

**EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF  
HAWAII**

REPORT TO BOARD OF TRUSTEES ON THE 90<sup>TH</sup> ANNUAL  
ACTUARIAL VALUATION

FOR THE YEAR ENDING JUNE 30, 2015

January 21, 2016

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, 2015**

We certify that the information contained in the 2015 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, 2015. 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. 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.

#### **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 cost plus the level percentage of payroll required to amortize the unfunded actuarial accrued liability (UAAL) over a period not in excess of 30 years.

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

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 62.2% and this is higher than the funded ratio from the previous valuation. In fact, the funded ratio has now increased for three straight valuations.

The 2011 Legislature made significant changes to the future employer contribution rates. The employer contribution rate for Police and Fire employees will increase to 25.00% in FY2016, and the employer contribution rate for All Other Employees will increase to 17.00% in FY2016. The contribution rates are then expected to stay at those levels until the System is fully funded. The Legislature also 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 assumes that all amortization payments in the future will be the same percentage of pay as in the current year.

We have determined that the funding period for paying off the UAAL of the System (in aggregate) is 26 years. Because this period does not exceed 30 years, the financing objectives of ERS are currently being realized. (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.)

The actuarial accrued liability, the unfunded actuarial accrued liability (UAAL), and the determination of the resulting funding period illustrate the progress toward the realization of financing objectives. The System's UAAL was expected to increase from the prior year based on the three-year phase-in into the 7.5% investment return assumption beginning with this valuation. In addition, the System had a liability experience gain which was caused by favorable experience compared to the assumptions. However, the gains were offset by the losses due to change in actuarial assumptions. As a result, the UAAL grew based on this actuarial valuation as

of June 30, 2015, ERS's underfunded status as measured by the UAAL is now \$8.775 billion.

Because of the less favorable investment performance in FY2015, the System is now deferring only \$42 million in investment gains (compared with \$561 million in deferred gains last year). If there are no significant investment gains or other actuarial gains over the next two years, the funded status of the System would be expected to decrease, as the remaining phase-in to the lower investment return assumption continues. Thereafter, the funded status would be expected to improve.

Thus, given the plan's contribution allocation procedure and the new tier of benefits, if all actuarial assumptions are met (including the assumption of the plan earning 7.65% 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 2023, and then begin to decrease
5. The unfunded actuarial accrued liability will be fully amortized after 26 years, and
6. In the absence of benefit improvements, the funded ratio should increase over time, until it reaches 100%.

## **BENEFIT PROVISIONS AND LEGISLATIVE CHANGES**

This is the third 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 System.

## **ASSUMPTIONS AND METHODS**

The actuarial assumptions used were adopted by the Board in December of 2010 based on the recommendations provided by an Experience Study performed by GRS.

There have been no changes to the assumptions or methods since the prior valuation other than the investment return assumption. This is the first year of the three-year phase-in of the investment return assumption. The investment return rate decreased beginning in fiscal year 2016 to 7.65% and will continue to decrease to 7.55% in fiscal year 2017 and to 7.50% in fiscal year 2018 and remain at 7.5% thereafter. Further detail on the assumptions and methods may be found in Table 18 of this report.

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.

#### **DATA**

Member data for retired, active, and inactive participants was supplied as of March 31, 2015, 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 Comprehensive Annual Financial Report (CAFR). Information with respect to years prior to 2000 was supplied by ERS.

Tables and schedules in the Actuarial Section of the CAFR 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.

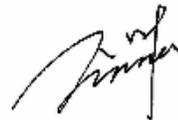
Sincerely,



Joseph P. Newton, FSA, EA  
Senior Consultant & Actuary



Lewis Ward  
Consultant



Linna Ye, ASA, MAAA  
Actuary

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## **SECTION A**

### **EXECUTIVE SUMMARY**

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### Executive Summary

The following table summarizes the key results of the June 30, 2015 actuarial valuation of the Employees' Retirement System of the State of Hawaii (ERS).

Item	2015	2014
<b>Membership</b>		
• Number of		
- Active members	67,310	67,206
- Retirees and beneficiaries	44,283	43,087
- Inactive, vested	7,413	8,105
- Total	119,006	118,398
• Covered payroll for active members	\$3,952.6 million	\$3,871.0 million
• Actual benefit payments and refunds	\$1,181.3 million	\$1,130.9 million
<b>Assets</b>		
• Actuarial (smoothed) value	\$14,463.7 million	\$13,641.8 million
• Market value	\$14,505.5 million	\$14,203.0 million
• Return on actuarial value	7.9%	9.2%
• Return on market value	3.9%	17.8%
• Employer contributions during fiscal year	\$717,792,981	\$653,127,697
• External cash flow %	(1.8%)	(2.0%)
<b>Actuarial Information</b>		
• Total normal cost % (employee + employer)	11.66%	10.96%
• Unfunded actuarial accrued liability (UAAL)	\$8,774.7 million	\$8,578.3 million
• Funded ratio (based on smoothed assets)	62.2%	61.4%
• Funded ratio (based on market assets)	62.4%	63.9%
• Funding period (years)*	26.0	26.0
• Employer contribution rate % of projected payroll** For FY beginning July 1	17.89%	17.28%

\* 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.

\*\* Weighted average of 25.0% Contribution Rate for Police and Firefighters and 17.0% Contribution Rate for All Other Employees for FY 2016, 24.0% and 16.5% respectively for FY 2015.

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**SECTION B**  
INTRODUCTION

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## **Introduction**

The results of the June 30, 2015 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 K contains the actuarial certification.

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

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**SECTION C**  
FUNDED STATUS

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## 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 \$27.0 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 20.39% of pay for Police and Fire employees and 10.53% for All Other employees. It includes all of the employees' contribution (if any) and the employers' normal cost rate.
- Last year, the impact of the new tier of benefits could be seen in the decline of the normal cost for Police and Fire Employees from the 2013 valuation to the 2014 valuation. However, the impact cannot be seen this year due to the lowering of the investment return assumption. The normal cost will likely increase each of the next two valuations as the phase-in of the investment return assumption change continues. After the phase-in is completed, we would expect the year-to-year decrease in the normal cost to resume.
- A part of the normal cost is paid by the employee contributions of 12.35% of pay for Police and Firefighters, leaving 8.04% of pay to be funded by the employers. Thus the current year's employer normal cost for Police and Firefighters is deemed to be 8.04% of the valuation payroll. As for the All Other Employees group, the average weighted effective employee contribution rate is 4.77% of pay, leaving 5.76% of pay to be funded by the employers. This is shown in Line 3 of Table 1.

- The UAAL is \$8.775 billion for 2015, an increase from \$8.578 billion in 2014. 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 System, we have assumed that the number of active members will remain constant in our open group projection.
- As shown in Item 10 of Table 1 and on Table 9c, the period to fund the UAAL is 27 years for Police and Fire and 25 years for the All Other Employees group. The aggregate funding period for ERS is 26 years. Since the aggregate funding period based on the contribution rates does not exceed 30 years, the rates are adequate to meet the requirements of Hawaii Revised Statutes §88-122(e)(1).

As of the valuation date, ERS has a funded ratio of 62.2%, 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 System. As shown on Table 9c, the System is expected to be fully funded in 2041 which is 26 years from now. Therefore, the funding period is equal to 26 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.

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## **SECTION D**

### **ANALYSIS OF CHANGES**

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## Analysis of Changes

Section C has noted that the unfunded actuarial accrued liability (UAAL) is \$8.775 billion as of June 30, 2015 compared to the \$8.578 billion UAAL for 2014.

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 7.75%.

As shown in Item 5 of Table 9b, the expected value of actuarial assets as of June 30, 2015 is \$14.450 billion. As developed in Table 6, the actual value of actuarial assets as of the valuation date is \$14.464 billion (as repeated in Item 6 of Table 9b). Thus the asset gain for the year is the difference between the actual value and the expected value, or \$13.9 million (as shown in Item 7). 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 7.85% (as shown in Item B4 of Table 7) being more than the assumed rate of return.

The actuarial asset valuation method is intended to smooth out year-to-year fluctuations in the market return. The expected actuarial value of assets is calculated and compared to the actual market value of assets. One fourth of the difference between these numbers is then recognized and added to the expected actuarial 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, as was the case this year. It is important to point out that the UAAL and the funded ratio disclosed in this report would be slightly different if measured on the market value instead of the actuarial value of assets. However, over time, the two values will converge.

After a favorable year in FY 2014, the investment markets did not do well FY 2015 with a return of 3.85% on the market value of assets. The rate of return for the actuarial value was 7.85%, which is more than the market return due to the smoothing methodology used in the determination of the actuarial value of assets. The market value of assets exceeds the actuarial value of assets by \$42 million, so there are \$42 million in deferred investment gains still to be recognized in the actuarial value of assets. Please note that as of the last valuation there was \$561 million in deferred gains, and almost all of the deferred investment gains were recognized or offset by investment losses in this valuation.

