

# EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF HAWAII

REPORT TO BOARD OF TRUSTEES ON THE 97<sup>th</sup> ANNUAL  
ACTUARIAL VALUATION  
FOR THE YEAR ENDING JUNE 30, 2022





January 11, 2023

Board of Trustees  
Employees' Retirement System of  
The State of Hawaii  
City Financial Tower  
201 Merchant St., Ste. 1400  
Honolulu, HI 96813-2980

Dear Trustees:

**SUBJECT: ACTUARIAL VALUATION AS OF JUNE 30, 2022**

We certify that the information contained in the 2022 actuarial valuation report is accurate and fairly presents the actuarial position of the Employees' Retirement System of the State of Hawaii (ERS) as of June 30, 2022. There have been no adjustments for events which occurred after this date.

All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, the results presented comply with the requirements of the Hawaii statutes and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. One or more of them are an Enrolled Actuary and/or a Member of the American Academy of Actuaries. All are experienced in performing valuations for large public retirement systems.

This report was prepared at the request of the Board and is intended for use by the ERS and those designated or approved by the Board. This report may be provided to parties other than the ERS only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

#### **ACTUARIAL VALUATIONS**

The primary purpose of the valuation report is to determine the adequacy of the current employer contribution rate through measuring the resulting funding period, to describe the current financial condition of ERS, and to analyze changes in ERS's condition. In addition, the report provides various summaries of the data. This report may not be appropriate for other purposes. The information required by ERS in connection with Governmental Accounting Standards Board Statement No. 67 (GASB No.67) will be provided in a separate report.

Valuations are prepared annually, as of June 30th of each year, the last day of ERS's plan year and fiscal year.

## **FINANCING OBJECTIVES**

Contribution rates are established by Law that, over time, are intended to remain level as a percent of payroll. The employee and employer contribution rates have been set by Law and are intended to provide for the normal costs of the ERS and to amortize the unfunded actuarial accrued liability (UAAL) over a reasonable amount of time, which will ensure benefit security and intergenerational equity. Hawaii Revised Statutes §88-122(e)(1) state that the employer contribution rates are subject to adjustment when the funding period is in excess of 30 years.

## **PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES**

We have determined that the funding period for paying off the UAAL of the ERS (in aggregate) is 24 years. This is the same as the prior year's funding period of 24 years. Normally, we would expect the funding period to decrease by one each year if all assumptions are exactly met. Therefore, this year's funding period is one year more than expected. Given that the System experienced actuarial gains on both its assets and its liabilities, this result may seem somewhat surprising. However, one of the reasons for the liability gains was a sizeable decrease in the covered payroll of the System. Since the contributions to the System are a fixed percentage of payroll, a decrease in the covered payroll implies a smaller contribution stream in future years, which means smaller payments towards the unfunded liabilities of the System. Hence, even though the total unfunded liabilities decreased from last year, the period over which the unfunded liabilities are to be paid off remained the same (24 years). Because this period is less than 30 years, the minimum objectives set in State statute are currently being realized. In addition, when the current contribution rates were passed by the Legislature in 2017, it was expected that the funding period would be 24 years as of the 2022 valuation, thus ERS remains on track to achieve full funding in the same timeframe as originally set.

The 2017 Legislature passed legislation that made significant changes to the future employer contribution rates. The employer contribution rate for Police and Fire employees increased to 41% for FY2021, and the employer contribution rate for All Other Employees increased to 24% for FY2021. This was the final phase of the increase in the employer contribution rates. The funding period assumes that these contribution rates will remain in effect throughout the 24 year funding period. Under current law, the contribution rates are expected to stay at these levels until the ERS is fully funded. These increases have improved the outlook of ERS. As long as the contributions are made, the ERS's funded status should improve and the ERS should be able to absorb moderate adverse experience without a need to further increase the contribution rates.

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. The funded status alone is not appropriate for assessing the need for future contributions nor assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. However, the trend (historical and projected) of the funded ratio is a strong metric to use for assessing the dependability of the current funding policy and its ability to accumulate assets to pay benefits when due. The funded ratio is currently 61.2% which is a large increase over the 58.3% funded ratio in the previous valuation. The funded ratio improved due to sizeable actuarial gains on both the liabilities and assets of the System.



The 2011 Legislature made changes to the benefits and member contribution rates for employees hired after June 30, 2012. Because these changes result in significantly higher contributions towards the unfunded liability in the future than in the current year, we believe it is more appropriate to determine the funding period using an open group projection rather than a static mathematical formula, which would instead assume that all amortization payments in the future will be the same percentage of pay as in the current year.

The actuarial accrued liability (AAL), the unfunded actuarial accrued liability (UAAL), and the determination of the resulting funding period illustrate the progress toward the realization of financing objectives. The ERS had a liability experience gain which was caused by individual salary increases being less than expected by the assumptions. ERS also experienced an aggregate decrease in its liabilities due to the change in actuarial assumptions. On the asset side, ERS experienced an actuarial gain even though the returns on a market value basis were less than assumed. This result was due to the continued recognition of a portion of the prior year's investment gain. In addition to these changes, the ERS currently experiences negative amortization (interest on the UAAL is greater than the contributions towards the elimination of the UAAL). However, each of the changes described above were all greater than the negative amortization, and actually resulted in a large decrease in the UAAL. As a result, the UAAL decreased (in dollars) based on this actuarial valuation as of June 30, 2022 and ERS's underfunded status as measured by the UAAL is now \$13.505 billion. This was the second year in a row the UAAL declined and as a reminder last year was the first year the UAAL had decreased since 2007.

Because of the very favorable investment performance in FY2021, the current year's shortfall of investment income was completely offset, and additional deferred gains were recognized to create a gain on the actuarial value of assets. Furthermore, ERS is still deferring \$537 million in investment gains, compared with \$2,026 million in deferred investment gains last year. If there are no significant investment losses or other actuarial losses, the funded status of the ERS would be expected to increase both in the near future and over the long term. Thus, given the plan's current and future contribution rates and the new tier of benefits, if all actuarial assumptions are met (including the assumption of the plan earning 7.00% on the actuarial valuation of assets), it is expected that:

1. The employer normal cost as a percentage of pay will decrease to the level of the newest tier as the old tier population declines and is replaced by new tier members,
2. The employer contribution will remain level throughout the amortization period,
3. Thus, the net amount available to amortize the UAAL will increase over time,
4. The unfunded actuarial accrued liability will increase in nominal dollars until the net amount for amortization is large enough to cover the interest charges, or approximately 2026, and then begin to decrease,
5. The unfunded actuarial accrued liability will be fully amortized after 24 years, and
6. In the absence of benefit improvements and in consistent financial markets, the funded ratio should increase steadily until it reaches 100%.



However, it is important to again note that these statements are based on the actual experience meeting the current assumptions. Also, these statements depend upon the employers meeting the contribution requirements established by the 2017 Legislature. Future changes to the actuarial assumptions or future changes to reduce the contribution requirements could significantly change the outlook of the ERS and the expectation on when the ERS will reach a 100% funded level.

This valuation assumed the continuing ability of the plan sponsors to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

#### **BENEFIT PROVISIONS AND LEGISLATIVE CHANGES**

This is the tenth valuation with members covered under the new benefit tier.

There have been no changes in the benefit provisions since the prior valuation. See Table 16 of this report for more details on the benefit provisions for members of the ERS.

#### **ASSUMPTIONS AND METHODS**

The actuarial assumptions used were adopted by the Board in August of 2022 based on the recommendations provided by an Experience Study performed by GRS. The actuarial assumptions and methods have been updated since the prior valuation.

Further detail on the assumptions and methods may be found in Table 18 of this report and in our Experience Study Report dated June 14, 2022.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. Based on the scope of this engagement, we have not performed analysis on the potential range of future measurements based on other factors. The actuarial calculations are intended to provide information for rational decision making.

In our opinion, the assumptions are internally consistent and are reasonably based on the actual experience of ERS.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

Member data for retired, active, and inactive participants was supplied as of March 31, 2022, by ERS's staff. We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data. Asset information was supplied by ERS's staff.

**RESPONSIBILITY FOR TABLES AND SCHEDULES**

The actuary is responsible for the information with respect to years after 1999 in the Required Supplementary Information, and the Notes to Required Supplementary Information in the Financial Section of the ERS's Annual Comprehensive Financial Report (ACFR). Information with respect to years prior to 2000 was supplied by ERS.

Tables and schedules in the Actuarial Section of the ACFR were generally prepared directly by the Actuary. However, certain of these tables were prepared by ERS utilizing information from this report. When the tables were prepared by ERS from our report, they are so noted.

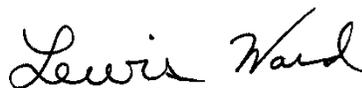
The undersigned are independent actuaries and consultants. Mr. Newton is an Enrolled Actuary, a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,

**Gabriel, Roeder, Smith & Company**



Joseph P. Newton, FSA, EA  
Pension Market Leader & Actuary



Lewis Ward  
Consultant

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## SECTION A – EXECUTIVE SUMMARY

The following table summarizes the key results of the June 30, 2022 actuarial valuation of the Employees' Retirement System of the State of Hawaii (ERS).

Item	2022	2021
<b>Membership</b> <ul style="list-style-type: none"> <li>• Number of               <ul style="list-style-type: none"> <li>- Active members</li> <li>- Retirees and beneficiaries</li> <li>- Inactive, vested</li> <li>- Total</li> </ul> </li> <li>• Covered payroll for active members</li> <li>• Actual benefit payments and refunds</li> </ul>	64,234 53,990 9,031 <hr style="width: 100%;"/> 127,255 \$4,537 million \$1,763 million	65,561 52,618 9,011 <hr style="width: 100%;"/> 127,190 \$4,622 million \$1,675 million
<b>Assets</b> <ul style="list-style-type: none"> <li>• Actuarial (smoothed) value</li> <li>• Market value</li> <li>• Return on actuarial value</li> <li>• Return on market value</li> <li>• Employer contributions during fiscal year</li> <li>• External cash flow %</li> </ul>	\$21,318 million \$21,855 million 8.4% 0.8% \$1,242 million (1.1%)	\$19,910 million \$21,936 million 10.8% 26.9% \$1,282 million (0.5%)
<b>Actuarial Information</b> <ul style="list-style-type: none"> <li>• Total normal cost % (employee + employer)</li> <li>• Unfunded actuarial accrued liability (UAAL)</li> <li>• Funded ratio (based on smoothed assets)</li> <li>• Funded ratio (based on market assets)</li> <li>• Funding period (years)*</li> <li>• Employer contribution rate               <ul style="list-style-type: none"> <li>% of projected payroll</li> <li>Police and Firefighters</li> <li>All Other Employees</li> </ul> </li> </ul>	14.60%  \$13,505 million 61.2% 62.8% 24   41.00% 24.00%	14.06%  \$14,229 million 58.3% 64.3% 24   41.00% 24.00%

\* Funding Period based on actuarial value of assets, scheduled increases in employer contribution rates, and an open group projection reflecting changes in benefits and future member contribution rates.



## SECTION B – INTRODUCTION

The results of the June 30, 2022 actuarial valuation of ERS are presented in this report.

The primary purpose of the valuation report is to determine the adequacy of the current employer contribution rates through measuring the resulting funding period, to describe the current financial condition of ERS, and to analyze changes in ERS's condition.

In preparing this valuation, Gabriel, Roeder, Smith & Company (GRS) has relied on employee data and asset information provided by the staff of ERS. While not verifying the data at their source, GRS has performed such tests for consistency and reasonableness as has been deemed necessary to be satisfied with the appropriateness of using the data supplied.

Section C discusses the funded status of ERS. Section D analyzes the change in the UAAL. Section G discusses the disclosure requirements of GASB No. 67.

Sections E, F, H, and I discuss background information used in the preparation of this report--benefit provisions, actuarial assumptions and methods, financial information, and membership data. Section J contains a discussion about risk and plan maturity measures and a table showing current and historical risk metrics. Section K contains a final summary and some closing comments about this year's valuation and Section L contains the actuarial certification.

All the tables referenced by the other sections appear in Section M.

## SECTION C – FUNDED STATUS

Table 1 shows the development of the Plan's liabilities and funded status for the current year and compares it with those of the prior year.

The calculation of the funded status involves the following steps and includes the following comments:

- The actuarial present value of future benefits is determined for the present members, including retired members, beneficiaries, inactive members, and active members. This amounts to \$40.8 billion. Table 2 shows the development of this total for the current year and the prior year.
- The individual entry age normal funding method is used to allocate the actuarial present value of future benefits between that portion due for the current year (the normal cost), prior years (the actuarial accrued liability) and future years (the present value of future normal cost). Under the individual entry age normal cost method, the current and future normal costs are determined as a level percentage of payroll. Table 3 shows an analysis of the normal cost for the current year and the prior year. The amount needed to fund the current and future normal costs is 27.31% of pay for Police and Fire employees and 12.96% for All Other Employees. It includes all of the employees' contribution (if any) and the employers' normal cost rate.
- Normally, the impact of the new tier of benefits can be seen in comparing the normal cost for the employee groups from the prior year to the current year. The change in the Total Normal Cost rate typically shows the impact of the change in benefits between the old tier and the new tier. The change in the employer normal cost rate shows both the impact on the change in benefits and the larger contribution rates paid by employees in the new tier. However, due to the new actuarial assumptions the Total Normal Cost Rate increased for each group year over year. Going forward, we expect a year-to-year decrease in the normal cost and for that to continue for at least the next decade.
- A part of the normal cost is paid by the employee contributions of 12.75% of pay for Police and Firefighters, leaving 14.56% of pay to be funded by the employers. Thus, the current year's employer normal cost for Police and Firefighters is deemed to be 14.56% of the valuation payroll. As for the All Other Employees group, the average weighted effective employee contribution rate is 5.79% of pay, leaving 7.17% of pay to be funded by the employers. This is shown in Line 3 of Table 1.
- The UAAL is \$13.505 billion for 2022, a decrease from \$14.229 billion in 2021. As indicated in Table 1, the UAAL equals the difference between the total actuarial accrued liability (Item 7) and current actuarial assets (Item 8).
- In determining the number of years that will be required to amortize the UAAL, an assumption is made concerning future growth of the ERS covered payroll. Payroll can grow from intrinsic growth in the pay of individual members and it can also grow due to active membership growth. In determining the funding period of the ERS, we have assumed that the number of active members will remain constant in our open group projection.

## SECTION C – FUNDED STATUS (CONTINUED)

- As shown in Item 10 of Table 1 and on Table 9c, the period to fund the UAAL is 23 years for the Police and Fire and 24 years for the All Other Employees group. When combining both groups, the aggregate funding period for ERS is 24 years (i.e. the UAAL is expected to be paid off in fiscal year 2046). Since the aggregate funding period based on the contribution rates is less than 30 years, the employer contribution rates are adequate to meet the requirements of Hawaii Revised Statutes §88-122(e)(1). Please note that this statement assumes the current contribution rates will remain in effect throughout the entire funding period.

As of the valuation date, ERS has a funded ratio of 61.2%, based on the actuarial value of assets.

Due to the significant changes in the future contribution rates and benefits for employees hired after June 30, 2012, the ERS funding policy uses an open group projection for determining how many years it will take to eliminate the unfunded liabilities of the ERS. The ERS is expected to be fully funded in 2046 which is 24 years from now. Therefore, the funding period is equal to 24 years. The open group projection assumes that the number of active members will remain constant and that there will be no actuarial gains or losses on liabilities or investments.

## SECTION D – ANALYSIS OF CHANGES

Section C has noted that the unfunded actuarial accrued liability (UAAL) is \$13.505 billion as of June 30, 2022 compared to the \$14.229 billion UAAL for 2021.

Table 7 develops the estimated yield for the year based on two measures of asset values. Table 9b takes the information contained in Table 6 and develops the expected value of actuarial assets for this valuation, based on the prior year's investment return assumption of 7.00%.

As shown in Item 6 of Table 9b, the expected value of actuarial assets as of June 30, 2022 is \$21.049 billion. As developed in Table 6, the actual value of actuarial assets as of the valuation date is \$21.318 billion (as repeated in Item 7 of Table 9b). Thus, the gain for the year is the difference between the actual value and the expected value, or \$268.5 million (as shown in Item 8 of Table 9b). This asset gain for the year is a direct reflection of the estimated yield for the year based on the value of actuarial assets, namely 8.36% (as shown in Item B4 of Table 7) being greater than the assumed rate of return.

The markets returned less than assumed in FY 2022 with a return of 0.75% on the market value of assets, which is significantly below our benchmark of 7.0%. Therefore, the return for the year was less than our expectation. The rate of return for the actuarial value was 8.36%, which is greater than the market return, due to the smoothing methodology used in the determination of the actuarial value of assets. The actuarial value of assets exceeds the market value of assets by \$537 million, so there are \$537 million in deferred investment gains still to be recognized in the actuarial value of assets.

Table 9a shows the total unanticipated change in the unfunded actuarial accrued liability was \$785 million (item 7), this means the UAAL decreased \$785 million more than expected from all sources for the 2022 fiscal year. As noted above, the actuarial investment gain was equal to \$268 million. There was also a decrease in the liabilities of \$155 million due to the change in assumptions. This means that there was a liability experience gain during the year equal to \$361 million. The liability experience gain is primarily due to lower than expected salary increases for both employee groups. For Tier 1 members, the pensionable earnings include overtime, and it is possible a source of the lower salaries was a decrease in overtime during the fiscal year.

Table 9c shows the current year's valuation results plus a 30-year open group projection of the ERS's assets and liabilities. As discussed previously, this projection assumes no actuarial gains or losses in the actuarial liabilities or the actuarial value of assets. In addition, the projection assumes the current employer contribution rates will continue and reflects the changes to the benefits and member contribution rates of employees hired after June 30, 2012. As may be seen by examining this table, the unfunded liability of the ERS (Column 7) is expected to grow as a dollar amount until 2026 before beginning to decline and finally being eliminated in 2046.

The June 30, 2046 valuation is 24 years from this valuation. Therefore, for the purpose of satisfying Hawaii Revised Statutes §88-122(e)(1) the funding period is considered to be 24 years.

## SECTION E – ERS ASSETS

Table 4 presents a summary of the market value of assets held by the ERS. About 66% of the total invested assets available for benefits are held in equities (including alternative investments) and real assets compared to about 59% last year. Table 5 shows a reconciliation of the assets from the beginning of the prior year to the valuation date.

Table 6 shows the development of the Actuarial Value of Assets (AVA). An actuarial value is used in order to dampen some of the year-to-year fluctuations which would occur if the market value were used instead. The expected actuarial value of assets is calculated and compared to the actual market value of assets. This difference is then compared with the remaining deferrals from the prior years to determine this year's excess/shortfall. The current year's excess/shortfall is offset directly against any prior years' deferrals of the opposite sign (oldest bases first). Any remaining bases are then recognized over a four-year period from the date the base was established. Any remaining deferrals, after the current year's recognition, are then subtracted from the market value of assets to get the final actuarial value of assets. This method has the advantage of more quickly converging towards the market value in years when the returns go in the opposite direction of the prior years.

Table 7 shows an estimate of the ERS's dollar-weighted rate of return for the year. This is shown on (i) the market value of assets (reflecting all realized and unrealized gains and losses), and (ii) the actuarial value of assets. While the dollar-weighted market return this year was 0.75%, the return on the actuarial value was 8.36%. The difference between these is due to the smoothing effect of the AVA valuation method.

Table 9b determines the asset gain or loss for the year, based on the difference between the actual fund return and the actuarial value of assets and the prior year's assumed rate of 7.00%.

