6,365,911	24,736,688	473,054,363	86.9%	100.0%	100.0%	87.8%
6/30/10	467,839,274	6,725,778	27,328,184	501,893,236	88.7%	100.0%	100.0%	89.5%
6/30/11	530,692,453	7,994,058	29,711,050	568,397,561	81.1%	100.0%	100.0%	82.3%
6/30/12	528,525,785	8,999,273	30,864,449	568,389,507	98.1%	100.0%	100.0%	98.2%
6/30/13	573,480,969	9,246,766	32,118,873	614,846,608	97.8%	100.0%	100.0%	98.0%
6/30/14	596,983,323	9,583,512	32,434,713	639,001,548	100.0%	100.0%	100.0%	100.0%
6/30/15	602,423,393	9,588,844	32,548,775	644,561,012	102.1%	102.4%	101.7%	101.9%
6/30/16	618,051,508	9,427,481	32,612,466	660,091,455	103.7%	110.4%	102.2%	103.7%
6/30/17	628,387,062	9,507,927	33,623,646	671,518,635	105.0%	110.1%	102.4%	105.0%
6/30/18	641,386,156	9,753,998	33,724,988	684,865,142	104.7%	108.3%	102.6%	104.7%
6/30/19	722,765,827	11,468,737	37,547,744	771,782,308	100.0%	100.0%	100.0%	100.0%
6/30/20	741,160,205	10,570,255	35,771,734	787,502,194	100.2%	109.9%	105.8%	100.6%
6/30/21	753,395,571	10,720,930	36,727,006	800,843,507	101.9%	109.7%	104.3%	102.1%
6/30/22	791,572,690	11,352,563	38,794,548	841,719,801	101.4%	106.5%	100.4%	101.4%
6/30/23	760,252,955	12,391,207	41,962,267	814,606,429	111.2%	103.5%	101.4%	110.6%

EXHIBIT 21

EXPECTED BENEFIT PAYMENTS

The following table shows the expected benefit payments to be made over the next 20 years. These payments include those expected to be made to current retirees and beneficiaries, current active members, and current deferred vested members (included in the active values) if all actuarial assumptions are met in future years. The benefits reflected include expected refunds and death benefits as well as retirement benefit payments.

These payouts do not include any current non-vested inactive members, any future members, or any FED payments.

Fiscal Year End	Actives at 6/30/23	Retirees at 6/30/23	Total
2024	$180,193,000	$2,546,313,000	$2,726,506,000
2025	321,191,000	2,501,021,000	2,822,212,000
2026	464,845,000	2,453,215,000	2,918,060,000
2027	609,995,000	2,402,661,000	3,012,656,000
2028	757,998,000	2,349,337,000	3,107,335,000
2029	906,894,000	2,293,259,000	3,200,153,000
2030	1,058,980,000	2,234,349,000	3,293,329,000
2031	1,217,707,000	2,172,295,000	3,390,002,000
2032	1,379,169,000	2,107,107,000	3,486,276,000
2033	1,545,106,000	2,039,009,000	3,584,115,000
2034	1,715,042,000	1,968,338,000	3,683,380,000
2035	1,887,347,000	1,895,065,000	3,782,412,000
2036	2,060,028,000	1,819,006,000	3,879,034,000
2037	2,238,440,000	1,740,227,000	3,978,667,000
2038	2,419,988,000	1,658,892,000	4,078,880,000
2039	2,605,507,000	1,575,229,000	4,180,736,000
2040	2,795,256,000	1,489,532,000	4,284,788,000
2041	2,988,309,000	1,402,162,000	4,390,471,000
2042	3,182,623,000	1,313,557,000	4,496,180,000
2043	3,377,632,000	1,224,220,000	4,601,852,000

Note: Cash flows are the expected future non-discounted payments to current members. These numbers exclude refund payouts to current non-vested inactives and assume future retirees elect the normal form of annuity payment (Option 2) and future withdrawals elect refunds according to valuation assumptions. All three membership groups are included.

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SECTION VI

RISK CONSIDERATIONS

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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 as anticipated by the assumptions each year 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. A separate Risk Study was prepared for the Iowa Public Employees' Retirement System in March 2019 that included a comprehensive evaluation of the various risks facing the System, using both qualitative and quantitative analysis. The findings and conclusions of the report were presented to the Investment Board on March 22, 2019. The Risk Report included various types of quantitative analysis including stress tests, sensitivity analysis, and stochastic modeling. A brief discussion of certain key risks is included in this report, but for a more comprehensive discussion please see the full Risk Report, dated March 2019. While this Risk Report was based on the June 30, 2018 valuation, we believe that the key results and analysis remain generally relevant.

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

- economic risks, such as investment return and inflation.
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages; and
- external risks such as the regulatory and political environment (these are not included in ASOP 51).

The IPERS Contribution Rate Funding Policy is designed to help IPERS manage contribution and funding risks. It is a positive factor in risk assessment because it permits the Required Contribution Rate to increase based on the results of the actuarial valuation but limits any reduction to the Required Contribution Rate until the group is at least 95% funded.

The most significant negative risk factor for IPERS and most retirement systems is investment returns because of the volatility of returns and the size of plan assets compared to payroll (see Exhibit 22). A perusal of historical rates over 10-20 years reveals that the actual return each year is rarely close to the average return for the same period. This is an expected result given the underlying capital market assumptions and the asset allocation.

While the information presented in Exhibit 22 illustrates the sensitivity of the Actuarial Contribution Rate to volatility in investment returns, it doesn't provide a sense of how likely such an event is to occur (i.e., experiencing an investment return that is 10% below the current assumption). The best available tool for measuring an event's likelihood uses what is called "stochastic modeling." Stochastic modeling is a highly technical procedure that utilizes the System's asset allocation, expected return and assumed volatility for each asset class to simulate many possible future investment return scenarios. As part of the most recent experience study, in November, 2021 we analyzed 1,000 such scenarios spanning over a 20-year period, resulting in 20,000 simulated investment returns. Based on the asset allocation at the time, and a 7.0% assumed rate of return, the stochastic analysis showed that the total Required Contribution Rate for the Regular membership, which is currently 15.73% of pay, would exceed 18.0% of pay 13% of the time over the following 10-year period. If the timeframe is expanded to 20 years, the total Required Contribution Rate for the Regular membership was above 18.0% in 28% of the scenarios. Such analysis helps to better illustrate the risk of future investment returns as they relate to the Required Contribution Rate.

Under the revised Actuarial Standards of Practice (ASOP) No. 4 effective for valuations after February 15, 2023, we are required to include an alternate calculation of the System's liability using discount rates derived from low-default-risk fixed-income obligations in our funding valuation report. This required disclosure, calculated as described below, is informational only and is not appropriate for assessing the funding progress or health of the plan. This measure uses the unit credit cost method and reflects all the assumptions and provisions of the funding valuation except that the discount rate is derived from considering low-default-risk fixed income securities. We considered the FTSE Pension Discount Curve which derives spot rate (effectively zero-coupon bonds) based on market bond rates. This data is published by the Society of Actuaries. We believe the rates as of June 30, 2023 with the 30-year spot rate used for all durations beyond 30 years to be an appropriate measure that meets the intent of the ASOP. Using these assumptions, we calculate a liability of approximately $50.550 billion. This amount approximates the termination liability if the plan (or all covered employment) ended on the valuation date and all of the accrued benefits had to be paid with cash-flow matched bonds. This assurance of funded status and benefit security is typically more relevant for corporate plans than for governmental plans since governments rarely have the need or option to completely terminate a plan.

There are several reasons this measure is not appropriate to use to assess IPERS' plan health or funding progress. Significant IPERS' benefit payments extend over 80 years into the future. However, there is not a significant market for fixed-income securities and bonds beyond 30 years into the future. This makes it impossible to achieve any reasonable certainty in this alternate liability calculation. This measure is typically used to assess what funds might be needed to fully settle a plan's obligations. For open public plans like IPERS, settling obligations is not an action that would be anticipated. Further, such a portfolio is unlikely to be considered appropriate for IPERS who by statute and by prudence principles is required to diversify its investment portfolio. This amount approximates the termination liability if the plan (or all covered employment) ended on the valuation date and all of the accrued benefits had to be paid with cash-flow matched bonds.

A key demographic risk for all retirement systems, including IPERS, is improvements in mortality (longevity) differing from anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, the COVID-19 pandemic has reminded us that 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, or a new endemic disease. This type of event is also significant, although the experience is more easily absorbed by the System.

When the actuarial valuation is performed each year, it determines the funded ratio, unfunded actuarial liability and the contribution rates needed to fully fund the System based on IPERS funding policy. The contributions needed (normal cost plus UAL amortization) are expressed as a percent of payroll which is consistent with how contributions are collected. Because the amortization payment on the unfunded actuarial liability is determined using the level percent of payroll methodology, an assumption must be used to develop the payment schedule for the amortization of the UAL. The current payroll growth assumption for IPERS is 3.25% per year which implicitly assumes that the number of active members remains stable over time.

The funding of the System could be negatively impacted if there was a material decline in the IPERS' active membership. When the payroll of IPERS declines, it requires an increase in the contribution rate to fund the System even if the UAL is unchanged. While the dollar amount of the UAL payment might be the same, the contribution rate has to increase to collect the same dollar amount. A decline in IPERS active membership could occur for a number of reasons, but the risk is likely different for the three groups. If the

state of Iowa experiences severe and prolonged fiscal challenges, the number of State employees might be reduced. Alternatively, if there is a decline in the student population, it could reduce the need to maintain the current level of teachers. Another possibility that could impact the number of active members is a shift in the way education is delivered, with higher utilization of online teaching. Regardless of the cause for the decline, a substantial decrease in the active membership could pose a risk to the stability of contribution rates.

The risk to the Regular membership of IPERS is likely mitigated because IPERS covers a diverse population across the entire state of Iowa and, as a result, is less vulnerable to significant decreases in the size of the active membership because changes often do not impact all of the various groups. The largest portion of the Regular membership is school employees which again, includes many different school districts across the state, thereby reducing the likelihood of a consistent reduction of active members across all school employers.

A significant decrease in the Sheriffs and Deputies or Protection Occupation groups may be less likely given the type of jobs covered and the ability of the state and counties to severely reduce the size of the covered group. However, because these groups are much smaller, modest changes could be more noticeable as a percentage of membership.

A common theme for most retirement plans is that risks change as a plan matures. Because this is a fundamental issue, ASOP 51 gives special attention to requiring the disclosure of appropriate measures of how a plan is maturing. In this section, we provide a number of illustrations to help demonstrate this trend. The following exhibits summarize some historical information that helps indicate how certain key risk metrics have changed over time. It is worth noting that the three membership groups in IPERS (Regular, Sheriffs and Deputies, and Protection Occupation) have some differences that relate to the nature of retirement eligibility and the historical inclusion of certain employment categories. This uniqueness can help explain why certain events may affect the groups differently.

EXHIBIT 22

ASSET VOLATILITY RATIO

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.

	Market Value of Assets ($ Millions)			Actual Covered Payroll* ($ Millions)			Asset Volatility Ratio		
Fiscal Year End	Regular Members	Sheriffs & Deputies	Protection Occupation	Regular Members	Sheriffs & Deputies	Protection Occupation	Regular Members	Sheriffs & Deputies	Protection Occupation
6/30/09	$16,592.7	$312.5	$698.1	$6,059.4	$85.9	$293.3	2.74	3.64	2.38
6/30/10	18,375.9	353.3	809.7	6,180.7	84.8	305.7	2.97	4.17	2.65
6/30/11	21,365.7	422.9	983.8	6,185.9	90.5	298.5	3.45	4.67	3.30
6/30/12	21,567.5	437.4	1,019.9	6,377.4	93.3	315.5	3.38	4.69	3.23
6/30/13	23,137.3	484.5	1,134.8	6,473.8	93.6	312.7	3.57	5.18	3.63
6/30/14	26,157.8	559.3	1,321.5	6,679.7	97.7	321.9	3.92	5.72	4.11
6/30/15	26,480.4	578.3	1,371.1	6,893.3	100.5	332.6	3.84	5.76	4.12
6/30/16	26,341.4	588.1	1,396.9	7,114.9	105.9	335.8	3.70	5.56	4.16
6/30/17	28,575.3	649.7	1,554.2	7,405.5	109.5	348.2	3.86	5.93	4.46
6/30/18	29,962.9	693.6	1,658.1	7,515.6	115.2	352.4	3.99	6.02	4.71
6/30/19	31,494.6	739.2	1,776.8	7,667.8	117.6	365.7	4.11	6.29	4.86
6/30/20	31,493.9	749.7	1,804.1	7,887.4	122.1	382.4	3.99	6.14	4.72
6/30/21	39,637.7	957.7	2,294.5	8,123.5	126.9	398.4	4.88	7.55	5.76
6/30/22	37,115.6	908.5	2,162.3	8,468.5	133.0	416.6	4.38	6.83	5.19
6/30/23	38,036.9	933.9	2,235.6	8,985.1	146.2	457.0	4.23	6.39	4.89

* Covered payroll amounts provided by the System.

Note: The impact of asset smoothing is not reflected in the impact on the ACR and amortization of the asset loss is over 20 years. Current year assumptions are used for all years shown.

EXHIBIT 22

HISTORICAL ASSET VOLATILITY RATIO
(continued)

Fiscal Year End	Asset Volatility Ratio: Regular Members	Asset Volatility Ratio: Sheriffs & Deputies	Asset Volatility Ratio: Protection Occupation	Increase in ACR with a One-Time Return 10% Lower than Assumed: Regular Members	Increase in ACR with a One-Time Return 10% Lower than Assumed: Sheriffs & Deputies	Increase in ACR with a One-Time Return 10% Lower than Assumed: Protection Occupation
6/30/09	2.74	3.64	2.38	1.95%	2.59%	1.69%
6/30/10	2.97	4.17	2.65	2.11%	2.96%	1.88%
6/30/11	3.45	4.67	3.30	2.45%	3.32%	2.35%
6/30/12	3.38	4.69	3.23	2.40%	3.33%	2.30%
6/30/13	3.57	5.18	3.63	2.54%	3.68%	2.58%
6/30/14	3.92	5.72	4.11	2.79%	4.07%	2.92%
6/30/15	3.84	5.76	4.12	2.73%	4.09%	2.93%
6/30/16	3.70	5.56	4.16	2.63%	3.95%	2.96%
6/30/17	3.86	5.93	4.46	2.74%	4.21%	3.17%
6/30/18	3.99	6.02	4.71	2.84%	4.28%	3.35%
6/30/19	4.11	6.29	4.86	2.92%	4.47%	3.45%
6/30/20	3.99	6.14	4.72	2.84%	4.36%	3.35%
6/30/21	4.88	7.55	5.76	3.47%	5.37%	4.09%
6/30/22	4.38	6.83	5.19	3.11%	4.85%	3.69%
6/30/23	4.23	6.39	4.89	3.01%	4.54%	3.48%

Note: The impact of asset smoothing is not reflected in the impact on the ACR and amortization of the asset loss is over 20 years. Current year assumptions are used for all years shown.

EXHIBIT 22

HISTORICAL ASSET VOLATILITY RATIO
(continued)

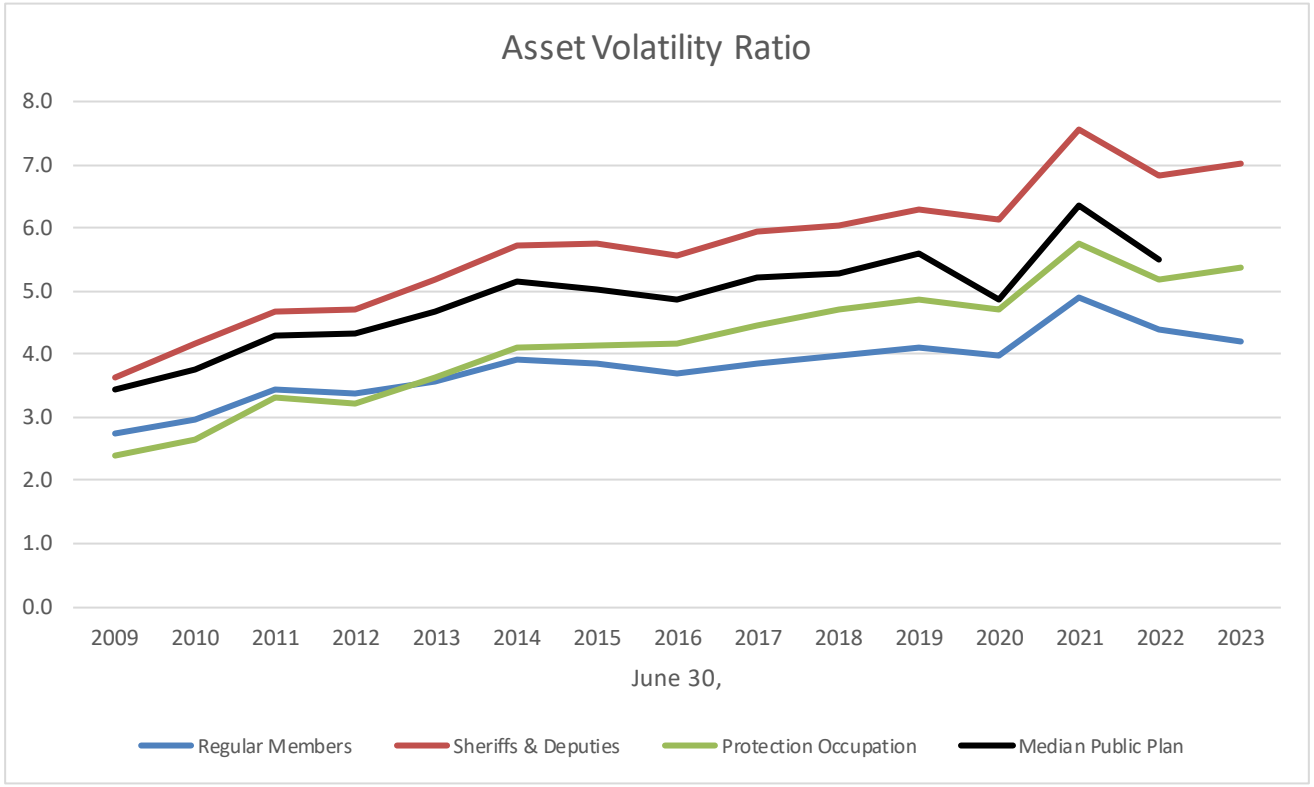


EXHIBIT 23

HISTORICAL CASH FLOWS

The net cash flow of a system, as a percentage of the beginning of year asset value, indicates the sensitivity of the system to short-term investment returns. Net cash flow is equal to contributions less benefits payments and expenses. Mature plans can have large amounts of benefit payments compared to contributions, particularly if they are well funded. In fact, this is one reason for prefunding retirement benefits - so a portion of investment return can help to pay plan benefits. When there is negative cash flow, investment losses in the short-term are compounded by the net withdrawal from plan assets leaving a smaller asset base to try to recover from the investment losses. Large negative cash flows, especially when increasing, can also create liquidity needs.