Table 9a indicates that there was an increase in the liabilities of the System of \$261 million due to the adoption of new actuarial assumptions. Since the total unanticipated change in the unfunded actuarial accrued liability was \$45.4 million (item 7), this means there was a total actuarial experience gain for the 2014/2015 plan year of \$215.8 million. As noted above, the actuarial investment gain was equal to \$13.9 million. This means that there was a liability gain during the year equal to \$202 million. This experience gain is primarily due to lower than expected salary increases for the non-police/fire employees.

Table 9c shows the current year's valuation results plus a 30-year open group projection of the System'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 reflects the changes made to the future employer contribution rates as well as the changes to the benefits and member contribution rates of employees hired after June 30, 2012. As may be seen by examining this table, unfunded liability of the System (Column 7) is expected to be eliminated in fiscal year 2041, which is 26 years from this valuation. Therefore, for the purpose of satisfying Hawaii Revised Statutes §88-122(e)(1) the funding period is considered to be 26 years.

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## **SECTION E**

### **ERS ASSETS**

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### **ERS Assets**

Table 4 presents a summary of the market value of assets held by the ERS. About 78% of the total assets available for benefits are held in equities (including alternative investments) and real estate compared to about 79% 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 method used, determines the actuarial value of assets as the expected actuarial value of assets plus 25% of the difference between the actual market value of assets and the expected actuarial value of assets.

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 3.85%, the return on the actuarial value was 7.85%. 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 prior year's assumed rate of 7.75%.

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

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**SECTION F**

**BENEFIT PROVISIONS**

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## Benefit Provisions

Table 16 summarizes the 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 System 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.

Legislation was also enacted in 2011 that impacted the employer contribution rates beginning in fiscal year 2013. The employer contribution rates for Police and Fire employees will increase according to the following schedule: 22.00% in FY2013, 23.00% in FY 2014, and 24.00% in FY 2015, and 25.00% in FY 2016 and beyond. The employer contribution rates for All Other Employees will increase according to the following schedule: 15.50% in FY2013, 16.00% in FY 2014, and 16.50% in FY 2015, and 17.00% in FY 2016 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 so transfer. The Hybrid class membership has since grown to more than 45,000 members.

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## **SECTION G**

### **GASB DISCLOSURE**

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**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.

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## **SECTION H**

### ACTUARIAL ASSUMPTIONS AND METHODS

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## **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.

There have been no changes to the assumptions or methods since the prior valuation other than the investment return assumption. This is the first year of the three-year phase-in of the investment return assumption. The investment return rate decreased beginning in fiscal year 2016 to 7.65% and will continue to decrease to 7.55% in fiscal year 2017 and to 7.50% in fiscal year 2018 and remain at 7.5% thereafter.

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

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## **SECTION I**

### **MEMBERSHIP DATA**

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## 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 2015, 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 increased by 104 members from 67,206 to 67,310. These 67,310 active members are distributed as follows:

Category	Number	% of Total
(1)	(2)	(3)
Police & Fire	5,044	7.5%
Contributory	1,125	1.7%
Noncontributory	16,023	23.8%
Hybrid Plan	<u>45,118</u>	<u>67.0%</u>
Total	67,310	100.00%

Covered payroll (which is the annualized pay for all active members on the census date) increased 2.1% since last year. ERS also provided the actual aggregate payroll for fiscal year 2015 on which contributions were received (this includes payroll for members who terminated and retired during the year). This aggregate payroll amount is adjusted by the payroll growth rate and the average growth in active membership during the year to produce the *projected FY 2016 payroll for contribution purposes*, as shown in Item 1 of Table 1.

Average age of the active members is 47.8 years as of June 30, 2015, compared to 47.8 years as of June 30, 2014, while average service decreased from 13.5 years to 13.2 years.

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## **SECTION J**

### SUMMARY AND CLOSING COMMENTS

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### Summary and Closing Comments

To summarize the results of the actuarial valuation of the Employees' Retirement System as of June 30, 2015, 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. The beginning of the phase-in to the lower discount rate has resulted in pushing out the year at which the plan is expected to be fully funded. Last year the ERS was expected to eliminate the unfunded liability of the System (be fully funded) in 2040 which was 26 years from the valuation date. This year's valuation shows that the ERS is expected to be fully funded in 2041, which is one year later than last year (this also happens to be 26 years from this year's valuation date). The funding period is less than the 30-year maximum period specified by Hawaii Revised Statute 88-122(e)(1).

The System is now deferring \$42 million in investment gains. In the absence of offsetting losses the funded position of the plan will increase faster than expected over the next several valuations as the deferred investment gains are recognized.

There are still concerns for the future. The key ones are as follow:

- The funded ratio based on the market value of assets is still only 62.3%.
- The current economic condition in the State. The overall levels of membership and payroll have direct impact on amount of contributions into the System. If payroll does not grow as assumed, then the contribution dollar amounts will not grow as anticipated.
- Nationally, recent trends in mortality improvement are substantially greater than in the prior decades. This trend may also be occurring in Hawaii. This may necessitate a change in the mortality assumption at the next experience study, which will be performed for the 5-year period ending June 30, 2015.
- The continued phase-in of the investment return assumption will result in increases in the normal cost and will likely further delay the expected date the plan will be fully funded.

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**SECTION K**

ACTUARIAL CERTIFICATION STATEMENT

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**Actuarial Certification Statement**

	Police and Firefighters June 30, 2015 <u>(1)</u>	All Other Employees June 30, 2015 <u>(2)</u>	All Employees June 30, 2015 <u>(3)</u>
1. Gross normal cost as a percentage of pay	20.39%	10.53%	11.66%
2. Present value of future benefits			
a. Active employees	\$ 2,805,781,787	\$ 11,326,967,582	\$ 14,132,749,369
b. Inactive members	53,622,806	531,915,906	585,538,712
c. Pensioners and beneficiaries	2,117,830,633	10,203,961,015	12,321,791,648
d. Total	<u>\$ 4,977,235,226</u>	<u>\$ 22,062,844,503</u>	<u>\$ 27,040,079,729</u>
3. Present value of future employee and employer contributions			
a. Present value of future normal costs	\$ 834,940,773	\$ 2,966,743,570	\$ 3,801,684,343
b. Present value of future employee contributions	<u>516,410,798</u>	<u>1,416,550,868</u>	<u>1,932,961,666</u>
c. Present value of future employer normal costs (Item 3a - Item 3b)	\$ 318,529,975	\$ 1,550,192,702	\$ 1,868,722,677
4. Actuarial accrued liability (Item 2d - Item 3a)	\$ 4,142,294,453	\$ 19,096,100,933	\$ 23,238,395,386
5. Actuarial value of assets			
a. Annuity Savings Fund	\$ 870,346,670	\$ 1,423,193,000	\$ 2,293,539,670
b. Pension Accumulation Fund	1,904,990,632	10,265,139,975	12,170,130,607
c. Total	<u>\$ 2,775,337,302</u>	<u>\$ 11,688,332,975</u>	<u>\$ 14,463,670,277</u>
6. Unfunded actuarial accrued liability	\$ 1,366,957,151	\$ 7,407,767,958	\$ 8,774,725,109
7. Adequacy of contribution rates			
a. Statutory Contribution Rate for Fiscal Year Fiscal Year 2016	25.00%	17.00%	17.89%
b. Funding Period in years as of June 30, 2015*	27	25	26

\* 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.

### Actuarial Certification Statement

The actuarial valuation as of June 30, 2015 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 on December 20, 2010 based on the actuary's actuarial experience investigation report covering the five-year period July 1, 2005 – June 30, 2010. The investment return assumption is formally adopted by the Board effective with the June 30, 2012 actuarial valuation (this assumption was previously prescribed by statute). The actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures.

In our opinion, the contributions required to meet 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  
Senior Consultant & Actuary

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## **SECTION L**

### **TABLES**

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**Development of Employer Cost**

	Police and Firefighters June 30, 2015 (1)	All Other Employees June 30, 2015 (2)	All Employees June 30, 2015 (3)
1. Projected FY 2016 payroll for contribution purposes	\$ 463,302,817	\$ 3,708,099,091	\$ 4,171,401,908
2. Gross normal cost (Table 3)	20.39%	10.53%	11.66%
3. Employer normal cost rate (Table 3)	8.04%	5.76%	6.02%
4. Present value future benefits (Table 2)	\$ 4,977,235,226	\$ 22,062,844,503	\$ 27,040,079,729
5. Present value future employer normal cost	\$ 318,529,975	\$ 1,550,192,702	\$ 1,868,722,677
6. Present value future employee contributions	\$ 516,410,798	\$ 1,416,550,868	\$ 1,932,961,666
7. Actuarial accrued liability (Item 4 - Item 5 - Item 6)	\$ 4,142,294,453	\$ 19,096,100,933	\$ 23,238,395,386
8. Actuarial value of assets	\$ 2,775,337,302	\$ 11,688,332,975	\$ 14,463,670,277
9. Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	\$ 1,366,957,151	\$ 7,407,767,958	\$ 8,774,725,109
10. Funding Period*	27	25	26

	Police and Firefighters June 30, 2014 (1)	All Other Employees June 30, 2014 (2)	All Employees June 30, 2014 (3)
1. Projected FY 2016 payroll for contribution purposes	\$ 414,605,839	\$ 3,577,034,439	\$ 3,991,640,278
2. Gross normal cost (Table 3)	19.47%	9.92%	10.96%
3. Employer normal cost rate (Table 3)	7.17%	5.34%	5.54%
4. Present value future benefits (Table 2)	\$ 4,585,596,643	\$ 21,138,433,912	\$ 25,724,030,555
5. Present value future employer normal cost	\$ 270,414,698	\$ 1,432,965,174	\$ 1,703,379,872
6. Present value future employee contributions	\$ 480,241,601	\$ 1,320,311,535	\$ 1,800,553,136
7. Actuarial accrued liability (Item 4 - Item 5 - Item 6)	\$ 3,834,940,344	\$ 18,385,157,203	\$ 22,220,097,547
8. Actuarial value of assets	\$ 2,584,963,114	\$ 11,056,792,186	\$ 13,641,755,300
9. Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	\$ 1,249,977,230	\$ 7,328,365,017	\$ 8,578,342,247
10. Funding Period*	29	26	26

\* 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. Please refer to Table 9c for the full projection.