Finally, Table 13 shows a history of cash flows for the trust.

## SECTION F – BENEFIT AND CONTRIBUTION PROVISIONS

Table 16 summarizes the benefit provisions of ERS used in this valuation. Table 17 is a historical record of prior legislative changes starting with changes effective in 1999. There were significant changes made by the 2011 Legislature to the benefit provisions of the ERS for employees hired after June 30, 2012. Because the Board has chosen to use the Individual Entry Age Normal Cost method, the normal cost and the growth of the accrued liabilities will be slowly impacted by the changes in the benefit provisions, as members under the new tier are hired to replace members who are covered under the older tier of benefits.

There have been no changes to the benefit provisions since the last valuation that had an actuarial impact on the valuation. The 2017 Legislature enacted ACT 017 which increased the employer contribution rates over a four-year period.

The employer contribution rates for Police and Fire employees are 41% of pay in FY 2021 and beyond while the employer contribution rates for All Other Employees are 24% of pay in FY 2021 and beyond.

This valuation reflects benefits promised to members by the ERS's statutes. There are no ancillary benefits - retirement type benefits not required by the ERS's statutes but which might be deemed an ERS liability if continued beyond the availability of funding by the current funding source.

Act 179/2004 was adopted during FY2003/2004 and established the new Hybrid class that became effective on July 1, 2006. Current participants had the choice to elect to move to the new class or stay in the current plan. There were 26,228 plan members who elected to transfer. The Hybrid class membership has since grown to approximately 50,000 members.

## SECTION G – GASB DISCLOSURE

The Governmental Accounting Standards Board (GASB) has issued Statement No. 67 which provides the manner in which the actuarial condition of a public sector retirement plan is to be disclosed in the system's financial statements. This new standard replaces GASB No. 25, and went into effect for the ERS for fiscal years ending on or after June 30, 2014.

Similar to last year, we will provide a separate accounting report with the required disclosures under this new standard.

## SECTION H – ACTUARIAL ASSUMPTIONS AND METHODS

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an investment return assumption. The ERS's Board adopts the assumptions used, taking into account the actuary's recommendations.

In addition to the actuarial assumptions, the actuary also makes use of an actuarial funding method to allocate costs to particular years. In common with most public sector plans, ERS uses the entry age normal method (individual normal cost). This method produces a relatively level pattern of funding for individual employees over time. We believe this method is appropriate for ERS.

The ERS's Board adopted new actuarial assumptions on August 8, 2022 to be used effective with the June 30, 2022 actuarial valuation. For a complete description of the recommended assumption changes please see our experience study report dated June 14, 2022.

Please see Table 18 for a complete description of the actuarial assumptions and methods.

## SECTION I – MEMBERSHIP DATA

Membership data was provided in electronic files, via a secured file transfer protocol, by the staff. Data for active members include sex, birthdate, service, pay rate as of March 2022, employer entity and accumulated employee contributions. Data for inactive, nonretired members was similar, but also includes the members' unreduced benefit. For retired members, data includes status (service retiree, disabled retiree or beneficiary), sex, birthdate, pension amount, pension COLA amount, form of payment, beneficiary sex and birthdate if applicable, and date of retirement.

While not verifying the correctness of the data at the source, we performed various tests to ensure the internal consistency of the data and its overall reasonableness. Membership statistics are summarized in Table 12a. Table 12b summarizes certain active member data, and the age/service distribution of active members is shown in Table 19. Tables 30-43 show various distributions of retirees.

Since last year, the number of active members decreased by 1,327 members from 65,561 to 64,234. These 64,234 active members are distributed as follows:

Category	Number	% of Total
(1)	(2)	(3)
Police & Fire	4,870	7.6%
Contributory	472	0.7%
Noncontributory	9,479	14.8%
Hybrid	<u>49,413</u>	<u>76.9%</u>
Total	64,234	100.00%

Covered payroll (which is the annualized pay for all active members on the census date) decreased by 1.8% since last year. ERS also provided the actual aggregate payroll for fiscal year 2022 on which contributions were received (this includes payroll for members who terminated and retired during the year). The lesser of the covered payroll and the aggregate payroll is adjusted by the payroll growth rate to produce the *projected FY 2022 payroll for contribution purposes*, as shown in Item 1 of Table 1.

Average age of the active members remained unchanged at 48.0 and the average service also remained unchanged at 13.2 years.

## SECTION J – ASSESSMENT AND DISCLOSURE OF RISK ASSOCIATED WITH MEASURING PENSION OBLIGATIONS AND DETERMINING PENSION PLAN CONTRIBUTIONS

The determination of the accrued liability and an actuarially determined contribution (or funding period) requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and an actuarially determined contribution (or funding period) that result from the differences between actual experience and the actuarial assumptions.

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; changes in economic or demographic assumptions due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening) increases (or decreases) in cost can be anticipated.

## **SECTION J – ASSESSMENT AND DISCLOSURE OF RISK ASSOCIATED WITH MEASURING PENSION OBLIGATIONS AND DETERMINING PENSION PLAN CONTRIBUTIONS (CONTINUED)**

### **ERS SPECIFIC RELATIONSHIP TO CERTAIN RISKS**

While ERS has various levels of exposure to all of the risks listed above, in our opinion the three that warrant the most observation for the ERS Board specifically are assumption change risk and affordability risk.

Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are adjusted to be different than the current assumptions. For example, declines in interest rates or increases in earnings multiples over time may result in a change in the assumed rates of return used in the valuation. A healthier workforce may result in changes in employee behavior such that retirement rates are adjusted to reflect employees working longer. And the difference in changing an assumption versus the other experience related risks listed above is instead of the loss slowly building over time, there is the immediate recognition of the change. Over the past decade, the changing of assumptions has increased the liabilities of ERS more than any other source. While those changes were warranted and put ERS on a stronger path going forward, it did cause a set back in many of the actuarial measurements and at least gives the appearance of a weaker System. We do not currently anticipate any significant changes to assumptions in the future and will continue to communicate with the Board if any issues beginning to show.

Affordability Risk is the simple fact that the contributions into ERS are quite large and in order to achieve the benefit security desired by the Board and the beneficiaries of ERS, they must remain high for quite a number of years. State Law requires the actuarial contribution occur and there has been no requests or attempts to lower the amounts, but it will always be a risk a future decision maker does attempt to do so.

Risk in continued contraction in the headcount of active members. As seen in this valuation, the contributions into ERS are directly tied to the covered payroll of the active membership and the projection of that payroll is used in determining the funding period. If the headcount were to continue to decline, it would be difficult for the amount of future revenue to meet the current expectations and thus it would likely take more than 24 years to fully amortize the UAAL.

### **PLAN MATURITY MEASURES**

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Several generally accepted plan maturity measures are described below and are followed by a table showing a 10-year history of the measurements for ERS.

### **RATIO OF MARKET VALUE OF ASSETS TO PAYROLL**

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher/lower or increasing/decreasing level of this



## **SECTION J – ASSESSMENT AND DISCLOSURE OF RISK ASSOCIATED WITH MEASURING PENSION OBLIGATIONS AND DETERMINING PENSION PLAN CONTRIBUTIONS (CONTINUED)**

maturity measure generally indicates a higher/lower or increasing/decreasing volatility in plan sponsor contributions as a percentage of payroll.

### **RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL**

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll (5 to 2 ratio), a change in liability 2% other than assumed would equal 5% of payroll. A higher/lower or increasing/decreasing level of this maturity measure generally indicates a higher/lower or increasing/decreasing volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

### **RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES**

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

### **RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS**

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

### **DURATION OF ACTUARIAL ACCRUED LIABILITY**

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

### **ADDITIONAL RISK ASSESSMENT**

Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. While a robust measurement of additional risk assessment is outside the scope of the annual actuarial valuation, some scenario tests and sensitivity tests are included in the valuation summary PowerPoint presentation presented to the Board at the Board's January Board Meeting.

In addition, an annual stress test as prescribed by state law is conducted each year. Please see the stress test report dated December 19, 2022, which was conducted in conjunction with this valuation.

## SECTION J – ASSESSMENT AND DISCLOSURE OF RISK ASSOCIATED WITH MEASURING PENSION OBLIGATIONS AND DETERMINING PENSION PLAN CONTRIBUTIONS (CONTINUED)

	<u>2022</u>	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>
Ratio of the market value of assets to payroll	4.74	4.59	3.75	3.81	3.79	3.68	3.30	3.48	3.56	3.16
Ratio of actuarial accrued liability to payroll	7.55	7.14	7.06	6.95	6.82	6.72	6.44	5.57	5.57	5.44
Ratio of actives to retirees and beneficiaries	1.19	1.25	1.30	1.33	1.36	1.40	1.48	1.52	1.56	1.58
Ratio of net cash flow to market value of assets	-1.1%	-0.5%	-1.1%	-1.8%	-2.0%	-2.0%	-1.9%	-1.8%	-2.0%	-2.5%
Duration of the actuarial accrued liability*	14.88	14.95	15.03	15.11	NA	NA	NA	NA	NA	NA

\*Duration measure not available prior to 2019

## SECTION K – SUMMARY AND CLOSING COMMENTS

To summarize the results of the actuarial valuation of the Employees' Retirement System as of June 30, 2022, it is our opinion that if all assumptions are met going forward, the present assets plus future required contributions will be sufficient to provide the benefits specified in the law.

This year's valuation shows that the ERS is expected to be fully funded in 2046 (24 years from this year's valuation date), which is one year later than the projected year in last year's valuation. This is due to the decrease in expected future contributions caused by the decline in the covered payroll that occurred in FY2022. However, the 24 is consistent with the original impact statement which set the current contribution pattern which projected a 24-year funding period in 2022.

Based on this year's valuation results, the statutory contribution rates are sufficient to eliminate the UAAL over a period of 30 years or less as specified by Hawaii Revised Statute 88-122(e)(1).

Our modeling continues to show that the new contribution levels should be able to absorb material adverse experience without resulting in a need for further contribution rate increases. Moderate adverse experience may result in the date the ERS obtaining a fully funded status in a year later than 2046, but it is not expected to result in a requirement for further contribution rate increases.

The results of this valuation are good from the financial outlook of the System. While the end date for achieving full funding for the System increased by one year when compared with last year (2046 versus 2045), the ERS saw a significant decline in its UAAL. This follows a decline in the UAAL in the prior year as well. In addition, ERS is still deferring over \$537 million in investment gains. If these deferred investment gains are recognized instead of being offset by investment losses, the end date for achieving full funding could be accelerated by several years.

Finally, while this valuation saw a reduction in the UAAL and the funding period remaining the same as last year, It is important to note that these projections assume the current contribution rates will be maintained throughout the funding period. Any reduction in the contribution rates would increase the length of time until the ERS achieves a fully funded status.



## SECTION L – ACTUARIAL CERTIFICATION STATEMENT

	Police and Firefighters June 30, 2022 (1)	All Other Employees June 30, 2022 (2)	All Employees June 30, 2022 (3)
1. Gross normal cost as a percentage of pay	27.31%	12.96%	14.60%
2. Present value of future benefits			
a. Active employees	\$ 4,075,348,827	\$ 16,030,544,741	\$ 20,105,893,568
b. Inactive members	66,876,228	1,009,112,261	1,075,988,489
c. Pensioners and beneficiaries	4,039,032,899	15,594,745,465	19,633,778,364
d. Total	<u>\$ 8,181,257,954</u>	<u>\$ 32,634,402,467</u>	<u>\$ 40,815,660,421</u>
3. Present value of future employee and employer contributions			
a. Present value of future normal costs	\$ 1,341,850,634	\$ 4,651,031,167	\$ 5,992,881,801
b. Present value of future employee contributions	686,362,784	2,343,631,009	3,029,993,793
c. Present value of future employer normal costs (Item 3a - Item 3b)	\$ 655,487,850	\$ 2,307,400,158	\$ 2,962,888,008
4. Actuarial accrued liability (Item 2d - Item 3a)	\$ 6,839,407,320	\$ 27,983,371,300	\$ 34,822,778,620
5. Actuarial value of assets			
a. Annuity Savings Fund	\$ 1,396,172,825	\$ 2,110,481,800	\$ 3,506,654,625
b. Pension Accumulation Fund	3,216,548,235	14,594,632,793	17,811,181,028
c. Total	<u>\$ 4,612,721,060</u>	<u>\$ 16,705,114,593</u>	<u>\$ 21,317,835,653</u>
6. Unfunded actuarial accrued liability	\$ 2,226,686,260	\$ 11,278,256,707	\$ 13,504,942,967
7. Adequacy of contribution rates			
a. Statutory Contribution Rate for Fiscal Year Fiscal Year 2023	41.00%	24.00%	25.92%
b. Funding Period in years as of June 30, 2022*	23	24	24

\* The Funding Period is calculated using an open group projection which reflects the impact of both the new employer contribution rates schedule and the benefits and member contribution rates for employees hired after June 30, 2012.



## SECTION L – ACTUARIAL CERTIFICATION STATEMENT (CONTINUED)

The actuarial valuation as of June 30, 2022 is based on the provisions of Chapter 88 of the Hawaii Revised Statutes, as amended. The assumptions used in the cost calculations were those adopted by the Board of Trustees in August of 2022 based on the actuary's actuarial experience investigation report for the period ending June 30, 2021. The actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures.

In our opinion, the comparison of the current contribution policies to ERS's liabilities were calculated in accordance with the provisions of Chapter 88 regarding the funding of the Employees' Retirement System on an actuarial reserve basis.

All of our work conforms with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of state law and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned is an independent actuary and consultant. Mr. Newton is an Enrolled Actuary, a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries. Finally, he is experienced in performing valuations for large public retirement systems.



Joseph P. Newton, FSA, EA, MAAA  
Pension Market Leader & Actuary

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# TABLE 1

## Development of Employer Cost

	Police and Firefighters June 30, 2022 (1)	All Other Employees June 30, 2022 (2)	All Employees June 30, 2022 (3)
1. Projected FY 2023 payroll for contribution purposes	\$ 521,695,052	\$ 4,092,295,884	\$ 4,613,990,936
2. Gross normal cost (Table 3)	27.31%	12.96%	14.60%
3. Employer normal cost rate (Table 3)	14.56%	7.17%	8.01%
4. Present value future benefits (Table 2)	\$ 8,181,257,954	\$ 32,634,402,467	\$ 40,815,660,421
5. Present value future employer normal cost	\$ 655,487,850	\$ 2,307,400,158	\$ 2,962,888,008
6. Present value future employee contributions	\$ 686,362,784	\$ 2,343,631,009	\$ 3,029,993,793
7. Actuarial accrued liability (Item 4 - Item 5 - Item 6)	\$ 6,839,407,320	\$ 27,983,371,300	\$ 34,822,778,620
8. Actuarial value of assets	\$ 4,612,721,060	\$ 16,705,114,593	\$ 21,317,835,653
9. Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	\$ 2,226,686,260	\$ 11,278,256,707	\$ 13,504,942,967
10. Funding Period*	23	24	24

	Police and Firefighters June 30, 2021 (1)	All Other Employees June 30, 2021 (2)	All Employees June 30, 2021 (3)
1. Projected FY 2022 payroll for contribution purposes	\$ 546,561,229	\$ 4,237,217,252	\$ 4,783,778,481
2. Gross normal cost (Table 3)	26.20%	12.43%	14.06%
3. Employer normal cost rate (Table 3)	13.53%	6.77%	7.57%
4. Present value future benefits (Table 2)	\$ 8,015,085,569	\$ 31,745,500,517	\$ 39,760,586,086
5. Present value future employer normal cost	\$ 632,420,589	\$ 2,110,765,000	\$ 2,743,185,589
6. Present value future employee contributions	\$ 690,224,720	\$ 2,188,010,305	\$ 2,878,235,025
7. Actuarial accrued liability (Item 4 - Item 5 - Item 6)	\$ 6,692,440,260	\$ 27,446,725,212	\$ 34,139,165,472
8. Actuarial value of assets	\$ 4,235,042,948	\$ 15,674,748,606	\$ 19,909,791,554
9. Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	\$ 2,457,397,312	\$ 11,771,976,606	\$ 14,229,373,918
10. Funding Period*	25	23	24

\* The Funding Period is calculated using an open group projection which reflects the impact of the smaller benefits and larger member contribution rates for employees hired after June 30, 2012. Please refer to Table 9c for the full projection.

**TABLE 2****Actuarial Present Value of Future Benefits**

	Police and Firefighters June 30, 2022 (1)	All Other Employees June 30, 2022 (2)	All Employees June 30, 2022 (3)
<b>1. Active members</b>			
a. Service retirement benefits	\$ 3,936,986,502	\$ 14,869,296,751	\$ 18,806,283,253
b. Termination Benefits	83,650,920	676,018,881	759,669,801
c. Survivor benefits	16,513,834	125,825,955	142,339,789
d. Disability retirement benefits	38,197,571	359,403,154	397,600,725
e. Total	<u>\$ 4,075,348,827</u>	<u>\$ 16,030,544,741</u>	<u>\$ 20,105,893,568</u>
<b>2. Retired members</b>			
a. Service retirement	\$ 3,786,345,877	\$ 14,383,298,870	\$ 18,169,644,747
b. Disability retirement	40,176,603	310,853,955	351,030,558
c. Beneficiaries	212,510,419	900,592,640	1,113,103,059
d. Total	<u>\$ 4,039,032,899</u>	<u>\$ 15,594,745,465</u>	<u>\$ 19,633,778,364</u>
<b>3. Inactive members</b>			
a. Vested terminations	\$ 59,848,063	\$ 862,323,648	\$ 922,171,711
b. Nonvested terminations	7,028,165	146,788,613	153,816,778
c. Total	<u>\$ 66,876,228</u>	<u>\$ 1,009,112,261</u>	<u>\$ 1,075,988,489</u>
<b>4. Total actuarial present value of future benefits</b>	<u>\$ 8,181,257,954</u>	<u>\$ 32,634,402,467</u>	<u>\$ 40,815,660,421</u>

	Police and Firefighters June 30, 2021 (1)	All Other Employees June 30, 2021 (2)	All Employees June 30, 2021 (3)
<b>1. Active members</b>			
a. Service retirement benefits	\$ 4,020,768,692	\$ 14,442,539,151	\$ 18,463,307,843
b. Termination Benefits	114,583,361	894,962,859	1,009,546,220
c. Survivor benefits	19,443,388	132,779,833	152,223,221
d. Disability retirement benefits	34,683,588	333,180,582	367,864,170
e. Total	<u>\$ 4,189,479,029</u>	<u>\$ 15,803,462,425</u>	<u>\$ 19,992,941,454</u>
<b>2. Retired members</b>			
a. Service retirement	\$ 3,524,781,804	\$ 13,813,731,206	\$ 17,338,513,010
b. Disability retirement	38,704,179	295,335,436	334,039,615
c. Beneficiaries	198,983,126	857,387,074	1,056,370,200
d. Total	<u>\$ 3,762,469,109</u>	<u>\$ 14,966,453,716</u>	<u>\$ 18,728,922,825</u>
<b>3. Inactive members</b>			
a. Vested terminations	\$ 56,109,266	\$ 828,795,763	\$ 884,905,029
b. Nonvested terminations	7,028,165	146,788,613	153,816,778
c. Total	<u>\$ 63,137,431</u>	<u>\$ 975,584,376</u>	<u>\$ 1,038,721,807</u>
<b>4. Total actuarial present value of future benefits</b>	<u>\$ 8,015,085,569</u>	<u>\$ 31,745,500,517</u>	<u>\$ 39,760,586,086</u>