Fiscal Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/09	$17,603,316,618	$695,559,397	$1,159,167,389	($463,607,992)	(2.63%)
6/30/10	19,538,971,423	755,210,092	1,250,296,562	(495,086,470)	(2.53%)
6/30/11	22,772,344,651	789,353,899	1,418,667,406	(629,313,507)	(2.76%)
6/30/12	23,024,773,746	942,394,013	1,504,467,980	(562,073,967)	(2.44%)
6/30/13	24,756,663,715	1,019,108,941	1,608,482,773	(589,373,832)	(2.38%)
6/30/14	28,038,549,893	1,082,521,228	1,706,250,521	(623,729,293)	(2.22%)
6/30/15	28,429,834,829	1,115,600,029	1,804,360,197	(688,760,168)	(2.42%)
6/30/16	28,326,433,656	1,176,666,912	1,904,921,736	(728,254,824)	(2.57%)
6/30/17	30,779,116,326	1,182,392,100	2,009,453,153	(827,061,053)	(2.69%)
6/30/18	32,314,588,595	1,202,788,183	2,126,106,199	(923,318,016)	(2.86%)
6/30/19	34,010,680,731	1,294,438,481	2,238,353,408	(943,914,927)	(2.78%)
6/30/20	34,047,692,112	1,327,864,560	2,332,726,605	(1,004,862,045)	(2.95%)
6/30/21	42,889,875,682	1,371,872,312	2,432,662,727	(1,060,790,415)	(2.47%)
6/30/22	40,186,392,289	1,430,839,060	2,546,095,673	(1,115,256,613)	(2.78%)
6/30/23	41,206,314,259	1,511,422,679	2,647,847,591	(1,136,424,912)	(2.76%)

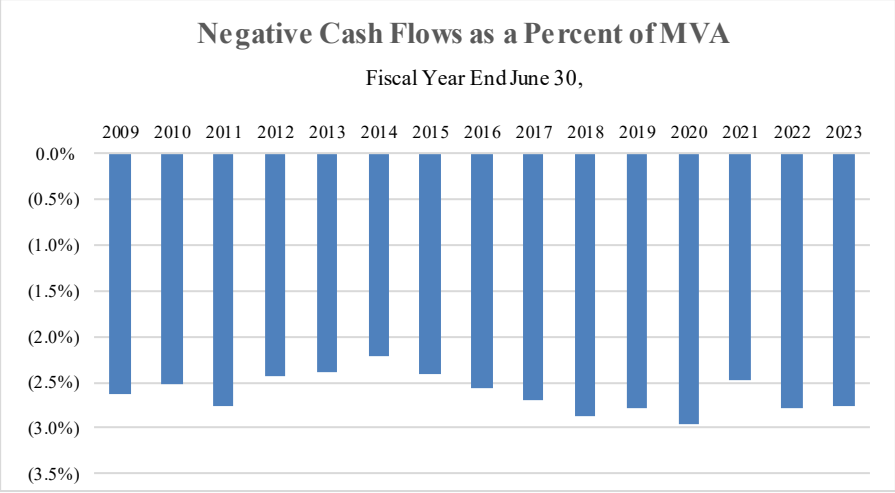


EXHIBIT 24

LIABILITY MATURITY MEASUREMENTS

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations indicated by 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 since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs.

The retirement system is also growing larger with respect to the sponsoring entities, as can be seen by the ratio of actuarial liability to payroll.

Regular Members

Fiscal Year End	Retiree Liability (a)	Total Actuarial Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
6/30/07	$8,941,802,561	$22,023,863,090	40.6%	$5,510,430,731	4.00
6/30/08	9,611,150,768	23,332,771,315	41.2%	5,763,634,079	4.05
6/30/09	10,238,166,793	24,733,483,621	41.4%	6,059,370,512	4.08
6/30/10	11,293,531,095	25,080,605,814	45.0%	6,180,689,916	4.06
6/30/11	12,698,425,109	26,752,154,635	47.5%	6,185,889,267	4.32
6/30/12	13,573,602,957	27,852,385,453	48.7%	6,377,421,205	4.37
6/30/13	14,329,968,181	28,799,324,938	49.8%	6,473,818,092	4.45
6/30/14	15,230,657,798	30,204,846,287	50.4%	6,679,683,181	4.52
6/30/15	16,028,939,271	31,451,851,955	51.0%	6,893,254,991	4.56
6/30/16	16,768,695,428	32,577,657,593	51.5%	7,114,861,564	4.58
6/30/17	18,304,044,337	35,176,950,577	52.0%	7,405,484,923	4.75
6/30/18	19,516,533,248	36,289,160,885	53.8%	7,515,600,156	4.83
6/30/19	20,276,746,842	37,324,200,774	54.3%	7,667,747,786	4.87
6/30/20	21,098,889,528	38,469,643,936	54.8%	7,887,362,749	4.88
6/30/21	21,804,010,789	39,777,935,943	54.8%	8,123,447,536	4.90
6/30/22	22,646,842,963	41,090,755,292	55.1%	8,468,458,536	4.85
6/30/23	23,332,893,647	42,651,088,157	54.7%	8,985,128,672	4.75

EXHIBIT 24
(continued)

Sheriffs & Deputies

Fiscal Year End	Retiree Liability (a)	Total Actuarial Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
6/30/07	$105,514,847	$345,220,872	30.6%	$78,112,455	4.42
6/30/08	119,881,091	374,066,361	32.0%	81,485,774	4.59
6/30/09	150,926,387	412,167,101	36.6%	85,935,900	4.80
6/30/10	169,436,571	447,627,643	37.9%	84,755,693	5.28
6/30/11	185,018,412	475,559,019	38.9%	90,506,138	5.25
6/30/12	195,188,608	502,716,830	38.8%	93,265,452	5.39
6/30/13	223,706,198	533,033,438	42.0%	93,607,893	5.69
6/30/14	240,964,615	556,135,092	43.3%	97,693,639	5.69
6/30/15	266,693,628	591,002,036	45.1%	100,469,418	5.88
6/30/16	281,179,979	624,791,635	45.0%	105,868,170	5.90
6/30/17	325,186,602	691,205,752	47.0%	109,516,368	6.31
6/30/18	341,195,487	697,339,410	48.9%	115,222,566	6.05
6/30/19	366,389,579	730,785,263	50.1%	117,564,234	6.22
6/30/20	384,403,732	766,018,806	50.2%	122,072,903	6.28
6/30/21	445,975,611	816,703,678	54.6%	126,886,204	6.44
6/30/22	453,337,835	849,677,745	53.4%	132,983,997	6.39
6/30/23	473,879,475	910,174,648	52.1%	146,213,713	6.22

EXHIBIT 24
(continued)

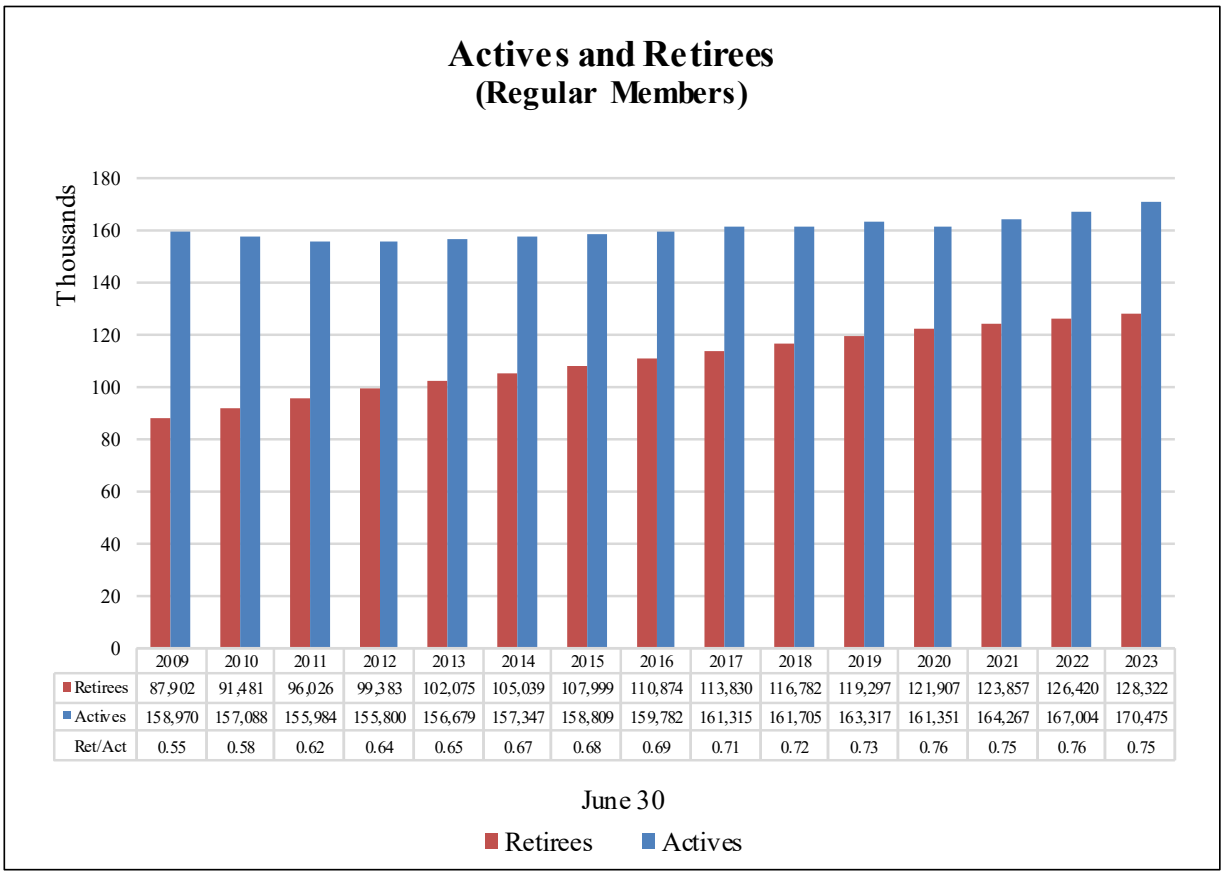
Protection Occupation

Fiscal Year End	Retiree Liability (a)	Total Actuarial Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
6/30/07	$169,925,365	$657,029,820	25.9%	193,163,013	3.40
6/30/08	191,726,385	815,378,913	23.5%	286,325,514	2.85
6/30/09	234,387,583	872,943,101	26.9%	293,336,712	2.98
6/30/10	306,902,663	940,186,193	32.6%	305,736,396	3.08
6/30/11	368,833,144	1,029,366,460	35.8%	298,477,314	3.45
6/30/12	383,175,993	1,091,095,203	35.1%	315,472,063	3.46
6/30/13	446,902,048	1,165,983,944	38.3%	312,705,149	3.73
6/30/14	503,104,371	1,243,474,709	40.5%	321,900,460	3.86
6/30/15	547,545,074	1,327,464,740	41.2%	332,623,732	3.99
6/30/16	607,529,406	1,417,299,919	42.9%	335,785,986	4.22
6/30/17	705,541,965	1,572,225,700	44.9%	348,159,152	4.52
6/30/18	801,836,796	1,656,333,358	48.4%	352,396,805	4.70
6/30/19	862,732,452	1,746,352,760	49.4%	365,731,448	4.77
6/30/20	922,989,793	1,836,764,798	50.3%	382,420,698	4.80
6/30/21	993,550,318	1,950,009,129	51.0%	398,449,796	4.89
6/30/22	1,054,117,486	2,029,281,569	51.9%	416,577,417	4.87
6/30/23	1,131,899,456	2,158,716,634	52.4%	456,996,615	4.72

EXHIBIT 25

HISTORICAL ACTIVE AND RETIREE COUNTS

The funding of a mature retirement system is more sensitive to the impact of variations in actual versus expected experience (actuarial experience gains and losses). The larger the system's assets and liabilities are in comparison to the contribution or revenue base that supports it (covered payroll for IPERS), the greater the risk of contribution rate volatility. One measure of plan maturity is the ratio of the number of members receiving benefits to the number of active members, sometimes called the support ratio. The revenue base supporting the system is usually proportionate to the number of active members, so a relatively high support ratio indicates a larger system (assets and liabilities) relative to its revenue base. All three membership groups reflect a trend of increasing support ratios.



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Retirees	87,902	91,481	96,026	99,383	102,075	105,039	107,999	110,874	113,830	116,782	119,297	121,907	123,857	126,420	128,322
Actives	158,970	157,088	155,984	155,800	156,679	157,347	158,809	159,782	161,315	161,705	163,317	161,351	164,267	167,004	170,475
Ret/Act	0.55	0.58	0.62	0.64	0.65	0.67	0.68	0.69	0.71	0.72	0.73	0.76	0.75	0.76	0.75

EXHIBIT 25
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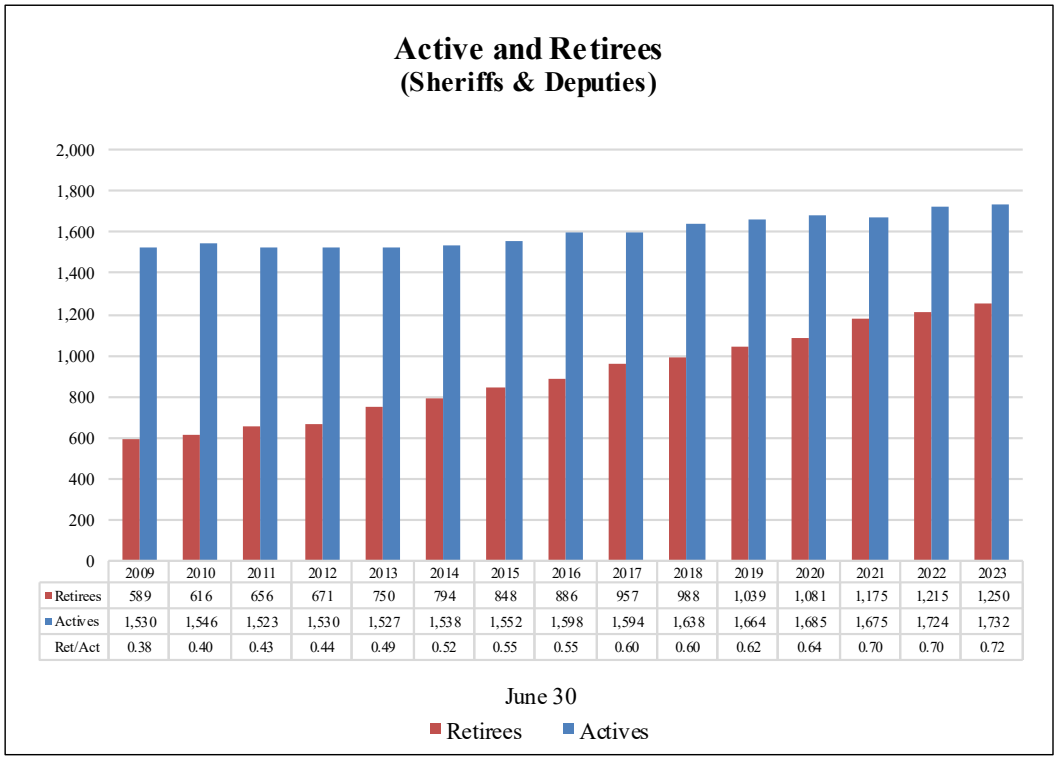

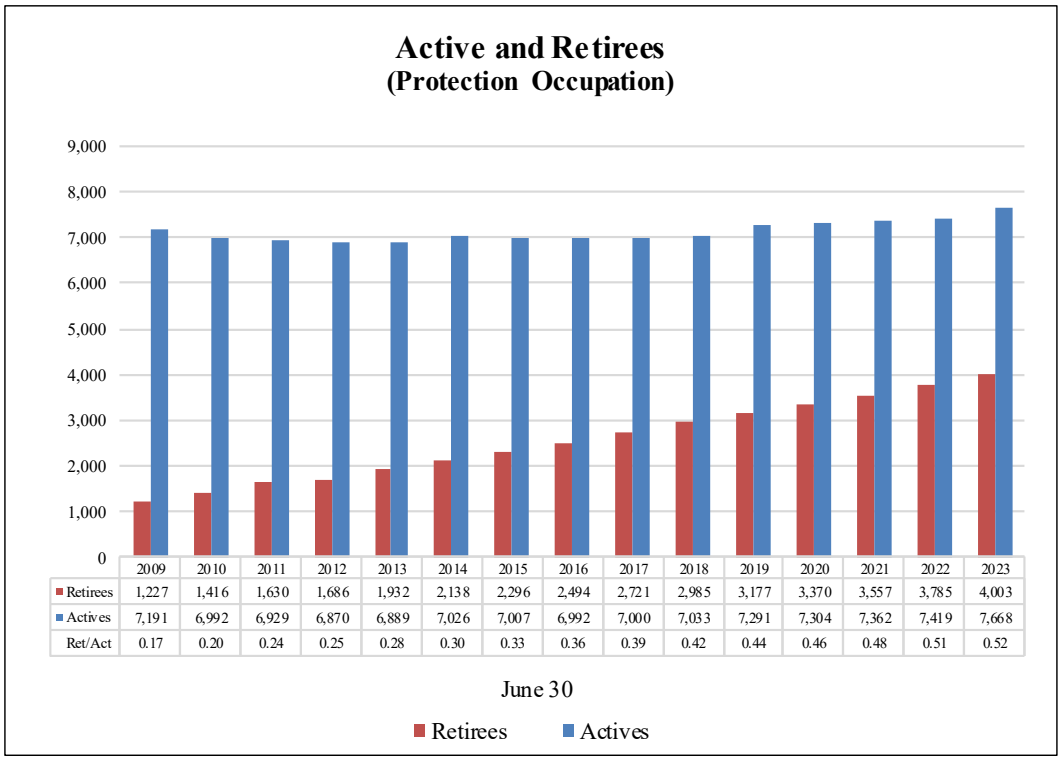

EXHIBIT 26

IMPACT OF FUNDING POLICY

Prior to the 2011 valuation, Regular members (about 95% of the active membership) contributed according to fixed contribution rates set in statute. For many years, the fixed contribution rate was less than the actuarial contribution rate and the System's funded status declined. Beginning with the 2011 valuation (which set contribution rates for FY 2013), IPERS was given the statutory authority to set the Required Contribution Rate for Regular members, subject to a maximum change of 1.00% per year. Since that time, contributions have been equal to or greater than the Actuarial Contribution Rate. The remaining 5% of the active members, the Sheriffs and Deputies and the Protection Occupation groups, have historically contributed at the Actuarial Contribution Rate which was subject to change each year as actual versus expected experience unfolded. These groups now contribute based on the same funding policy as is used for the Regular members.