**Actuarial Present Value of Future Benefits**

	Police and Firefighters June 30, 2015 (1)	All Other Employees June 30, 2015 (2)	All Employees June 30, 2015 (3)
1. Active members			
a. Service retirement benefits	\$ 2,665,186,345	\$ 10,240,759,922	\$ 12,905,946,267
b. Termination Benefits	85,772,444	731,959,892	817,732,336
c. Survivor benefits	42,053,042	255,744,079	297,797,121
d. Disability retirement benefits	12,769,956	98,503,689	111,273,645
e. Total	<u>\$ 2,805,781,787</u>	<u>\$ 11,326,967,582</u>	<u>\$ 14,132,749,369</u>
2. Retired members			
a. Service retirement	\$ 1,987,033,692	\$ 9,516,257,391	\$ 11,503,291,083
b. Disability retirement	29,157,877	180,700,290	209,858,167
c. Beneficiaries	101,639,064	507,003,334	608,642,398
d. Total	<u>\$ 2,117,830,633</u>	<u>\$ 10,203,961,015</u>	<u>\$ 12,321,791,648</u>
3. Inactive members			
a. Vested terminations	\$ 49,917,185	\$ 471,817,363	\$ 521,734,548
b. Nonvested terminations	3,705,621	60,098,543	63,804,164
c. Total	<u>\$ 53,622,806</u>	<u>\$ 531,915,906</u>	<u>\$ 585,538,712</u>
4. Total actuarial present value of future benefits	<u>\$ 4,977,235,226</u>	<u>\$ 22,062,844,503</u>	<u>\$ 27,040,079,729</u>

	Police and Firefighters June 30, 2014 (1)	All Other Employees June 30, 2014 (2)	All Employees June 30, 2014 (3)
1. Active members			
a. Service retirement benefits	\$ 2,414,882,084	\$ 10,014,902,083	\$ 12,429,784,167
b. Termination Benefits	80,450,842	705,704,501	786,155,343
c. Survivor benefits	38,550,200	246,300,570	284,850,770
d. Disability retirement benefits	11,625,004	94,535,318	106,160,322
e. Total	<u>\$ 2,545,508,130</u>	<u>\$ 11,061,442,472</u>	<u>\$ 13,606,950,602</u>
2. Retired members			
a. Service retirement	\$ 1,889,621,754	\$ 9,032,484,732	\$ 10,922,106,486
b. Disability retirement	29,733,132	171,580,522	201,313,654
c. Beneficiaries	90,093,421	459,474,185	549,567,606
d. Total	<u>\$ 2,009,448,307</u>	<u>\$ 9,663,539,439</u>	<u>\$ 11,672,987,746</u>
3. Inactive members			
a. Vested terminations	\$ 28,085,050	\$ 369,301,164	\$ 397,386,214
b. Nonvested terminations	2,555,156	44,150,837	46,705,993
c. Total	<u>\$ 30,640,206</u>	<u>\$ 413,452,001</u>	<u>\$ 444,092,207</u>
4. Total actuarial present value of future benefits	<u>\$ 4,585,596,643</u>	<u>\$ 21,138,433,912</u>	<u>\$ 25,724,030,555</u>

**Analysis of Normal Cost**

	Police and Firefighters June 30, 2015 <u>(1)</u>	All Other Employees June 30, 2015 <u>(2)</u>	All Employees June 30, 2015 <u>(3)</u>
1. Normal cost as a percent of pay			
a. Service retirement benefits	17.56%	8.00%	9.10%
b. Deferred termination benefits	0.84%	0.69%	0.71%
c. Refunds	1.32%	1.36%	1.35%
d. Disability retirement benefits	0.18%	0.17%	0.17%
e. Survivor benefits	0.49%	0.31%	0.33%
f. Total	<u>20.39%</u>	<u>10.53%</u>	<u>11.66%</u>
2. Employee contribution rate	12.35%	4.77%	5.64%
3. Effective employer normal cost rate (Item 1f - Item 2)	8.04%	5.76%	6.02%

	Police and Firefighters June 30, 2014 <u>(1)</u>	All Other Employees June 30, 2014 <u>(2)</u>	All Employees June 30, 2014 <u>(3)</u>
1. Normal cost as a percent of pay			
a. Service retirement benefits	16.66%	7.43%	8.43%
b. Deferred termination benefits	0.78%	0.67%	0.68%
c. Refunds	1.39%	1.36%	1.37%
d. Disability retirement benefits	0.17%	0.16%	0.16%
e. Survivor benefits	0.47%	0.30%	0.32%
f. Total	<u>19.47%</u>	<u>9.92%</u>	<u>10.96%</u>
2. Employee contribution rate	12.30%	4.58%	5.42%
3. Effective employer normal cost rate (Item 1f - Item 2)	7.17%	5.34%	5.54%

**Plan Net Assets**  
**(Assets at Market or Fair Value)**

Item	Valuation as of	
	June 30, 2015	June 30, 2014
1. Cash and cash equivalents	\$ 656,459,323	\$ 421,279,485
2. Receivables:		
a. Accounts receivable and others	\$ 7,436,038	\$ 8,509,083
b. Investment sale proceeds	93,202,906	77,605,229
c. Accrued income	45,817,527	42,264,207
d. Employer contributions	67,055,380	55,910,549
e. Member contributions	-	5,464,431
f. Subtotal	<u>\$ 213,511,851</u>	<u>\$ 189,753,499</u>
3. Investments		
a. Equity securities	\$ 9,261,462,836	\$ 9,450,253,187
b. Fixed income securities	2,807,089,435	2,669,398,695
c. Real estate investments	1,188,494,377	1,192,580,996
d. Real estate mortgages	-	-
e. Alternative investments	888,218,644	751,113,517
f. Subtotal	<u>\$ 14,145,265,292</u>	<u>\$ 14,063,346,395</u>
4. Other		
a. Invested securities lending collateral	\$ 1,232,818,935	\$ 1,233,104,953
b. Equipment at cost, net of depreciation	8,297,696	10,104,068
c. Other assets	-	-
d. Subtotal	<u>\$ 1,241,116,631</u>	<u>\$ 1,243,209,021</u>
5. Total assets	\$ 16,256,353,097	\$ 15,917,588,400
6. Liabilities		
a. Bank overdraft	\$ -	\$ -
b. Accounts payable	50,822,998	48,127,972
c. Investment commitments payable	219,884,122	182,232,054
d. Due to employers	-	-
e. Securities lending collateral	1,232,818,935	1,233,104,953
f. Notes payable	247,362,486	251,108,118
g. Total liabilities	<u>\$ 1,750,888,541</u>	<u>\$ 1,714,573,097</u>
7. Total market value of assets available for benefits (Item 5 - Item 6g)	\$ 14,505,464,556	\$ 14,203,015,303

**Reconciliation of Plan Net Assets**

	Year Ending	
	June 30, 2015	June 30, 2014
1. a. Value of assets at beginning of year	\$ 14,203,015,303	\$12,357,825,626
b. Adjustment due to post valuation changes in CAFR assets	-	(45,997,676)
c. Adjusted value of assets at beginning of year	\$ 14,203,015,303	\$12,311,827,950
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 223,505,419	\$ 206,127,337
ii. Employer contributions	717,792,981	653,127,697
iii. Total	\$ 941,298,400	\$ 859,255,034
b. Income		
i. Interest, dividends, and other income	\$ 370,265,240	\$ 407,762,710
ii. Investment expenses	(44,844,759)	(34,096,053)
iii. Net	\$ 325,420,481	\$ 373,666,657
c. Net realized and unrealized gains (loss)	\$ 231,015,994	\$ 1,801,813,303
d. Net income (loss)	\$ 556,436,475	\$ 2,175,479,960
e. Total revenue	\$ 1,497,734,875	\$ 3,034,734,994
3. Expenditures for the year		
a. Refunds	\$ 10,507,888	\$ 8,475,969
b. Benefit payments	1,170,744,770	1,122,445,642
c. Administrative and miscellaneous expenses	14,032,964	12,626,030
d. Total expenditures	\$ 1,195,285,622	\$ 1,143,547,641
4. Increase (decrease) in net assets (Item 2e - Item 3d)	\$ 302,449,253	\$ 1,891,187,353
5. Value of assets at end of year (Item 1c + Item 4)	\$ 14,505,464,556	\$14,203,015,303