### TABLE 3

#### Analysis of Normal Cost

	Police and Firefighters June 30, 2022 <u>(1)</u>	All Other Employees June 30, 2022 <u>(2)</u>	All Employees June 30, 2022 <u>(3)</u>
1. Normal cost as a percent of pay			
a. Service retirement benefits	24.53%	9.92%	11.59%
b. Deferred termination benefits	0.88%	0.63%	0.66%
c. Refunds	0.84%	1.36%	1.30%
d. Disability retirement benefits	0.48%	0.52%	0.52%
e. Survivor benefits	0.18%	0.13%	0.13%
f. Administrative Expenses	0.40%	0.40%	0.40%
g. Total	<u>27.31%</u>	<u>12.96%</u>	<u>14.60%</u>
2. Employee contribution rate	12.75%	5.79%	6.59%
3. Effective employer normal cost rate (Item 1g - Item 2)	14.56%	7.17%	8.01%

	Police and Firefighters June 30, 2021 <u>(1)</u>	All Other Employees June 30, 2021 <u>(2)</u>	All Employees June 30, 2021 <u>(3)</u>
1. Normal cost as a percent of pay			
a. Service retirement benefits	23.19%	9.17%	10.82%
b. Deferred termination benefits	1.17%	0.82%	0.86%
c. Refunds	0.88%	1.49%	1.42%
d. Disability retirement benefits	0.42%	0.47%	0.47%
e. Survivor benefits	0.19%	0.13%	0.14%
f. Administrative Expenses	0.35%	0.35%	0.35%
g. Total	<u>26.20%</u>	<u>12.43%</u>	<u>14.06%</u>
2. Employee contribution rate	12.67%	5.66%	6.49%
3. Effective employer normal cost rate (Item 1g - Item 2)	13.53%	6.77%	7.57%

**TABLE 4**

**Statement of Net Position  
(Assets at Market or Fair Value)**

Item	Valuation as of	
	June 30, 2022	June 30, 2021
1. Cash and cash equivalents	\$ 1,486,515,050	\$ 2,725,920,321
2. Receivables:		
a. Accounts receivable and others	\$ 7,214,997	\$ 5,981,475
b. Investment sale proceeds	39,940,051	65,065,111
c. Accrued income	37,088,564	44,912,755
d. Member and employer contributions	84,468,296	90,874,146
e. Subtotal	\$ 168,711,908	\$ 206,833,487
3. Investments		
a. Equity securities	\$ 6,847,449,940	\$ 7,482,033,452
b. Fixed income securities	6,210,601,284	6,545,141,487
c. Real assets	3,633,157,140	1,871,180,686
d. Alternative investments	3,959,185,004	3,600,762,896
e. Subtotal	\$ 20,650,393,368	\$ 19,499,118,521
4. Other		
a. Invested securities lending collateral	\$ 735,926,602	\$ 1,003,664,522
b. Equipment at cost, net of depreciation	4,984,223	6,005,533
c. Other assets	-	-
d. Subtotal	\$ 740,910,825	\$ 1,009,670,055
5. Total assets	\$ 23,046,531,151	\$ 23,441,542,384
6. Liabilities		
a. Accounts payable	\$ 161,650,571	\$ 153,922,392
b. Investment commitments payable	24,645,946	94,105,759
c. Securities lending collateral	735,926,602	1,003,664,522
d. Notes payable	269,494,000	254,058,000
e. Total liabilities	\$ 1,191,717,119	\$ 1,505,750,673
7. Total market value of assets available for benefits (Item 5 - Item 6e)	\$ 21,854,814,032	\$ 21,935,791,711
% in equities, real assets, or alternative investments	14,439,792,084	12,953,977,034
	66%	59%



## TABLE 5

### Statement of Changes in Net Position

	Year Ending	
	June 30, 2022	June 30, 2021
1. a. Value of assets at beginning of year	\$ 21,935,791,711	\$ 17,385,480,476
b. Adjustment due to post valuation changes in ACFR assets	-	-
c. Adjusted value of assets at beginning of year	\$ 21,935,791,711	\$ 17,385,480,476
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 293,027,560	\$ 300,626,446
ii. Employer contributions	1,242,139,095	1,281,558,696
iii. Total	\$ 1,535,166,655	\$ 1,582,185,142
b. Income		
i. Interest, dividends, and other income	\$ 804,719,099	\$ 635,042,285
ii. Investment expenses	(212,497,577)	(119,947,169)
iii. Net	\$ 592,221,522	\$ 515,095,116
c. Net realized and unrealized gains/(loss)	\$ (427,662,487)	\$ 4,147,130,645
d. Net income/(loss)	\$ 164,559,035	\$ 4,662,225,761
e. Total revenue	\$ 1,699,725,690	\$ 6,244,410,903
3. Expenditures for the year		
a. Refunds	\$ 24,454,256	\$ 23,618,435
b. Benefit payments	1,738,751,492	1,651,431,372
c. Administrative and miscellaneous expenses	17,497,621	19,049,861
d. Total expenditures	\$ 1,780,703,369	\$ 1,694,099,668
4. Increase/(decrease) in net assets (Item 2e - Item 3d)	\$ (80,977,679)	\$ 4,550,311,235
5. Value of assets at end of year (Item 1c + Item 4)	\$ 21,854,814,032	\$ 21,935,791,711

## TABLE 6

### Development of Actuarial Value of Assets

	Year Ending June 30, 2022
1. Actuarial value of assets, beginning of year	\$ 19,909,791,554
2. Net new investments	
a. Contributions	\$ 1,535,166,655
b. Benefits paid and Refunds	(1,763,205,748)
c. Administrative expenses	(17,497,621)
d. Subtotal	(245,536,714)
3. Market value of assets at end of year	\$ 21,854,814,032
4. Expected return on actuarial value of assets	\$ 1,385,091,624
5. Expected actuarial value of assets, end of year	\$ 21,049,346,464
6. Excess/(shortfall) return (Item 3-Item 5)	\$ 805,467,568
7. Development of amounts to be recognized as of June 30, 2022:	
	Remaining Deferrals of Excess (Shortfall)
	of Investment
	Offsetting of
	Net Deferrals
	Years
	Recognized for
	Remaining after
	this valuation
	this valuation
	of Investment
	Offsetting of
	Net Deferrals
	Years
	Recognized for
	Remaining after
	this valuation
	this valuation
	of Investment
	Offsetting of
	Net Deferrals
	Years
	Recognized for
	Remaining after
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## TABLE 7

### Estimation of Yields

	June 30, 2022	June 30, 2021
	(1)	(2)
<b>A. Market value yield</b>		
1. Beginning of year market assets	\$ 21,935,791,711	\$ 17,385,480,476
2. Investment income		
a. Change in assets (Item 3 - Item 1)	\$ (80,977,679)	\$ 4,550,311,235
b. Cash Flow	(245,536,714)	(111,914,526)
c. Total investment income based on market value (Item 2a less Item 2b)	\$ 164,559,035	\$ 4,662,225,761
3. End of year market assets	\$ 21,854,814,032	\$ 21,935,791,711
4. Estimated dollar weighted market value yield (net of investment and administrative expenses)	0.75%	26.90%
<b>B. Actuarial value yield</b>		
1. Beginning of year actuarial assets	\$ 19,909,791,554	\$ 18,084,382,899
2. Investment income (based on asset valuation method)		
a. Change in assets (Item 3 - Item 1)	\$ 1,408,044,099	\$ 1,825,408,655
b. Cash Flow	(245,536,714)	(111,914,526)
c. Total investment income based on market value (Item 2a less Item 2b)	\$ 1,653,580,813	\$ 1,937,323,181
3. End of year actuarial assets	\$ 21,317,835,653	\$ 19,909,791,554
4. Estimated actuarial value yield (net of investment and administrative expenses)	8.36%	10.75%

## TABLE 8

### Allocation of Cash and Investments

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
	(1)	(2)
1. Cash and short-term equivalents	6.7%	12.3%
2. Fixed income securities	28.1%	29.4%
3. Equity securities	30.9%	33.7%
4. Real assets	16.4%	8.4%
5. Other	<u>17.9%</u>	<u>16.2%</u>
6. Total investments	100.0%	100.0%

**TABLE 9A****Total Experience Gain or Loss**

Item (1)	Police and Firefighters (2)	All Other Employees (3)	All Employees (4)
<b>A. Calculation of total actuarial gain or loss</b>			
1. Unfunded actuarial accrued liability (UAAL), as of June 30, 2021	\$ 2,457,397,312	\$ 11,771,976,606	\$ 14,229,373,918
2. Normal cost for the year (includes admin expense)	\$ 133,956,404	\$ 497,091,562	\$ 631,047,966
3. Less: contributions and assessments for the year	\$ (323,185,122)	\$ (1,211,981,533)	\$ (1,535,166,655)
4. Interest at 7.00%			
a. On UAAL	\$ 172,017,812	\$ 824,038,362	\$ 996,056,174
b. On normal cost	4,688,474	17,398,205	22,086,679
c. On contributions	(11,311,479)	(42,419,354)	(53,730,833)
d. Total	\$ 165,394,807	\$ 799,017,213	\$ 964,412,020
5. Expected UAAL as of June 30, 2022 (Sum of Items 1 - 4)	\$ 2,433,563,401	\$ 11,856,103,848	\$ 14,289,667,249
6. Actual UAAL as of June 30, 2022	\$ 2,226,686,260	\$ 11,278,256,707	\$ 13,504,942,967
7. Total gain/(loss) for the year (Item 5 - Item 6)	\$ 206,877,141	\$ 577,847,141	\$ 784,724,282
<b>B. Source of gains and losses</b>			
8. Asset gain/(loss) for the year (Table 9b)	\$ 58,095,285	\$ 210,393,904	\$ 268,489,189
9. Gain/(loss) due to change in actuarial assumptions	(16,640,000)	171,600,000	154,960,000
10. Other liability gain/(loss)	165,421,856	195,853,237	361,275,093
11. Change in benefit provisions	-	-	-
12. Total gain/(loss) for the year	\$ 206,877,141	\$ 577,847,141	\$ 784,724,282

**TABLE 9B****Investment Experience Gain or Loss**

Item (1)	June 30, 2022 (2)	June 30, 2021 (3)
1. Actuarial assets, beginning of year	\$ 19,909,791,554	\$ 18,084,382,899
2. Total contributions during year	\$ 1,535,166,655	\$ 1,582,185,142
3. Benefits and refunds paid	\$ (1,763,205,748)	\$ (1,675,049,807)
4. Administrative expenses paid	\$ (17,497,621)	\$ (19,049,861)
5. Assumed net investment income at 7.00%		
a. Beginning of year assets	\$ 1,393,685,409	\$ 1,265,906,803
b. Contributions	53,730,833	55,376,480
c. Benefits and refunds paid	(61,712,201)	(58,626,743)
d. Administrative expenses paid	(612,417)	(666,745)
e. Total	\$ 1,385,091,624	\$ 1,261,989,795
6. Expected actuarial assets, end of year (Sum of items 1 through 5)	\$ 21,049,346,464	\$ 19,234,458,168
7. Actual actuarial assets, end of year	\$ 21,317,835,653	\$ 19,909,791,554
8. Asset gain/(loss) for year (Item 7 - Item 6)	\$ 268,489,189	\$ 675,333,386
9. Asset gain/(loss) as a percent of actuarial value of assets, end of year (Item 8 / Item 7)	1.26%	3.39%

## TABLE 9C

### Projection Results Based on June 30, 2022 Actuarial Valuation

Valuation as of June 30,	Employer Contribution Rate for Fiscal Year Following Valuation Date	Compensation (in Millions)	Employer Contributions (in Millions)	Actuarial Accrued Liability (AAL, in Millions)	Actuarial Value of Assets (AVA, in Millions)	Unfunded Actuarial Accrued Liability (UAAL, in Millions)	Funded Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2022	25.92%	\$ 4,614	\$ 1,196	\$ 34,823	\$ 21,318	\$ 13,505	61.2%
2023	25.92%	4,726	1,225	36,043	22,450	13,593	62.3%
2024	25.92%	4,852	1,258	37,257	23,601	13,656	63.3%
2025	25.91%	4,983	1,291	38,469	24,778	13,691	64.4%
2026	25.90%	5,120	1,326	39,675	25,982	13,694	65.5%
2027	25.90%	5,262	1,363	40,879	27,218	13,661	66.6%
2028	25.89%	5,408	1,400	42,077	28,487	13,590	67.7%
2029	25.88%	5,560	1,439	43,271	29,796	13,476	68.9%
2030	25.88%	5,717	1,480	44,462	31,147	13,315	70.1%
2031	25.88%	5,880	1,522	45,648	32,546	13,102	71.3%
2032	25.88%	6,049	1,565	46,829	33,997	12,833	72.6%
2033	25.88%	6,223	1,610	48,006	35,505	12,500	74.0%
2034	25.88%	6,404	1,657	49,177	37,077	12,100	75.4%
2035	25.88%	6,590	1,705	50,347	38,721	11,626	76.9%
2036	25.88%	6,783	1,755	51,513	40,443	11,071	78.5%
2037	25.88%	6,983	1,807	52,679	42,252	10,427	80.2%
2038	25.88%	7,191	1,861	53,848	44,160	9,688	82.0%
2039	25.88%	7,407	1,917	55,021	46,176	8,846	83.9%
2040	25.88%	7,632	1,975	56,205	48,314	7,890	86.0%
2041	25.88%	7,865	2,035	57,402	50,589	6,813	88.1%
2042	25.88%	8,107	2,098	58,618	53,014	5,604	90.4%
2043	25.88%	8,357	2,163	59,857	55,605	4,252	92.9%
2044	25.88%	8,616	2,230	61,124	58,378	2,746	95.5%
2045	25.88%	8,883	2,299	62,423	61,349	1,073	98.3%
2046	25.88%	9,159	2,370	63,758	64,536	(778)	101.2%
2047	25.88%	9,445	2,444	65,135	67,958	(2,823)	104.3%
2048	25.88%	9,740	2,520	66,560	71,636	(5,076)	107.6%
2049	25.88%	10,043	2,599	68,036	75,591	(7,555)	111.1%
2050	25.88%	10,355	2,680	69,567	79,841	(10,274)	114.8%
2051	25.88%	10,675	2,763	71,154	84,409	(13,255)	118.6%

Projection assumes all assumptions exactly met, including a 7.00% annual return on the current actuarial value of assets.



**TABLE 10****Employer Covered Payroll**

	Police and Firefighters		All Other Employees		All Employees	
	March 31, 2022	March 31, 2021	March 31, 2022	March 31, 2021	March 31, 2022	March 31, 2021
	(1)	(2)	(3)	(4)	(5)	(6)
State of Hawaii	\$ 22,648,428	\$ 22,434,833	\$ 3,334,443,057	\$ 3,382,182,344	\$ 3,357,091,485	\$ 3,404,617,177
City & County of Honolulu	310,858,294	329,849,886	365,380,744	378,115,044	676,239,038	707,964,930
Board of Water Supply	-	-	39,692,339	40,608,422	39,692,339	40,608,422
County of Hawaii	81,764,153	80,569,443	110,574,295	112,060,580	192,338,448	192,630,023
County of Maui	60,881,031	66,109,789	120,196,291	118,144,436	181,077,322	184,254,225
County of Kauai	27,901,285	29,114,531	62,816,889	62,818,887	90,718,174	91,933,418
Total All Employers	\$ 504,053,191	\$ 528,078,482	\$ 4,033,103,615	\$ 4,093,929,713	\$ 4,537,156,806	\$ 4,622,008,195

**TABLE 11****Schedule of Funding Progress**

Valuation Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial		Annual Covered Payroll	UAAL as % of Payroll (4)/(6)
			Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
June 30, 2006 *	\$ 9,529.4	\$ 14,661.4	\$ 5,132.0	65.0%	\$ 3,238.3	158.5%
June 30, 2007 **	10,589.8	15,696.5	5,106.8	67.5%	3,507.0	145.6%
June 30, 2008	11,381.0	16,549.1	5,168.1	68.8%	3,782.1	136.6%
June 30, 2009	11,400.1	17,636.4	6,236.3	64.6%	4,030.1	154.7%
June 30, 2010	11,345.6	18,483.7	7,138.1	61.4%	3,895.7	183.2%
June 30, 2011 **	11,942.8	20,096.9	8,154.2	59.4%	3,916.0	208.2%
June 30, 2012	12,242.5	20,683.4	8,440.9	59.2%	3,890.0	217.0%
June 30, 2013	12,748.8	21,243.7	8,494.9	60.0%	3,906.7	217.4%
June 30, 2014	13,641.8	22,220.1	8,578.3	61.4%	3,991.6	214.9%
June 30, 2015**	14,463.7	23,238.4	8,774.7	62.2%	4,171.4	210.4%
June 30, 2016**	14,998.7	27,439.2	12,440.5	54.7%	4,258.9	292.1%
June 30, 2017	15,720.6	28,648.6	12,928.0	54.9%	4,265.0	303.1%
June 30, 2018	16,512.7	29,917.4	13,404.7	55.2%	4,383.7	305.8%
June 30, 2019**	17,322.2	31,396.4	14,074.3	55.2%	4,519.7	311.4%
June 30, 2020	18,084.4	32,691.8	14,607.4	55.3%	4,630.2	315.5%
June 30, 2021	19,909.8	34,139.2	14,229.4	58.3%	4,783.8	297.5%
June 30, 2022**	21,317.8	34,822.8	13,504.9	61.2%	4,614.0	292.7%

Note : Dollar amounts in millions.

\* Assumption changes and new Hybrid class effective June 30, 2006.

\*\* New assumption effective on valuation date.