The following graph compares the funded ratios of the three IPERS membership groups, illustrating the clear advantage of contributing the full Actuarial Contribution Rate.

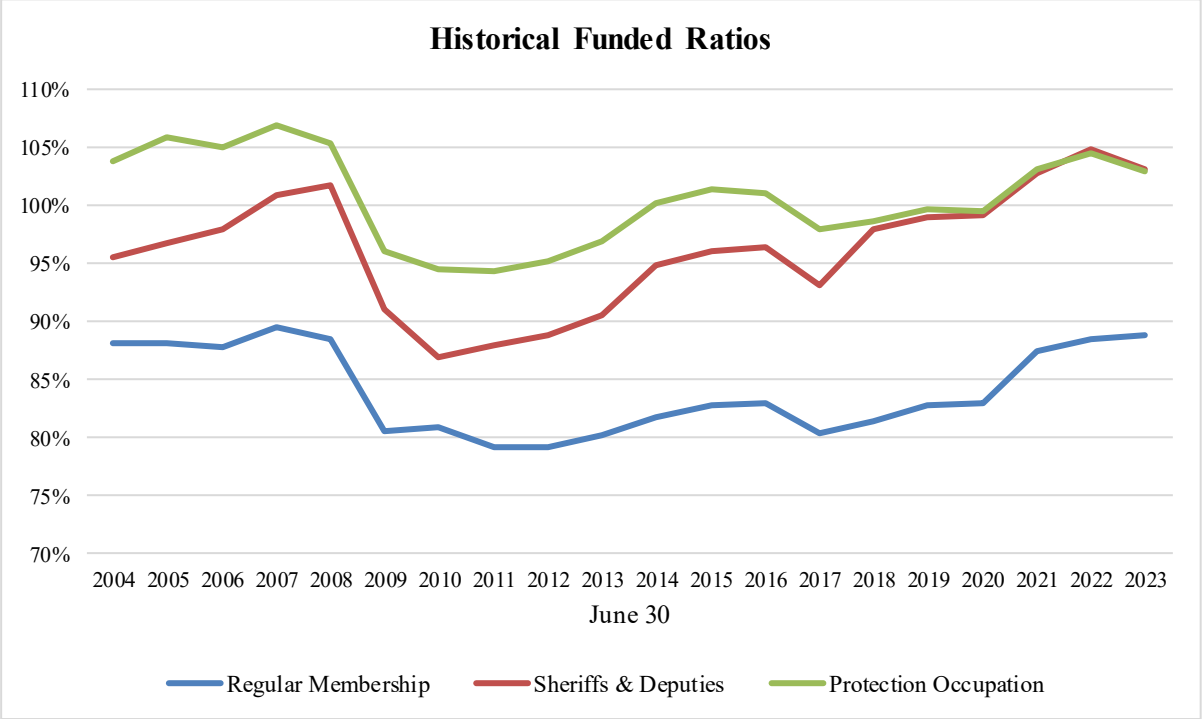

EXHIBIT 27

COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

Regular Members

This exhibit compares the key June 30, 2023, valuation results over five 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 ($ in millions).

Investment Return Assumption	**6.50%**	**6.75%**	**7.00%**	**7.25%**	**7.50%**
Contributions for FY 2025					
Total Normal Cost	11.93%	11.26%	10.62%	10.03%	9.48%
Unfunded Actuarial Liability	5.09%	4.18%	3.27%	2.37%	1.48%
Actuarial Contribution Rate	17.02%	15.44%	13.89%	12.40%	10.96%
Required Contribution Rate	16.73%	15.73%	15.73%	15.73%	15.73%
Employer Contribution Rate	10.04%	9.44%	9.44%	9.44%	9.44%
Employee Contribution Rate	6.69%	6.29%	6.29%	6.29%	6.29%
Contribution Shortfall/(Margin)	0.29%	(0.29%)	(1.84%)	(3.33%)	(4.77%)
Actuarial Liability	$45,132.6	$43,864.2	$42,651.1	$41,490.4	$40,379.4
Actuarial Value of Assets	37,856.2	37,856.2	37,856.2	37,856.2	37,856.2
Unfunded Actuarial Liability	$7,276.4	$6,008.0	$4,794.9	$3,634.2	$2,523.2
Funded Ratio	83.88%	86.30%	88.76%	91.24%	93.75%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.

EXHIBIT 27
(continued)

Sheriffs & Deputies

This exhibit compares the key June 30, 2023, valuation results over five 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 ($ in millions).

Investment Return Assumption	**6.50%**	**6.75%**	**7.00%**	**7.25%**	**7.50%**
Contributions for FY 2025					
Total Normal Cost	18.89%	17.81%	16.80%	15.86%	14.97%
Unfunded Actuarial Liability	1.53%	0.19%	0.00%	0.00%	0.00%
Actuarial Contribution Rate	20.42%	18.00%	16.80%	15.86%	14.97%
Required Contribution Rate	20.42%	18.00%	17.02%	16.52%	16.52%
Employer Contribution Rate	10.21%	9.00%	8.51%	8.26%	8.26%
Employee Contribution Rate	10.21%	9.00%	8.51%	8.26%	8.26%
Contribution Shortfall/(Margin)	0.00%	0.00%	(0.22%)	(0.66%)	(1.55%)
Actuarial Liability	$964.3	$936.6	$910.2	$884.8	$860.6
Actuarial Value of Assets	933.8	933.8	933.8	933.8	933.8
Unfunded Actuarial Liability	$30.5	$2.8	($23.6)	($49.0)	($73.2)
Funded Ratio	96.84%	99.70%	102.60%	105.53%	108.51%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.

EXHIBIT 27
(continued)

Protection Occupation

This exhibit compares the key June 30, 2023, valuation results over five 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 ($ in millions).

Investment Return Assumption	**6.50%**	**6.75%**	**7.00%**	**7.25%**	**7.50%**
Contributions for FY 2025					
Total Normal Cost	17.16%	16.22%	15.34%	14.52%	13.75%
Unfunded Actuarial Liability	1.07%	0.04%	0.00%	0.00%	0.00%
Actuarial Contribution Rate	18.23%	16.26%	15.34%	14.52%	13.75%
Required Contribution Rate	18.23%	16.26%	15.52%	15.02%	15.02%
Employer Contribution Rate	10.94%	9.76%	9.31%	9.01%	9.01%
Employee Contribution Rate	7.29%	6.50%	6.21%	6.01%	6.01%
Contribution Shortfall/(Margin)	0.00%	0.00%	(0.18%)	(0.50%)	(1.27%)
Actuarial Liability	$2,288.4	$2,222.1	$2,158.7	$2,098.1	$2,040.0
Actuarial Value of Assets	2,222.5	2,222.5	2,222.5	2,222.5	2,222.5
Unfunded Actuarial Liability	$65.8	($0.4)	($63.8)	($124.5)	($182.5)
Funded Ratio	97.12%	100.02%	102.96%	105.93%	108.95%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.

APPENDIX A

SUMMARY STATISTICS ON SYSTEM MEMBERSHIP

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APPENDIX A

SUMMARY STATISTICS ON SYSTEM MEMBERSHIP

TABLE OF CONTENTS

RECONCILIATION OF ACTIVE MEMBERS

Below is a summary of the changes in active members (excluding retired re-employed members) between June 30, 2022 and June 30, 2023.

	Regular Membership	Sheriffs & Deputies	Protection Occupation	Total
6/30/2022 Starting count	167,004	1,724	7,419	176,147
New actives	20,222	67	1,040	21,329
Returning actives	3,556	2	106	3,664
Nonvested Terminations	(9,297)	(16)	(326)	(9,639)
Elected Refund	(3,024)	(14)	(195)	(3,233)
Vested Terminations	(3,437)	(42)	(214)	(3,693)
Total Withdrawals	(15,758)	(72)	(735)	(16,565)
Deaths	(226)	0	(4)	(230)
Disability Retirements	(47)	(1)	(6)	(54)
AE Benefits	(168)	0	(1)	(169)
Service Retirements	(4,129)	(38)	(191)	(4,358)
Total Retirements	(4,344)	(39)	(198)	(4,581)
Other/transfer	21	50	40	111
6/30/2023 Ending count	170,475	1,732	7,668	179,875

HISTORICAL SUMMARY OF MEMBERS

The following table displays selected historical data (including Regular, Sheriffs and Deputies, and Protection Occupation groups) as available.

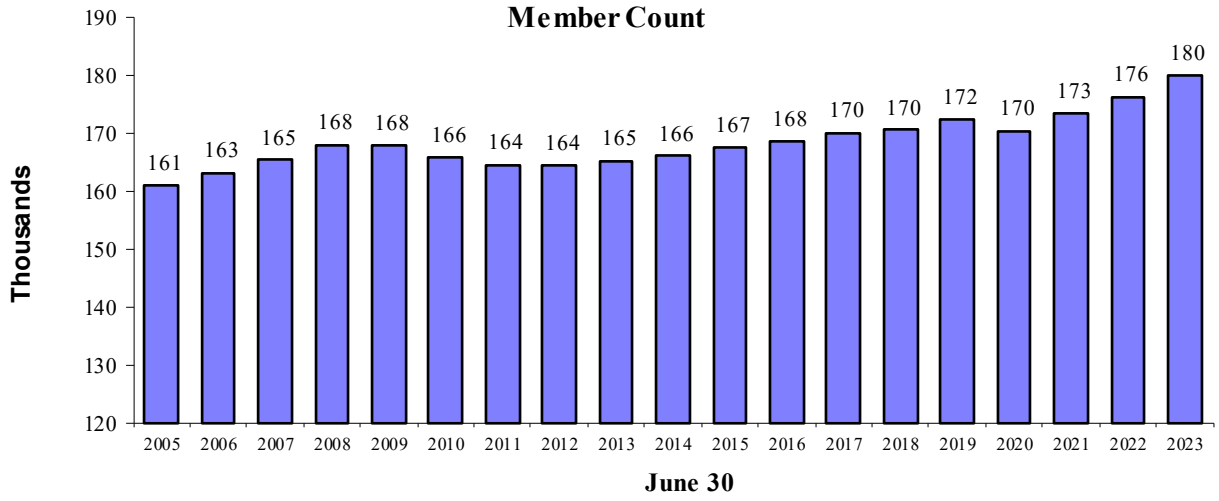
Valuation Date June 30	Total Count	Number	Average					Number			Active/Retired Ratio
			Age	Entry Age	Service	Annual Pay ($)	% Change	Retired Reemployed	Inactive Vested	Retired	
1999	250,168	152,440	44.8	33.4	11.4	27,322	2.1%	4,853	34,332	63,396	2.40
2000	249,970	153,039	44.8	33.2	11.6	29,032	6.3%	5,050	31,219	65,712	2.33
2001	255,963	154,610	45.0	33.5	11.5	30,341	4.5%	4,886	32,650	68,703	2.25
2002	264,974	158,467	45.1	33.8	11.3	32,119	5.9%	5,387	34,792	71,715	2.21
2003	268,813	159,310	45.2	33.8	11.4	31,950	-0.5%	6,126	35,375	74,128	2.15
2004	272,573	160,003	45.4	33.8	11.6	33,082	3.5%	6,438	35,788	76,782	2.08
2005	267,214	160,876	45.6	33.8	11.8	34,066	3.0%	6,592	26,919	79,419	2.03
2006	271,007	163,052	45.7	34.0	11.7	35,475	4.1%	8,044	25,918	82,037	1.99
2007	276,421	165,216	45.7	34.0	11.7	36,615	3.2%	7,848	26,435	84,770	1.95
2008	282,778	167,823	45.7	34.1	11.6	38,515	5.2%	8,523	27,626	87,309	1.92
2009	294,076	167,691	46.0	34.2	11.8	40,326	4.7%	8,427	28,240	89,718	1.87
2010	287,611	165,626	46.0	34.1	11.9	40,635	0.8%	8,347	28,472	93,513	1.77
2011	291,825	164,436	45.8	34.1	11.7	40,782	0.4%	8,321	29,077	98,312	1.67
2012	294,996	164,200	45.8	34.2	11.6	42,223	3.5%	8,265	29,119	101,677	1.61
2013	299,793	165,095	45.7	34.1	11.6	42,404	0.4%	9,925	28,443	104,640	1.58
2014	302,558	165,911	45.7	34.1	11.6	44,225	4.3%	9,931	28,713	107,934	1.54
2015	306,154	167,368	45.6	34.1	11.5	45,247	2.3%	10,295	27,659	111,127	1.51
2016	309,572	168,372	45.5	34.0	11.5	46,399	2.5%	10,608	26,960	114,240	1.47
2017	313,401	169,909	45.4	34.1	11.3	47,425	2.2%	10,787	25,984	117,508	1.45
2018	316,824	170,376	45.3	34.0	11.3	47,989	1.2%	10,601	25,693	120,755	1.41
2019	320,574	172,272	45.2	34.0	11.2	48,658	1.4%	10,793	24,789	123,513	1.39
2020	322,789	170,340	45.0	33.8	11.2	50,611	4.0%	10,530	26,091	126,358	1.35
2021	327,172	173,304	44.8	33.7	11.1	51,497	1.8%	9,321	25,279	128,589	1.35
2022	333,301	176,147	44.6	33.8	10.8	52,680	2.3%	8,520	25,734	131,420	1.34
2023	339,767	179,875	44.5	33.9	10.6	54,987	4.4%	8,412	26,317	133,575	1.35

Note: The Total Count figure represents the number of members valued in this report, with the exception of nonvested inactive members. The Retired Reemployed figure represents the number of members who have both an in-pay record and a not-in-pay record.

SUMMARY OF ACTIVE MEMBERS

	Regular Membership	Sheriffs & Deputies	Protection Occupations	Total 6/30/2023	Total 6/30/2022	Percent Change
Total Active Members	170,475	1,732	7,668	179,875	176,147	2.1
Projected Payroll* (millions)	$9,259	$151	$481	$9,891	$9,279	6.6
Average Age	44.7	40.1	39.9	44.5	44.6	(0.2)
Average Entry Age	34.1	26.6	30.5	33.9	33.8	0.3
Average Projected Salary	$54,313	$87,261	$62,667	$54,987	$52,680	4.4
Retired Reemployed	7,470	126	309	7,905	7,489	5.6

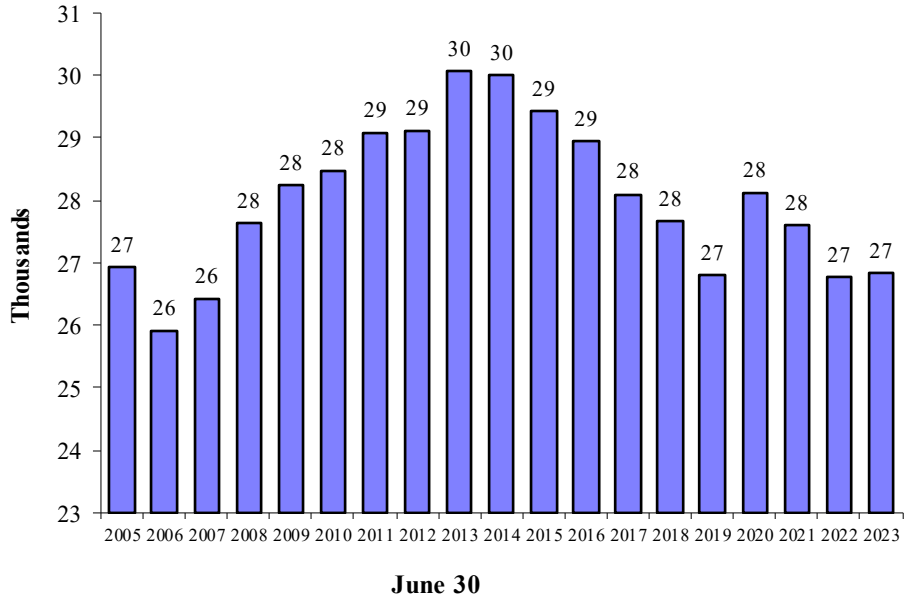
*Payroll figures as of June 30 are actual amounts paid during the prior fiscal year, increased by the assumed salary increase factor for the upcoming fiscal year.



SUMMARY OF INACTIVE VESTED MEMBERS

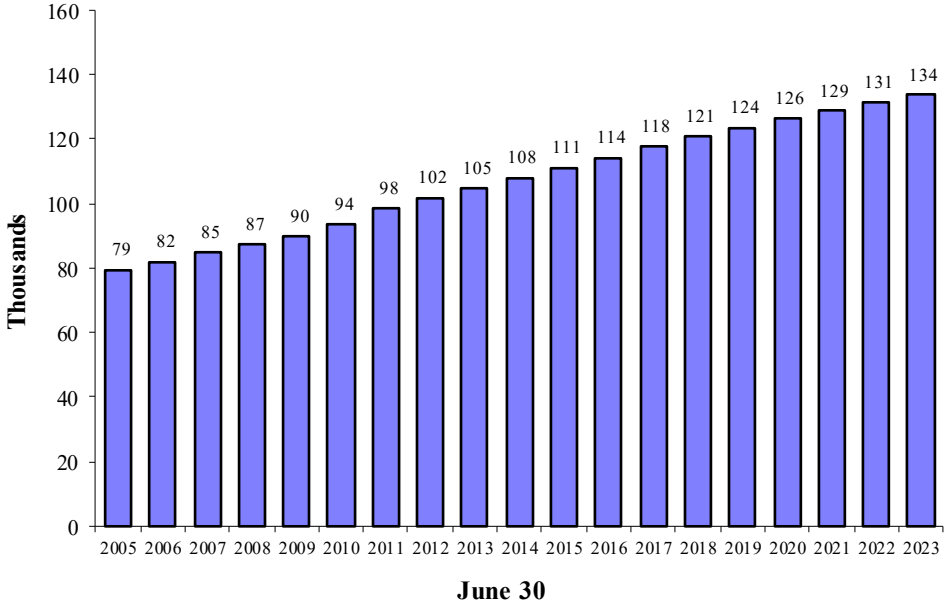
	Regular Membership	Sheriffs & Deputies	Protection Occupations	Total 6/30/2023	Total 6/30/2022	Percent Change
Inactive Vested	24,845	167	1,305	26,317	25,734	2.3%
Inactive Retired Reemployed	491	6	10	507	1,031	(50.8%)
Total Inactive Vested	25,336	173	1,315	26,824	26,765	0.2%

Note: As of June 30, 2023 there are also 62,717 nonvested inactive members due a refund of employee contribution.