**Development of Actuarial Value of Assets**

	Year Ending June 30, 2015	Year Ending June 30, 2014
1. Actuarial value of assets, beginning of year	\$ 13,641,755,300	\$ 12,748,828,110
2. Net new investments		
a. Contributions	\$ 941,298,400	\$ 859,255,034
b. Benefits paid	(1,170,744,770)	(1,122,445,642)
c. Refunds	(10,507,888)	(8,475,969)
d. Subtotal	<u>(239,954,258)</u>	<u>(271,666,577)</u>
3. Market value of assets at end of year	\$ 14,505,464,556	\$ 14,203,015,303
4. Expected return on actuarial value of assets	\$ 1,047,937,808	\$ 977,507,099
5. Expected actuarial value of assets, end of year	\$ 14,449,738,850	\$ 13,454,668,632
6. Excess/(shortfall) return (Item 3-Item 5)	\$ 55,725,706	\$ 748,346,671
7. Excess/(shortfall) recognized (25% of Item 6)	\$ 13,931,427	\$ 187,086,668
8. Actuarial value of assets as of June 30, 2015 (Item 5 + Item 7)	\$ 14,463,670,277	\$ 13,641,755,300
9. Ratio of actuarial value to market value	99.7%	96.0%
10. Remaining deferred Excess/(shortfall) (Item 6 - Item 7)	\$ 41,794,279	\$ 561,260,003

**Estimation of Yields**

	June 30, 2015 (1)	June 30, 2014 (2)
<b>A. Market value yield</b>		
1. Beginning of year market assets	\$14,203,015,303	\$12,311,827,950
2. Investment income		
a. Change in assets (Item 3 - Item 1)	\$ 302,449,253	\$ 1,891,187,353
b. Cash Flow (excluding expenses)	(239,954,258)	(271,666,577)
c. Total investment income based on market value (Item 2a less Item 2b)	\$ 542,403,511	\$ 2,162,853,930
3. End of year market assets	\$14,505,464,556	\$14,203,015,303
4. Estimated dollar weighted market value yield (net of investment and administrative expenses)	3.85%	17.76%
<b>B. Actuarial value yield</b>		
1. Beginning of year actuarial assets	\$13,641,755,300	\$12,748,828,110
2. Investment income (based on asset valuation method)		
a. Change in assets (Item 3 - Item 1)	\$ 821,914,977	\$ 892,927,190
b. Cash Flow	(239,954,258)	(271,666,577)
c. Total investment income based on market value (Item 2a less Item 2b)	\$ 1,061,869,235	\$ 1,164,593,767
3. End of year actuarial assets	\$14,463,670,277	\$13,641,755,300
4. Estimated actuarial value yield (net of investment and administrative expenses)	7.85%	9.23%

**Allocation of Cash and Investments**

	<u>June 30, 2015</u>	<u>June 30, 2014</u>
	(1)	(2)
1. Cash and short-term equivalents	4.4%	2.9%
2. Fixed income securities	19.0%	18.4%
3. Equity securities	62.6%	65.3%
4. Real estate	8.0%	8.2%
5. Other	<u>6.0%</u>	<u>5.2%</u>
6. Total investments	100.0%	100.0%

**Total Experience Gain or Loss**

Item (1)	Police and Firefighters (2)	All Other Employees (3)	All Employees (4)
A. Calculation of total actuarial gain or loss			
1. Unfunded actuarial accrued liability (UAAL), as of June 30, 2014	\$ 1,249,977,230	\$ 7,328,365,017	\$ 8,578,342,247
2. Normal cost for the year (employer and employee)	\$ 87,074,377	\$ 359,502,404	\$ 446,576,781
3. Less: contributions and assessments for the year	\$ (167,976,588)	\$ (773,321,812)	\$ (941,298,400)
4. Interest at 7.75 %			
a. On UAAL	\$ 96,873,235	\$ 567,948,289	\$ 664,821,524
b. On normal cost	3,374,132	13,930,718	17,304,850
c. On contributions	(6,509,093)	(29,966,220)	(36,475,313)
d. Total	\$ 93,738,274	\$ 551,912,787	\$ 645,651,061
5. Expected UAAL as of June 30, 2015 (Sum of Items 1 - 4)	\$ 1,262,813,293	\$ 7,466,458,396	\$ 8,729,271,689
6. Actual UAAL as of June 30, 2015	\$ 1,366,957,151	\$ 7,407,767,958	\$ 8,774,725,109
7. Total gain (loss) for the year (Item 5 - Item 6)	\$ (104,143,858)	\$ 58,690,438	\$ (45,453,420)
B. Source of gains and losses			
8. Asset gain (loss) for the year (Table 9b)	\$ 2,673,209	\$ 11,258,218	\$ 13,931,427
9. Gain (loss) due to change in actuarial assumptions	(48,547,003)	(212,666,538)	(261,213,541)
10. Gain (loss) due to change in actuarial method	-	-	-
11. Other liability gain (loss)	(58,270,064)	260,098,758	201,828,694
12. Change in benefit provisions	-	-	-
13. Total gain (loss) for the year	\$ (104,143,858)	\$ 58,690,438	\$ (45,453,420)

**Investment Experience Gain or Loss**

Item (1)	June 30, 2015 (2)	June 30, 2014 (3)
1. Actuarial assets, beginning of year	\$ 13,641,755,300	\$ 12,748,828,110
2. Total contributions during year	\$ 941,298,400	\$ 859,255,034
3. Benefits and refunds paid	\$ (1,181,252,658)	\$ (1,130,921,611)
4. Assumed net investment income at 7.75%		
a. Beginning of year assets	\$ 1,057,236,035	\$ 988,034,178
b. Contributions	36,475,313	33,296,133
c. Benefits and refunds paid	(45,773,540)	(43,823,212)
d. Total	\$ 1,047,937,808	\$ 977,507,099
5. Expected actuarial assets, end of year (Sum of items 1 through 4)	\$ 14,449,738,850	\$ 13,454,668,632
6. Actual actuarial assets, end of year	\$ 14,463,670,277	\$ 13,641,755,300
7. Asset gain (loss) for year (Item 6 - Item 5)	\$ 13,931,427	\$ 187,086,668
8. Asset gain (loss) as a percent of actuarial value of assets, end of year (Item 7 / Item 6)	0.10%	1.37%

**Projection Results Based on June 30, 2015 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)
2015	17.89%	\$ 4,171.4	\$ 746	\$ 23,238	\$ 14,464	\$ 8,775	62.2%
2016	17.89%	4,263.9	763	24,142	15,226	8,916	63.1%
2017	17.89%	4,371.9	782	25,085	16,037	9,048	63.9%
2018	17.89%	4,489.1	803	26,023	16,856	9,167	64.8%
2019	17.89%	4,616.3	826	26,953	17,684	9,269	65.6%
2020	17.89%	4,752.4	850	27,878	18,526	9,353	66.5%
2021	17.89%	4,896.3	876	28,797	19,383	9,414	67.3%
2022	17.89%	5,048.5	903	29,708	20,258	9,450	68.2%
2023	17.89%	5,210.4	932	30,613	21,155	9,458	69.1%
2024	17.88%	5,380.7	962	31,512	22,078	9,433	70.1%
2025	17.88%	5,560.0	994	32,405	23,032	9,373	71.1%
2026	17.88%	5,747.6	1,027	33,292	24,020	9,272	72.1%
2027	17.87%	5,944.2	1,062	34,172	25,046	9,126	73.3%
2028	17.87%	6,150.4	1,099	35,047	26,116	8,931	74.5%
2029	17.87%	6,367.2	1,138	35,917	27,238	8,679	75.8%
2030	17.87%	6,594.1	1,178	36,786	28,420	8,366	77.3%
2031	17.87%	6,831.7	1,221	37,654	29,670	7,984	78.8%
2032	17.86%	7,079.9	1,265	38,524	30,997	7,526	80.5%
2033	17.86%	7,339.3	1,311	39,397	32,412	6,986	82.3%
2034	17.86%	7,611.4	1,360	40,279	33,925	6,354	84.2%
2035	17.87%	7,896.3	1,411	41,173	35,552	5,621	86.3%
2036	17.87%	8,193.4	1,464	42,082	37,305	4,777	88.6%
2037	17.87%	8,504.4	1,520	43,013	39,200	3,813	91.1%
2038	17.87%	8,830.4	1,578	43,969	41,253	2,715	93.8%
2039	17.87%	9,171.0	1,639	44,956	43,483	1,473	96.7%
2040	17.87%	9,526.7	1,703	45,980	45,908	72	99.8%
2041	17.88%	9,897.4	1,769	47,047	48,550	(1,503)	103.2%
2042	17.88%	10,284.2	1,839	48,163	51,429	(3,266)	106.8%
2043	17.88%	10,687.3	1,911	49,333	54,569	(5,236)	110.6%
2044	17.88%	11,107.5	1,986	50,565	57,994	(7,429)	114.7%

Projection assumes all assumptions exactly met, including a 7.65% annual return on the current actuarial value of assets.