## TABLE 12A

### Membership Data

	Police and Firefighters		All Other Employees		All Employees	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
	(1)	(2)	(3)	(4)	(5)	(6)
1. Active members						
a. Number	4,870	4,897	59,364	60,664	64,234	65,561
b. Total salary	\$ 504,053,191	\$ 528,078,482	\$ 4,033,103,615	\$ 4,093,929,713	\$ 4,537,156,806	\$ 4,622,008,195
c. Average salary	\$ 103,502	\$ 107,837	\$ 67,939	\$ 67,485	\$ 70,635	\$ 70,499
d. Average age	42.1	42.3	48.5	48.5	48.0	48.0
e. Average service	13.7	13.9	13.1	13.1	13.2	13.2
2. Inactive members						
a. Number	242	239	8,789	8,772	9,031	9,011
b. Total annual deferred benefits	\$ 5,794,515	\$ 5,552,300	\$ 103,824,257	\$ 99,765,972	\$ 109,618,772	\$ 105,318,272
c. Average annual deferred benefit	\$ 23,944	\$ 23,231	\$ 11,813	\$ 11,373	\$ 12,138	\$ 11,688
3. Service retirees						
a. Number	4,103	3,977	43,064	41,998	47,167	45,975
b. Total annual benefits	\$ 278,238,588	\$ 258,146,590	\$ 1,264,013,343	\$ 1,202,295,261	\$ 1,542,251,931	\$ 1,460,441,851
c. Average annual benefit	\$ 67,813	\$ 64,910	\$ 29,352	\$ 28,627	\$ 32,698	\$ 31,766
4. Disabled retirees						
a. Number	128	128	1,618	1,621	1,746	1,749
b. Total annual benefits	\$ 3,528,613	\$ 3,433,775	\$ 25,629,578	\$ 24,677,949	\$ 29,158,191	\$ 28,111,724
c. Average annual benefit	\$ 27,567	\$ 26,826	\$ 15,840	\$ 15,224	\$ 16,700	\$ 16,073
5. Beneficiaries						
a. Number	389	376	4,688	4,518	5,077	4,894
b. Total annual benefits	\$ 17,660,517	\$ 16,649,880	\$ 86,687,801	\$ 81,296,984	\$ 104,348,318	\$ 97,946,864
c. Average annual benefit	\$ 45,400	\$ 44,282	\$ 18,491	\$ 17,994	\$ 20,553	\$ 20,014



**TABLE 12B****Historical Summary of Active Member Data**

Year Ending June 30,	Active Members		Total Salaries		Average Salary		Average Age	Average Service
	Number	Percent Increase	Amount in \$ Millions	Percent Increase	\$ Amount	Percent Increase		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2002	62,208	3.7%	\$ 2,568.7	9.3%	\$ 41,292	5.4%	45.8	13.2
2003	62,292	0.1%	2,718.4	5.8%	43,640	5.7%	46.0	13.1
2004	62,573	0.5%	2,755.5	1.4%	44,037	0.9%	46.0	13.0
2005	63,073	0.8%	2,924.5	6.1%	46,368	5.3%	46.3	13.0
2006	64,069	1.6%	3,113.7	6.5%	48,599	4.8%	46.4	13.0
2007	65,251	1.8%	3,340.5	7.3%	51,194	5.3%	46.5	13.0
2008	66,589	2.1%	3,601.7	7.8%	54,089	5.7%	46.6	12.9
2009	67,912	2.0%	3,838.0	6.6%	56,514	4.5%	46.8	12.9
2010	65,890	-3.0%	3,713.6	-3.2%	56,360	-0.3%	47.1	13.2
2011	65,310	-0.9%	3,731.4	0.5%	57,133	1.4%	47.4	13.4
2012	65,599	0.4%	3,706.1	-0.7%	56,497	-1.1%	47.6	13.5
2013	66,226	1.0%	3,720.8	0.4%	56,184	-0.6%	47.7	13.5
2014	67,206	1.5%	3,871.0	4.0%	57,600	2.5%	47.8	13.5
2015	67,310	0.2%	3,952.6	2.1%	58,723	1.9%	47.8	13.2
2016	67,377	0.1%	4,118.4	4.2%	61,124	4.1%	47.9	13.3
2017	65,911	-2.2%	4,134.2	0.4%	62,723	2.6%	48.0	13.3
2018	66,271	0.5%	4,257.2	3.0%	64,240	2.4%	47.9	13.2
2019	66,383	0.2%	4,393.0	3.2%	66,176	3.0%	47.9	13.1
2020	66,750	0.6%	4,523.4	3.0%	67,766	2.4%	47.9	13.1
2021	65,561	-1.8%	4,622.0	2.2%	70,499	4.0%	48.0	13.2
2022	64,234	-2.0%	4,537.2	-1.8%	70,635	0.2%	48.0	13.2

**TABLE 13****History of Cash Flow**

Year Ending June 30,	Contributions			Expenditures				External Cash Flow for the Year <sup>2</sup>	Market Value of Assets	External Cash Flow as Percent of Market Value
	Employee	Employer	Total	Benefit Payments	Refunds	Administrative Expenses <sup>1</sup>	Total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2009	\$ 184.5	\$ 578.6	\$ 763.1	\$ (839.1)	\$ (3.5)	\$ (12.3)	\$ (854.9)	\$ (91.8)	\$ 8,818.0	(1.0%)
2010	360.0	547.6	907.6	(906.4)	(7.8)	(12.2)	(926.4)	(18.8)	9,821.6	(0.2%)
2011	231.0	534.9	765.9	(960.2)	(7.9)	(13.3)	(981.4)	(215.5)	11,642.3	(1.9%)
2012	178.8	548.4	727.2	(1,015.4)	(7.2)	(11.6)	(1,034.2)	(307.0)	11,285.9	(2.7%)
2013	185.8	581.4	767.2	(1,060.6)	(7.2)	(12.3)	(1,080.1)	(312.9)	12,357.8	(2.5%)
2014	206.1	653.1	859.2	(1,122.4)	(8.5)	(12.6)	(1,143.5)	(284.3)	14,203.0	(2.0%)
2015	223.5	717.8	941.3	(1,170.7)	(10.5)	(14.0)	(1,195.2)	(253.9)	14,505.5	(1.8%)
2016	236.8	756.6	993.4	(1,232.6)	(12.9)	(14.0)	(1,259.5)	(266.1)	14,070.0	(1.9%)
2017	250.7	781.2	1,031.9	(1,306.8)	(16.3)	(15.0)	(1,338.1)	(306.2)	15,698.3	(2.0%)
2018	259.4	847.6	1,107.0	(1,395.9)	(20.8)	(15.8)	(1,432.5)	(325.5)	16,598.4	(2.0%)
2019	273.2	922.6	1,195.8	(1,469.6)	(16.5)	(13.8)	(1,499.9)	(304.1)	17,227.0	(1.8%)
2020	287.4	1,098.6	1,386.0	(1,545.6)	(22.4)	(17.8)	(1,585.8)	(199.8)	17,385.5	(1.1%)
2021	300.6	1,281.6	1,582.2	(1,651.4)	(23.6)	(19.0)	(1,694.0)	(111.8)	21,935.8	(0.5%)
2022	293.0	1,242.1	1,535.1	(1,738.8)	(24.5)	(17.5)	(1,780.8)	(245.7)	21,854.8	(1.1%)

Amounts in \$ millions

<sup>1</sup> Excludes investment expenses<sup>2</sup> Column (9) = Column (4) + Column (8)

## TABLE 14

### Solvency Test

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
	(1)	(2)
1. Actuarial accrued liability (AAL)		
a. Active member contributions	\$ 2,249,447,034	\$ 2,243,208,368
b. Retirees and beneficiaries	19,633,778,364	18,728,922,825
c. Active and inactive members	<u>12,939,553,222</u>	<u>13,167,034,279</u>
d. Total	\$ 34,822,778,620	\$ 34,139,165,472
2. Actuarial value of assets	\$ 21,317,835,653	\$ 19,909,791,554
3. Cumulative portion of AAL covered		
a. Active member contributions	100%	100%
b. Retirees and beneficiaries	97%	94%
c. Active and inactive members	0%	0%

**TABLE 15****Highlights of Last Five Annual Actuarial Valuations  
2018 through 2022**

Item	Valuation Date: June 30				
	2018	2019	2020	2021	2022
Number of active members	66,271	66,383	66,750	65,561	64,234
Number of inactive members	9,249	9,321	9,204	9,011	9,031
Number of pensioners	44,305	45,440	46,486	47,724	48,913
Number of beneficiaries	4,264	4,445	4,667	4,894	5,077
Average monthly contributory member pension amount	\$ 2,994	\$ 3,136	\$ 3,293	\$ 3,458	\$ 3,632
Average monthly noncontributory member pension amount	\$ 1,702	\$ 1,736	\$ 1,773	\$ 1,813	\$ 1,861
Average monthly hybrid member pension amount	\$ 2,238	\$ 2,285	\$ 2,345	\$ 2,416	\$ 2,495
Average monthly beneficiary amount	\$ 1,515	\$ 1,558	\$ 1,610	\$ 1,668	\$ 1,713
Total actuarial value of assets (\$millions)	\$ 16,513	\$ 17,322	\$ 18,084	\$ 19,910	\$ 21,318
Unfunded actuarial accrued liability (\$millions)	\$ 13,404.7	\$ 14,074.3	\$ 14,607.4	\$ 14,229.4	\$ 13,504.9
Funding Period (in years) <sup>(1)</sup>	25	26	26	24	24
Item (Dollar amounts in millions)	Fiscal Year				
	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Employer contributions <sup>(2)</sup>	\$ 847.6	\$ 922.6	\$ 1,098.6	\$ 1,281.6	\$ 1,242.1

<sup>(1)</sup> Beginning with the 2011 valuation, the funding period was determined using an open group projection. Prior valuations determined the remaining amortization based on the assumption that the amortization payment would remain constant as a percentage of pay.

<sup>(2)</sup> Beginning July 1, 2017, the employer contribution rate was 28.0% for Police and Fire, 18.0% for All Other Employees. Beginning July 1, 2018, the employer contribution rate was 31.0% for Police and Fire, 19.0% for All Other Employees. Beginning July 1, 2019, the employer contribution rate was 36.0% for Police and Fire, 22.0% for All Other Employees. Beginning July 1, 2020, the employer contribution rate was 41.0% for Police and Fire, 24.0% for All Other Employees.

**TABLE 16****Summary of Benefit Provisions  
(For Members Hired Prior to 7/1/2012)**

	<u>Noncontributory</u>	<u>Contributory</u>	<u>Hybrid</u>
<b>Employee Contributions</b>	No employee contributions	7.8% of salary	6.0% of salary
<b>Normal Retirement</b>			
Eligibility	Age 62 and 10 years credited service; or Age 55 and 30 years credited service	Age 55 and 5 years credited service	Age 62 and 5 years credited service; or Age 55 and 30 years credited service
Benefit	1 ¼% of average final compensation times years of credited service (Average Final Compensation or AFC is an average of the highest salaries during any three years of credited service, excluding any salary paid in lieu of vacation or if ERS membership occurred prior to 1/1/71, AFC may be an average of the highest salaries during any five years of credited service including any salary paid in lieu of vacation.)	2% of average final compensation times years of credited service (Average Final Compensation or AFC is an average of the highest salaries during any three years of credited service, excluding any salary paid in lieu of vacation or if ERS membership occurred prior to 1/1/71, AFC may be an average of the highest salaries during any five years of credited service including any salary paid in lieu of vacation.)	2% of average final compensation times years of credited service, split formula for unconverted noncontributory service at 1 ¼% (Average Final Compensation or AFC is an average of the highest salaries during any three years of credited service, excluding any salary paid in lieu of vacation or if ERS membership occurred prior to 1/1/71, AFC may be an average of the highest salaries during any five years of credited service including any salary paid in lieu of vacation.)

**TABLE 16 (CONTINUED)**

	<b>Noncontributory</b>	<b>Contributory</b>	<b>Hybrid</b>
<b>Early Retirement</b>			
Eligibility	Age 55 and 20 years credited service	Any age and 25 years credited service	Age 55 with 20 years credited service
Benefit	Maximum allowance reduced 6% per year under age 62	Maximum allowance reduced 5% per year under age 55 plus 4% per year under age 50	Maximum allowance reduced 5% for each year under age 62
<b>Deferred Vesting</b>			
Eligibility	10 years credited service	5 years credited service and contributions left in the ERS	5 years credited service and contributions left in the ERS
Benefit	Accrued maximum allowance payable at age 65	Accrued maximum allowance payable at age 55	Accrued maximum allowance payable at age 62
<b>Annuity Savings Account</b>			
Interest	Not applicable	4.5% per annum on employee contributions and accrued interest	4.5% per annum on employee contributions and accrued interest
Eligibility	Not applicable	Requests refund and forfeits future retirement benefit	Requests refund and forfeits future retirement benefit
Benefit			
- Terminates with less than 5 years credited service	Not applicable	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest
- Terminates with 5 or more years of credited service	Not applicable	Return of member's contributions and accrued interest	Return of member's Hybrid contributions and accrued interest, both times 150%. Return of non-Hybrid balance transfers and accrued interest.

**TABLE 16 (CONTINUED)**

	<b>Noncontributory</b>	<b>Contributory</b>	<b>Hybrid</b>
<b>Ordinary Disability</b>			
Eligibility	10 years credited service	10 years credited service	10 years credited service
Benefit	1 ¼% of AFC times years of credited service, unreduced for age (Minimum is 12.5% of AFC)	1 ¾% of AFC times years of credited service, unreduced for age  (Minimum is 30% of AFC)	2% of AFC times years of credited service, unreduced for age, split formula for unconverted noncontributory service at 1 ¼% (Minimum is 25% of AFC)
<b>Service-Connected Disability</b>			
Eligibility	Any age or credited service	Any age or credited service	Any age or credited service
Benefit	Accrued maximum allowance, but not less than 15% AFC.  For accidents that occur on or after July 1, 2004, lifetime pension of 35% of AFC.	Totally disabled: lifetime pension of 66 2/3% AFC plus annuity.  Occupationally disabled: same benefit (66 2/3% pension plus annuity) paid for 3 years and then pension is reduced to 33 1/3% AFC if not totally disabled.  For accidents on or after July 7, 1998, lifetime pension of 50% of AFC plus refund of member's contributions and accrued interest.	Lifetime pension of 35% of AFC plus refund of member's contributions and accrued interest.

**TABLE 16 (CONTINUED)**

	<b>Noncontributory</b>	<b>Contributory</b>	<b>Hybrid</b>
<b>Ordinary Death</b>			
Eligibility	Active employee at time of death with at least 10 years of credited service	Active employee at time of death with at least 1 year of service	Active employee at time of death with at least 5 years of service
Benefit	<p>Surviving spouse/reciprocal beneficiary and dependent children receive a benefit equal to a percentage of member's accrued maximum allowance unreduced for age; or</p> <p>Option B (100% Joint and Survivor) benefit for surviving spouse if member was eligible for retirement at time of death and a percentage of member's accrued maximum allowance unreduced for age for the dependent children</p>	<p>Lump sum payment of member's contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; or</p> <p>Option 3 (50% Joint and Survivor) benefit if member was not eligible for retirement at the time of death, credited with 10 years of service, and one beneficiary designated (benefit calculated using the ordinary disability retirement formula); or</p> <p>Option 2 (100% Joint and Survivor) benefit if member was eligible for retirement at the time of death and one beneficiary designated</p>	<p>Return of member's Hybrid contributions and accrued interest (both times 150%) plus return of non-Hybrid balance transfers and accrued interest; or</p> <p>Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or</p> <p>Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated</p>

**TABLE 16 (CONTINUED)**

	<b>Noncontributory</b>	<b>Contributory</b>	<b>Hybrid</b>
<b>Service-Connected Death</b>			
Eligibility	Any age or service	Any age or service	Any age or service
Benefit	<p>Surviving spouse/reciprocal beneficiary receives pension equal to 30% of AFC (until remarriage or re-entry into a new reciprocal beneficiary relationship); additional benefits payable to surviving dependent children (up to age 18)</p> <p>If there is no spouse/reciprocal beneficiary or dependent children, no benefit is payable.</p>	<p>Lump sum payment of member’s contributions and accrued interest, plus pension of 50% AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship);</p> <p>If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit.</p> <p>If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.</p>	<p>Lump sum payment of member’s contributions and accrued interest, plus pension of 50% AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship);</p> <p>If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit.</p> <p>If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.</p>

## TABLE 16 (CONTINUED)

For members hired after June 30, 2011, the interest crediting rate on employee contributions and accrued interest is 2.0% per annum.

The plan provisions summarized above apply to teachers and most State and County employees. Special provisions applicable to other groups of employees are outlined below:

- A. Police officers, firefighters, investigators of the Department of the Prosecuting Attorney and the Attorney General, narcotic enforcement investigators, and public safety investigators contribute 12.2% of their monthly salary to the ERS instead of 7.8%. These members may retire at age 55 with 5 years of credited service or at any age with 25 years of credited service and receive a retirement benefit of 2 ½% of average final compensation (AFC) for each year of such service up to a maximum of 80% AFC, provided the last 5 years of credited service in any of these occupations.
- B. Judges, elected officials, and legislative officers may retire at age 55 with at least 5 years of credited service, or at any age with at least 10 years of credited service and receive a pension of 3 ½% of AFC for each year of such service plus an annuity from their contributions allocable to the period of such service. This benefit cannot exceed 75% of the AFC. Judges hired after June 30, 1999 require 25 years of credited service in order to retire before age 55.
- C. Sewer workers in specified classifications, water safety officers, and emergency medical technicians (EMTs) may retire at any age if they are credited with 25 years of such service with the last 5 or more years in these occupations. (The 25-year feature is phased in through 7/1/2008 for EMTs.)
- D. Sewer workers in specified classifications, water safety officers, and emergency medical technicians (EMTs) that transfer to the Hybrid class contribute 9.75% of their monthly salary to the ERS. These members may retire at age 62 with 5 years of credited service or at any age if they are credited with 25 years of such service with the last 5 or more years in these occupations.

**TABLE 16 (CONTINUED)**  
**Summary of Benefit Provisions**  
**(For Members Hired After 6/30/2012)**

	<b>Contributory (for Police/Fire)</b>	<b>Contributory (for Judges/Elected Officers)</b>	<b>Hybrid</b>
<b>Employee Contributions</b>	14.2% of base pay earnings	9.8% of base pay earnings	8.0% of base pay earnings 11.75% of base pay earnings for Sewer workers, water safety officers, and emergency medical technicians (EMTs)
<b>Normal Retirement Eligibility</b>	Age 60 and 10 years credited service	Age 60 and 10 years credited service	Age 65 and 10 years credited service; or Age 60 and 30 years credited service Sewer workers, water safety officers, and EMTs may retire with 25 years credited service at age 55.
<b>Benefit</b>	2.25% of average final compensation times years of credited service. (Average final compensation or AFC is an average of the highest base pay earnings during any five years of credited service, excluding any salary paid in lieu of vacation.) Maximum is 80% of AFC.	3.0% of average final compensation times years of credited service (Average final compensation or AFC is an average of the highest base pay earnings during any five years of credited service, excluding any salary paid in lieu of vacation.) Maximum is 75% of AFC.	1.75% of average final compensation times years of credited service (Average final compensation or AFC is an average of the highest base pay earnings during any five years of credited service, excluding any salary paid in lieu of vacation.)

**TABLE 16 (CONTINUED)**

	<b>Contributory (for Police/Fire)</b>	<b>Contributory (for Judges/Elected Officers)</b>	<b>Hybrid</b>
<b>Early Retirement</b>			
Eligibility	Age 55 and 25 years credited service	Age 55 and 25 years credited service Any age with 10 years for elected officers	Age 55 with 20 years credited service Sewer workers, water safety officers, and emergency medical technicians (EMTs) may retire with 25 years credited service.
Benefit	Maximum allowance reduced 6% per year under age 60	Maximum allowance reduced 6% per year under age 60	Maximum allowance reduced 5% for each year under age 65
<b>Deferred Vesting</b>			
Eligibility	10 years credited service and contributions left in the ERS	10 years credited service and contributions left in the ERS	10 years credited service and contributions left in the ERS
Benefit	Accrued maximum allowance payable at age 60	Accrued maximum allowance payable at age 60	Accrued maximum allowance payable at age 65
<b>Annuity Savings Account</b>			
Interest	2.0% per annum	2.0% per annum	2.0% per annum
Eligibility	Requests refund and forfeits future retirement benefit	Requests refund and forfeits future retirement benefit	Requests refund and forfeits future retirement benefit
Benefit			
- Terminates with less than 10 years credited service	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest
- Terminates with 10 or more years of credited service	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest, both times 120%

TABLE 16 (CONTINUED)

	<b>Contributory (for Police/Fire)</b>	<b>Contributory (for Judges/Elected Officers)</b>	<b>Hybrid</b>
<b>Ordinary Disability</b>			
Eligibility	10 years credited service	10 years credited service	10 years credited service
Benefit	1 $\frac{3}{4}$ % of AFC times years of credited service, unreduced for age (Minimum is 30% of AFC)	3.0% of AFC times years of credited service, unreduced for age (Minimum is 30% of AFC)	1 $\frac{3}{4}$ % of AFC times years of credited service, unreduced for age (Minimum is 25% of AFC)
<b>Service-Connected Disability</b>			
Eligibility	Any age or credited service	Any age or credited service	Any age or credited service
Benefit	Lifetime pension of 50% of AFC plus refund of member's contributions and accrued interest.	Lifetime pension of 50% of AFC plus refund of member's contributions and accrued interest.	Lifetime pension of 35% of AFC plus refund of member's contributions and accrued interest.