SUMMARY OF RETIRED MEMBERS AND BENEFICIARIES

Regular Membership	Sheriffs & Deputies	Protection Occupations	Total 6/30/2023	Total 6/30/2022	Percent Change
128,322	1,250	4,003	133,575	131,420	1.6%



AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 2023 FOR ACTIVE MEMBERS*

Males and Females - Regular Membership

	Years of Service																			
	0 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 35		35 to 40		40 and 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	No.	Avg. Salary
Under 25	9,635	23,180	112	35,219	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	9,747	23,318
25-29	11,967	38,738	3,337	48,452	29	44,385	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	15,333	40,863
30-34	8,131	39,221	7,369	53,320	2,286	58,914	38	54,313	0	NA	0	NA	0	NA	0	NA	0	NA	17,824	47,608
35-39	7,190	39,351	5,159	55,319	5,584	63,880	1,913	68,497	23	67,912	0	NA	0	NA	0	NA	0	NA	19,869	53,230
40-44	6,795	38,684	4,814	52,542	3,740	63,279	5,277	73,103	1,642	75,350	16	66,604	0	NA	0	NA	0	NA	22,284	56,678
45-49	5,279	39,317	4,058	50,965	3,076	60,486	3,057	69,376	4,212	77,386	1,153	81,113	7	69,849	0	NA	0	NA	20,842	59,134
50-54	4,120	39,389	3,228	49,958	2,773	55,464	2,932	64,328	2,784	72,558	3,753	80,473	902	81,838	14	80,079	1	92,757	20,507	60,711
55-59	3,835	36,246	2,663	47,878	2,193	50,485	2,706	56,565	2,728	63,699	2,456	71,858	2,270	82,655	493	82,041	13	59,604	19,357	57,312
60-64	4,319	27,663	2,535	42,383	1,883	48,588	1,998	52,618	2,308	55,250	1,895	61,886	1,008	70,448	815	80,086	372	74,419	17,133	48,579
65-69	3,312	18,658	1,658	30,146	835	40,173	683	49,197	582	51,445	455	56,124	267	62,461	193	72,860	251	76,686	8,236	34,530
70 & over	3,673	19,339	1,846	18,071	766	18,100	299	18,418	106	21,817	46	32,906	30	36,601	17	86,313	30	62,083	6,813	19,377
Totals	68,256	33,884	36,779	48,485	23,165	56,931	18,903	64,374	14,385	68,598	9,774	73,400	4,484	78,216	1,532	79,874	667	74,456	177,945	49,783

*Including retired/reemployed members. Salary amounts are actual reported earnings from prior year, annualized for members with less than one year of service.

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 2023 FOR ACTIVE MEMBERS*

Males and Females - Sheriffs and Deputies

	Years of Service																			
	0 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 35		35 to 40		40 and 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	No.	Avg. Salary
Under 25	83	60,559	1	71,575	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	84	60,690
25-29	124	66,138	77	79,019	1	65,607	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	202	71,046
30-34	77	67,872	145	81,408	61	84,366	1	115,502	0	NA	0	NA	0	NA	0	NA	0	NA	284	78,494
35-39	43	72,249	77	80,710	111	81,840	67	88,359	2	83,423	0	NA	0	NA	0	NA	0	NA	300	81,642
40-44	27	70,867	39	79,979	38	80,612	112	87,257	51	94,642	1	126,598	0	NA	0	NA	0	NA	268	85,157
45-49	11	73,274	24	75,019	25	86,994	41	88,082	110	94,218	41	102,078	1	66,661	0	NA	0	NA	253	90,943
50-54	18	53,836	10	77,148	6	84,076	24	86,590	50	91,929	76	92,970	11	112,590	0	NA	0	NA	195	88,327
55-59	39	29,752	10	36,164	5	93,420	9	85,332	20	87,572	24	98,473	23	108,149	11	93,890	1	93,598	142	73,843
60-64	20	40,868	11	26,679	5	64,481	3	28,845	4	104,384	11	94,951	4	88,788	13	97,341	1	174,991	72	66,352
65-69	17	16,669	8	25,706	3	28,777	0	NA	2	85,812	0	NA	1	160,528	2	90,130	3	96,457	36	38,254
70 & over	5	9,719	10	14,461	3	15,248	3	16,980	1	20,657	0	NA	0	NA	0	NA	0	NA	22	14,116
Totals	464	59,393	412	74,931	258	81,242	260	86,166	240	92,980	153	96,636	40	107,707	26	95,326	5	111,592	1,858	78,708

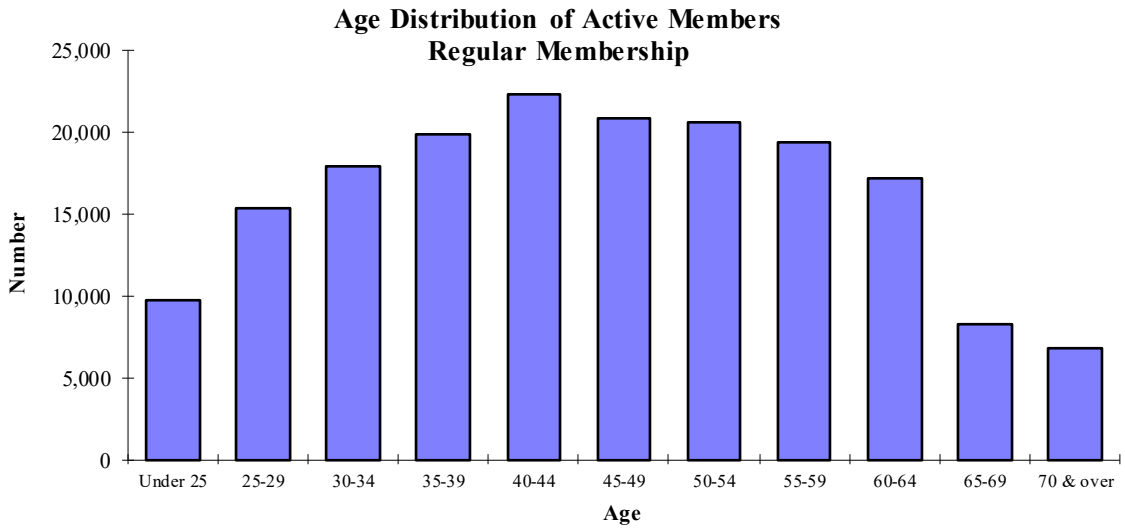
*Including retired/reemployed members. Salary amounts are actual reported earnings from prior year, annualized for members with less than one year of service.

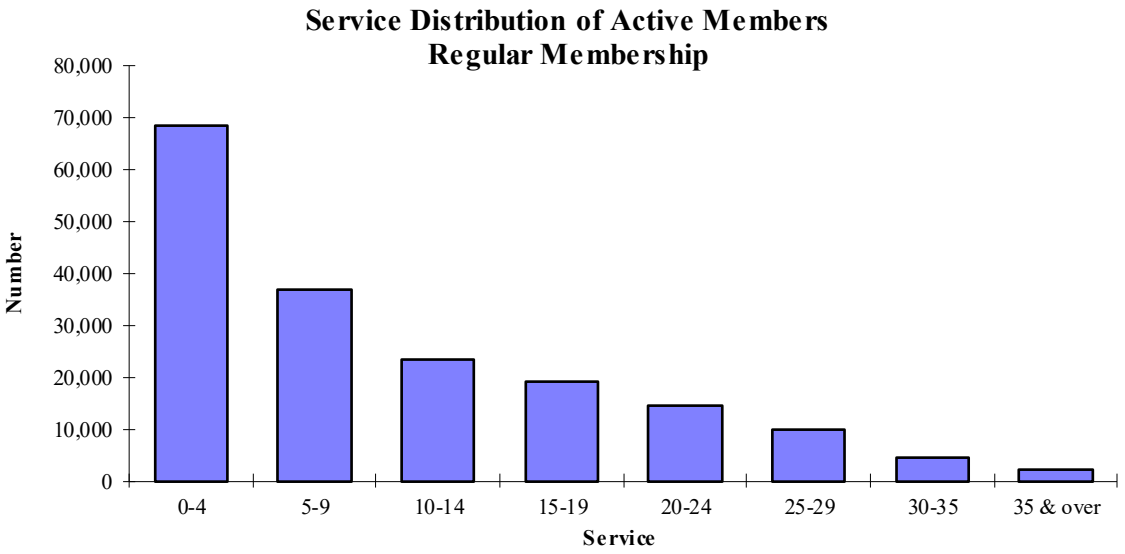
AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 2023 FOR ACTIVE MEMBERS*

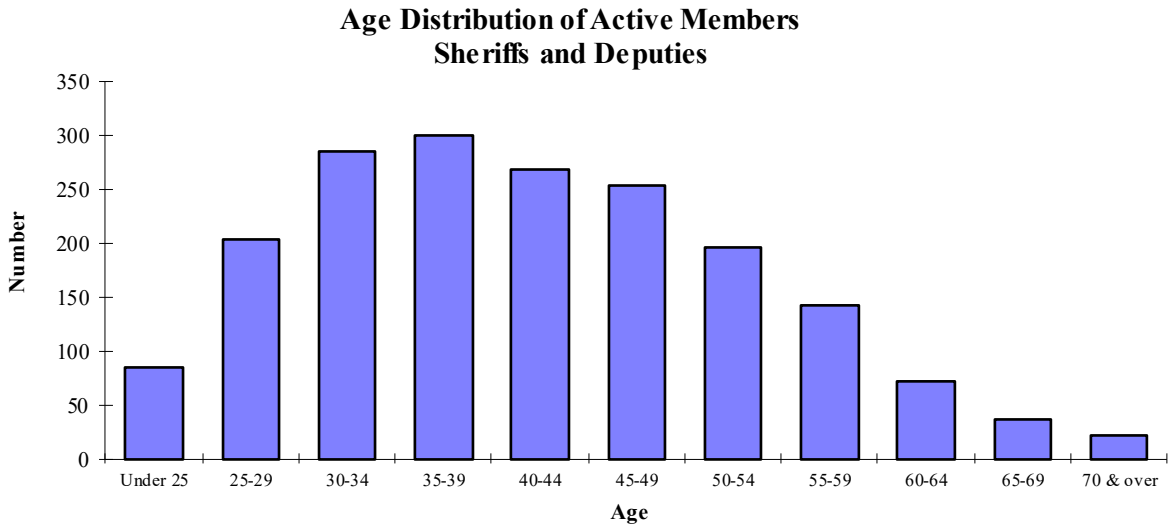
Males and Females - Protection Occupation

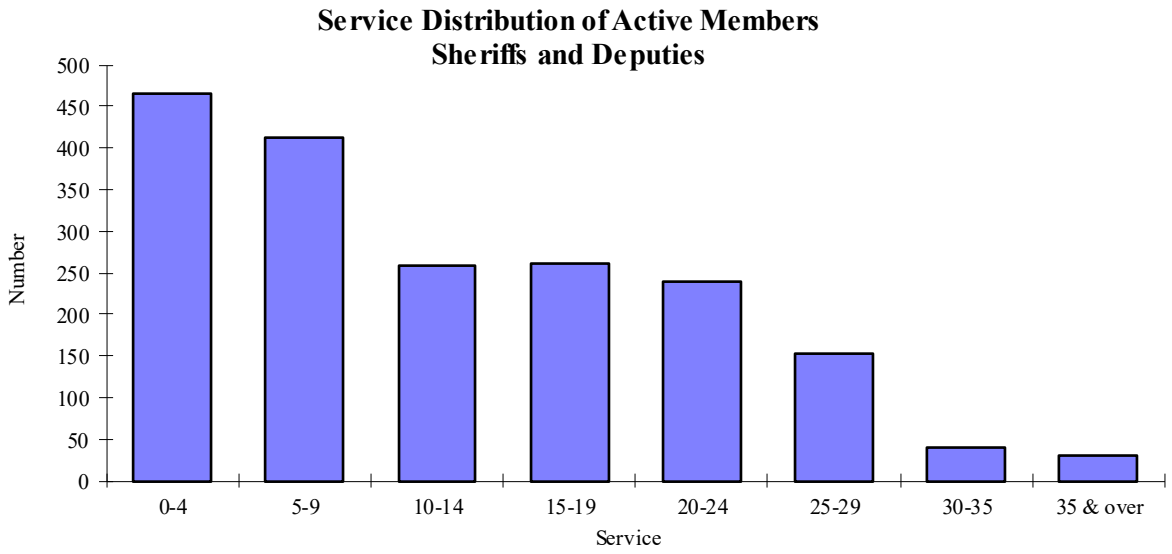
	Years of Service																			
	0 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 35		35 to 40		40 and over		Total	
Age	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary	No.	Avg. Salary
Under 25	811	40,116	4	43,201	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	815	40,131
25-29	824	47,877	228	56,997	6	74,337	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	1,058	49,993
30-34	499	45,855	391	63,089	105	66,425	7	90,283	0	NA	0	NA	0	NA	0	NA	0	NA	1,002	55,046
35-39	403	47,241	254	62,929	244	72,467	121	76,515	0	NA	0	NA	0	NA	0	NA	0	NA	1,022	60,629
40-44	278	46,227	175	60,786	168	71,944	264	76,163	84	76,950	1	91,632	0	NA	0	NA	0	NA	970	64,162
45-49	212	45,221	144	61,152	110	67,173	153	73,156	194	77,268	73	76,729	2	89,825	0	NA	0	NA	888	65,029
50-54	161	45,179	107	55,099	100	67,305	149	70,148	154	76,420	186	80,932	50	85,075	1	101,939	0	NA	908	67,764
55-59	174	38,904	70	60,281	68	54,623	84	70,369	95	72,359	69	84,882	49	81,303	11	75,662	0	NA	620	61,551
60-64	116	32,017	63	49,485	47	59,794	53	69,365	52	64,992	33	75,624	12	73,366	20	81,388	8	68,878	404	55,081
65-69	80	19,268	33	29,570	20	53,432	10	51,923	15	48,173	5	21,426	10	50,519	1	49,620	8	106,340	182	34,837
70 & over	64	25,206	24	12,822	16	27,416	2	2,156	0	NA	0	NA	2	84,178	0	NA	0	NA	108	23,446
Totals	3,622	43,417	1,493	58,794	884	67,127	843	73,254	594	74,409	367	79,580	125	79,769	33	79,139	16	87,609	7,977	56,853

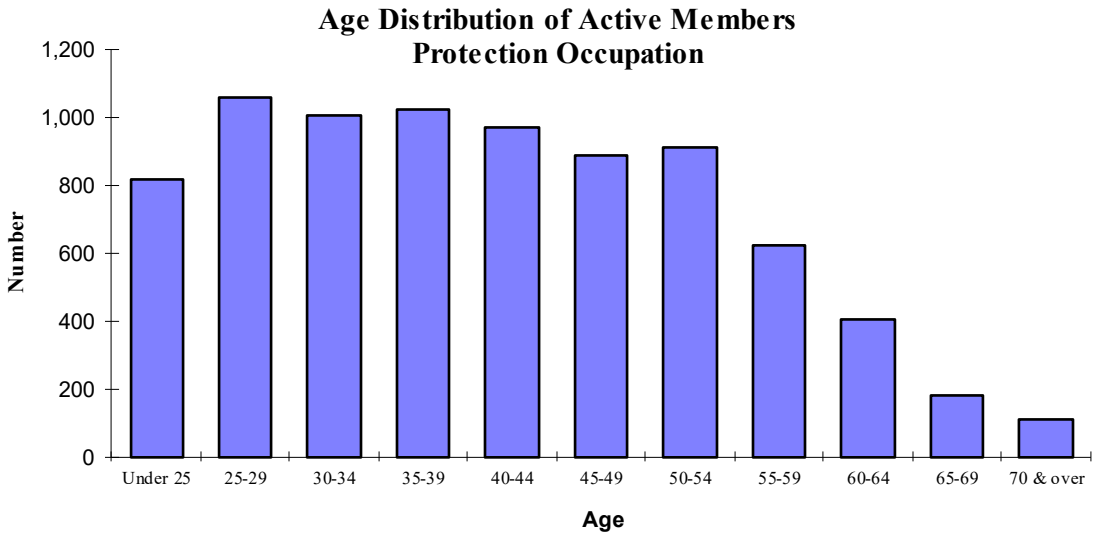
*Including retired/reemployed members. Salary amounts are actual reported earnings from prior year, annualized for members with less than one year of service.