**Employer Covered Payroll**

	Police and Firefighters		All Other Employees		All Employees	
	March 31, 2015 (1)	March 31, 2014 (2)	March 31, 2015 (3)	March 31, 2014 (4)	March 31, 2015 (5)	March 31, 2014 (6)
State of Hawaii	\$ 18,291,445	\$ 15,825,252	\$ 2,936,749,528	\$ 2,894,093,727	\$ 2,955,040,973	\$ 2,909,918,979
City & County of Honolulu	268,669,616	250,908,710	311,186,022	308,936,385	579,855,638	559,845,095
Board of Water Supply	-	-	32,996,367	33,411,383	32,996,367	33,411,383
County of Hawaii	67,752,957	62,796,259	89,977,778	85,763,414	157,730,735	148,559,673
County of Maui	58,156,017	53,484,544	94,295,056	92,251,101	152,451,073	145,735,645
County of Kauai	25,286,077	23,412,506	49,272,169	50,152,804	74,558,246	73,565,310
Total All Employers	\$ 438,156,112	\$ 406,427,271	\$ 3,514,476,920	\$ 3,464,608,814	\$ 3,952,633,032	\$ 3,871,036,085

## 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, 2000	\$ 9,204.7	\$ 9,698.9	\$ 494.2	94.9%	\$ 2,275.3	21.7%
June 30, 2001	9,516.0	10,506.9	991.0	90.6%	2,444.2	40.5%
June 30, 2002	9,415.2	11,210.2	1,795.1	84.0%	2,671.7	67.2%
June 30, 2003	9,074.0	11,952.1	2,878.1	75.9%	2,826.7	101.8%
June 30, 2004	8,797.1	12,271.3	3,474.2	71.7%	2,865.1	121.3%
June 30, 2005	8,914.8	12,986.0	4,071.1	68.6%	3,041.1	133.9%
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%

Note : Dollar amounts in millions.

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

\*\* New assumption effective on valuation date.

**Membership Data**

	Police and Firefighters		All Other Employees		All Employees	
	June 30, 2015	June 30, 2014	June 30, 2015	June 30, 2014	June 30, 2015	June 30, 2014
	(1)	(2)	(3)	(4)	(5)	(6)
1. Active members						
a. Number	5,044	5,006	62,266	62,200	67,310	67,206
b. Total salary	\$ 438,156,112	\$ 406,427,272	\$ 3,514,476,920	\$ 3,464,608,815	\$ 3,952,633,032	\$ 3,871,036,087
c. Average salary	\$ 86,867	\$ 81,188	\$ 56,443	\$ 55,701	\$ 58,723	\$ 57,600
d. Average age	42.3	42.0	48.3	48.2	47.8	47.8
e. Average service	14.2	14.1	13.1	13.5	13.2	13.5
2. Inactive members						
a. Number	361	245	7,052	7,860	7,413	8,105
b. Total annual deferred benefits	\$ 5,620,538	\$ 3,886,865	\$ 67,095,426	\$ 57,116,099	\$ 72,715,964	\$ 61,002,964
c. Average annual deferred benefit	\$ 15,569	\$ 15,865	\$ 9,514	\$ 7,267	\$ 9,809	\$ 7,527
3. Service retirees						
a. Number	3,267	3,238	35,796	34,866	39,063	38,104
b. Total annual benefits	\$ 164,846,594	\$ 157,342,660	\$ 898,802,303	\$ 855,752,432	\$ 1,063,648,897	\$ 1,013,095,092
c. Average annual benefit	\$ 50,458	\$ 48,593	\$ 25,109	\$ 24,544	\$ 27,229	\$ 26,588
4. Disabled retirees						
a. Number	135	146	1,459	1,430	1,594	1,576
b. Total annual benefits	\$ 2,780,590	\$ 2,859,902	\$ 17,951,655	\$ 16,975,618	\$ 20,732,245	\$ 19,835,520
c. Average annual benefit	\$ 20,597	\$ 19,588	\$ 12,304	\$ 11,871	\$ 13,006	\$ 12,586
5. Beneficiaries						
a. Number	270	248	3,356	3,159	3,626	3,407
b. Total annual benefits	\$ 9,105,407	\$ 8,015,198	\$ 50,132,644	\$ 45,309,054	\$ 59,238,051	\$ 53,324,252
c. Average annual benefit	\$ 33,724	\$ 32,319	\$ 14,938	\$ 14,343	\$ 16,337	\$ 15,651

**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)
1995	58,498	-0.7%	\$ 2,083.0	2.6%	\$ 35,608	3.3%		
1996	56,985	-2.6%	1,990.1	-4.5%	34,923	-1.9%		
1997	57,044	0.1%	2,019.3	1.5%	35,399	1.4%		
1998	57,797	1.3%	2,135.9	5.8%	36,955	4.4%		
1999	58,387	0.9%	2,186.5	2.4%	37,448	1.3%		
2000	59,191	1.4%	2,275.3	4.1%	38,440	2.6%	45.5	13.0
2001	59,992	1.4%	2,350.2	3.3%	39,175	1.9%	45.6	13.3
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

## 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)
2004	\$ 55.1	\$ 235.7	\$ 290.8	\$ (636.2)	\$ (2.3)	\$ (10.5)	\$ (649.0)	\$ (358.2)	\$ 8,565.4	(4.2%)
2005	57.1	328.7	385.8	(676.3)	(3.4)	(7.3)	(687.0)	(301.2)	9,195.9	(3.3%)
2006	56.3	423.4	479.7	(720.5)	(2.5)	(8.5)	(731.5)	(251.8)	9,932.4	(2.5%)
2007	144.7	454.5	599.2	(761.0)	(3.5)	(9.6)	(774.1)	(174.9)	11,434.3	(1.5%)
2008	163.4	488.8	652.2	(792.3)	(3.7)	(10.7)	(806.7)	(154.5)	10,846.8	(1.4%)
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%)

Amounts in \$ millions

<sup>1</sup> Excludes investment expenses

<sup>2</sup> Column (9) = Column (4) + Column (8)

**Solvency Test**

	<u>June 30, 2015</u>	<u>June 30, 2014</u>
	(1)	(2)
1. Actuarial accrued liability (AAL)		
a. Active member contributions	\$ 1,981,835,121	\$ 1,812,870,083
b. Retirees and beneficiaries	12,321,791,648	11,672,987,746
c. Active and inactive members	<u>8,934,768,617</u>	<u>8,734,239,718</u>
d. Total	\$ 23,238,395,386	\$ 22,220,097,547
2. Actuarial value of assets	\$ 14,463,670,277	\$ 13,641,755,300
3. Cumulative portion of AAL covered		
a. Active member contributions	100%	100%
b. Retirees and beneficiaries	100%	100%
c. Active and inactive members	2%	2%

**Highlights of Last Five Annual Actuarial Valuations**  
2011 through 2015

Item	Valuation Date: June 30				
	2011	2012	2013	2014	2015
Number of active members	65,310	65,599	66,226	67,206	67,310
Number of inactive members	6,649	6,909	7,312	8,105	7,413
Number of pensioners	36,871	37,830	38,741	39,680	40,657
Number of beneficiaries	2,818	2,944	3,071	3,407	3,626
Average monthly contributory plan pension amount	\$ 2,221	\$ 2,315	\$ 2,414	\$ 2,508	\$ 2,621
Average monthly noncontributory plan pension amount	\$ 1,509	\$ 1,538	\$ 1,562	\$ 1,585	\$ 1,611
Average monthly hybrid plan pension amount	\$ 2,055	\$ 2,090	\$ 2,092	\$ 2,088	\$ 2,114
Average monthly beneficiary amount	\$ 1,188	\$ 1,219	\$ 1,247	\$ 1,304	\$ 1,361
Total actuarial value of assets (\$millions)	\$ 11,943	\$ 12,242	\$ 12,749	\$ 13,642	\$ 14,464
Unfunded actuarial accrued liability (\$millions)	\$ 8,154.2	\$ 8,440.9	\$ 8,494.9	\$ 8,578.3	\$ 8,774.7
Funding Period (in years) <sup>(1)</sup>	25.0	30.0	28.0	26.0	26.0
Item (Dollar amounts in millions)	Fiscal Year				
	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Employer contributions <sup>(2)</sup>	\$ 534.9	\$ 548.4	\$ 581.4	\$ 653.1	\$ 717.8

<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 with the fiscal year beginning July 1, 2005 a dollar contribution amount is not determined under the provisions of Act 181/2004. Instead a fixed percentage of payroll is contributed (15.75% for Police and Fire, 13.75% for All Others). Beginning July 1, 2008, the percentages increased to 19.70% for Police and Fire, 15.00% for All Others. Beginning July 1, 2012, the percentages increased to 22.0% for Police and Fire, 15.5% for All Others. Beginning July 1, 2013, the percentages increased to 23.0% for Police and Fire, 16.0% for All Others. Beginning July 1, 2014, the percentages increased to 24.0% for Police and Fire, 16.5% for All Others.

**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.)

	<u>Noncontributory</u>	<u>Contributory</u>	<u>Hybrid</u>
<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.