**TABLE 16 (CONTINUED)**

	<b>Contributory (for Police/Fire)</b>	<b>Contributory (for Judges/Elected Officers)</b>	<b>Hybrid</b>
<b>Ordinary Death</b>			
Eligibility	Active employee at time of death with at least 1 years of credited service	Active employee at time of death with at least 1 years of credited service	Active employee at time of death with at least 10 years of service
Benefit	<p>Lump sum payment of member’s contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; or</p> <p>Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or</p> <p>Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated</p>	<p>Lump sum payment of member’s contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; or</p> <p>Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or</p> <p>Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated</p>	<p>Return of member’s Hybrid contributions and interest; or</p> <p>Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or</p> <p>Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated</p>

## TABLE 16 (CONTINUED)

	Contributory (for Police/Fire)	Contributory (for Judges/Elected Officers)	Hybrid
<b>Service-Connected Death</b>			
Eligibility	Any age or service	Any age or service	Any age or service
Benefit	<p>Same for all members.</p> <p>Lump sum payment of member’s contributions and interest, plus pension of 50% AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship);</p> <p>If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit.</p> <p>If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.</p>		

## TABLE 16 (CONTINUED)

### Post Retirement Benefit

Each retiree's original retirement allowance is increased by 1 ½% (if their membership date is after June 30, 2012) or 2 ½% (if their membership date is before July 1, 2012) on each July 1 beginning the calendar year after retirement. This cumulative benefit is not compounded.

### Retirement Options

#### Contributory or Hybrid Member

**Maximum Allowance:** The member receives a lifetime maximum allowance and at death the difference between the value of the member's contributions at the time of retirement and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.

**Option One:** The member receives a reduced lifetime allowance based on age and at death, the difference between the initial insurance reserve and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.

**Option Two (100% Joint and Survivor with Pop-Up):** The member receives a reduced lifetime allowance based on ages of both the member and the sole beneficiary and at death of the member; the same allowance is paid to the designated beneficiary for life. Should the designated beneficiary predecease the retiree, another beneficiary cannot be named, the benefit will revert back to the Maximum Allowance, and all payments will cease at the retiree's death.

**Option Three (50% Joint and Survivor with Pop-Up):** This allowance is similar to Option Two. The member receives a reduced lifetime allowance which is higher than Option Two and is based on ages of both the member and the sole beneficiary; however, at death of the member one-half of the allowance is paid to the designated beneficiary for life. Like Option Two, should the designated beneficiary predecease the retiree, another beneficiary cannot be named, the benefit will revert back to the Maximum Allowance, and all payments will cease at the retiree's death.

**Option Four:** This option allows the member to devise an allowance that will provide a benefit according to the member's specifications. It requires certification by the Actuary and approval of the Board of Trustees. The following Option Four allowances have been approved:

Combination of Options Five and Maximum Allowance: The member receives a reduced lifetime allowance and is allowed to withdraw the pre-1987 nontaxable contribution, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid class members are not allowed the 75% option); at death, the difference between the value of the member's contributions at the time of retirement and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.

Combination of Options Five and One: The member receives a reduced lifetime allowance and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid class members are not allowed the 75% option); at death, the difference between the initial insurance reserve and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.



## TABLE 16 (CONTINUED)

Combination of Options Five and Two: The member receives a reduced lifetime allowance based on ages of both member and the sole beneficiary, and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid class members are not allowed the 75% option); at death of the member, the same allowance is paid to the designated beneficiary for life. As in the case of Option Two, should the designated beneficiary predecease the retiree, another beneficiary cannot be named, the benefit will revert back to the Maximum Allowance (as adjusted for the contribution withdrawal), and all payments will cease at the retiree's death.

Combination of Options Five and Three: The member receives a reduced lifetime allowance based on ages of both member and the sole beneficiary, and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid class members are not allowed the 75% option); at death of the member, one-half of the allowance is paid to the designated beneficiary for life. As in the case of Option Three, should the designated beneficiary predecease the retiree, another beneficiary cannot be named, the benefit will revert back to the Maximum Allowance (as adjusted for the contribution withdrawal), and all payments will cease at the retiree's death.

**Option Five:** The member receives a reduced lifetime allowance and is allowed to withdraw all accumulated contributions; at death, the retiree is entitled to the pension for the entire month that death occurs.

Option Four and Option Five are restricted to those members with at least ten years of credited service excluding unused sick leave credit.

Regardless of the option selected, should death occur during the first year of retirement, the designated beneficiary may elect to receive benefits as if death had occurred immediately prior to retirement in lieu of the death benefits described above.

### **Noncontributory Member**

**Maximum Allowance:** The member receives a lifetime pension and at death, the retiree is entitled to the pension for the entire month that death occurs.

**Option A (50% Joint and Survivor with Pop-Up):** The member receives a reduced lifetime pension and at death of the member, one-half of the pension is paid to the sole designated beneficiary for life. Should the designated beneficiary predecease the retiree, another beneficiary cannot be named, the benefit will revert back to the Maximum Allowance, and all payments will cease at the retiree's death.

**Option B (100% Joint and Survivor with Pop-up):** The member receives a reduced lifetime pension and at death of the member, the same pension is paid to the sole designated beneficiary for life. Like Option A, should the designated beneficiary predecease the retiree, another beneficiary cannot be named, the benefit will revert back to the Maximum Allowance, and all payments will cease at the retiree's death.

**Option C (Ten-Year Guarantee):** The member receives a reduced lifetime pension. Should death occur within ten years of retirement, the same pension will be paid to the designated beneficiary for the balance of the ten-year period. Should the designated beneficiary predecease the retiree, another beneficiary can be named.

Regardless of the option selected, should death occur during the first year of retirement, the designated beneficiary may elect to receive benefits as if death had occurred immediately prior to retirement in lieu of the death benefits described above.



## TABLE 17

### Summary of Plan Changes

#### **Act 65, effective July 1, 1999**

Requires judges who enter or re-enter service after June 30, 1999 to be at least 55 years old and five years of service or have 25 years of service to rehire.

#### **Act 100, effective June 30, 1999**

Uses actuarial investment earnings in excess of a ten percent (10%) actuarial investment yield rate to reduce the employer's contribution requirements by \$147.0 million and \$50.6 million for fiscal years ending June 30, 2000 and 2001, respectively.

#### **Act 284, effective June 30, 2001**

Provide an increase in pension benefits for current retirees with military service who retired prior to July 2, 1989. A retirant who rendered honorable active military service could be granted up to 4 years of military service credits based upon his/her years of credited service under the ERS, not to exceed his/her actual years of military service. The years of military service credits granted are based on the following schedule:

- 0 years for retirants with less than 8 years of credited service
- Up to 2 years of retirants with 8 years or more of credited service
- Up to 3 years of retirants with 20 years or more of credited service
- Up to 4 years of retirants with 25 years or more of credited service

For each year of military service credits granted on the schedule above, the retirant will be provided a \$36.00 increase in his/her monthly pension or retirement allowance.

#### **Act 199, effective June 30, 2003**

Emergency Medical Technicians (EMTs) are allowed to retire with an unreduced benefit after 25 years of service regardless of age, of which the last five or more years prior to retirement must be in that capacity. This feature is phased in one year at a time, July 1, 2003 through June 30, 2008.

#### **Act 177, effective July 1, 2004**

This Act allows police officers with a permanent service-connected disability to retain the 2-1/2% benefit multiplier for each year of service as a police officer.

#### **Act 181, effective July 1, 2004**

This Act establishes fixed employer contribution rates as a percentage of compensation effective July 1, 2005. Employers will contribute 15.75% for their police officers and firefighters and 13.75% for other employees.



## TABLE 17 (CONTINUED)

### **Act 183, effective July 1, 2004**

This Act amends the ERS statutes to comply with the federal tax limits on compensation retroactive to July 1, 1996.

### **Act 56, effective December 1, 2004**

This Act amends the ERS statutes to allow the automatic cost-of-living-adjustment to be reflected when determining actuarial equivalent optional forms of payment.

### **Act 256, effective July 5, 2007**

Legislation was enacted to remove the statutory salary increase assumption from the statutes and to grant the ERS's Board of Trustees the authority to set the salary increase assumption. As a result of this legislation, the Board has adopted effective with this valuation the salary increase assumption recommended by GRS as a result of the Experience Study performed in 2006.

Legislation was also enacted to increase the employer contribution rates to the ERS. Effective July 1, 2008, the employer contribution rate for Police and Fire employees will increase from 15.75% to 19.70% and the rate for All Other employees will increase from 13.75% to 15.00%.

### **Act 163, effective June 23, 2011**

Legislation was enacted that increased the future employer contribution rates to ERS. Employers of Police and Fire employees will contribute 22% of pay in FY 2013, 23% in FY 2014, 24% in FY 2015, and 25% in FY 2016 and beyond. Employers of All Other Employees will contribute 15.5% of pay in FY 2013, 16.0% in FY 2014, 16.5% in FY 2015, and 17.0% in FY 2016 and beyond.



## TABLE 17 (CONTINUED)

Legislation was enacted that made numerous changes to the benefits and member contribution rates for employees hired after June 30, 2012. Key changes are shown below:

Benefit Provision	Police & Fire Employees	All Other Employees
Benefit Multiplier	2.25%	1.75%
Normal Retirement	Age 55 with 25 years of service, or age 60 with 10 years of service	Age 60 with 30 years of service, or age 65 with 10 years of service
Post-Retirement Increase	1.5%	1.5%
Hybrid Match	N/A	120%
Average Final Compensation	Highest 5 annual base salaries	Highest 5 annual base salaries
Eligibility for Deferred Benefit	10 years of service	10 years of service
Member Contribution Rate	14.20%	8.00%

Similar changes were also made to the benefits of Judges, Legislative Officers, etc.

Similar changes were also made to those employees in the All Other Employees group who are eligible to retire at 25 years of service including the addition of a minimum age requirement (55).

Finally, legislation was enacted that set the investment return assumption for the June 30, 2011 valuation at 7.75% (the rate recommended in the Experience Study presented to the Board in December of 2010). In addition, the legislation granted ERS's Board the authority to set this assumption for valuations after 2011.

### **Act 152, effective June 26, 2012**

Legislation was enacted to eliminate most types of non-base pay from the definition of compensation for employees hired after June 30, 2012. For the impacted employees, non-base pay compensation will be excluded in determining both the contributions made by and on behalf of these employees and the benefits they will earn in the System.

### **Act 153, effective June 26, 2012**

Legislation was enacted to require employers to pay additional contributions if a retiring employee, who was first employed prior to July 1, 2012 and who was last employed by the employer, has significant non-base pay increases included in their average final compensation. The additional contribution is equal to the actuarial present value of the additional benefits earned due to the "excessive" non-base pay increases.

## TABLE 17 (CONTINUED)

### Act 017, effective July 1, 2017

Legislation was enacted that increased the future employer contribution rates to ERS. Employers of Police and Fire employees will contribute 28% of pay in FY 2018, 31% in FY 2019, 36% in FY 2020, and 41% in FY 2021 and beyond. Employers of All Other Employees will contribute 18% of pay in FY 2018, 19% in FY 2019, 22% in FY 2020, and 24% in FY 2021 and beyond.

## TABLE 18

### Summary of Actuarial Methods and Assumptions

Basis for assumption setting: The actuarial assumptions were adopted by the Board on August 8, 2022. Rationale for the recommendations are in the most recent experience study dated June 14, 2022.

I. Valuation Date

The valuation date is June 30th of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The normal cost and actuarial accrued liability are determined using the Entry Age Actuarial Cost Method. The actuarial accrued liability is assigned to years prior to the valuation, and the normal cost is assigned to the year following the valuation. The remaining costs are assigned to future years. The normal cost and accrued liability are determined on an individual basis.

The normal cost is the level percentage of payroll contribution required to accumulate the needed funds to pay all expected benefits. This percentage of payroll is then applied to the total compensation for the prior year for all active members, and is then adjusted for the payroll growth assumption.

The actuarial accrued liability is the difference between the total present value of future benefits and the actuarial present value of future normal costs. The unfunded actuarial accrued liability (UAAL) is the excess of the actuarial accrued liability over the actuarial value of assets.

III. Funding of Unfunded Actuarial Accrued Liability

Since the State statutes governing the System establish the employee and employer contribution rates, the actuarial valuation determines the number of years required to amortize (or fund) the UAAL. Because of the legislated increases in future employer contribution rates and the new tier of benefits for employees hired after June 30, 2012, an open group projection of liabilities and assets was used to determine the length of time until the UAAL is eliminated. The open group projection assumed that the number of active members would remain static (i.e. each active employee who leaves employment due to termination, retirement, death or disability, would be replaced by exactly one new employee.

Because of this methodology for determining the funding period, any change in the unfunded actuarial accrued liability due to (i) actuarial gains and losses, (ii) changes in actuarial assumptions, or (iii) amendments, affects the funding period.

Please see Section V of this table for a description of the new entrant profile used in the open group projection.

## TABLE 18 (CONTINUED)

### IV. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a four-year phase-in of actual investment return in excess of/(less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continue to be recognized on their original timeframe. The expected actuarial value of assets is calculated net of investment expenses, and the expected investment return is equal to the assumed investment return rate multiplied by the prior year's actuarial value of assets, adjusted for contributions, benefits paid, and refunds.

### V. New Entrant Profile

For the purposes of determining the funding period, an open group projection is used which replaces on a one-to-one basis each active member who leaves employment with an average new hire. The average new hire is determined based on a new entrant profile, which is created from the valuation data by determining the entry age and entry pay for anyone with seven or less years of service as of the valuation date. Each group of new hires' salaries is assumed to grow at the General Wage Inflation over the salaries of the previous year's group.

The new entrant profile for members assumed to be hired during the year following the valuation date for the Police and Fire Employees and the All Other Employees are shown in the table below.

New Entrant Profile for Police & Fire Employees		
Entry Age	# of Employees	Average Salary
20-24	227	\$67,764
25-29	439	66,966
30-34	312	65,420
35-39	126	65,675
40-44	41	67,596
45-49	17	70,072
50-54	6	105,373
55-59	8	89,074
Total	1,113	\$66,933

It is assumed that 90% of new hires will be male.

**TABLE 18 (CONTINUED)**

New Entrant Profile for All Other Employees		
Entry Age	# of Employees	Average Salary
15-19	14	\$45,787
20-24	1,596	48,406
25-29	3,466	50,905
30-34	2,988	53,401
35-39	2,575	54,097
40-44	2,171	53,636
45-49	1,765	53,337
50-54	1,417	53,082
55-59	1,190	53,376
60-64	623	56,006
65-69	89	58,920
Total	17,894	\$52,680

It is assumed that 40% of new hires will be male and Teachers replace Teachers and Non-Teachers replace Non-Teachers

VI. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.00% per year, compounded annually, composed of an assumed 2.50% inflation rate and a 4.50% net real rate of return (net of investment expenses).
2. General Wage Inflation: (used to index each year's group of new entrants in the open group projection) 3.50% per annum for Police and Fire Employees and 3.00% per annum for General Employees and Teachers.

**TABLE 18 (CONTINUED)**

## 3. Salary increase rates: As shown below

Years of Service	General Employees		Teachers	
	Service-related Component	Total Rate Including 2.50% Inflation Component and 1.25% Productivity Component	Service-related Component	Total Rate Including 2.50% Inflation Component and 1.25% Productivity Component
1	3.00%	6.75%	3.00%	6.75%
2	3.00%	6.75%	3.00%	6.75%
3	2.00%	5.75%	2.00%	5.75%
4	1.50%	5.25%	1.50%	5.25%
5	1.50%	5.25%	1.50%	5.25%
6	1.25%	5.00%	1.25%	5.00%
7	1.25%	5.00%	1.25%	5.00%
8	1.00%	4.75%	1.00%	4.75%
9	1.00%	4.75%	1.00%	4.75%
10	1.00%	4.75%	1.00%	4.75%
11	0.75%	4.50%	0.75%	4.50%
12	0.75%	4.50%	0.75%	4.50%
13	0.50%	4.25%	0.50%	4.25%
14	0.50%	4.25%	0.50%	4.25%
15	0.50%	4.25%	0.50%	4.25%
16	0.50%	4.25%	0.50%	4.25%
17	0.50%	4.25%	0.50%	4.25%
18	0.50%	4.25%	0.50%	4.25%
19	0.50%	4.25%	0.50%	4.25%
20	0.25%	4.00%	0.25%	4.00%
21	0.25%	4.00%	0.25%	4.00%
22	0.25%	4.00%	0.25%	4.00%
23	0.25%	4.00%	0.25%	4.00%
24	0.25%	4.00%	0.25%	4.00%
25 or more	0.00%	3.75%	0.00%	3.75%

## TABLE 18 (CONTINUED)

3. Salary increase rates (continued):

Police & Firefighters		
Years of Service	Service-related Component	Total Annual Rate of Increase Including 2.50% Inflation Component and 2.50% General Increase Rate
1	1.00%	6.00%
2	1.00%	6.00%
3	1.00%	6.00%
4	1.00%	6.00%
5	1.00%	6.00%
6	1.00%	6.00%
7	1.00%	6.00%
8	1.00%	6.00%
9	1.00%	6.00%
10	1.00%	6.00%
11	1.00%	6.00%
12	1.00%	6.00%
13	1.00%	6.00%
14	1.00%	6.00%
15	1.00%	6.00%
16	0.75%	5.75%
17	0.75%	5.75%
18	0.75%	5.75%
19	0.50%	5.50%
20	0.50%	5.50%
21	0.50%	5.50%
22	0.25%	5.25%
23	0.25%	5.25%
24	0.25%	5.25%
25 or more	0.00%	5.00%

Salary increases are assumed to occur once a year, on July 1. Therefore the pay used for the period between the valuation date and the first anniversary of the valuation date is equal to the reported pay for the prior year, annualized if necessary, and then increased by the salary increase assumption. To adjust the pays received as of March 31<sup>st</sup> to the June 30<sup>th</sup> valuation date, the reported pay for each member is increased by 1%.