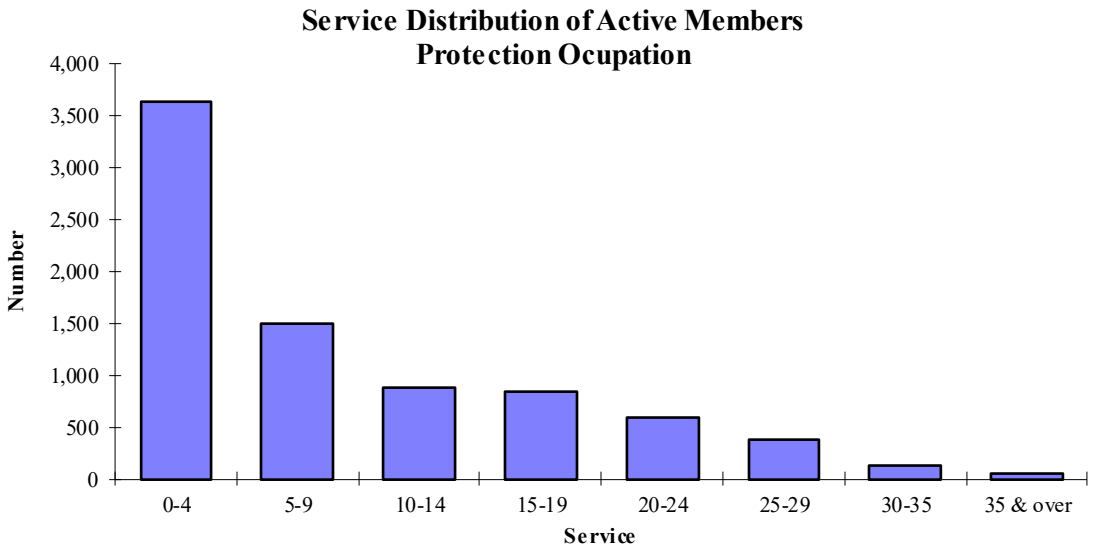

Age Distribution of Active Members
Regular Membership
Number
25,000
20,000
15,000
10,000
5,000
0
Under 25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70 & over
Age


Service Distribution of Active Members
Regular Membership
Number
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
0-4
5-9
10-14
15-19
20-24
25-29
30-35
35 & over
Service


Age Distribution of Active Members
Sheriffs and Deputies
Number
350
300
250
200
150
100
50
0
Under 25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70 & over
Age


Service Distribution of Active Members
Sheriffs and Deputies
Number
500
450
400
350
300
250
200
150
100
50
0
0-4
5-9
10-14
15-19
20-24
25-29
30-35
35 & over
Service


Age Distribution of Active Members
Protection Occupation
1,200
1,000
800
600
400
200
0
Number
Under 25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70 & over
Age


Service Distribution of Active Members
Protection Ocupation
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Number
0-4
5-9
10-14
15-19
20-24
25-29
30-35
35 & over
Service

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 2023 FOR INACTIVE VESTED MEMBERS*

Males and Females - Regular Membership

	Years of Service																			
	0 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 35		35 to 40		40 and over		Total	
Age	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.
Under 25	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA
25-29	0	NA	62	27,621	1	30,877	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	63	27,673
30-34	7	7,485	639	42,258	116	45,992	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	762	42,507
35-39	112	23,185	1,113	39,360	601	51,256	50	48,692	1	42,747	0	NA	0	NA	0	NA	0	NA	1,877	42,454
40-44	329	26,324	1,471	39,161	851	49,729	323	57,780	29	64,666	1	28,065	0	NA	0	NA	0	NA	3,004	42,993
45-49	276	25,690	1,504	36,019	886	44,349	426	54,307	172	63,061	12	68,251	0	NA	0	NA	0	NA	3,276	41,318
50-54	318	25,573	1,655	31,775	1,129	40,014	559	51,710	284	57,998	112	64,321	15	66,672	1	83,276	0	NA	4,073	39,175
55-59	334	24,197	1,709	27,207	1,128	32,959	568	39,394	312	53,654	125	64,124	30	68,850	0	NA	0	NA	4,206	33,512
60-64	388	25,428	1,647	23,680	1,008	27,643	525	32,670	277	40,028	83	46,785	13	40,387	5	62,797	0	NA	3,946	27,799
65-69	1,034	16,133	868	17,193	338	19,994	141	22,148	66	22,288	33	31,089	2	87,282	5	63,584	4	57,985	2,491	17,948
70 & over	1,117	10,863	343	16,947	115	16,981	36	20,477	13	22,351	8	28,554	2	102,111	2	51,924	2	53,867	1,638	13,169
Totals	3,915	18,722	11,011	31,162	6,173	38,346	2,628	44,340	1,154	50,975	374	56,695	62	64,023	13	63,003	6	56,612	25,336	33,739

*Including inactive retired/reemployed members

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 2023 FOR INACTIVE VESTED MEMBERS*

Males and Females - Sheriffs and Deputies

	Years of Service																			
	0 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 35		35 to 40		40 and over		Total	
Age	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.
Under 25	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA
25-29	3	63,414	7	64,503	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	10	64,177
30-34	4	47,037	26	64,980	4	68,746	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	34	63,312
35-39	5	53,705	13	63,229	9	63,700	1	58,604	0	NA	0	NA	0	NA	0	NA	0	NA	28	61,515
40-44	3	37,062	15	52,387	4	53,050	5	66,702	3	75,643	0	NA	0	NA	0	NA	0	NA	30	55,654
45-49	3	44,901	10	47,384	13	53,380	4	62,783	5	76,635	1	78,604	0	NA	0	NA	0	NA	36	55,983
50-54	2	35,127	6	49,881	7	54,780	4	63,565	2	60,248	0	NA	0	NA	0	NA	0	NA	21	53,703
55-59	3	69,781	4	41,959	0	NA	1	52,318	2	58,617	0	NA	0	NA	0	NA	0	NA	10	54,673
60-64	1	75,730	2	56,830	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	3	63,130
65-69	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA
70 & over	1	45,459	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	1	45,459
Totals	25	51,743	83	57,872	37	57,781	15	63,321	12	70,653	1	78,604	0	NA	0	NA	0	NA	173	58,446

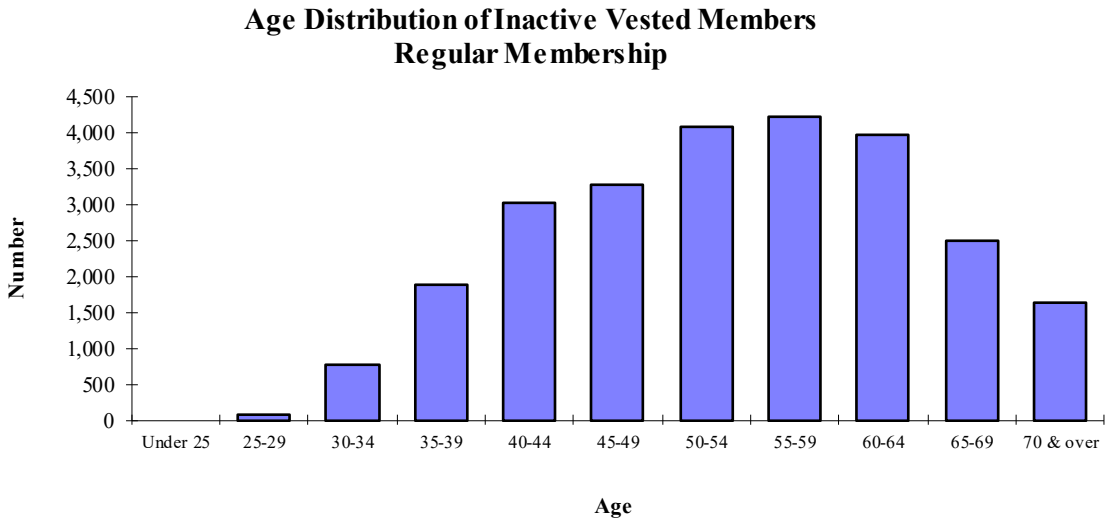
*Including inactive retired/reemployed members

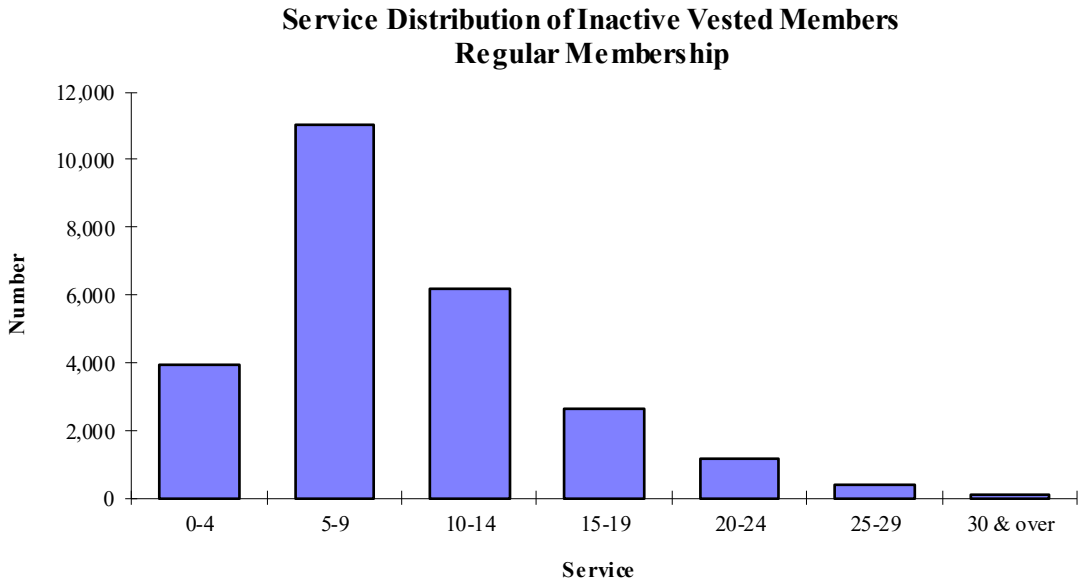
AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 2023 FOR INACTIVE VESTED MEMBERS*

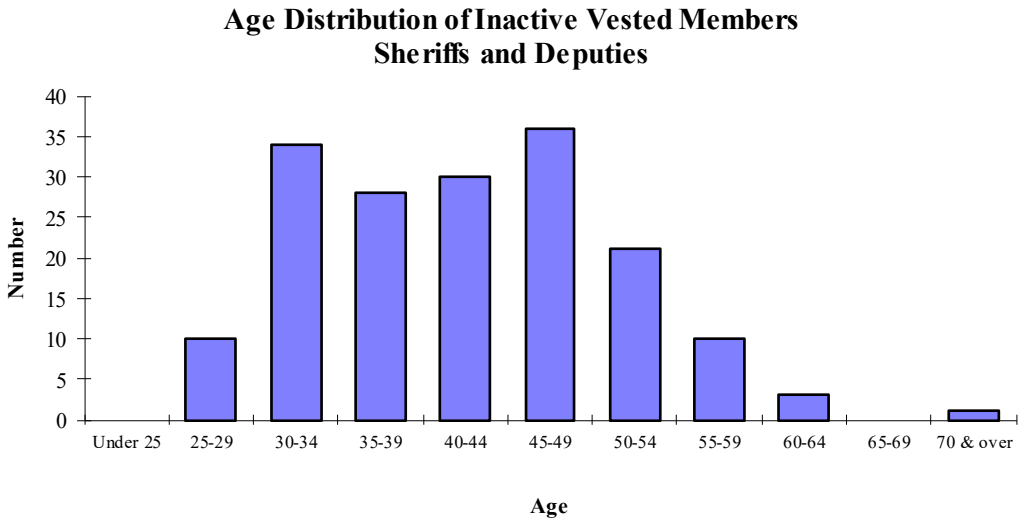
Males and Females - Protection Occupation

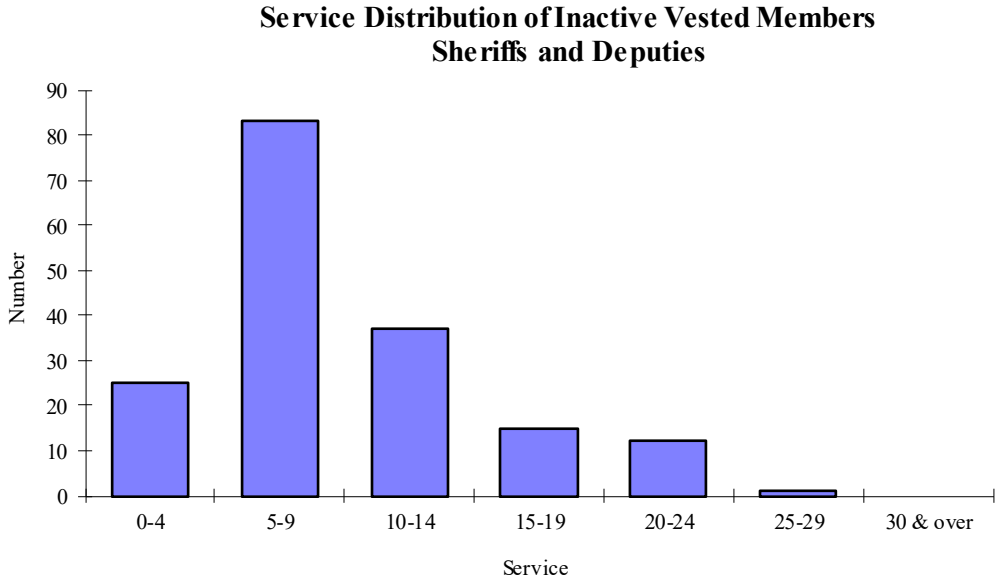
	Years of Service																			
	0 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 35		35 to 40		40 and over		Total	
Age	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.	No.	Avg. Sal.
Under 25	3	24,505	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	3	24,505
25-29	25	39,465	29	42,537	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	54	41,115
30-34	45	32,802	94	42,759	4	56,156	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	143	40,000
35-39	26	26,764	118	34,086	48	52,557	7	58,238	0	NA	0	NA	0	NA	0	NA	0	NA	199	38,434
40-44	27	25,044	95	31,271	58	46,705	24	55,136	11	64,132	0	NA	0	NA	0	NA	0	NA	215	38,998
45-49	18	33,516	83	32,479	48	44,080	29	51,405	13	70,586	3	58,283	0	NA	0	NA	0	NA	194	41,227
50-54	13	29,017	67	23,395	47	31,433	20	42,414	26	54,335	14	65,449	3	76,268	1	62,788	0	NA	191	36,078
55-59	28	19,596	50	27,383	34	28,678	21	31,172	9	51,458	6	68,400	0	NA	0	NA	0	NA	148	29,872
60-64	30	17,143	22	18,547	22	20,157	10	21,992	8	29,657	2	31,348	0	NA	0	NA	0	NA	94	20,060
65-69	22	6,890	12	13,069	6	10,291	6	7,288	4	14,977	1	13,909	0	NA	0	NA	0	NA	51	9,563
70 & over	14	10,976	7	6,191	1	45,321	1	1,691	0	NA	0	NA	0	NA	0	NA	0	NA	23	10,609
Totals	251	24,928	577	32,039	268	39,459	118	42,287	71	53,466	26	60,698	3	76,268	1	62,788	0	NA	1,315	34,961

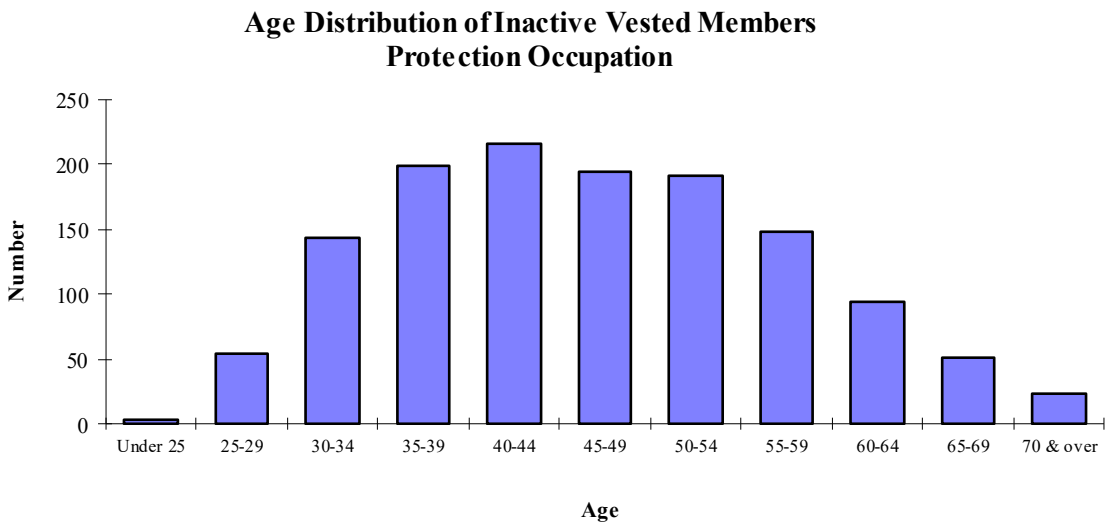
*Including inactive retired/reemployed members

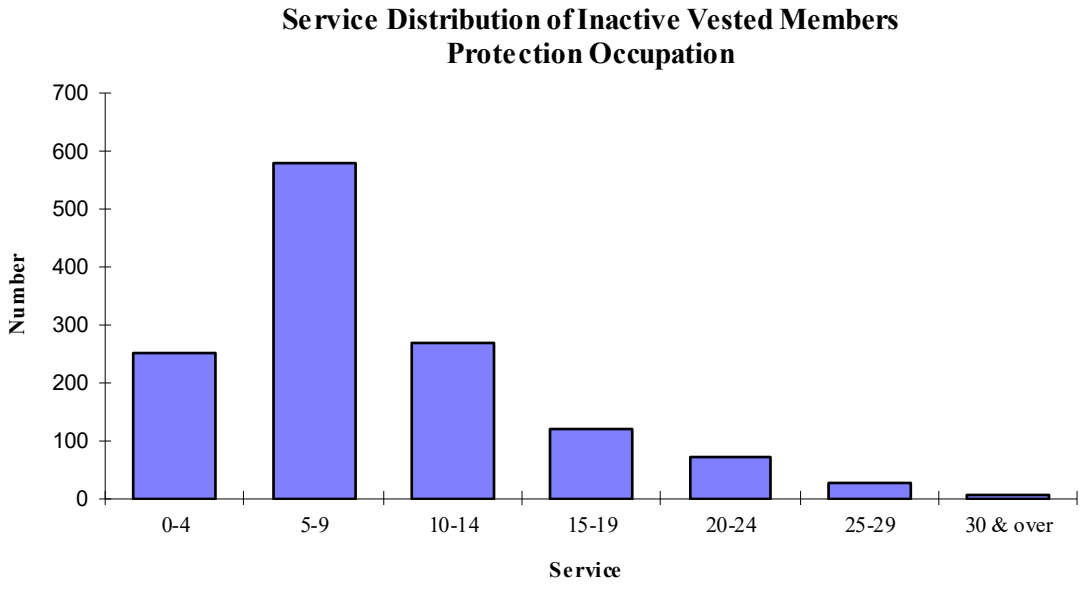

Age Distribution of Inactive Vested Members
Regular Membership
Number
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Under 25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70 & over
Age


Service Distribution of Inactive Vested Members
Regular Membership
Number
12,000
10,000
8,000
6,000
4,000
2,000
0
0-4
5-9
10-14
15-19
20-24
25-29
30 & over
Service


Age Distribution of Inactive Vested Members
Sheriffs and Deputies
Number
40
35
30
25
20
15
10
5
0
Under 25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70 & over
Age


Service Distribution of Inactive Vested Members
Sheriffs and Deputies
Number
90
80
70
60
50
40
30
20
10
0
0-4
5-9
10-14
15-19
20-24
25-29
30 & over
Service


Age Distribution of Inactive Vested Members
Protection Occupation
Number
250
200
150
100
50
0
Under 25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70 & over
Age


Service Distribution of Inactive Vested Members
Protection Occupation
Number
700
600
500
400
300
200
100
0
0-4
5-9
10-14
15-19
20-24
25-29
30 & over
Service