	<u>Noncontributory</u>	<u>Contributory</u>	<u>Hybrid</u>
<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% AFC)	1 ¾% of AFC times years of credited service, unreduced for age  (Minimum is 30% AFC)	2% of AFC times years of credited service, unreduced for age, split formula for unconverted noncontributory service at 1 ¼% (Minimum is 25% 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.

	<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>

	<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>

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.

**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.)

	<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%

	<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 ¾% of AFC times years of credited service, unreduced for age (Minimum is 30% AFC)	3.0% of AFC times years of credited service, unreduced for age (Minimum is 30% AFC)	1 ¾% of AFC times years of credited service, unreduced for age (Minimum is 25% 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.

	<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	Lump sum payment of member's contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; or  Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or  Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated	Lump sum payment of member's contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; or  Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or  Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated	Return of member's Hybrid contributions and interest; or  Option 3 (50% Joint Survivor) lifetime benefit if credited with at least 10 years of service and one beneficiary designated; or  Option 2 (100% Joint Survivor) lifetime monthly benefit if member was eligible for service retirement at time of death, and one beneficiary designated

	<b>Contributory (for Police Fire)</b>	<b>Contributory (for Judges/Elected Officers)</b>	<b>Hybrid</b>
<b>Service-Connected Death</b>			
Eligibility	Any age or service	Any age or service	Any age or service
Benefit	Same for all members.		
	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);		
	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.		
	If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.		

**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.

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.

## 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 179, effective July 1, 2004**

This Act increased the Noncontributory service-connected disability formula to 35% of average final compensation. The Act also changed the methodology for crediting interest on contributions for terminated members so that interest continues to accrue until the date of refund. The Act adds a “pop-up” feature to the joint & survivor benefit options if the beneficiary pre-deceases the retiree.

This Act also created the new Hybrid class which became effective July 1, 2006.

**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.

**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 System'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 System. 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.

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 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.

#### **Act 153, 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.

## Summary of Actuarial Methods and Assumptions

Basis for assumption setting: The actuarial assumptions are based on the most recent experience study dated December 20, 2010. Between experience studies, the Board elected to lower the investment return assumption effective with the June 30, 2015 valuation.

### *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 VIII of this table for a description of the new entrant profile used in the open group projection.

IV. Actuarial Value of Assets

The actuarial value of assets is equal to the expected actuarial value of assets plus 25% of the difference between the actual market value of assets and the expected actuarial value of assets. The expected actuarial value of assets is calculated net of investment and administrative 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. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.65% per year, compounded annually, composed of an assumed 3.00% inflation rate and a 4.65% net real rate of return **(effective June 30, 2015)**.
2. Payroll growth rate: 3.50% per annum **(effective June 30, 2006)**.
3. Salary increase rate **(effective June 30, 2011)**: As shown below

	General Employees		Teachers	
Years of Service	Service-related Component	Total Annual Rate of Increase Including 3.00% Inflation Component and 1.00% General Increase Rate	Service-related Component	Total Annual Rate of Increase Including 3.00% Inflation Component and 1.50% General Increase Rate
(1)	(2)	(3)	(2)	(3)
1	4.00%	8.00%	4.00%	8.50%
2	3.00%	7.00%	3.25%	7.75%
3	2.00%	6.00%	2.50%	7.00%
4	1.25%	5.25%	2.00%	6.50%
5	1.00%	5.00%	1.50%	6.00%
6	0.75%	4.75%	1.00%	5.50%
7	0.50%	4.50%	1.00%	5.50%
8	0.50%	4.50%	0.75%	5.25%
9	0.50%	4.50%	0.75%	5.25%
10	0.25%	4.25%	0.75%	5.25%
11	0.25%	4.25%	0.50%	5.00%
12	0.25%	4.25%	0.50%	5.00%
13	0.25%	4.25%	0.50%	5.00%
14	0.25%	4.25%	0.50%	5.00%
15 or more	0.00%	4.00%	0.00%	4.50%

Police & Firefighters		
Years of Service	Service-related Component	Total Annual Rate of Increase Including 3.00% Inflation Component and 2.00% General Increase Rate
(1)	(2)	(3)
0	14.00%	19.00%
1	12.00%	17.00%
2 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.

B. Demographic Assumptions

1. Post-Retirement Mortality rates

General Employees (effective June 30, 2011)

- a. Healthy males – Client Specific Table for males, 89% multiplier.
- b. Healthy females - Client Specific Table for females, 89% multiplier.
- c. Disabled males - 1994 US Group Annuity Mortality Static Table for males set forward nine years.
- d. Disabled females - 1994 US Group Annuity Mortality Static Table for females set forward nine years.

Teachers

- a. Healthy males – Client Specific Table for male teachers, 65% multiplier (**effective June 30, 2011**).
- b. Healthy females - Client Specific Table for female teachers, 67% multiplier (**effective June 30, 2011**).
- c. Disabled males - 1994 US Group Annuity Mortality Static Table for males set forward five years (**effective June 30, 2011**).
- d. Disabled females - 1994 US Group Annuity Mortality Static Table for females set forward six years (**effective June 30, 2006**).

Police and Fire

- a. Healthy males – 1994 US Group Annuity Mortality Static Table for males, 85% multiplier (**effective June 30, 2006**).
- b. Healthy females - 1994 US Group Annuity Mortality Static Table for females, 85% multiplier (**effective June 30, 2006**).
- c. Disabled males - 1994 US Group Annuity Mortality Static Table for males set forward three years (**effective June 30, 2011**).
- d. Disabled females - 1994 US Group Annuity Mortality Static Table for females set forward three years (**effective June 30, 2011**).

Mortality Improvement: To account for future mortality improvement, the healthy mortality rates were chosen so that the assumed mortality rates are smaller than the rates observed in the most recent experience study (dated 12-20-2010). The margin at the time of the study was at least 7% for all groups (i.e. 7% more actual male deaths than expected). No future mortality improvement after the measurement date is assumed except as described above.

2. Pre-retirement Mortality Rates (**effective June 30, 2011**)

The male pre-retirement mortality rates are multiples of a table that has the RP-2000 Male Employee rates for ages 1 to 70 and the RP-2000 Combined Male rates for ages above 70. Similarly, the female pre-retirement rates are multiples of a table that has the RP-2000 Female Employee rates for ages 1 to 70 and the RP-2000 Combined Female rates for ages above 70. The following table shows the factors that are used in conjunction with the tables described above to derive the final ordinary and accidental death rates.

Type	General Employees		Teachers		Police and Fire	
	Males	Females	Males	Females	Males	Females
Ordinary	64%	48%	50%	40%	15%	15%
Accidental	16%	12%	10%	5%	35%	35%

3. Disability rates (**effective June 30, 2011**) – The assumed total disability rates for employees covered by the contributory class, hybrid class and the noncontributory class 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 vary by employee group as follows:

Type	General Employees		Teachers		Police and Fire
	Male	Female	Male	Female	Male & Female
Ordinary	135%	85%	50%	40%	70%
Duty	30%	7%	5%	5%	35%

4. Termination Rates (**effective June 30, 2011**) - Separate male and female rates, based on both age and service, developed from 2010 Experience Study. 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:

For first 6 years of service

Group	Expected Terminations per 100 Lives (Male Members)					
	Years of Service					
	0	1	2	3	4	5
General Employees	15.5	12.5	10.5	9.0	7.0	6.0
Teachers	33.0	23.0	15.0	13.0	11.0	9.0
Police & Fire	12.0	9.0	4.0	4.0	4.0	4.0

Group	Expected Terminations per 100 Lives (Female Members)					
	Years of Service					
	0	1	2	3	4	5
General Employees	18.5	16.5	12.5	10.0	8.0	7.0
Teachers	28.0	23.0	16.0	14.0	12.0	8.0
Police & Fire	12.0	9.0	4.0	4.0	4.0	4.0

After first 6 years of service

Age	Expected Terminations per 100 Lives				
	Years of Service				
	General Employees Males	General Employees Females	Teachers Males	Teachers Females	Police & Fire
(1)	(2)	(3)	(4)	(5)	(6)
20	7.15	8.12	6.22	7.12	2.03
25	6.50	7.83	4.98	6.72	1.91
30	5.46	5.84	4.12	6.15	2.53
35	4.40	4.04	3.95	4.99	2.75
40	3.60	3.30	3.60	3.70	2.01
45	3.02	2.65	2.88	2.88	1.18
50	2.54	2.41	2.34	2.36	0.79
55	2.52	2.41	2.34	2.36	0.24
60	2.52	2.41	2.34	2.36	0.00

5. Retirement rates (**effective June 30, 2011**) - Separate male and female rates, based on age, developed from the 2010 Experience Study. Sample rates are shown below:

Contributory or Hybrid

Age	Expected Retirements per 100 Lives				
	General Employees		Teachers		Police and Fire
	Male	Female	Male	Female	Male & Female
45	2	1	0	0	13
46	2	1	0	0	13
47	2	1	0	0	13
48	2	1	0	0	13
49	2	1	0	0	13
50	2	1	1	0	15
51	2	1	1	1	15
52	2	1	1	1	15
53	2	2	2	2	15
54	3	3	3	3	15
55	16	13	20	18	20
56	14	13	15	16	20
57	14	13	15	16	20
58	14	13	15	16	20
59	14	13	15	16	20
60	14	15	14	18	30
61	15	15	14	18	30
62	25	25	14	25	30
63	20	20	14	20	30
64	20	20	14	15	30
65	25	25	20	25	100
66	25	25	15	25	100
67	20	20	15	20	100
68	20	20	15	20	100
69	20	20	15	20	100
70	20	20	15	20	100
71	20	20	15	20	100
72	20	20	15	20	100
73	20	20	15	20	100
74	20	20	15	20	100
75	100	100	100	100	100

Retirement rates for 25 & out group ages 50-54 are 10% for both males and females

Noncontributory

Expected Retirements per 100 Lives

Age	General Employees				Teachers			
	Unreduced Retirement		Reduced Retirement		Unreduced Retirement		Reduced Retirement	
	Male	Female	Male	Female			Male	Female
55	13	12	2	2	10	13	2	3
56	13	12	2	2	10	13	2	3
57	13	12	2	2	10	14	2	3
58	13	12	2	2	10	15	2	3
59	13	12	3	3	10	16	3	3
60	14	15	4	4	10	17	5	5
61	14	18	5	5	10	18	10	5
62	25	25			16	25		
63	25	25			12	20		
64	20	20			10	18		
65	25	22			20	30		
66	25	22			15	25		
67	25	22			15	25		
68	25	22			15	25		
69	25	22			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		

Retirement rates for the 25 & out group ages 50-54 are 10% for both males and females

For Hybrid class, early retirement rates are reduced by a factor of 10% for each year prior to age 65 (if hired after June 30, 2012) or 62 (if hired before July 1, 2012) for a maximum of 10 years.

Normal retirement rates for those hired after June 30, 2012 are increased by a factor of 10% for each year the member's first eligible normal retirement age is beyond the first eligible normal retirement age if he is hired before July 1, 2012. For Police/Fire, this factor will be 20% each year.

C. Other Assumptions

1. Projected Payroll for Contributions Purposes (**effective June 30, 2014**): 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.
2. Percent married (**effective June 30, 2006**): 77% of male employees and 57.6% of female employees are assumed to be married.
3. Age difference (**effective June 30, 2006**): 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.
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. 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.
6. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt when eligible for early retirement.
7. Administrative expenses (**effective June 30, 2011**): The assumed investment return rate represents the anticipated net return after payment of all investment and administrative expenses. For purposes of determining the investment return assumption administrative expenses are assumed to be equal to 40 basis points of each year's investment return.
8. 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.
9. 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	3.75%
Teachers	4.25%
Police and Fire	5.00%

10. COLA delay: It is assumed that the first COLA will be received 9 months after retirement. Teachers are assumed to receive the first COLA 12 months after retirement.
11. There will be no recoveries once disabled.
12. No surviving spouse will remarry and there will be no children's benefit.
13. 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.
14. 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.
15. 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.
16. Decrement relativity: Decrement rates are used directly from the Experience Study, without adjustment for multiple decrement table effects.
17. 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.
18. 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.
19. 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.

## VI. Participant Data

Participant data was supplied 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 earnings for the March preceding the valuation date. This salary was compared to March base pay plus a twelve-month average of overtime, with the greater of the two being used for valuation pay.

VII. Dates of Adoption of Assumptions and Methods

Generally, actuarial assumptions and methods were adopted by the Board of Trustees on December 20, 2010 as recommended by Gabriel, Roeder, Smith & Company (GRS). The legislature set the investment return assumption for the 2011 valuation to the assumption recommended by GRS. The ERS Board has adopted the assumption beginning with the 2012 valuation.

VIII. 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. The new entrant profile 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	199	\$42,080
25-29	421	41,841
30-34	286	41,807
35-39	136	42,273
40-44	47	42,310
45-49	17	43,503
50-54	6	45,708
55-59	1	40,632
Total	1,113	41,993

It is assumed that 92.7% of new hires will be male.

Each group of new hires' salaries is assumed to grow 4.00% over the salaries of the previous year's group.

New Entrant Profile for All Other Employees		
Entry Age	# of Employees	Average Salary
15-19	19	\$26,410
20-24	1,433	37,250
25-29	3,459	40,108
30-34	2,759	42,208
35-39	2,388	43,097
40-44	1,954	41,537
45-49	1,785	40,980
50-54	1,449	42,278
55-59	1,169	45,146
60-64	484	46,511
65-69	52	47,971
Total	16,951	41,610

It is assumed that 40.0% of new hires will be male.

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**SECTION M**

**STATISTICAL TABLES**

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## STATISTICAL TABLES

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**Distribution of Active Members by Age and by Years of Service - All Employees  
As of 06/30/2015**

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	347 \$38,129	239 \$38,153	59 \$41,082	25 \$36,950	6 \$44,996	1 \$40,894	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	677 \$38,416
25-29	862 \$42,130	924 \$43,017	773 \$46,700	477 \$50,003	301 \$52,909	368 \$50,700	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3,705 \$46,045
30-34	726 \$45,045	800 \$45,692	746 \$48,753	621 \$50,683	555 \$53,605	2,415 \$54,718	325 \$55,347	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	6,188 \$51,225
35-39	468 \$43,627	616 \$46,938	591 \$50,616	496 \$55,054	423 \$54,235	2,486 \$55,505	2,135 \$60,484	241 \$64,291	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	7,456 \$55,272
40-44	348 \$42,804	460 \$46,796	451 \$47,711	372 \$54,358	306 \$54,174	1,972 \$55,409	2,228 \$61,040	1,811 \$68,460	316 \$68,174	4 \$71,408	0 \$0	0 \$0	0 \$0	8,268 \$58,758
45-49	304 \$45,434	378 \$46,755	316 \$47,730	312 \$52,085	282 \$53,498	1,687 \$53,605	1,828 \$58,592	1,713 \$67,368	2,099 \$71,850	422 \$77,206	0 \$0	0 \$0	0 \$0	9,341 \$61,475
50-54	236 \$44,414	339 \$46,425	283 \$48,527	270 \$54,517	204 \$53,294	1,649 \$51,475	1,556 \$54,525	1,224 \$61,638	2,001 \$68,442	1,978 \$72,998	296 \$71,849	3 \$119,128	3 \$119,128	10,039 \$61,130
55-59	197 \$51,826	268 \$48,740	275 \$49,929	224 \$51,499	189 \$56,630	1,351 \$51,333	1,398 \$53,783	1,193 \$57,132	1,616 \$63,693	1,826 \$71,155	952 \$74,982	181 \$69,456	181 \$69,456	9,670 \$60,884
60-64	104 \$50,473	156 \$50,549	176 \$50,919	163 \$58,280	139 \$58,821	1,045 \$52,751	1,140 \$54,473	920 \$58,503	1,193 \$62,356	1,191 \$70,829	761 \$78,051	653 \$77,743	653 \$77,743	7,641 \$62,784
65 & Over	44 \$46,048	65 \$56,225	96 \$59,183	71 \$62,027	81 \$50,956	620 \$54,225	695 \$53,192	524 \$59,226	579 \$64,790	568 \$72,471	334 \$79,129	648 \$89,669	648 \$89,669	4,325 \$65,833
Total	3,636 \$43,823	4,245 \$45,671	3,766 \$48,729	3,031 \$52,849	2,486 \$54,075	13,594 \$53,811	11,305 \$57,437	7,626 \$63,380	7,804 \$67,163	5,989 \$72,250	2,343 \$76,174	1,485 \$82,021	1,485 \$82,021	67,310 \$58,723

**Distribution of Active Members by Age and by Years of Service  
Noncontributory Members, All  
As of 06/30/2015**

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	1 \$60,347	0 \$0	0 \$0	6 \$35,662	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	7 \$39,188
30-34	0 \$0	0 \$0	0 \$0	0 \$0	1 \$37,008	160 \$52,669	147 \$47,006	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	308 \$49,915
35-39	0 \$0	0 \$0	1 \$50,232	0 \$0	1 \$24,408	251 \$52,656	852 \$55,493	86 \$51,970	0 \$0	0 \$0	0 \$0	0 \$0	1,191 \$54,610
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	188 \$50,751	898 \$55,083	621 \$59,734	117 \$55,325	2 \$95,399	0 \$0	0 \$0	1,826 \$56,278
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	174 \$50,211	794 \$53,345	651 \$60,060	732 \$62,214	137 \$60,775	0 \$0	0 \$0	2,488 \$57,901
50-54	0 \$0	1 \$35,880	0 \$0	0 \$0	2 \$26,878	141 \$44,254	751 \$51,143	564 \$56,022	786 \$61,427	691 \$64,052	70 \$67,964	0 \$0	3,006 \$57,762
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	126 \$49,012	602 \$48,264	581 \$52,158	739 \$57,193	704 \$64,847	249 \$70,296	43 \$62,925	3,044 \$57,050
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	94 \$45,674	469 \$49,112	394 \$52,862	595 \$59,687	498 \$64,630	246 \$73,295	199 \$73,662	2,495 \$59,536
65 & Over	0 \$0	0 \$0	0 \$0	1 \$5,393	0 \$0	63 \$43,229	298 \$48,722	272 \$52,280	324 \$59,557	310 \$68,419	141 \$73,140	249 \$85,711	1,658 \$62,503
<b>Total</b>	0 \$0	1 \$35,880	2 \$55,290	1 \$5,393	4 \$28,793	1,203 \$49,516	4,811 \$52,178	3,169 \$56,046	3,293 \$59,936	2,342 \$64,827	706 \$71,678	491 \$78,832	16,023 \$57,853