## TABLE 18 (CONTINUED)

### B. Demographic Assumptions

#### 1. Mortality rates:

Active Members: Multiples of the Pub-2010, Employee Tables for active employees based on the occupation of the member as follows:

Type	General Employees	Teachers	Police and Fire
	Male & Female	Male & Female	Male & Female
Ordinary	94%	92%	80%
% of Ordinary	41%	52%	24%
Choosing Annuity			
Duty Related	6%	8%	20%

Healthy Retirees: The 2022 Public Retirees of Hawaii mortality tables. The rates are projected on a fully generational basis by the long-term rates of scale UMP from the year 2022 and with multiplier and setbacks based on plan and group experience. The following are sample rates of the base table as of 2022 with the corresponding multipliers:

#### Healthy Annuitant Mortality Rates Before Projection (Multiplier Applied)

Age	General Employees		Teachers		Police and Fire	
	Male	Female	Male	Female	Male	Female
50	0.2094%	0.1276%	0.1698%	0.0951%	0.2421%	0.1130%
55	0.3215%	0.1687%	0.2883%	0.1596%	0.3473%	0.1633%
60	0.5570%	0.3095%	0.4672%	0.2467%	0.6179%	0.2799%
65	0.8041%	0.4488%	0.7256%	0.4063%	0.8426%	0.4283%
70	1.2621%	0.7066%	1.0762%	0.6015%	1.4172%	0.6565%
75	2.0700%	1.0964%	1.7879%	0.9358%	2.3227%	1.0121%
80	3.5996%	2.1275%	3.0429%	1.6565%	4.1824%	1.8863%
85	6.5891%	4.1569%	5.5564%	3.2698%	7.6513%	3.6977%
90	11.9340%	8.3647%	10.1056%	6.5007%	13.6689%	7.3991%
Multiplier	102%	98%	97%	101%	93%	100%
Setback	0	-1	1	1	-2	0



## TABLE 18 (CONTINUED)

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

<u>Life Expectancy for an Age 65 Retiree in Years</u>					
Gender	Year of Retirement				
	2025	2030	2035	2040	2045
<u>General Retirees</u>					
Male	22.8	23.2	23.5	23.9	24.2
Female	26.3	26.6	26.9	27.2	27.5
<u>Teachers</u>					
Male	24.1	24.5	24.9	25.2	25.5
Female	28.0	28.3	28.6	28.9	29.2
<u>Police and Fire</u>					
Male	21.8	22.1	22.4	22.8	23.1
Female	27.1	27.4	27.7	28.0	28.3

Disabled retirees: Base Table for healthy retiree's occupation, set forward 3 years, generational projection using the UMP projection table from the year 2022. Minimum mortality rate of 3.5% for males and 2.5% for females.

2. Disability rates – The assumed total disability rates at select ages are multiples of the client specific table that follows:

Age	Male & Female
25	0.000%
30	0.001%
35	0.008%
40	0.026%
45	0.064%
50	0.146%
55	0.198%
60	0.217%

Note: The disability rates project the percentage of employees at each age that is assumed to become disabled before retiring. Multiples of the rates above are assumed to be ordinary disability or accidental disability, and varies by employee group as follows:

Type	General Employees	Teachers	Police and Fire
	Male & Female	Male & Female	Male & Female
Ordinary	200%	100%	50%
Accidental	60%	8%	120%

## TABLE 18 (CONTINUED)

3. Termination Rates - Same male and female rates, based solely on the member's service. Rates reflect terminations for causes other than death, disability or retirement. Employees eligible for retirement are assumed to have no probability of termination. Sample rates are shown below:

Years of Service	Expected Terminations per 1000 Lives (Male & Female)		
	General Employees	Teachers	Police & Fire
0	177.2	0.0	140.0
1	142.2	197.9	52.4
2	114.2	165.2	41.3
3	92.0	134.8	34.8
4	74.8	108.2	30.2
5	61.7	86.3	26.6
6	51.9	69.4	23.7
7	44.7	57.3	21.3
8	39.6	49.4	19.1
9	35.8	44.5	17.2
10	32.8	41.0	15.6
11	30.3	35.8	10.6
12	27.9	32.4	10.0
13	22.6	29.1	9.4
14	19.8	26.1	8.8
15	17.7	23.2	8.2
16	16.1	20.6	7.6
17	14.8	18.1	7.0
18	13.7	15.8	6.4
19	12.8	13.6	5.8
20	11.9	11.7	5.2
21	11.1	10.0	4.6
22	10.2	8.4	4.0
23	9.3	7.0	3.4
24	8.3	5.8	2.8
25	7.1	4.8	0.0
26	6.0	4.0	0.0
27	4.7	3.3	0.0
28	3.5	2.8	0.0
29	2.4	2.6	0.0
30 and more	0.0	0.0	0.0

## TABLE 18 (CONTINUED)

4. Retirement Rates – separate male and female rates, based on age. Sample rates are shown below:

### Contributory Members

Expected Retirements per 100 Lives									
	General Employees				Teachers				Police/Fire
	Unreduced Retirement		Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement
Age	Male	Female	Male	Female	Male	Female	Male	Female	Male & Female
45	0	0	0	0	0	0	0	0	15.5
46	0	0	0	0	0	0	0	0	15.5
47	0	0	0	0	0	0	0	0	15.5
48	0	0	0	0	0	0	0	0	15.5
49	0	0	0	0	0	0	0	0	15.5
50	0	0	0	0	0	0	1	0	18.0
51	0	0	2	1	0	0	1	1	18.0
52	0	0	2	1	0	0	1	1	18.0
53	0	0	2	1	0	0	2	2	18.0
54	0	0	3	2	0	0	3	3	18.0
55	25	20			20	18			22.0
56	25	20			15	16			22.0
57	16	13			15	16			22.0
58	16	13			15	16			24.0
59	13	13			15	16			27.0
60	13	15			14	18			30.0
61	13	15			14	18			30.0
62	28	25			14	25			30.0
63	20	20			14	20			30.0
64	20	20			14	15			30.0
65	20	20			20	25			100.0
66	18	20			15	25			
67	18	20			15	20			
68	18	20			15	20			
69	18	20			15	20			
70	20	20			15	20			
71	20	20			15	20			
72	20	20			15	20			
73	20	20			15	20			
74	20	20			15	20			
75	100	100			100	100			

## TABLE 18 (CONTINUED)

### Noncontributory Members

Age	Expected Retirements per 100 Lives									
	General Employees						Teacher			
	Unreduced		25 & Out		Reduced		Unreduced		Reduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
55	20	11	15	11	1	1	10	13	1	2
56	18	11	23	11	1	1	10	7	1	2
57	13	11	18	11	1	1	10	8	1	2
58	10	11	15	11	2	2	10	10	2	2
59	10	11	15	11	2	2	10	20	3	3
60	10	14	15	14	4	4	10	11	5	5
61	11	18	16	18	4	4	10	16	7	5
62	20	20	25	20			16	25		
63	20	20	25	20			12	20		
64	12	20	17	20			10	15		
65	14	20	19	20			20	25		
66	20	20	25	20			15	25		
67	20	20	25	20			15	25		
68	20	20	25	20			15	25		
69	20	20	25	20			15	25		
70	20	20	25	20			15	25		
71	20	20	25	20			15	25		
72	20	20	25	20			15	25		
73	20	20	25	20			15	25		
74	20	20	25	20			15	25		
75	100	100	100	100			100	100		

Note: Retirement rates for the 25&out group prior to age 55 are 15% for male and 11% for female.

**TABLE 18 (CONTINUED)**

Hybrid Members

Age	Expected Retirements per 100 Lives							
	General Employees				Teachers			
	Unreduced		Reduced		Unreduced		Reduced	
Male	Female	Male	Female	Male	Female	Male	Female	
55	18	18	1	1	20	16	2	2
56	12	13	1	1	13	10	2	2
57	12	13	1	1	13	10	2	2
58	16	13	2	2	13	12	2	2
59	16	13	2	2	13	12	3	3
60	14	13	4	4	14	14	3	5
61	14	15	4	4	14	18	3	10
62	21	20			22	30		
63	18	20			14	20		
64	18	20			14	20		
65	21	20			20	25		
66	18	18			15	25		
67	18	18			15	25		
68	18	18			15	25		
69	18	18			15	25		
70	20	20			15	25		
71	20	20			15	25		
72	20	20			15	25		
73	20	20			15	25		
74	20	20			15	25		
75	100	100			100	100		

Note: For the 25&out group with membership dates before July 1, 2012, the retirement rates prior to age 55 are 6% for both male and female.

For members hired after June 30, 2012 the retirement rates for members once they reach unreduced retirement eligibility are increased 10% (multiplicative) for each year the member is beyond the age the member would have been eligible under the Hybrid provisions for members hired prior to June 30, 2012.

## TABLE 18 (CONTINUED)

### C. Other Assumptions

1. Projected payroll for contributions: The aggregate projected payroll for the fiscal year following the valuation date is calculated taking the lesser of the actual payroll paid during the previous fiscal year and the current annualized pay on the valuation date and increasing this number by the payroll growth rate.
2. Age difference: Male members are assumed to be four years older than their spouses, and female members are assumed to be four years younger than their spouses.
3. Marriage Assumption: While not implicitly used in the valuation, 100% of active members are assumed to be married when setting other benefit election and eligibility assumptions.
4. Percent electing annuity on death for contributory participants (when eligible): All of the spouses of married participants who die after becoming eligible for a retirement benefit are assumed to elect an annuity or a refund, whichever is more valuable at time of participant's death.
5. Payment Option: Future healthy retirees are assumed to choose the life only payment option. 50% of future disabled retirees are assumed to choose the 100% Joint and Survivor option.
6. Percent electing deferred termination benefit: vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.
7. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt when eligible for early retirement.
8. Administrative expenses: Administrative expenses are assumed to be 0.35% of active member payroll.
9. Reemployment, purchase of service, transfers: No recognition is made of (i) future member reimbursements upon reemployment, (ii) future purchase of additional service, or (iii) special transfer provisions.
10. Sick Leave: It is assumed that all members will have their benefit service increased by sick leave and the following loads will be applied by group:

General Employees	3.25%
Teachers	3.75%
Police and Fire	5.00%

## TABLE 18 (CONTINUED)

11. COLA delay: It is assumed that the first COLA will be received 9 months after retirement. Teachers are assumed to receive COLA 12 months after retirement,
12. There will be no recoveries once disabled.
13. No surviving spouse will remarry and there will be no children's benefit.
14. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
15. Decrement timing: Retirements and terminations of Teachers are assumed to occur at the beginning of the year. All other decrements are assumed to occur mid-year.
16. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
17. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
18. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
19. Benefit Service: All members are assumed to accrue 1 year of service each year. Exact fractional service is used to determine the amount of benefit payable.
20. Police officers, firefighters, investigators of the Department of the Prosecuting Attorney and the Attorney General, narcotic enforcement investigators, and public safety investigators hired prior to June 30, 2012 are not assumed to retire at age 55 unless they have 10 years of service.

### VII. Participant Data

Participant data was supplied in electronic files for (i) active members, (ii) inactive vested members, who are entitled to a future deferred benefit, (iii) members and beneficiaries receiving benefits.

Salary supplied for the current year was based on the actual pensionable earnings for the 12-month period ending the March preceding the valuation date. This pay was increased by 1% to reflect the three-month difference from March to June. For members with less than one year of service, the base pay rate provided in the data was used

## TABLE 18 (CONTINUED)

### VIII. Dates of Adoption of Assumptions and Methods

The actuarial assumptions and methods were adopted by the Board of Trustees on August 8, 2022 as recommended by Gabriel, Roeder, Smith & Company (GRS).

### IX. Changes in Assumptions and Methods since Prior Valuation

The actuarial assumptions have been revised since the prior valuation. Please see our Experience Study report dated June 14, 2022 for a more extensive discussion of the changes in the actuarial assumptions and the rationale for the current assumptions.

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**TABLE 19**

**Distribution of Active Members by Age and by Years of Service - All Employees  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 25	446 \$47,305	227 \$49,658	81 \$50,429	38 \$48,568	12 \$45,950	1 \$51,062	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	805 \$48,327
25-29	815 \$51,098	706 \$51,238	712 \$54,032	591 \$54,751	384 \$55,048	433 \$57,300	1 \$72,077	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3,642 \$53,451
30-34	600 \$50,567	530 \$53,271	645 \$54,226	659 \$56,361	686 \$57,400	2,382 \$61,981	226 \$76,151	1 \$68,635	0 \$0	0 \$0	0 \$0	0 \$0	5,729 \$58,472
35-39	452 \$52,808	418 \$54,545	520 \$56,916	570 \$58,132	552 \$58,069	2,414 \$64,314	1,694 \$78,043	295 \$79,525	0 \$0	0 \$0	0 \$0	0 \$0	6,915 \$65,419
40-44	382 \$55,048	351 \$54,556	452 \$55,269	494 \$56,437	452 \$59,312	2,002 \$64,221	1,781 \$76,365	1,943 \$83,429	274 \$84,959	1 \$102,838	0 \$0	0 \$0	8,132 \$70,082
45-49	308 \$53,451	286 \$52,889	353 \$54,473	375 \$58,785	345 \$58,995	1,629 \$62,306	1,470 \$76,542	1,944 \$82,307	1,750 \$91,843	156 \$96,705	2 \$84,432	0 \$0	8,618 \$74,636
50-54	258 \$56,566	232 \$53,268	306 \$55,654	290 \$59,517	332 \$57,284	1,332 \$61,743	1,155 \$72,288	1,626 \$78,964	1,907 \$89,912	1,612 \$94,338	322 \$85,525	2 \$78,805	9,374 \$77,408
55-59	214 \$52,449	186 \$52,821	251 \$54,612	254 \$55,082	242 \$55,633	1,059 \$61,345	1,021 \$68,790	1,338 \$74,133	1,314 \$79,677	1,313 \$87,056	1,363 \$91,087	135 \$87,114	8,690 \$74,973
60-64	130 \$56,118	130 \$59,001	182 \$58,846	211 \$57,337	179 \$62,057	978 \$62,180	860 \$68,669	1,047 \$70,358	1,028 \$71,148	869 \$83,582	957 \$88,063	542 \$91,700	7,113 \$73,410
65 & Over	72 \$62,508	68 \$66,680	104 \$58,910	119 \$59,879	100 \$56,152	710 \$64,014	637 \$68,483	758 \$72,335	790 \$72,879	513 \$86,210	599 \$89,479	746 \$102,684	5,216 \$77,417
Total	3,677 \$52,232	3,134 \$53,332	3,606 \$55,162	3,601 \$56,895	3,284 \$57,700	12,940 \$62,696	8,845 \$73,987	8,952 \$78,387	7,063 \$83,658	4,464 \$89,253	3,243 \$89,341	1,425 \$96,997	64,234 \$70,635

**TABLE 20**

**Distribution of Active Members by Age and by Years of Service  
Noncontributory Members, All  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total Count & Avg. Comp.	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.		
Under 25	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
30-34	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
35-39	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$93,825	50 \$62,910	0 \$0	0 \$0	0 \$0	0 \$0	51 \$63,517
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$55,071	12 \$53,854	570 \$76,069	102 \$66,421	1 \$102,838	0 \$0	0 \$0	686 \$74,254
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$79,581	5 \$54,179	613 \$75,994	597 \$79,054	51 \$76,708	1 \$85,971	0 \$0	1,268 \$77,388
50-54	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	4 \$56,885	487 \$71,430	717 \$77,732	569 \$83,022	133 \$76,022	1 \$74,902	1,911 \$77,537
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2 \$29,179	3 \$90,280	433 \$69,651	605 \$72,427	563 \$80,610	545 \$84,864	62 \$81,996	2,213 \$77,282
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$44,735	4 \$74,031	302 \$63,994	510 \$64,849	404 \$78,102	447 \$83,085	186 \$86,884	1,854 \$74,214
65 & Over	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3 \$81,169	237 \$64,969	391 \$66,982	268 \$81,401	299 \$85,681	298 \$96,552	1,496 \$78,902
<b>Total</b>	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	5 \$47,549	32 \$64,030	2,692 \$71,604	2,922 \$72,822	1,856 \$80,823	1,425 \$83,653	547 \$91,575	9,479 \$76,710	



## TABLE 21

### Distribution of Active Members by Age and by Years of Service Noncontributory Members, General Employees As of 06/30/2022

Attained Age	Years of Credited Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 25	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
30-34	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
35-39	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$93,825	38 \$58,840	0 \$0	0 \$0	0 \$0	0 \$0	39 \$59,737
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$55,071	10 \$50,541	276 \$70,351	80 \$62,610	1 \$102,838	0 \$0	0 \$0	368 \$68,177
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$79,581	5 \$54,179	371 \$71,286	303 \$74,594	35 \$74,577	1 \$85,971	0 \$0	716 \$72,759
50-54	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	4 \$56,885	374 \$67,401	478 \$73,117	289 \$77,669	117 \$74,699	1 \$74,902	1,263 \$72,563
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2 \$29,179	3 \$90,280	338 \$63,974	483 \$67,477	390 \$76,291	376 \$80,632	58 \$81,360	1,650 \$72,323
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$44,735	4 \$74,031	249 \$59,968	428 \$60,128	308 \$72,460	351 \$77,582	144 \$83,552	1,485 \$69,083
65 & Over	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	196 \$59,516	323 \$60,253	204 \$74,161	240 \$77,583	210 \$87,261	1,173 \$70,929
Total	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	5 \$47,549	27 \$61,653	1,842 \$65,976	2,095 \$66,992	1,227 \$75,272	1,085 \$78,336	413 \$85,109	6,694 \$71,151

**TABLE 22**

**Distribution of Active Members by Age and by Years of Service  
Noncontributory Members, Teachers  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 25	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
30-34	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
35-39	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	12 \$75,799	0 \$0	0 \$0	0 \$0	0 \$0	12 \$75,799
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2 \$70,416	294 \$81,436	22 \$80,278	0 \$0	0 \$0	0 \$0	318 \$81,287
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	242 \$83,213	294 \$83,651	16 \$81,369	0 \$0	0 \$0	552 \$83,393
50-54	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	113 \$84,764	239 \$86,962	280 \$88,548	16 \$85,697	0 \$0	648 \$87,233
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	95 \$89,847	122 \$92,025	173 \$90,348	169 \$94,281	4 \$91,215	563 \$91,814
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	53 \$82,907	82 \$89,490	96 \$96,204	96 \$103,204	42 \$98,307	369 \$94,862
65 & Over	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3 \$81,169	41 \$91,036	68 \$98,946	64 \$104,479	59 \$118,623	88 \$118,725	323 \$107,856
Total	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	5 \$76,867	850 \$83,800	827 \$87,590	629 \$91,650	340 \$100,620	134 \$111,504	2,785 \$90,072

**TABLE 23**

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, All  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 25	46 \$65,453	31 \$70,013	19 \$70,135	8 \$67,535	3 \$63,876	0 \$0	107 \$67,717							
25-29	55 \$66,573	76 \$68,698	96 \$70,381	72 \$72,866	40 \$68,107	63 \$74,665	0 \$0	402 \$70,432						
30-34	32 \$61,258	46 \$66,687	88 \$68,206	78 \$68,667	78 \$68,060	310 \$77,754	54 \$104,767	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	686 \$75,009
35-39	20 \$56,724	22 \$63,397	41 \$68,590	36 \$70,046	39 \$69,529	271 \$76,981	291 \$103,385	70 \$114,905	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	790 \$88,057
40-44	5 \$61,262	11 \$69,023	14 \$68,902	18 \$70,352	24 \$69,159	135 \$78,832	223 \$101,087	327 \$114,513	62 \$130,954	0 \$0	0 \$0	0 \$0	0 \$0	819 \$102,205
45-49	3 \$67,158	7 \$70,880	5 \$92,850	3 \$74,842	8 \$86,940	69 \$81,314	143 \$101,972	273 \$117,925	370 \$130,962	38 \$148,809	0 \$0	0 \$0	0 \$0	919 \$118,148
50-54	2 \$188,999	4 \$151,243	3 \$69,455	5 \$83,128	3 \$61,879	31 \$90,822	61 \$106,615	184 \$115,775	379 \$129,081	207 \$150,057	28 \$156,837	0 \$0	0 \$0	907 \$128,764
55-59	3 \$95,760	2 \$91,849	2 \$167,811	4 \$101,652	3 \$101,712	7 \$92,863	18 \$108,031	49 \$116,142	97 \$132,059	92 \$143,031	71 \$151,773	10 \$160,073	10 \$134,495	358 \$134,495
60-64	1 \$74,292	1 \$62,757	6 \$158,872	3 \$68,901	1 \$82,139	12 \$112,335	11 \$123,739	15 \$128,000	18 \$125,123	30 \$130,058	24 \$135,265	56 \$95,946	56 \$116,751	178 \$116,751
65 & Over	2 \$96,050	0 \$0	1 \$76,909	1 \$77,240	1 \$209,155	5 \$154,809	4 \$144,984	8 \$128,787	14 \$129,656	12 \$142,309	6 \$173,663	122 \$100,859	122 \$112,553	176 \$112,553
Total	169 \$66,311	200 \$69,803	275 \$72,388	228 \$71,322	200 \$70,368	903 \$79,192	805 \$103,424	926 \$116,227	940 \$130,185	379 \$146,398	129 \$150,819	188 \$102,545	5,342 \$103,780	