ANALYSIS OF RETIREES AND BENEFICIARIES

Males and Females - Regular Membership

	Number of Members and Beneficiaries									Average
Age	Option 1	Option 2	Option 3	Option 4	Contingent Beneficiary	Option 5	Option 6	Period Certain	Total	Annual Benefit
Under 40	2	1	1	0	70	2	0	12	88	$8,418
40 to 44	8	4	3	1	40	0	10	12	78	8,690
45 to 49	16	6	7	4	51	0	10	9	103	10,126
50 to 54	35	25	8	17	110	6	28	6	235	12,610
55 to 59	494	527	204	226	180	213	891	7	2,742	26,895
60 to 64	1,973	2,678	964	924	425	931	3,900	14	11,809	26,074
65 to 69	4,369	6,116	2,319	1,922	750	1,995	7,836	20	25,327	22,155
70 to 74	5,972	7,880	3,625	2,230	1,201	2,524	7,963	28	31,423	20,250
75 to 79	5,019	6,185	3,511	1,689	1,418	2,117	4,744	16	24,699	17,345
80 to 84	3,659	3,751	2,402	1,482	1,362	1,612	1,562	8	15,838	14,038
85 to 89	2,554	2,208	1,299	1,258	1,136	1,180	222	1	9,858	11,348
90 to 94	1,260	1,081	540	551	595	534	23	0	4,584	8,611
95 to 99	388	372	149	122	174	128	0	0	1,333	6,441
100 & up	42	70	25	9	26	33	0	0	205	5,155
Counts	25,791	30,904	15,057	10,435	7,538	11,275	27,189	133	128,322	$18,674
% of Total	20.1%	24.1%	11.7%	8.1%	5.9%	8.8%	21.2%	0.1%	100.0%	

ANALYSIS OF RETIREES AND BENEFICIARIES

Males and Females - Sheriffs and Deputies

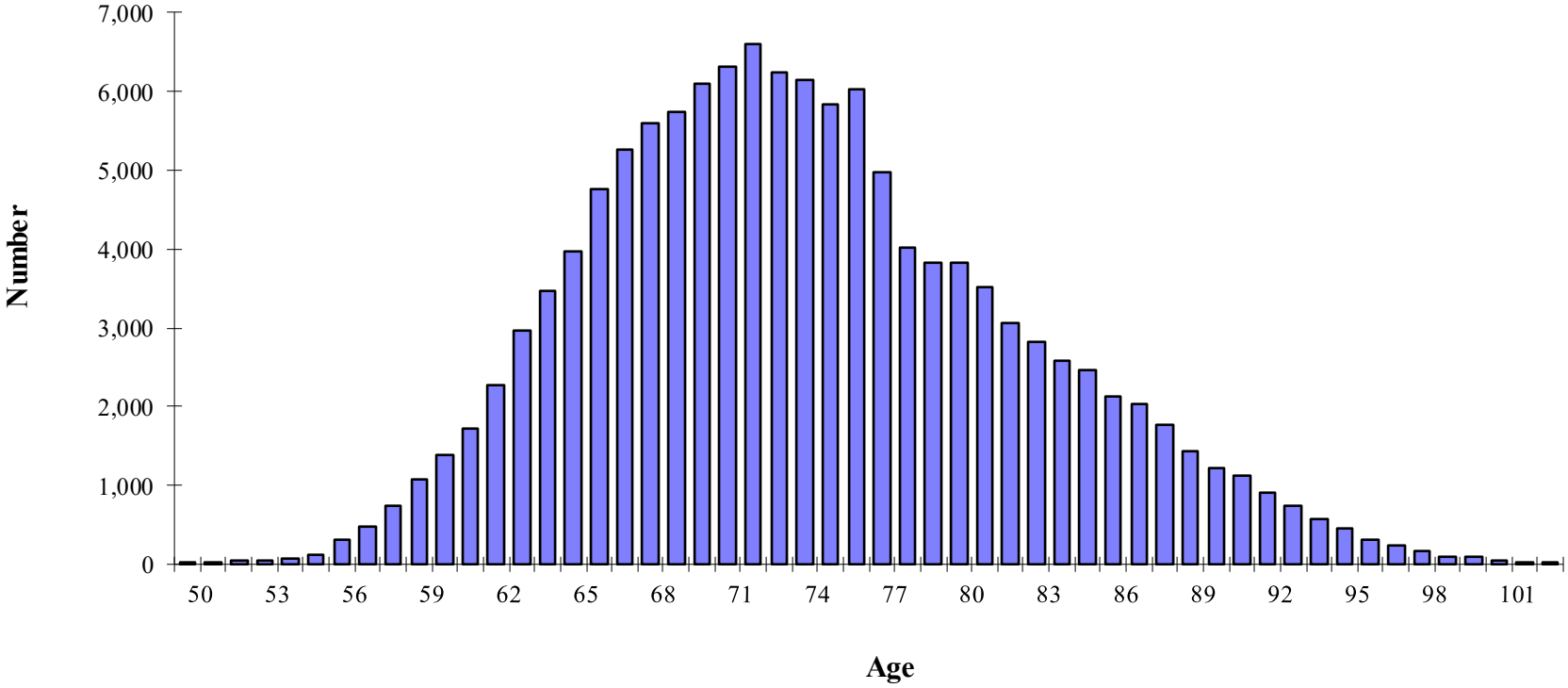
	Number of Members and Beneficiaries									Average
Age	Option 1	Option 2	Option 3	Option 4	Contingent Beneficiary	Option 5	Option 6	Period Certain	Total	Annual Benefit
Under 40	1	0	0	1	0	0	0	0	2	$27,942
40 to 44	1	0	1	4	3	1	1	0	11	32,651
45 to 49	1	0	1	2	3	0	3	0	10	29,288
50 to 54	11	4	2	19	3	1	33	0	73	48,957
55 to 59	24	20	8	29	8	8	94	0	191	43,785
60 to 64	25	21	14	38	10	6	80	0	194	43,923
65 to 69	39	31	17	51	26	14	103	0	281	39,534
70 to 74	37	28	13	28	21	13	86	0	226	32,758
75 to 79	31	17	12	25	18	7	31	0	141	27,704
80 to 84	14	9	3	16	13	5	9	0	69	23,132
85 to 89	10	2	2	10	9	2	3	0	38	16,526
90 to 94	2	2	1	3	5	0	0	0	13	11,385
95 to 99	0	1	0	0	0	0	0	0	1	21,910
100 & up	0	0	0	0	0	0	0	0	0	NA
Counts	196	135	74	226	119	57	443	0	1,250	$36,783
% of Total	15.7%	10.8%	5.9%	18.1%	9.5%	4.6%	35.4%	0.0%	100.0%	

ANALYSIS OF RETIREES AND BENEFICIARIES

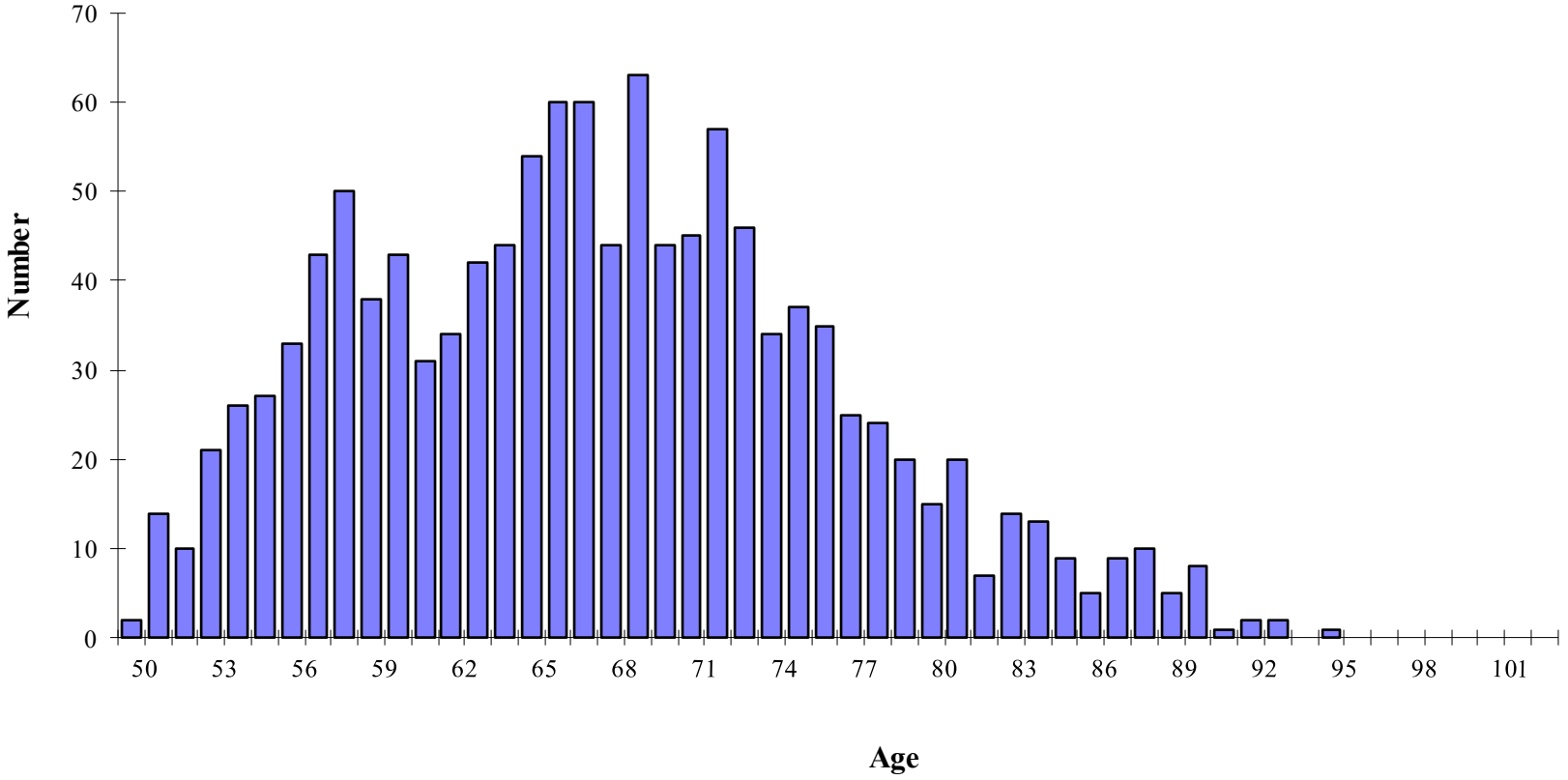
Males and Females - Protection Occupation

	Number of Members and Beneficiaries									Average
Age	Option 1	Option 2	Option 3	Option 4	Contingent Beneficiary	Option 5	Option 6	Period Certain	Total	Annual Benefit
Under 40	1	0	1	3	3	0	0	0	8	$15,732
40 to 44	0	2	0	4	6	0	0	0	12	14,515
45 to 49	2	0	0	4	5	1	3	0	15	28,987
50 to 54	6	0	2	9	11	3	12	1	44	26,357
55 to 59	74	69	28	68	12	17	189	1	458	35,845
60 to 64	118	128	61	154	28	25	307	0	821	33,720
65 to 69	169	155	44	149	51	55	340	1	964	29,264
70 to 74	158	163	55	112	68	38	256	0	850	25,836
75 to 79	87	94	36	71	55	25	118	1	487	20,833
80 to 84	47	42	22	35	42	6	35	0	229	16,619
85 to 89	21	5	5	20	19	5	7	0	82	13,862
90 to 94	3	2	0	5	15	1	0	0	26	11,690
95 to 99	3	0	1	2	1	0	0	0	7	10,194
100 & up	0	0	0	0	0	0	0	0	0	NA
Counts	689	660	255	636	316	176	1,267	4	4,003	$27,887
% of Total	17.1%	16.5%	6.4%	15.9%	7.9%	4.4%	31.7%	0.1%	100.0%	

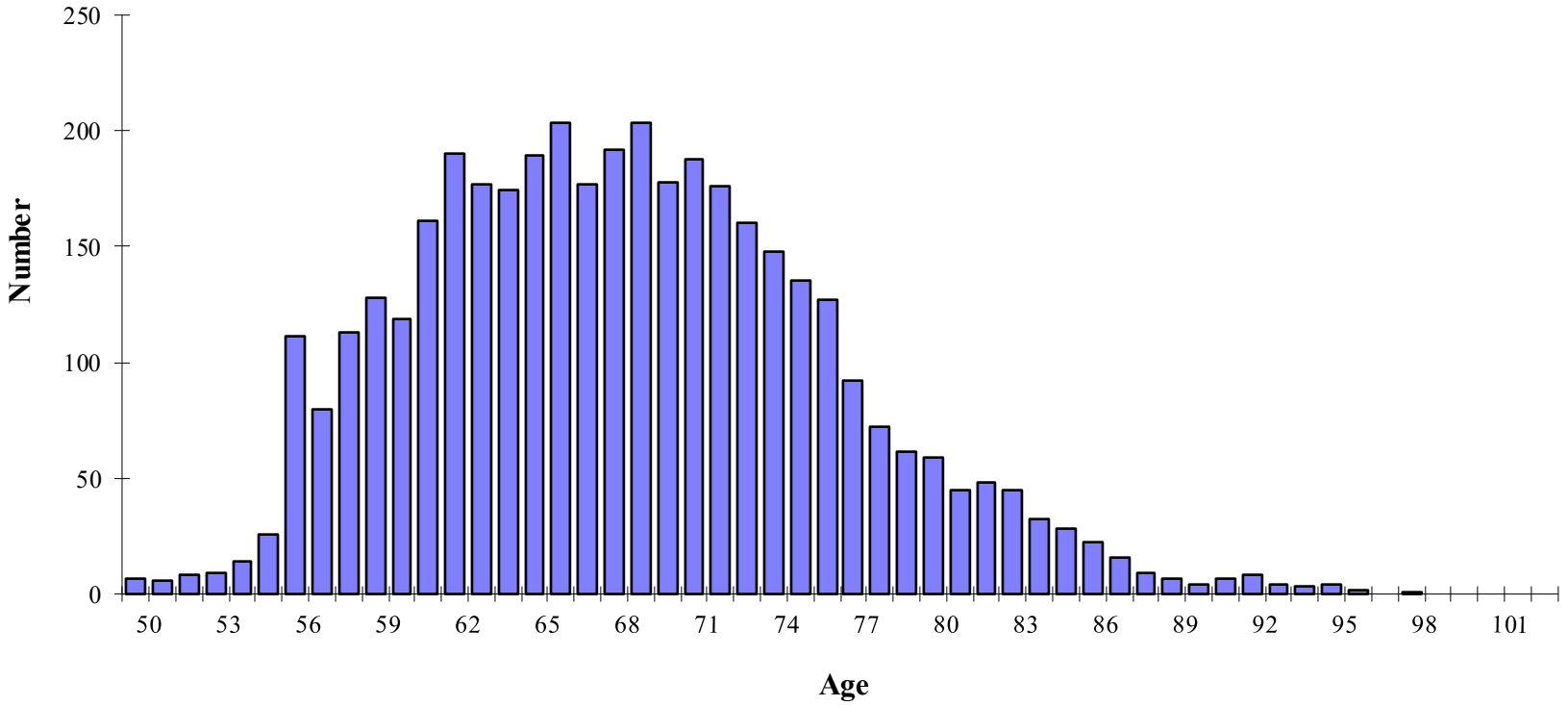
Age Distribution of Retirees & Beneficiaries
Regular Membership



Age Distribution of Retirees & Beneficiaries
Sheriffs and Deputies



Age Distribution of Retirees & Beneficiaries
Protection Occupation



SUMMARY OF DATA FILE RECONCILIATION

The following table reconciles the data we received from IPERS to the final membership counts used in the valuation.

Records on the in-pay data file	133,848
Removed those no longer entitled to benefits	(276)
Removed those who have filed for benefits but are not receiving	0
Added those still entitled to benefits	3
Records used in the valuation	133,575
Records on the not-in-pay data file	278,730
Records removed because the member has received all benefits	(23)
Records removed because member is deceased	(1,386)
Records used in the valuation*	277,321

* These records are allocated as follows:

Active members	179,875
Retired, reemployed members	8,412
Vested inactive members	26,317
Nonvested inactive members	62,717
Total	277,321

Nonvested inactive members include deceased vested inactive members with employee contributions still held by the System. Records that had no remaining benefit or had passed away prior to the valuation date were removed.

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APPENDIX B

SUMMARY OF PLAN PROVISIONS

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Chapter 97B of the Iowa code sets out the IPERS provisions, which are briefly summarized as follows:

Participation: In general, the System covers people in non-federal public employment within the State of Iowa. Membership is mandatory if a person is in covered employment. Exceptions to this are set out in the law. Notable exceptions are those covered by another public system in Iowa (such as judges, state patrol, and policemen and firemen in cities having civil service), employees of the Regents' institutions, and employees of the community colleges who elect alternative coverage.

Service Credit: A member will receive membership credit for service rendered after July 4, 1953 (special rules apply to service before this date). Service is counted to the complete quarter of a calendar year. A member will not receive credit for more than four quarters of service in a calendar year regardless of the number of employers reporting covered wages for that member. A calendar year is the 12-month period beginning January 1 and ending December 31.

Members may purchase service under specified conditions. To make such a purchase, the member must pay the actuarial cost of such service.

REGULAR MEMBERS:

Average Salary: The average of the member's highest three years of covered wages. Effective July 1, 2012 the average of a member's highest five years of covered wages, but not less than the member's highest three years as of June 30, 2012, if vested at that time.

Age and Service Requirements for Benefits:

Normal Retirement	Earliest of the first day of the month of the member's 65th birthday, age 62 with 20 years of service or Rule of 88 (age plus service equals/exceeds 88), with a minimum of age 55.
Early Retirement	First day of any month starting with the month of the member's 55th birthday but preceding the normal retirement date.
Inactive Vested Benefit	Four years of service (seven years effective July 1, 2012). Prior to July 1, 2005 inactive members could become eligible for a vested benefit merely by reaching age 55.
Pre-retirement Death Benefit	Upon death of a member before benefits have started.
Disability Benefit	Upon meeting requirements to be vested, if the active or inactive member begins receiving federal Social Security disability or Railroad Retirement disability benefits.