**TABLE 24**

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, General Employees  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 25	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	4 \$61,805	1 \$36,364	0 \$0	0 \$0	1 \$63,230	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	6 \$57,803
30-34	0 \$0	0 \$0	0 \$0	0 \$0	1 \$63,230	1 \$63,230	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2 \$63,230
35-39	0 \$0	1 \$63,230	0 \$0	2 \$69,672	2 \$131,034	7 \$63,853	7 \$81,757	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	19 \$78,100
40-44	0 \$0	0 \$0	1 \$63,230	2 \$64,927	0 \$0	5 \$95,147	3 \$46,889	8 \$70,313	1 \$95,909	0 \$0	0 \$0	0 \$0	20 \$73,395
45-49	0 \$0	1 \$77,240	2 \$131,676	1 \$70,708	1 \$197,229	3 \$107,912	6 \$100,853	13 \$110,486	8 \$83,202	0 \$0	0 \$0	0 \$0	35 \$103,980
50-54	1 \$209,155	3 \$153,298	1 \$69,593	1 \$59,146	1 \$45,438	6 \$131,416	6 \$144,548	21 \$122,889	18 \$108,977	8 \$112,608	1 \$95,387	0 \$0	67 \$119,963
55-59	2 \$63,230	1 \$59,146	1 \$197,229	2 \$136,193	1 \$63,230	5 \$100,203	5 \$159,633	12 \$123,934	11 \$128,412	10 \$125,232	6 \$111,862	2 \$136,139	58 \$122,640
60-64	0 \$0	0 \$0	5 \$175,199	1 \$63,230	0 \$0	11 \$116,318	6 \$137,639	8 \$140,976	5 \$108,026	8 \$92,044	8 \$102,892	36 \$73,117	88 \$101,184
65 & Over	1 \$59,146	0 \$0	0 \$0	1 \$77,240	1 \$209,155	5 \$154,809	4 \$144,984	6 \$142,971	9 \$138,074	6 \$140,890	3 \$221,747	93 \$92,020	129 \$107,507
<b>Total</b>	<b>4</b> <b>\$98,690</b>	<b>10</b> <b>\$90,673</b>	<b>11</b> <b>\$136,888</b>	<b>10</b> <b>\$81,191</b>	<b>7</b> <b>\$120,050</b>	<b>44</b> <b>\$107,181</b>	<b>37</b> <b>\$118,630</b>	<b>68</b> <b>\$118,416</b>	<b>52</b> <b>\$113,816</b>	<b>32</b> <b>\$116,715</b>	<b>18</b> <b>\$125,274</b>	<b>131</b> <b>\$87,499</b>	<b>424</b> <b>\$106,103</b>



## TABLE 25

### Distribution of Active Members by Age and by Years of Service Contributory Members, Teachers As of 06/30/2022

Attained Age	Years of Credited Service												Total Count & Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 25	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
30-34	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
35-39	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$83,156	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$71,834	0 \$0	1 \$74,977	1 \$87,106	0 \$0	0 \$0	0 \$0
50-54	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$113,187	0 \$0	0 \$0	0 \$0	0 \$0
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$101	0 \$0	0 \$0	1 \$103,044	2 \$91,676	0 \$0	0 \$0
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3 \$90,855	1 \$209,591	7 \$100,126	11 \$107,549
65 & Over	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$71,054	0 \$0	1 \$196,856	2 \$106,092	24 \$123,862	28 \$123,313
<b>Total</b>	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3 \$51,697	1 \$71,054	2 \$94,082	6 \$109,929	5 \$121,025	31 \$118,502	48 \$111,512

**TABLE 26**

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, Police and Firefighters  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total Count & Avg. Comp.	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.		
Under 25	46 \$65,453	31 \$70,013	19 \$70,135	8 \$67,535	3 \$63,876	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	107 \$67,717
25-29	55 \$66,573	72 \$69,081	95 \$70,739	72 \$72,866	40 \$68,107	62 \$74,849	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	396 \$70,623
30-34	32 \$61,258	46 \$66,687	88 \$68,206	78 \$68,667	77 \$68,123	309 \$77,801	54 \$104,767	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	684 \$75,043
35-39	20 \$56,724	21 \$63,405	41 \$68,590	34 \$70,068	37 \$66,204	264 \$77,329	283 \$103,991	70 \$114,905	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	770 \$88,309
40-44	5 \$61,262	11 \$69,023	13 \$69,338	16 \$71,030	24 \$69,159	130 \$78,204	220 \$101,826	319 \$115,621	61 \$131,528	0 \$0	0 \$0	0 \$0	0 \$0	799 \$102,926
45-49	3 \$67,158	6 \$69,820	3 \$66,967	2 \$76,909	7 \$71,184	66 \$80,105	136 \$102,243	260 \$118,297	361 \$132,175	37 \$150,477	0 \$0	0 \$0	0 \$0	881 \$118,848
50-54	1 \$168,843	1 \$145,076	2 \$69,386	4 \$89,123	2 \$70,099	25 \$81,079	55 \$102,477	163 \$114,859	360 \$130,130	199 \$151,562	27 \$159,113	0 \$0	0 \$0	839 \$129,485
55-59	1 \$160,820	1 \$124,551	1 \$138,392	2 \$67,112	2 \$120,953	2 \$74,511	12 \$95,525	37 \$113,615	86 \$132,526	81 \$145,722	63 \$157,482	8 \$166,057	8 \$137,667	296 \$137,667
60-64	1 \$74,292	1 \$62,757	1 \$77,237	2 \$71,736	1 \$82,139	1 \$68,520	5 \$107,060	7 \$113,171	13 \$131,699	19 \$152,254	15 \$147,576	13 \$156,916	13 \$135,372	79 \$135,372
65 & Over	1 \$132,954	0 \$0	1 \$76,909	0 \$0	0 \$0	0 \$0	0 \$0	1 \$101,417	5 \$114,503	5 \$133,102	1 \$164,554	5 \$154,854	5 \$130,954	19 \$130,954
<b>Total</b>	<b>165</b> \$65,526	<b>190</b> \$68,705	<b>264</b> \$69,700	<b>218</b> \$70,869	<b>193</b> \$68,566	<b>859</b> \$77,758	<b>765</b> \$102,891	<b>857</b> \$116,106	<b>886</b> \$131,227	<b>341</b> \$149,825	<b>106</b> \$156,562	<b>26</b> \$159,332	<b>4,870</b> \$103,502	<b>4,870</b> \$103,502



**TABLE 27**

**Distribution of Active Members by Age and by Years of Service  
Hybrid Members, All  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.		
Under 25	400 \$45,218	196 \$46,439	62 \$44,391	30 \$43,510	9 \$39,975	1 \$51,062	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	698 \$45,355
25-29	760 \$49,978	630 \$49,132	616 \$51,484	519 \$52,238	344 \$53,530	370 \$54,344	1 \$72,077	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3,240 \$51,344
30-34	568 \$49,965	484 \$51,996	557 \$52,017	581 \$54,709	608 \$56,032	2,072 \$59,621	172 \$67,167	1 \$68,635	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	5,043 \$56,222
35-39	432 \$52,627	396 \$54,053	479 \$55,917	534 \$57,329	513 \$57,198	2,143 \$62,713	1,402 \$72,772	175 \$70,120	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	6,074 \$62,491
40-44	377 \$54,965	340 \$54,088	438 \$54,833	476 \$55,910	428 \$58,760	1,866 \$63,169	1,546 \$72,973	1,046 \$77,722	110 \$76,224	0 \$0	0 \$0	0 \$0	0 \$0	6,627 \$65,680
45-49	305 \$53,316	279 \$52,438	348 \$53,922	372 \$58,655	337 \$58,331	1,559 \$61,454	1,322 \$73,876	1,058 \$76,773	783 \$83,109	67 \$82,374	1 \$82,892	0 \$0	0 \$0	6,431 \$67,876
50-54	256 \$55,531	228 \$51,549	303 \$55,517	285 \$59,103	329 \$57,242	1,301 \$61,050	1,090 \$70,424	955 \$75,713	811 \$82,375	836 \$88,244	161 \$80,974	1 \$82,707	1 \$82,707	6,556 \$70,265
55-59	211 \$51,833	184 \$52,397	249 \$53,703	250 \$54,337	239 \$55,055	1,050 \$61,196	1,000 \$68,019	856 \$73,996	612 \$78,541	658 \$84,744	747 \$89,859	63 \$80,571	63 \$80,571	6,119 \$70,655
60-64	129 \$55,977	129 \$58,972	176 \$55,436	208 \$57,171	178 \$61,944	965 \$61,574	845 \$67,927	730 \$71,806	500 \$75,629	435 \$85,466	486 \$90,311	300 \$93,893	300 \$93,893	5,081 \$71,598
65 & Over	70 \$61,550	68 \$66,680	103 \$58,735	118 \$59,731	99 \$54,606	705 \$63,371	630 \$67,936	513 \$74,857	385 \$76,804	233 \$88,853	294 \$91,623	326 \$108,971	326 \$108,971	3,544 \$75,045
<b>Total</b>	<b>3,508</b> \$51,554	<b>2,934</b> \$52,209	<b>3,331</b> \$53,739	<b>3,373</b> \$55,920	<b>3,084</b> \$56,879	<b>12,032</b> \$61,465	<b>8,008</b> \$71,068	<b>5,334</b> \$75,240	<b>3,201</b> \$79,887	<b>2,229</b> \$86,556	<b>1,689</b> \$89,445	<b>690</b> \$99,784	<b>690</b> \$99,784	<b>49,413</b> \$65,886



**TABLE 28**

**Distribution of Active Members by Age and by Years of Service  
Hybrid Members, General Employees  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total Count & Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 25	236 \$43,069	111 \$42,185	56 \$43,268	30 \$43,510	9 \$39,975	1 \$51,062	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	443 \$42,857
25-29	481 \$48,888	366 \$47,446	360 \$49,749	320 \$49,048	227 \$51,161	242 \$49,542	1 \$72,077	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1,997 \$49,154
30-34	392 \$48,421	337 \$51,720	414 \$50,879	419 \$52,952	427 \$53,988	1,271 \$56,323	101 \$63,672	1 \$68,635	0 \$0	0 \$0	0 \$0	0 \$0	3,362 \$53,778
35-39	304 \$51,400	288 \$52,779	363 \$52,916	405 \$53,978	387 \$54,565	1,540 \$60,518	712 \$72,360	108 \$64,870	0 \$0	0 \$0	0 \$0	0 \$0	4,107 \$59,590
40-44	275 \$54,763	261 \$52,280	331 \$52,220	368 \$52,583	319 \$54,776	1,361 \$59,764	945 \$71,044	561 \$76,254	64 \$72,344	0 \$0	0 \$0	0 \$0	4,485 \$62,140
45-49	220 \$51,747	218 \$51,302	264 \$52,617	288 \$55,495	260 \$54,531	1,207 \$57,806	918 \$70,325	668 \$73,261	380 \$80,391	35 \$75,382	1 \$82,892	0 \$0	4,459 \$63,503
50-54	198 \$54,120	184 \$50,760	226 \$54,097	228 \$56,874	259 \$53,268	1,004 \$56,259	807 \$66,366	694 \$71,485	535 \$78,324	384 \$85,442	124 \$77,427	1 \$82,707	4,644 \$65,266
55-59	171 \$49,534	151 \$51,048	208 \$51,615	208 \$52,351	199 \$52,415	854 \$57,931	793 \$63,920	663 \$69,554	453 \$74,389	428 \$82,395	481 \$86,148	54 \$76,170	4,663 \$66,271
60-64	107 \$54,651	115 \$59,317	162 \$55,087	164 \$54,069	147 \$57,901	822 \$58,702	690 \$62,760	580 \$66,967	392 \$69,377	305 \$77,613	362 \$87,599	204 \$88,209	4,050 \$66,653
65 & Over	50 \$60,434	58 \$68,543	85 \$57,494	94 \$57,286	89 \$53,817	598 \$61,362	531 \$64,288	407 \$70,274	305 \$67,760	166 \$81,040	218 \$86,858	219 \$101,171	2,820 \$69,753
<b>Total</b>	<b>2,434</b> \$50,446	<b>2,089</b> \$51,389	<b>2,469</b> \$52,067	<b>2,524</b> \$53,285	<b>2,323</b> \$53,949	<b>8,900</b> \$58,297	<b>5,498</b> \$67,553	<b>3,682</b> \$71,146	<b>2,129</b> \$74,515	<b>1,318</b> \$81,819	<b>1,186</b> \$85,807	<b>478</b> \$92,776	<b>35,030</b> \$62,327



**TABLE 29**

**Distribution of Active Members by Age and by Years of Service  
Hybrid Members, Teachers  
As of 06/30/2022**

Attained Age	Years of Credited Service												Total Count & Avg. Comp.	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.		
Under 25	164 \$48,310	85 \$51,994	6 \$54,873	0 \$0	255 \$49,693									
25-29	279 \$51,858	264 \$51,470	256 \$53,924	199 \$57,368	117 \$58,125	128 \$63,422	0 \$0	1,243 \$54,864						
30-34	176 \$53,403	147 \$52,627	143 \$55,313	162 \$59,254	181 \$60,854	801 \$64,853	71 \$72,140	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1,681 \$61,111
35-39	128 \$55,542	108 \$57,450	116 \$65,307	129 \$67,852	126 \$65,287	603 \$68,317	690 \$73,197	67 \$78,583	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1,967 \$68,548
40-44	102 \$55,511	79 \$60,061	107 \$62,917	108 \$67,248	109 \$70,421	505 \$72,347	601 \$76,007	485 \$79,420	46 \$81,622	0 \$0	0 \$0	0 \$0	0 \$0	2,142 \$73,094
45-49	85 \$57,377	61 \$56,496	84 \$58,024	84 \$69,491	77 \$71,164	352 \$73,961	404 \$81,945	390 \$82,789	403 \$85,671	32 \$90,022	0 \$0	0 \$0	0 \$0	1,972 \$77,763
50-54	58 \$60,350	44 \$54,848	77 \$59,685	57 \$68,018	70 \$71,944	297 \$77,245	283 \$81,995	261 \$86,957	276 \$90,228	452 \$90,625	37 \$92,863	0 \$0	0 \$0	1,912 \$82,409
55-59	40 \$61,662	33 \$58,568	41 \$64,298	42 \$64,168	40 \$68,188	196 \$75,423	207 \$83,725	193 \$89,257	159 \$90,370	230 \$89,116	266 \$96,570	9 \$106,976	9 \$106,976	1,456 \$84,694
60-64	22 \$62,431	14 \$56,138	14 \$59,480	44 \$68,732	31 \$81,115	143 \$78,083	155 \$90,931	150 \$90,518	108 \$98,322	130 \$103,893	124 \$98,227	96 \$105,971	96 \$105,971	1,031 \$91,025
65 & Over	20 \$64,340	10 \$55,874	18 \$64,595	24 \$69,310	10 \$61,628	107 \$74,595	99 \$87,507	106 \$92,456	80 \$111,285	67 \$108,210	76 \$105,290	107 \$124,937	107 \$124,937	724 \$95,658
Total	1,074 \$54,065	845 \$54,237	862 \$58,530	849 \$63,755	761 \$65,823	3,132 \$70,467	2,510 \$78,768	1,652 \$84,366	1,072 \$90,554	911 \$93,409	503 \$98,023	212 \$115,586	212 \$115,586	14,383 \$74,555



**TABLE 30**

**Summary of Pensions in Force by Type of Retirement**

Employee Group	Contributory		Noncontributory		Hybrid	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
All Employees	17,348	\$ 3,632	17,428	\$ 1,861	14,137	\$ 2,495
	<u>Service</u>		<u>Service</u>		<u>Service</u>	
Total	17,013	\$ 3,667	16,521	\$ 1,903	13,633	\$ 2,527
General Employees - male	3,186	3,226	5,329	1,916	4,056	2,611
General Employees - female	5,004	2,320	6,628	1,471	5,917	2,162
Teachers - male	1,074	3,944	1,435	2,672	1,068	3,379
Teachers - female	3,646	3,595	3,129	2,443	2,592	2,878
Police and Firefighters	4,103	5,645	-	-	-	-
	<u>Ordinary Disability</u>		<u>Ordinary Disability</u>		<u>Ordinary Disability</u>	
Total	121	\$ 1,171	699	\$ 1,096	363	\$ 1,622
General Employees - male	35	1,143	326	1,089	162	1,513
General Employees - female	39	845	288	966	133	1,551
Teachers - male	4	1,762	29	1,670	15	2,238
Teachers - female	15	1,570	56	1,506	53	1,960
Police and Firefighters	28	1,363	-	-	-	-
	<u>Accidental Disability</u>		<u>Accidental Disability</u>		<u>Accidental Disability</u>	
Total	214	\$ 2,199	208	\$ 1,090	141	\$ 1,607
General Employees - male	69	1,888	109	1,148	66	1,591
General Employees - female	41	1,750	92	989	63	1,561
Teachers - male	-	-	1	1,287	1	1,561
Teachers - female	4	4,041	6	1,551	11	1,974
Police and Firefighters	100	2,525	-	-	-	-

**TABLE 31****Summary of Pensions in Force by Age and Type****General Employees**

Age	Type of Pension			
	Total	Service	Ordinary Disability	Accidental Disability
Total	31,543	30,120	983	440
	<b>Contributory</b>			
Total	8,374	8,190	74	110
30-39	-	-	-	-
40-44	1	1	-	-
45-49	4	4	-	-
50-54	8	7	-	1
55-59	47	45	1	1
60-64	302	283	8	11
65-69	771	747	10	14
70-74	1,137	1,109	12	16
75-79	1,430	1,404	10	16
80-84	1,389	1,355	13	21
85-89	1,473	1,456	5	12
90-94	1,207	1,187	8	12
95-99	526	515	7	4
100 & over	79	77	-	2
	<b>Noncontributory</b>			
Total	12,772	11,957	614	201
30-39	-	-	-	-
40-44	1	-	1	-
45-49	9	2	5	2
50-54	28	5	18	5
55-59	307	246	49	12
60-64	1,015	863	118	34
65-69	2,589	2,391	140	58
70-74	3,094	2,921	134	39
75-79	3,016	2,887	102	27
80-84	1,732	1,674	40	18
85-89	721	712	7	2
90-94	224	220	-	4
95-99	35	35	-	-
100 & over	1	1	-	-
	<b>Hybrid</b>			
Total	10,397	9,973	295	129
30-39	2	-	1	1
40-44	7	-	4	3
45-49	10	-	5	5
50-54	30	5	15	10
55-59	463	395	54	14
60-64	1,632	1,525	81	26
65-69	3,465	3,353	77	35
70-74	3,163	3,100	42	21
75-79	1,313	1,288	14	11
80-84	254	249	2	3
85-89	48	48	-	-
90-94	10	10	-	-
95-99	-	-	-	-
100 & over	-	-	-	-

## TABLE 32

### Summary of Pensions in Force by Age and Type

#### Teachers

Age	Type of Pension			
	Total	Service	Ordinary Disability	Accidental Disability
Total	13,139	12,944	172	23
<b>Contributory</b>				
Total	4,743	4,720	19	4
30-39	-	-	-	-
40-44	-	-	-	-
45-49	-	-	-	-
50-54	-	-	-	-
55-59	1	1	-	-
60-64	63	63	-	-
65-69	226	224	2	-
70-74	621	616	5	-
75-79	1,120	1,114	5	1
80-84	1,011	1,006	4	1
85-89	961	961	-	-
90-94	564	560	2	2
95-99	143	143	-	-
100 & over	33	32	1	-
<b>Noncontributory</b>				
Total	4,656	4,564	85	7
30-39	-	-	-	-
40-44	-	-	-	-
45-49	-	-	-	-
50-54	5	-	5	-
55-59	108	97	11	-
60-64	241	225	15	1
65-69	595	574	17	4
70-74	1,187	1,164	22	1
75-79	1,446	1,433	12	1
80-84	772	769	3	-
85-89	237	237	-	-
90-94	58	58	-	-
95-99	7	7	-	-
100 & over	-	-	-	-
<b>Hybrid</b>				
Total	3,740	3,660	68	12
30-39	-	-	-	-
40-44	1	-	1	-
45-49	1	-	1	-
50-54	12	-	11	1
55-59	177	167	8	2
60-64	545	523	17	5
65-69	1,058	1,040	16	2
70-74	1,258	1,244	12	2
75-79	551	549	2	-
80-84	106	106	-	-
85-89	27	27	-	-
90-94	4	4	-	-
95-99	-	-	-	-
100 & over	-	-	-	-

**TABLE 33****Summary of Pensions in Force by Age and Type****Police and Firefighters**

Age	Type of Pension			
	Total	Service	Ordinary Disability	Accidental Disability
Total	4,231	4,103	28	100
30-39	-	-	-	-
40-44	4	-	-	4
45-49	27	25	1	1
50-54	301	289	6	6
55-59	658	643	4	11
60-64	727	716	3	8
65-69	674	657	4	13
70-74	752	729	4	19
75-79	587	557	4	26
80-84	321	315	1	5
85-89	132	126	1	5
90-94	36	34	-	2
95-99	11	11	-	-
100 & over	1	1	-	-

**TABLE 34**

**Noncontributory Service Pensions in Force  
by Years of Service**

Years of Service	Total		General Employees		Teachers	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	16,521	\$ 1,903	11,957	\$ 1,669	4,564	\$ 2,515
Less than 5	4	766	4	766	-	-
5-9	10	732	7	761	3	665
10-14	2,992	617	2,392	584	600	747
15-19	2,424	1,019	1,878	953	546	1,246
20-24	2,569	1,358	1,990	1,258	579	1,700
25-29	2,210	1,938	1,675	1,767	535	2,472
30-34	3,862	2,723	2,413	2,497	1,449	3,099
35 and over	2,450	3,601	1,598	3,298	852	4,170

**TABLE 35**

**Noncontributory Service Pensions in Force  
by Years Since Retirement**

Years Since Retirement	Total		General Employees		Teachers	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	16,521	\$ 1,903	11,957	\$ 1,669	4,564	\$ 2,515
Less than 5	3,875	1,809	3,030	1,678	845	2,277
5-9	3,636	1,680	2,760	1,533	876	2,144
10-14	3,167	1,934	2,344	1,688	823	2,635
15-19	3,306	2,048	2,211	1,729	1,095	2,692
20-24	1,668	2,069	1,079	1,680	589	2,781
25-29	784	2,306	480	2,008	304	2,776
30 -34	83	1,980	51	1,650	32	2,506
35 and over	2	685	2	685	-	-

**TABLE 36-1**

**Contributory Service Pensions in Force  
by Years of Service**

Years of Service	Total		General Employees		Teachers		Police and Firefighters	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	17,013	\$ 3,667	8,190	\$ 2,672	4,720	\$ 3,674	4,103	\$ 5,645
Less than 5	13	2,387	8	2,361	4	2,271	1	3,061
5-9	416	481	313	548	94	243	9	640
10-14	810	998	638	998	114	795	58	1,388
15-19	1,146	1,611	893	1,529	164	1,481	89	2,674
20-24	1,707	2,163	1,192	1,866	327	2,284	188	3,834
25-29	5,562	3,919	1,941	2,635	1,211	3,152	2,410	5,339
30-34	5,147	4,490	1,907	3,540	2,031	3,996	1,209	6,818
35 and over	2,212	4,929	1,298	4,318	775	5,542	139	7,224

**TABLE 36-2****Hybrid Service Pensions in Force****by Years of Service**

Years of Service	Total		General Employees		Teachers	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	13,633	\$ 2,527	9,973	\$ 2,345	3,660	\$ 3,024
Less than 5	5	673	2	672	3	673
5-9	1,186	745	949	743	237	754
10-14	1,923	1,079	1,549	1,036	374	1,257
15-19	1,816	1,557	1,359	1,485	457	1,773
20-24	1,882	1,950	1,325	1,808	557	2,289
25-29	1,810	2,719	1,288	2,549	522	3,139
30-34	3,124	3,573	2,186	3,446	938	3,867
35 and over	1,887	4,722	1,315	4,444	572	5,362

**TABLE 37-1**

**Contributory Service Pensions in Force  
by Years Since Retirement**

Years Since Retirement	Total		General Employees		Teachers		Police and Firefighters	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	17,013	\$ 3,667	8,190	\$ 2,672	4,720	\$ 3,674	4,103	\$ 5,645
Less than 5	1,408	6,597	323	4,915	98	5,413	987	7,264
5-9	1,499	5,167	613	3,832	209	5,214	677	6,361
10-14	2,108	4,522	1,051	3,432	435	4,846	622	6,136
15-19	2,818	3,828	1,354	3,002	863	4,315	601	4,990
20-24	2,498	3,182	1,222	2,434	783	3,648	493	4,295
25-29	3,241	3,021	1,692	2,406	1,105	3,487	444	4,208
30-34	1,997	2,319	1,052	1,787	768	2,806	177	3,360
35 -39	1,444	1,846	883	1,531	459	2,235	102	2,829
40-44	-	-	-	-	-	-	-	-
45 and over	-	-	-	-	-	-	-	-

## TABLE 37-2

### Hybrid Service Pensions in Force

#### by Years Since Retirement

Years Since Retirement	Total		General Employees		Teachers	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	13,633	\$ 2,527	9,973	\$ 2,345	3,660	\$ 3,024
Less than 5	5,852	2,570	4,443	2,380	1,409	3,169
5-9	4,691	2,391	3,375	2,200	1,316	2,880
10-14	2,809	2,690	1,970	2,535	839	3,053
15-19	281	2,283	185	2,105	96	2,627

**TABLE 38****Pensions in Force by Payment Option****General Employees**

Type of Option	Total		Service		Ordinary Disability		Accidental Disability		Other	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
<b>Total</b>	31,543	\$ 2,124	30,120	\$ 2,165	983	\$ 1,178	440	\$ 1,412	-	\$ -
<b>Contributory</b>										
<b>Total</b>	8,374	\$ 2,646	8,190	\$ 2,672	74	\$ 986	110	\$ 1,836	-	\$ -
Maximum	1,214	2,872	1,190	2,902	14	1,290	10	1,491	-	-
Option 1	465	2,004	445	2,040	12	1,101	8	1,350	-	-
Option 2	621	3,320	599	3,373	7	1,663	15	1,959	-	-
Option 3	331	3,818	325	3,852	3	985	3	2,974	-	-
Option 4	3,675	2,828	3,603	2,853	23	869	49	1,913	-	-
Option 5	2,068	1,945	2,028	1,958	15	472	25	1,769	-	-
<b>Noncontributory</b>										
<b>Total</b>	12,772	\$ 1,629	11,957	\$ 1,669	614	\$ 1,032	201	\$ 1,075	-	\$ -
Maximum	6,523	1,616	6,199	1,646	235	1,025	89	1,102	-	-
Option A	2,676	1,723	2,544	1,755	91	1,122	41	1,074	-	-
Option B	2,890	1,569	2,574	1,638	255	997	61	1,055	-	-
Option C	683	1,633	640	1,672	33	1,093	10	969	-	-
<b>Hybrid</b>										
<b>Total</b>	10,397	\$ 2,312	9,973	\$ 2,345	295	\$ 1,530	129	\$ 1,576	-	\$ -
Maximum	3,706	2,257	3,591	2,279	70	1,619	45	1,493	-	-
Option 1	685	2,078	664	2,090	15	1,622	6	1,983	-	-
Option 2	2,312	2,366	2,168	2,425	100	1,460	44	1,553	-	-
Option 3	1,435	2,811	1,391	2,850	28	1,564	16	1,574	-	-
Option 4	1,369	2,279	1,309	2,311	53	1,483	7	2,210	-	-
Option 5	890	1,829	850	1,843	29	1,565	11	1,392	-	-

**TABLE 39****Pensions in Force by Payment Option****Teachers**

Type of Option	Total		Service		Ordinary Disability		Accidental Disability		Other	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	13,139	\$ 3,063	12,944	\$ 3,082	172	\$ 1,749	23	\$ 2,175	-	\$ -
Contributory										
Total	4,743	\$ 3,666	4,720	\$ 3,674	19	\$ 1,611	4	\$ 4,041	-	\$ -
Maximum	747	4,038	740	4,054	6	1,952	1	4,860	-	-
Option 1	190	3,260	188	3,282	2	1,260	-	-	-	-
Option 2	177	3,839	177	3,839	-	-	-	-	-	-
Option 3	147	4,590	146	4,597	1	3,504	-	-	-	-
Option 4	1,988	4,022	1,980	4,030	6	1,727	2	3,098	-	-
Option 5	1,494	2,947	1,489	2,952	4	625	1	5,107	-	-
Noncontributory										
Total	4,656	\$ 2,496	4,564	\$ 2,515	85	\$ 1,562	7	\$ 1,513	-	\$ -
Maximum	2,880	2,548	2,832	2,564	42	1,607	6	1,551	-	-
Option A	806	2,619	797	2,628	8	1,859	1	1,287	-	-
Option B	734	2,210	703	2,244	31	1,425	-	-	-	-
Option C	236	2,343	232	2,356	4	1,552	-	-	-	-
Hybrid										
Total	3,740	\$ 3,003	3,660	\$ 3,024	68	\$ 2,021	12	\$ 1,940	-	\$ -
Maximum	1,525	2,907	1,493	2,927	26	2,032	6	1,834	-	-
Option 1	185	2,898	181	2,916	4	2,091	-	-	-	-
Option 2	779	2,969	759	2,988	15	2,347	5	2,008	-	-
Option 3	533	3,452	525	3,476	7	1,823	1	2,231	-	-
Option 4	384	3,152	371	3,200	13	1,783	-	-	-	-
Option 5	334	2,686	331	2,695	3	1,709	-	-	-	-

**TABLE 40**  
**Pensions in Force by Payment Option**  
**Police and Firefighters**

Type of Option	Total		Service		Ordinary Disability		Accidental Disability		Other	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	4,231	\$ 5,543	4,103	\$ 5,645	28	\$ 1,363	100	\$ 2,525	-	\$ -
Maximum	210	6,187	195	6,466	-	-	15	2,561	-	-
Option 1	53	5,773	46	6,136	1	2,797	6	3,490	-	-
Option 2	326	6,058	304	6,305	9	1,957	13	3,103	-	-
Option 3	147	7,075	143	7,209	2	1,416	2	3,184	-	-
Option 4	2,567	5,906	2,534	5,951	7	1,147	26	2,770	-	-
Option 5	928	3,956	881	4,075	9	766	38	1,959	-	-

**TABLE 41****Pensions in Force by Payment Option****General Employees - New Retirees**

Type of Option	Total		Service		Ordinary Disability		Accidental Disability		Other	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
<b>Total</b>	<b>1,783</b>	<b>\$ 2,145</b>	<b>1,731</b>	<b>\$ 2,158</b>	<b>34</b>	<b>\$ 1,783</b>	<b>18</b>	<b>\$ 1,524</b>	<b>-</b>	<b>\$ -</b>
	<b>Contributory</b>									
Total	46	\$ 4,809	46	\$ 4,809	-	\$ -	-	\$ -	-	\$ -
Maximum	5	5,319	5	5,319	-	-	-	-	-	-
Option 1	1	6,456	1	6,456	-	-	-	-	-	-
Option 2	6	4,624	6	4,624	-	-	-	-	-	-
Option 3	2	11,377	2	11,377	-	-	-	-	-	-
Option 4	25	4,468	25	4,468	-	-	-	-	-	-
Option 5	7	3,708	7	3,708	-	-	-	-	-	-
	<b>Noncontributory</b>									
Total	677	\$ 1,684	660	\$ 1,688	10	\$ 1,588	7	\$ 1,395	-	\$ -
Maximum	297	1,666	292	1,663	4	1,876	1	1,625	-	-
Option A	156	1,689	153	1,696	1	835	2	1,595	-	-
Option B	206	1,718	199	1,728	4	1,602	3	1,245	-	-
Option C	18	1,549	16	1,596	1	1,134	1	1,219	-	-
	<b>Hybrid</b>									
Total	1,060	\$ 2,323	1,025	\$ 2,342	24	\$ 1,864	11	\$ 1,606	-	\$ -
Maximum	347	2,300	333	2,306	11	2,152	3	2,200	-	-
Option 1	65	2,044	64	2,057	1	1,192	-	-	-	-
Option 2	249	2,517	233	2,589	9	1,531	7	1,411	-	-
Option 3	126	2,778	122	2,810	3	2,032	1	1,190	-	-
Option 4	159	2,201	159	2,201	-	-	-	-	-	-
Option 5	114	1,799	114	1,799	-	-	-	-	-	-

**TABLE 42****Pensions in Force by Payment Option****Teachers - New Retirees**

Type of Option	Total		Service		Ordinary Disability		Accidental Disability		Other	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	598	\$ 2,945	588	\$ 2,961	8	\$ 1,984	2	\$ -	-	\$ -
Contributory										
Total	13	\$ 4,642	13	\$ 4,642	-	\$ -	-	\$ -	-	\$ -
Maximum	3	6,482	3	6,482	-	-	-	-	-	-
Option 1	-	-	-	-	-	-	-	-	-	-
Option 2	1	3,200	1	3,200	-	-	-	-	-	-
Option 3	1	7,799	1	7,799	-	-	-	-	-	-
Option 4	4	6,031	4	6,031	-	-	-	-	-	-
Option 5	4	1,445	4	1,445	-	-	-	-	-	-
Noncontributory										
Total	226	\$ 2,449	222	\$ 2,450	4	\$ 2,413	-	\$ -	-	\$ -
Maximum	124	2,448	123	2,448	1	2,546	-	-	-	-
Option A	39	2,726	38	2,695	1	3,886	-	-	-	-
Option B	50	2,337	48	2,367	2	1,609	-	-	-	-
Option C	13	2,056	13	2,056	-	-	-	-	-	-
Hybrid										
Total	359	\$ 3,197	353	\$ 3,221	4	\$ 1,556	2	\$ 2,144	-	\$ -
Maximum	120	3,093	119	3,092	1	3,153	-	-	-	-
Option 1	22	3,296	22	3,296	-	-	-	-	-	-
Option 2	75	2,992	74	3,005	-	-	1	2,056	-	-
Option 3	62	3,511	60	3,540	1	3,069	1	2,231	-	-
Option 4	45	3,391	43	3,457	2	1,989	-	-	-	-
Option 5	35	3,235	35	3,235	-	-	-	-	-	-

**TABLE 43****Pensions in Force by Payment Option****Police and Firefighters - New Retirees**

Type of Option	Total		Service		Ordinary Disability		Accidental Disability		Other	
	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
Total	211	\$ 6,793	210	\$ 6,807	-	\$ -	1	\$ 3,780	-	\$ -
Maximum	16	7,108	16	7,108	-	-	-	-	-	-
Option 1	1	8,364	1	8,364	-	-	-	-	-	-
Option 2	33	6,254	32	6,331	-	-	1	3,780	-	-
Option 3	13	6,934	13	6,934	-	-	-	-	-	-
Option 4	126	7,140	126	7,140	-	-	-	-	-	-
Option 5	22	5,232	22	5,232	-	-	-	-	-	-

## SECTION O – DEFINITION OF ACTUARIAL TERMS

1. *Actuarial Accrued Liability* – for benefits payable in the future to present members, it will equal the present value of benefits payable in the future to them less the present value of future normal costs.
2. *Actuarial Assumptions* – assumptions as to future experience under the ERS. Current actuarial assumptions are detailed in Table 18 of the current annual valuation report. Assumptions include future fund earnings rate, rates of future salary increases, and rates of death (both before and after retirement), disability, retirement, and withdrawal.
3. *Actuarial Gain or Actuarial Loss* - a measure of the difference between actual experience and assumed experience of the ERS. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, actuarial liabilities emerge which may be the same as forecasted, or they may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the ERS's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
4. *Actuarial Liabilities* - the actuarially determined present value of future benefits to be provided by the ERS. There are separate actuarially determined present values for retired members and non-retired members (either active or inactive). When applied to active members, it takes into account benefits which will be earned through future service and future salary increases.
5. *Actuarial Value of Present Assets* - the value of present ERS assets for valuation purposes. This value is calculated under a four-year phase-in of the excess (shortfall) between expected and actual income return.
6. *Actuarially Determined* - values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
7. *Decrement* - those types of activities by members of the ERS which cause them no longer to be members, i.e., death, retirement, disability, and withdrawal. It is a general term referring to any or all of these membership-terminating events.
8. *Defined Benefits* - in a retirement plan, benefits which are defined by a specific formula applied to specific member compensation and/or specific years of service. The amount of the benefit is not a function of contributions or actual earnings on those contributions.
9. *Defined Contributions* - in a retirement plan, periodic contributions to the plan which are defined as a specific percent of compensation.

10. *Experience Study* - a periodic review and analysis of the actual experience of the ERS which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
11. *Funding Period* - the number of years in the future that will be required to fund (i.e., pay off or eliminate) the unfunded actuarial accrued liability, based on the actuarial assumptions and assuming no future actuarial gains or losses.
12. *Future Benefits* - benefits specified in the law which will become payable at some time in the future when the member satisfies the requirement to receive such benefits.
13. *Future Contributions* - contributions to be made by the member or the employers in the future.
14. *Normal Cost* - the actuarial cost to fund the benefits provided by the ERS were the funding to begin at date of hire.
15. *Present Value* - the actuarially determined lump sum value as of the valuation date of a series of payments to be made in the future, where the lump sum value is equal to the sum of the discounted value of each future payment. The discounted value of each payment is the product of (a) the amount of the payment, (b) the probability that the payment will be made (based on the current actuarial assumptions as to future experience), and (c) the time value of money (based on the current assumed interest rate).
16. *Unfunded Actuarial Accrued Liability* - that portion of the actuarial accrued liability (including the present value of benefits presently being paid to retired members) that exceeds the value of current assets.
17. *Covered Payroll* - the total annualized payroll of active members as of the valuation date. Used to project individual members pay and benefits.
18. *Projected Payroll for Contributions Purposes* - The aggregate projected payroll for the fiscal year following the valuation date is calculated by increasing the actual payroll paid during the previous fiscal year by the payroll growth rate and multiplying by the ratio of current active members to the average number of active members during the previous fiscal year.