Retirement Benefits:

Normal Retirement	An annuity equal to 2% of Average Salary for each year of service up to 30 years plus 1% of Average Salary for each of the next 5 years of service. Maximum years of service recognized for benefit accrual purposes is 35 with a resulting maximum benefit of 65% of Average Salary (Option 2).
Early Retirement	An annuity, determined in the same manner as for normal retirement. However, a reduction of 0.25% per month is applied for each month the benefit commences prior to normal retirement age (based on service at early retirement). Effective July 1, 2012, the reduction changed to 0.50% per month and applies to each month that the benefit commences before age 65. Transition rules apply if members have service both before and after July 1, 2012.
Pre-retirement Death Benefits	Beneficiaries of members may receive a lump sum determined by a formula that includes how much the member contributed to IPERS, years of service, highest year's salary, and other factors. Beneficiaries may have the option of receiving a monthly benefit based on the present value of the member's accrued benefit at death.
Disability Benefits	An annuity, payable immediately, equal to the Normal Retirement Benefit without an early retirement adjustment.

Termination Benefits:

Less than four* years of Service (Nonvested)	A refund of all of the member's accumulated contributions.
Four* or more years of Service (Vested)	At the member's election either: (1) a refund of all of the member's accumulated contributions plus a portion (years of service divided by 30) of the employer's contributions with interest, or (2) a deferred benefit determined in the same manner as for normal retirement. Payments can begin at normal or early retirement.

* Effective July 1, 2012 seven years of service for those not vested at that time.

Form of Annuity:	The base form, or normal form, is a life annuity with a guaranteed return of employee contributions (Option 2).

Optional Forms of Payment:	*Option 1:* The member specifies a dollar amount, in $1,000 increments, that the member wishes to have paid to a designated beneficiary following the death of the member. The death benefit will be in the form of a single payment and cannot exceed the amount of a member's own accumulated contributions to IPERS, and it cannot lower the member's benefit as calculated under Option 2 by more than 50%. *Option 3:* After the member's death, all benefits cease. *Option 4:* The member receives a reduced monthly benefit so that a lifetime monthly benefit may be provided after the member's death to the person named by the member as the contingent annuitant. The member specifies what benefit the contingent annuitant will receive after the death of the member. The monthly benefit can be the same as the member's monthly benefit or three-fourths, one-half, or one-fourth of the amount. These choices may be restricted if the contingent annuitant is not the member's spouse and is more than ten years younger than the member. *Option 5:* If the member dies before ten full years (120 months of payments) have ended, the member's beneficiary will receive a monthly benefit for the remainder of the ten years. Members who have attained age 90 as of the first month of entitlement are not allowed to select this option. *Option 6:* The member receives a reduced monthly benefit so that a lifetime monthly benefit may be provided after the member's death to the person named by the member as the contingent annuitant. In addition, the monthly amounts are also reduced to pay for a pop-up feature. The pop-up feature provides that if the contingent annuitant dies before the member, the member's benefit will pop back up to what it would have been under IPERS Option 2, and death benefits may be payable to the member's designated beneficiary if certain conditions are met.
Actuarial Equivalent Lump Sum Payment:	If a vested member is entitled to receive a benefit and it is less than $50 per month under Option 2, the member shall receive a retirement benefit in an actuarial equivalent lump sum payment. The lump sum will include the member's and employer's accumulated contributions.
Post-retirement Benefit Increases:	Annual dividends are paid to those retired prior to July 1, 1990. Effective with the November 2000 dividend payment, the dividend is adjusted by the least of the following percentages: (1) the change in the CPI, (2) percentage certified to by the actuary as affordable by the System, and (3) 3%.

Favorable Experience Dividend (FED):

For members who retired after June 30, 1990, a favorable experience dividend (FED) reserve account has been established under Iowa Code §97B.49F(2). The main purpose of this account is to help offset the negative effects of postretirement inflation. All members and beneficiaries who receive a monthly allowance qualify for favorable experience dividend payments. Each November, IPERS determines if a FED payment should be paid the following January subject to the following conditions:

- The member must be retired one year.
- The FED rate cannot exceed 3%.
- The FED payment will be issued in a lump sum in January.
- The FED payment is not guaranteed.

The formula is as follows:
(December's Monthly benefit) X (12 months) X (Rate) X (Full calendar years retired) = FED

Source of Funds:

Regular Membership:

Contribution Rates

Time Period	Employees**	Employer	Total
Prior to 7/1/07	3.70%	5.75%	9.45%
7/1/07 – 6/30/08	3.90%	6.05%	9.95%
7/1/08 – 6/30/09	4.10%	6.35%	10.45%
7/1/09 – 6/30/10	4.30%	6.65%	10.95%
7/1/10 – 6/30/11	4.50%	6.95%	11.45%
7/1/11 – 6/30/12	5.38%	8.07%	13.45%
7/1/12 and later	Determined by Contribution Rate Funding Policy*		

* Change in contribution rate cannot exceed 1.0% per year.
** Employee rate is 40% of total contribution rate.

SHERIFFS/DEPUTIES AND PROTECTION OCCUPATION:

Average Salary:

The average of the member's highest three years of covered wages

Age and Service Requirements for Benefits:

Normal Retirement

Generally age 55. However, a member of the Sheriffs and Deputy Sheriffs may retire at age 50 with 22 years of service.

Inactive Vested Benefit	Four years of service. Prior to July 1, 2005 inactive members could become eligible for vested benefits merely by reaching age 55.
Pre-retirement Death Benefit	Upon death of a member before benefits have started.
Disability Benefit	Upon meeting requirements to be vested, (i) if the active or inactive member begins receiving federal Social Security or Railroad Retirement disability benefits, or (ii) upon being determined by IPERS to be disabled under the provisions of Iowa Code section 97B.50A. The disability benefits under Iowa Code section 97B.50A must be applied for through IPERS within one (1) year after termination of employment. Benefits under Iowa Code section 97B.50A may be paid for in-service disability or ordinary disability.

Retirement Benefits:

Normal Retirement	60% of Average Salary after completion of 22 years of service, plus an additional 1.5% of Average Salary for years of service greater than 22 but not more than 30. Maximum formula is 72% of Average Salary.
Pre-retirement Death Benefit	Beneficiaries of members may receive a lump sum determined by a formula that includes how much the member contributed to IPERS, years of service, highest year's salary, and other factors. Beneficiaries may have the option of receiving a monthly benefit based on the present value of the member's accrued benefit at death.
Disability Benefits	An annuity, payable immediately, equal to the Normal Retirement Benefit, without an adjustment. The benefit is the greater of the Normal Retirement Benefit and either 50% (for ordinary disability) or 60% (for in-service disability) of Average Salary.

Termination Benefits:

Less than four years of Service (Non-vested)	A refund of all of the member's accumulated contributions.
Four or more years of Service (Vested)	At the member's election either: (1) a refund of all of the member's accumulated contributions plus a portion (years of service divided by 22) of the employer's contributions with interest, or

(2) a deferred benefit determined in the same manner as for normal retirement. Payments begin at normal retirement.

Form of Annuity:

The base form, or normal form, is a life annuity with a guaranteed return of employee contributions (Option 2).

Optional Forms of Payment:

Option 1: The member specifies a dollar amount, in $1,000 increments, that the member wishes to have paid to a designated beneficiary following the death of the member. The death benefit will be in the form of a single payment and cannot exceed the amount of a member's own accumulated contributions to IPERS, and it cannot lower the member's benefit as calculated under Option 2 by more than 50%.

Option 3: After the member's death, all benefits cease.

Option 4: The member receives a reduced monthly benefit so that a lifetime monthly benefit may be provided after the member's death to the person named by the member as the contingent annuitant. The member specifies what benefit the contingent annuitant will receive after the death of the member. The monthly benefit can be the same as the member's monthly benefit or three-fourths, one-half, or one-fourth of the amount. These choices may be restricted if the contingent annuitant is not the member's spouse and is more than ten years younger than the member.

Option 5: If the member dies before ten full years (120 months of payments) have ended, the member's beneficiary will receive a monthly benefit for the remainder of the ten years. Members who have attained age 90 as of the first month of entitlement are not allowed to select this option.

Option 6: The member receives a reduced monthly benefit so that a lifetime monthly benefit may be provided after the member's death to the person named by the member as the contingent annuitant. In addition, the monthly amounts are also reduced to pay for a pop-up feature. The pop-up feature provides that if the contingent annuitant dies before the member, the member's benefit will pop back up to what it would have been under IPERS Option 2, and death benefits may be payable to the member's designated beneficiary if certain conditions are met.

Level Income Payment Option: A Level Income payment alternative is authorized for members of the Sheriffs and Deputies group and the Protection Occupation group. This alternative applies to all IPERS retirement options listed above except Option 6. The Level Income payment

alternative permits a member to receive a relatively level income both before and after age 62 when benefits from IPERS and Social Security are combined. Higher IPERS benefits are paid prior to age 62. When the member reaches age 62, the member's IPERS benefit is permanently reduced. This amount is determined when the member retires and is not recomputed based on the actual Social Security benefit.

Actuarial Equivalent Lump Sum Payment: If a vested member is entitled to receive a benefit and it is less than $50 per month under Option 2, the member shall receive a retirement benefit in an actuarial equivalent lump sum payment. The lump sum will include the member's and employer's accumulated contributions.

Post-retirement Benefit Increases: Annual dividends are paid to those retired prior to July 1, 1990. Effective with the November 2000 dividend payment, the dividend is adjusted by the least of the following percentages: (1) the change in the CPI, (2) percentage certified to by the actuary as affordable by the System, and (3) 3%.

Favorable Experience Dividend (FED): For members who retired after June 30, 1990, a favorable experience dividend (FED) reserve account has been established under Iowa Code §97B.49F(2). The main purpose of this account is to help offset the negative effects of postretirement inflation. All members and beneficiaries who receive a monthly allowance qualify for favorable experience dividend payments. Each November, IPERS determines if a FED payment should be paid the following January subject to the following conditions:

- The member must be retired one year.
- The FED rate cannot exceed 3%.
- The FED payment will be issued in a lump sum in January.
- The FED payment is not guaranteed.

The formula is as follows:
(December's Monthly benefit) x (12 months) x (Rate) x (Full calendar years retired) = FED

Source of Funds:

Sheriffs and Deputies: Determined by Contribution Rate Funding Policy. Employees contribute 50% and employers contribute 50%.

Protection Occupation: Determined by Contribution Rate Funding Policy. Employees contribute 40% and employers contribute 60%.

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APPENDIX C

ACTUARIAL ASSUMPTIONS AND METHODS

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TABLE OF CONTENTS

Sound financing of any retirement system requires that benefits accruing to its members shall be paid for during their active working lifetime so that when a member (or his beneficiary) becomes entitled to a benefit, the monies necessary to provide such benefit shall be on hand. In this way, the cost of benefits for present active members will not become a liability to future members and taxpayers.

The principal purpose of an actuarial valuation is to calculate, on the basis of certain assumptions, the present value of benefits that are payable in the future from the system to present members (and their beneficiaries) and the present value of future contributions to be made by the members and their employers. Having calculated such present values, the level of annual contribution to the system required to fund (or pay for) the benefits, in accordance with the above stated principle of sound financing, may be determined.

VALUATION ASSUMPTIONS

Retirement System contribution requirements and actuarial present values are calculated by applying experience assumptions to the benefit provisions and census (member) information of the Retirement System, using the actuarial cost method.

The principal areas of risk which require experience assumptions about future activities of the Retirement System are:

- long-term rates of investment return to be generated by the assets of the system
- patterns of pay increases to members
- rates of mortality among members, retirants and beneficiaries
- rates of withdrawal of active members
- rates of disability among active members
- the age patterns of actual retirements

In making a valuation, the monetary effect of each assumption is calculated for as long as a present member survives -- a period of time which can be as long as a century.

Actual experience of the Retirement System will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experiences. The result is a continual series of adjustments to the computed contribution rate, or alternatively to the amortization period for the unfunded actuarial liability.

From time to time, one or more of the assumptions are modified to reflect experience trends (but not random or temporary year to year fluctuations). A complete review of the actuarial assumptions was completed in 2022, based on experience from July 1, 2017 through June 30, 2021. The Investment Board has adopted and approved the use of the actuarial assumptions presented in the 2022 Experience Study, with the exception of an explicit assumption to fund administrative expenses. The following is a summary of the assumptions and methods used in the valuation:

ECONOMIC ASSUMPTIONS:

Rate of Inflation (effective June 30, 2017)

2.60% per annum

Rate of Crediting Interest on Contribution Balances (effective June 30, 2017)

3.50% per annum, compounded annually

Rate of Investment Return (effective June 30, 2017)

7.00% per annum, compounded annually, net of expenses.

Wage Growth Assumption (effective June 30, 2017)

3.25% per annum based on 2.60% inflation assumption and 0.65% real wage inflation.

Payroll Increase Assumption (effective June 30, 2017)

3.25% per year

Cost of Living Adjustments Assumption (effective June 30, 2017)

2.60% for members who retired before July 1, 1990. No cost-of-living adjustments are assumed to be granted to future retirees

DEMOGRAPHIC ASSUMPTIONS:

Rates of Mortality

Pre-Retirement (effective June 30, 2022)

State		
	Male	PubG-2010 Employee Table, Generational using MP-2021, 2 Year age setback
	Female	PubG-2010 Employee Table, Generational using MP-2021, 2 Year age setback
School		
	Male	PubG-2010 Employee Table, Generational using MP-2021, 4 Year age setback
	Female	PubG-2010 Employee Table, Generational using MP-2021, 8 Year age setback
Other		
	Male	PubG-2010 Employee Table, Generational using MP-2021, 4 Year age setback
	Female	PubG-2010 Employee Table, Generational using MP-2021, 8 Year age setback

Sheriffs/Deputies and Protection Occupation	
Male	PubG-2010 Employee Table, Generational using MP-2021, 4 Year age setback
Female	PubG-2010 Employee Table, Generational using MP-2021, 2 Year age setback

5% of active deaths are assumed to be service related for non-regular members.

Post-Retirement (effective June 30, 2022)

State	PubG-2010 Healthy Annuitant, Generational using MP-2021
Male	2 Year age set forward, 8% increase below age 75, 5% decrease above age 75
Female	2 Year age set forward, 20% increase below age 75, 10% decrease above age 75
School	PubG-2010 Healthy Annuitant, Generational using MP-2021
Male	No age adjustment, 20% decrease in rates below age 75
Female	1 Year age setback, 10% increase below age 75, 6% increase above age 75
Other	PubG-2010 Healthy Annuitant, Generational using MP-2021
Male	2 Year age set forward, 3% decrease at all ages
Female	No age adjustment, 4% decrease at all ages
Sheriffs/Deputies and Protection Occupation	PubS-2010 Healthy Annuitant, Generational using MP-2021
Male	3 Year age set forward
Female	2 Year age set forward, 4% decrease at all ages
Beneficiaries:	Same as members
Disabled Members	
Regular	PubG-2010 Disabled Mortality, Generational using MP-2021
Male	7 Year age set forward
Female	5 Year age set forward
Sheriffs/Deputies and Protection Occupation	PubG-2010 Disabled Mortality, Generational using MP-2021
Male	3 Year age set forward
Female	3 Year age set forward

Retirement Rates (effective June 30, 2022)

Upon meeting the requirements for early retirement, the following rates apply to Regular Members:

	Assumed Retirement Rates – Early		
Age	State	School	Other
55	4.0%	5.0%	4.0%
56	4.0%	5.0%	4.0%
57	4.0%	5.0%	4.0%
58	4.0%	5.0%	4.0%
59	4.0%	7.0%	4.0%
60	5.0%	10.0%	5.0%
61	15.0%	10.0%	8.0%
62	15.0%	13.0%	11.0%
63	15.0%	13.0%	11.0%
64	15.0%	15.0%	11.0%

Upon reaching the requirements for normal retirement (unreduced benefits), the following rates apply:

	Assumed Retirement Rates – Select Unreduced		
Age	State	School	Other
55	25.0%	26.0%	19.0%
56	20.0%	26.0%	19.0%
57	20.0%	26.0%	19.0%
58	20.0%	26.0%	19.0%
59	20.0%	26.0%	19.0%
60	20.0%	26.0%	19.0%
61	20.0%	33.0%	19.0%
62	30.0%	35.0%	27.0%
63	35.0%	30.0%	20.0%
64	30.0%	30.0%	25.0%
65	30.0%	30.0%	40.0%

	Assumed Retirement Rates – Ultimate Unreduced		
Age	State	School	Other
56	15.0%	20.0%	12.0%
57	15.0%	20.0%	12.0%
58	15.0%	20.0%	12.0%
59	15.0%	21.0%	12.0%
60	15.0%	23.0%	15.0%
61	20.0%	28.0%	20.0%
62	35.0%	35.0%	27.0%
63	30.0%	30.0%	20.0%
64	30.0%	30.0%	25.0%
65	30.0%	45.0%	40.0%
66	30.0%	35.0%	30.0%
67	20.0%	25.0%	20.0%
68	20.0%	25.0%	20.0%
69	35.0%	40.0%	40.0%
70	100.0%	100.0%	100.0%

	Assumed Retirement Rates	
Age	Sheriffs and Deputies	Protection Occupation
50	17.0%	
51	15.0%	
52	15.0%	
53	15.0%	
54	15.0%	
55	15.0%	25.0%
56	15.0%	10.0%
57	15.0%	10.0%
58	15.0%	10.0%
59	15.0%	10.0%
60	15.0%	10.0%
61	15.0%	15.0%
62	30.0%	30.0%
63	30.0%	25.0%
64	30.0%	25.0%
65	100.0%	100.0%

Terminated vested members are assumed to retire at age 62 (55 for Sheriffs/Deputies and Protection Occupation groups).

For Regular membership, retired reemployed members are assumed to retire at a rate of 25% per year until age 80 when all are assumed to retire.

All retirees are assumed to elect a modified cash refund annuity (Option 2).

Rates of Disablement (effective June 30, 2022)

	Assumed Rates					
	Males			Females		
Age	State	School	Other	State	School	Other
27	0.017%	0.018%	0.016%	0.016%	0.018%	0.016%
32	0.017%	0.018%	0.016%	0.016%	0.018%	0.016%
37	0.026%	0.031%	0.024%	0.024%	0.027%	0.024%
42	0.043%	0.050%	0.040%	0.032%	0.036%	0.032%
47	0.085%	0.088%	0.088%	0.056%	0.063%	0.058%
52	0.153%	0.128%	0.208%	0.144%	0.117%	0.126%
57	0.221%	0.207%	0.400%	0.248%	0.171%	0.224%
62	0.289%	0.286%	0.576%	0.400%	0.234%	0.320%

Assumed Rates Sheriffs/Deputies Protection Occupation*	
Age	Rate
27	0.130%
32	0.130%
37	0.130%
42	0.150%
47	0.200%
52	0.240%
57	0.320%
62	0.430%

* 66.67% of disabilities are assumed to be in-service disabilities.

Rates of Termination of Employment (effective June 30, 2022)

Regular Membership

	Male			Female		
Years of Service	State	School	Other	State	School	Other
1	14.00%	14.20%	17.50%	14.20%	14.20%	19.99%
5	5.25%	6.60%	7.00%	6.60%	6.60%	8.35%
10	2.40%	2.70%	3.75%	3.25%	2.70%	4.93%
15	1.60%	1.70%	2.55%	2.00%	1.70%	3.36%
20	1.10%	1.20%	1.90%	1.30%	1.20%	2.66%
25	1.00%	1.00%	1.40%	1.00%	1.00%	1.98%
30	1.00%	1.00%	1.00%	1.00%	1.00%	1.30%

Sheriffs/Deputies and Protection Occupation

Years of Service	Sheriffs/Deputies	Protection Occupation
1	6.00%	11.50%
5	2.50%	6.50%
10	1.15%	3.75%
15	1.00%	2.35%
20	1.00%	1.60%
25	1.00%	1.25%
30	1.00%	1.25%

Probability of Electing a Deferred Vested Benefit (effective June 30, 2018)

	Regular Membership					
	Male			Female		
Years of Service	State	School	Other	State	School	Other
5	62.0%	74.0%	62.0%	56.0%	80.0%	70.0%
10	71.0%	79.0%	71.0%	62.0%	80.0%	73.0%
15	76.0%	84.0%	76.0%	72.0%	85.0%	80.0%
20	81.0%	89.0%	81.0%	82.0%	90.0%	85.0%
25	86.0%	94.0%	86.0%	92.0%	95.0%	90.0%
30	90.0%	95.0%	90.0%	100.0%	100.0%	90.0%

	Sheriffs/Deputies and Protection Occupation
Years of Service	Rate
5	53.0%
10	65.0%
15	85.0%
20	95.0%
25	100.0%
30	100.0%

Rates of Salary Increase* (effective June 30, 2018)

	Annual Increase			
Years of Service	State	School	Other	Sheriffs/Deputies and Protection Occupation
1	14.25%	16.25%	14.25%	16.25%
5	7.75%	5.75%	5.35%	5.75%
10	5.50%	4.55%	4.55%	4.55%
15	4.45%	3.75%	4.05%	4.05%
20	3.85%	3.40%	3.75%	3.75%
25	3.60%	3.25%	3.65%	3.75%
30	3.35%	3.25%	3.65%	3.25%
35+	3.25%	3.25%	3.25%	3.25%

* Includes 3.25% wage growth

Marriage Assumption

100% of members are assumed to be married, with males 3 years older than females.

ACTUARIAL COST METHOD (adopted 1996)

The actuarial cost method is a procedure for allocating the actuarial present value of pension plan benefits and expenses to time periods. The method used for the valuation is known as the entry age normal actuarial cost method. Under this method, a total contribution rate is determined which consists of two parts: (i) the normal cost rate and (ii) the unfunded actuarial liability (UAL) rate. The entry age normal cost method has the following characteristics:

(i) The annual normal costs for each individual active member are sufficient to accumulate the value of the member's pension at time of retirement.

(ii) Each annual normal cost is a constant percentage of the member's year by year projected compensation rates.

The entry age normal actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's compensation rates between the entry age of the member and the assumed exit ages.

ACTUARIAL AMORTIZATION METHOD (adopted 2013)

The portion of the actuarial present value of benefits allocated to the valuation year is called the normal cost. The portion of the actuarial present value of benefits not provided for by the actuarial present value of future normal costs is called the actuarial liability. Deducting the actuarial value of assets from the actuarial liability determines the unfunded actuarial liability (UAL). The one-year lag between the valuation date and the date the contribution rate is effective is reflected in calculating the corresponding amortization payment. The UAL is amortized according to the Actuarial Amortization Method adopted by the Investment Board and summarized below:

1. Amortization payments will be calculated as a level percentage of payroll.
2. For the actuarial valuation prepared as of June 30, 2013, the amortization period of the UAL shall be 30-year open for all membership groups.
3. For the actuarial valuation prepared as of June 30, 2014:
4. The UAL for each membership group shall be amortized over a 30-year closed period.
5. This will be designated as the initial UAL base for subsequent valuations and it will be amortized over the remaining years of the 30-year closed period set on June 30, 2014.
6. For each valuation subsequent to June 30, 2014, annual net experience gains/losses for each membership group will be amortized over a new, closed 20-year period.
7. Subsequent plan amendments or changes in actuarial assumptions or methods that create a change in the UAL will be amortized over a demographically appropriate period selected by the Investment Board at the time that the change is incurred.
8. The dollar amount of the UAL payment for purposes of computing the UAL component of the actuarial and required contribution rate will be the sum of the amortization payments for each amortization schedule divided by the total projected payroll. Unless the plan has been 110 percent funded for the current and prior two years, a negative amortization payment shall be ignored.

9. If the valuation shows that the group has surplus, the prior amortization bases will be eliminated and one base equal to the amount of surplus shall be established. The amortization period of a surplus shall be a 30-year open period for all groups.

Please note that the use of closed amortization periods, coupled with employers contributing the full actuarial required contribution each year, will result in the System being fully funded at the end of the amortization period, if all actuarial assumptions are met. Based on the current valuation, the full funded date is the 2046 valuation. In our opinion, the amortization policy meets the requirements of Actuarial Standard of Practice Number 4.

Due to the remaining amortization period of the legacy UAAL, the expected contributions in the next year are greater than the normal cost plus interest on the UAAL. In our professional judgement, the funding policy adopted by the Investment Board produces a reasonable actuarial required contribution as defined in Actuarial Standard of Practice Number 4. Contributions are developed with the intent of being level as a percentage of covered payroll, assuming the number of active members remains stable. Furthermore, the funding policy is expected to accumulate sufficient assets to make all future benefit payments as they become due, if all assumptions are met.

ACTUARIAL VALUE OF ASSETS SMOOTHING METHOD (adopted 2007)

The market value of assets, representing a fair value of System assets, may not necessarily be 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 volatility in the market value while still indirectly recognizing market value. The specific technique follows:

Step 1: Determine the expected value of plan assets at the current valuation date using the actuarial assumption for investment return applied to the prior actuarial value and the actual receipts and disbursements of the fund for the previous 12 months.

Step 2: Subtract the expected value determined in Step 1 from the total market value of the Fund at the current valuation date.

Step 3: Multiply the difference between market and expected values determined in Step 2 by 25%.

Step 4: Add the expected value of Step 1 and the product of Step 3 to determine the actuarial value of assets.

Step 5: Verify the preliminary actuarial value of assets in Step 4 is not more than 120% of the market value of assets nor less than 80% of the market value. If it is, adjust the actuarial value of assets so it falls within the 80% - 120% corridor.

TECHNICAL VALUATION PROCEDURES

Data Procedures

In-pay members:

If a birth date is not available, the member is assumed to be 80. If a retirement date is also not available, the member is assumed to have retired at 65.

If a beneficiary birth date is needed but not supplied, husbands are assumed to be 3 years older than wives.

Not in-pay members:

If a birth date is not available, the member is assumed to be the average age of the members with the same status.

If gender is not provided, regular members are assumed to be female and Sheriffs/Deputies and Protection Occupation members are assumed to be male.

Salaries for first year members are annualized based on the number of quarters with wages.

Membership Transfers

IPERS provides a code in the valuation data to indicate that a member is in a membership group (Regular, Sheriffs and Deputies and Protection Occupation) different from that on the prior valuation date. The actuarial liability for these members is calculated under the assumptions and provisions of the prior membership group. A preliminary funded ratio (before asset transfer) is determined for the three membership groups. Assets are then transferred from the prior to the current membership group based on the funded ratio of the prior group times the actuarial liability of the member in the prior group. Then, the members are revalued in the current membership group for purposes of valuation calculations.

Other Valuation Procedures

No actuarial accrued liability in excess of the unclaimed member contribution balance is held for nonvested, inactive members. Inactive vested members who have died are treated in the same manner.

The wages used in the projection of benefits and liabilities are considered earnings for the current year ending June 30, increased by the salary scale.

The calculations for the actuarial contribution rate are determined as of mid-year. This is a reasonable estimate since contributions are made throughout the year.

The projected IRC Section 415 limit for active participants was not valued. The impact was assumed to be *de minimus*.

The compensation limitation under IRC Section 401(a)(17) is considered in this valuation.

No future additions to, or payments from, the Favorable Experience Dividend (FED) Reserve Account or the Supplemental Accounts for Active Members (SAAM) are reflected in the valuation. The FED and SAAM were first developed in a funding framework in which the Regular membership contribution rate was a fixed contribution rate, set in statute, which had been constant for many years. Legislation has subsequently made the contribution rate variable and the IPERS Board has developed a funding policy to guide them in setting the statutory contribution rate. There are some interactions between a variable contribution rate and the rules for the FED and SAAM transfers that we believe may not reflect the original intent of the FED and SAAM. Given the intent, we anticipate that the issues described here may encourage a review of the statutes and policies related to the FED and SAAM. Therefore, the potential liability from the FED and SAAM are not reflected in this valuation.

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APPENDIX D

DEFINITION OF TERMS

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Accrued Service	Service credited under the system that was rendered before the date of the actuarial valuation.
Actuarial Assumptions	Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefits between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method."
Actuarial Equivalent	A single amount or series of amounts of equal value to another single amount or series of amounts computed on the basis of a given set of actuarial assumptions.
Actuarial Liability	The difference between the actuarial present value of system benefits and the actuarial value of future normal costs. Also referred to as "accrued liability" or "actuarial accrued liability."
Actuarial Present Value	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
Amortization	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with lump sum payment.
Experience Gain (Loss)	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.

Unfunded Actuarial Liability

The difference between actuarial liability and the actuarial value of assets. Sometimes referred to as "unfunded accrued liability" or "unfunded liability".

Most retirement systems have unfunded actuarial liability. They arise anytime new benefits are added and anytime an actuarial loss is realized.

APPENDIX E

CONTRIBUTION RATE FUNDING POLICY

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Background:
IPERS is charged with setting a "Required Contribution Rate" for each membership category within IPERS that will discharge its liabilities. Iowa Code §97B.11(3)(d) provides the basic framework for implementing this charge by stating:

> The Required Contribution Rate that is set by the system for a membership category shall be the contribution rate the system actuarially determines, based upon the most recent actuarial valuation of the system and using the actuarial methods, assumptions, and funding policy approved by the investment board, is the rate required by the system to discharge its liabilities as a percentage of the covered wages of members in that membership category. However, the Required Contribution Rate set by the system for members in regular service for a fiscal year shall not vary by more than one percentage point from the Required Contribution Rate for the prior fiscal year.

Goal:
To establish policy and procedures in setting contribution rates that combined with investment income will fund the benefits specified in Chapter 97B of the Iowa Code.

To move towards fully funding the benefits (100 percent or greater funded ratio) in as expeditious manner as is reasonable within the guidelines acknowledged herein.

Procedure:
The Investment Board shall retain a consulting actuary to conduct an annual actuarial valuation of assets and liabilities. The consulting actuary shall use the entry age normal cost method and all other actuarial assumptions and methods approved by the Investment Board.

In the annual valuation process, the consulting actuary shall calculate an Actuarial Contribution Rate and a Required Contribution Rate pursuant to this policy. Each shall be calculated as a level percent of pay.

There is a one-year lag between the completion of an annual actuarial valuation report and the fiscal year to which the contribution rates calculated therein are applied. Therefore, the Actuarial Contribution Rate and the Required Contribution Rate declared in the annual valuation process are applicable to the fiscal year immediately following the completion of the valuation report (for example the rates declared in the report presented to the Investment Board in December 2013 are applicable to the rates for the fiscal year beginning July 1, 2014).

Actuarial Contribution Rate (ACR):
1. ACR is the combined employer and employee contribution rate that is the minimum rate necessary to fund the benefits using the actuarial assumptions and methods approved by the Investment Board.

2. A separate ACR shall be determined for each membership group within IPERS according to this policy.

3. The ACR shall consist of:

    a. Normal cost and an amortization payment (not less than zero) of any unfunded actuarial liability.
    b. Normal cost may only be offset by a negative amortization payment after a membership group has attained a funded ratio of 110 percent or greater for 3 consecutive years.

Required Contribution Rate:

1. The Required Contribution Rate is the combined employer and employee rate payable pursuant to this policy and Iowa Code §97B.11(3)(d).

2. The Required Contribution Rate shall be determined by comparing the ACR determined in the annual valuation process to the Required Contribution Rate of the previous year.

    a. If the ACR is less than the previous Required Contribution Rate by fewer than 50 basis points, then the Required Contribution Rate shall remain unchanged from the previous year.

    b. If the ACR is less than the previous Required Contribution Rate by 50 basis points or more, then the Required Contribution Rate shall be lowered by 50 basis points provided the funded ratio of the membership group is 95 percent or higher.

    c. If the ACR is greater than the Required Contribution Rate of the previous year, then the Required Contribution Rate shall be:

        i. Increased to be equal to ACR for Sheriffs and Deputies.
        ii. Increased to be equal to ACR for Protection Occupation Members.
        iii. Increased to be equal to ACR for Regular Members, or one percentage point greater than the prior year's Required Contribution Rate, whichever is smaller.

Favorable Experience Dividend ("FED") and Supplemental Account for Active Members ("SAAM") transfers:

For the purposes and only for the purposes of calculating potential transfers to the favorable experience dividend reserve account and to each member's supplemental account the term "fully funded" as specified in the relevant Iowa Code and Administrative Rules[1] shall mean:

The funding percentage, which shall not be less than 100 percent,[2] determined by the System's actuary at which calculated transfers to the favorable experience dividend reserve account and to the member's supplemental accounts will not result in a material probability that the System will fall below 100 percent funded.[3]

[1] §97B.49F(2)(c)(5); §97B.49H (3); IAC 495—15.2(1).
[2] §97B.1A(11A).
[3] As contemplated in §97B.4(4)(d) and §97B.65(2) the terms "fully funded" and "fully fund" shall reference a 100 percent funding ratio.

Policy Guidelines:
In adopting actuarial assumptions and methods to be used in setting contribution rates, the Investment Board shall strive to provide a balance among the following:

1. Stability in contribution rates (such as use of smoothing and amortization schedules that do not produce dramatic swings in the required contributions from year to year).

2. Disciplined funding approach (such as requiring full payment of normal cost and an amortization payment towards the unfunded actuarial liability and deferring decreases in contribution rates until strong funded ratios are attained).

3. Interperiod equity (such as shortening the amortization schedule when reasonable and amortization of retroactive benefit enhancements over a reasonable time period such as the average working lifetime for active members and the average life expectancy of retired members).

4. Support an affordable, sustainable plan (in consultation with the Benefits Advisory Committee review affordability of required contribution rates and/or the benefit provisions).

5. At a minimum, this policy will be reviewed in conjunction with the quadrennial experience study.

IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
CERTIFICATION

This Addendum is being prepared solely for the 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

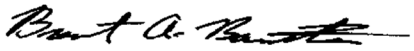
All other assumptions, methodologies, and System provisions used are consistent with those used in the June 30, 2023 valuation for the Iowa Public Employees' Retirement System.

The results shown in this Addendum may not be consistent with those in the June 30, 2023 valuation. The June 30, 2023 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 A. Beckham, FSA, EA, FCA, MAAA — October 31, 2023 Date



Brent A. Banister, PhD, FSA, EA, FCA, MAAA — October 31, 2023 Date

Bryan K. Hoge, FSA, FCA, EA, MAAA — October 31, 2023 Date

IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
SUMMARY OF VALUATION RESULTS UNDER PRESCRIBED METHODOLOGY PER CHAPTER 97 D.5

This addendum report has been prepared to present the results of a valuation of the Iowa Public Employees' Retirement System as of June 30, 2023, based on the prescribed methodology under Chapter D.5.

The unfunded actuarial accrued liability has been amortized as a level percent of payroll over 30 years. The payroll growth assumption used was 3.25%.

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

	Regular Membership Actuarial Valuation as of	
	June 30, 2023	**June 30, 2022**
Summary of Costs		
Normal cost	10.62%	10.60%
UAL amortization	2.63%	2.79%
Total	13.25%	13.39%
Less Employee Contribution Rate	(6.29%)	(6.29%)
Employer Required Contribution Rate	6.96%	7.10%
Funded Status		
Actuarial liability	$42,651,088,157	$41,090,755,292
Actuarial value of assets	37,856,178,601	36,345,895,362
Unfunded actuarial liability	$4,794,909,556	$4,744,859,930
Funded Ratio	88.8%	88.5%
Asset Values		
Market value of assets (MVA)	$38,036,856,757	$37,115,609,381
Actuarial Value of Assets (AVA)	37,856,178,601	36,345,895,362
MVA/AVA	100%	102%

	Sheriffs and Deputies Actuarial Valuation as of	
	June 30, 2023	**June 30, 2022**
Summary of Costs		
Normal cost	16.80%	16.78%
UAL amortization	(0.89%)	(1.66%)
Total	15.91%	15.12%
Less Employee Contribution Rate	(8.51%)	(8.51%)
Employer Required Contribution Rate	7.40%	6.61%
Funded Status		
Actuarial liability	$910,174,648	$849,677,745
Actuarial value of assets	933,813,522	889,635,045
Unfunded actuarial liability	($23,638,874)	($39,957,300)
Funded Ratio	102.6%	104.7%
Asset Values		
Market value of assets (MVA)	$933,865,445	$908,454,027
Actuarial Value of Assets (AVA)	933,813,522	889,635,045
MVA/AVA	100%	102%

	Protection Occupation Group* Actuarial Valuation as of	
	June 30, 2023	**June 30, 2022**
Summary of Costs		
Normal cost	15.34%	15.31%
UAL amortization	(0.76%)	(1.18%)
Total	14.58%	14.13%
Less Employee Contribution Rate	(6.21%)	(6.21%)
Employer Required Contribution Rate	8.37%	7.92%
Funded Status		
Actuarial liability	$2,158,716,634	$2,029,281,569
Actuarial value of assets	2,222,532,093	2,118,701,972
Unfunded actuarial liability	($63,815,459)	($89,420,403)
Funded Ratio	103.0%	104.4%
Asset Values		
Market value of assets (MVA)	$2,235,592,057	$2,162,328,881
Actuarial Value of Assets (AVA)	2,222,532,093	2,118,701,972
MVA/AVA	101%	102%

* Includes all public safety members other than Sheriffs and Deputies.