**Distribution of Active Members by Age and by Years of Service  
Noncontributory Members, General Employees  
As of 06/30/2015**

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	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	1 \$60,347	0 \$0	0 \$0	6 \$35,662	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	7 \$39,188
30-34	0 \$0	0 \$0	0 \$0	0 \$0	1 \$37,008	91 \$48,189	105 \$42,617	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	197 \$45,163
35-39	0 \$0	0 \$0	0 \$0	0 \$0	1 \$24,408	148 \$49,307	443 \$52,399	61 \$48,626	0 \$0	0 \$0	0 \$0	0 \$0	653 \$51,303
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	147 \$49,208	596 \$52,486	317 \$54,916	99 \$51,748	2 \$95,399	0 \$0	0 \$0	1,161 \$52,745
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	150 \$47,952	608 \$49,593	431 \$57,895	483 \$59,034	116 \$58,477	0 \$0	0 \$0	1,788 \$54,583
50-54	0 \$0	1 \$35,880	0 \$0	0 \$0	1 \$5,849	124 \$42,508	605 \$47,687	429 \$51,167	593 \$57,589	479 \$59,995	63 \$67,036	0 \$0	2,295 \$53,693
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	109 \$46,997	481 \$44,748	473 \$48,518	615 \$53,522	574 \$62,166	197 \$67,420	41 \$61,677	2,490 \$53,818
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	80 \$43,012	391 \$46,483	307 \$48,282	457 \$54,187	386 \$59,149	193 \$70,513	165 \$69,964	1,979 \$55,172
65 & Over	0 \$0	0 \$0	0 \$0	1 \$5,393	0 \$0	52 \$37,661	240 \$45,015	215 \$46,638	262 \$52,891	214 \$60,092	100 \$65,521	151 \$75,008	1,235 \$54,567
<b>Total</b>	0 \$0	1 \$35,880	1 \$60,347	1 \$5,393	3 \$22,422	907 \$46,435	3,469 \$48,566	2,233 \$51,535	2,509 \$55,530	1,771 \$60,467	553 \$68,112	357 \$71,145	11,805 \$53,817

**Distribution of Active Members by Age and by Years of Service  
Noncontributory Members, Teachers  
As of 06/30/2015**

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	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	69 \$58,578	42 \$57,976	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	111 \$58,350
35-39	0 \$0	0 \$0	1 \$50,232	0 \$0	0 \$0	103 \$57,467	409 \$58,845	25 \$60,131	0 \$0	0 \$0	0 \$0	0 \$0	538 \$58,625
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	41 \$56,281	302 \$60,209	304 \$64,757	18 \$74,997	0 \$0	0 \$0	0 \$0	665 \$62,446
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	24 \$64,331	186 \$65,610	220 \$64,300	249 \$68,384	21 \$73,466	0 \$0	0 \$0	700 \$66,377
50-54	0 \$0	0 \$0	0 \$0	0 \$0	1 \$47,906	17 \$56,983	146 \$65,467	135 \$71,450	193 \$73,216	212 \$73,216	7 \$76,317	0 \$0	711 \$70,896
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	17 \$61,926	121 \$62,239	108 \$68,100	124 \$75,397	130 \$76,684	52 \$81,193	2 \$88,498	554 \$71,580
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	14 \$60,888	78 \$62,292	87 \$69,023	138 \$77,901	112 \$83,518	53 \$83,425	34 \$91,610	516 \$76,273
65 & Over	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	11 \$69,553	58 \$64,064	57 \$73,560	62 \$87,727	96 \$86,981	41 \$91,724	98 \$102,204	423 \$85,673
Total	0 \$0	0 \$0	1 \$50,232	0 \$0	1 \$47,906	296 \$58,958	1,342 \$61,515	936 \$66,809	784 \$74,039	571 \$78,350	153 \$84,565	134 \$99,312	4,218 \$69,148

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, All  
As of 06/30/2015**

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	17 \$58,745	15 \$53,450	12 \$60,427	2 \$79,051	0 \$0	46 \$58,340								
25-29	58 \$56,922	54 \$57,745	80 \$61,069	49 \$68,150	56 \$73,586	71 \$74,360	0 \$0	368 \$65,339						
30-34	42 \$56,695	34 \$59,049	81 \$61,426	36 \$69,901	81 \$69,758	318 \$74,914	63 \$77,767	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	655 \$70,615
35-39	24 \$56,713	18 \$60,703	48 \$59,826	25 \$64,137	55 \$69,045	324 \$74,261	314 \$81,018	65 \$89,485	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	873 \$75,651
40-44	9 \$57,763	9 \$58,948	18 \$61,398	15 \$77,952	25 \$73,438	159 \$74,888	332 \$83,351	403 \$92,035	71 \$106,569	0 \$0	0 \$0	0 \$0	0 \$0	1,041 \$85,876
45-49	5 \$55,083	5 \$62,070	6 \$57,406	7 \$75,927	8 \$68,911	72 \$76,846	190 \$81,761	309 \$93,521	350 \$103,112	129 \$112,609	0 \$0	0 \$0	0 \$0	1,081 \$94,907
50-54	0 \$0	5 \$107,624	2 \$56,394	3 \$58,575	7 \$89,480	30 \$78,780	48 \$85,612	102 \$90,450	255 \$103,886	252 \$110,598	103 \$82,203	1 \$189,456	1 \$0	808 \$99,220
55-59	2 \$59,004	1 \$178,536	3 \$100,156	1 \$67,360	2 \$71,171	9 \$112,482	20 \$111,906	46 \$95,612	101 \$102,003	136 \$116,093	240 \$80,308	43 \$79,390	43 \$0	604 \$94,758
60-64	1 \$189,456	0 \$0	1 \$59,004	0 \$0	1 \$55,488	11 \$98,534	16 \$107,456	22 \$101,466	28 \$116,915	57 \$118,804	157 \$79,557	134 \$76,769	134 \$0	428 \$89,164
65 & Over	1 \$60,332	0 \$0	3 \$62,496	1 \$56,280	1 \$82,225	7 \$118,044	11 \$88,831	11 \$113,836	12 \$84,602	12 \$127,289	62 \$79,735	144 \$83,826	144 \$0	265 \$86,789
Total	159 \$57,897	141 \$60,836	254 \$61,288	139 \$69,190	236 \$71,450	1,001 \$75,813	994 \$83,089	958 \$92,811	817 \$103,718	586 \$113,456	562 \$80,382	322 \$80,625	322 \$0	6,169 \$85,846

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, General Employees  
As of 06/30/2015**

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	3	0	2	0	0	0	0	0	0	0	5
	\$0	\$0	\$56,672	\$0	\$56,774	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$56,713
30-34	1	3	1	0	1	4	1	0	0	0	0	0	11
	\$56,781	\$58,217	\$58,008	\$0	\$52,800	\$59,680	\$60,780	\$0	\$0	\$0	\$0	\$0	\$58,340
35-39	0	0	1	1	2	5	8	0	0	0	0	0	17
	\$0	\$0	\$59,004	\$59,004	\$59,004	\$50,771	\$63,878	\$0	\$0	\$0	\$0	\$0	\$58,876
40-44	1	0	1	1	1	3	13	7	1	0	0	0	28
	\$59,004	\$0	\$59,004	\$178,536	\$178,536	\$110,871	\$68,174	\$54,106	\$129,564	\$0	\$0	\$0	\$78,652
45-49	1	0	0	0	1	9	22	13	9	3	0	0	58
	\$59,004	\$0	\$0	\$0	\$59,004	\$93,237	\$81,846	\$100,839	\$82,246	\$68,880	\$0	\$0	\$86,474
50-54	0	2	1	0	4	6	10	8	13	17	58	1	120
	\$0	\$178,536	\$59,004	\$0	\$106,053	\$74,366	\$99,371	\$63,334	\$67,422	\$85,184	\$59,502	\$189,456	\$72,934
55-59	2	1	3	0	1	4	12	9	12	17	133	30	224
	\$59,004	\$178,536	\$100,156	\$0	\$76,516	\$159,798	\$128,898	\$93,681	\$111,738	\$110,898	\$64,454	\$65,292	\$77,946
60-64	1	0	1	0	0	9	10	13	10	16	103	89	252
	\$189,456	\$0	\$59,004	\$0	\$0	\$102,013	\$120,196	\$111,950	\$150,316	\$156,074	\$71,167	\$66,441	\$83,602
65 & Over	0	0	3	1	1	7	9	10	7	8	42	89	177
	\$0	\$0	\$62,496	\$56,280	\$82,225	\$118,044	\$90,503	\$117,217	\$78,302	\$127,935	\$73,766	\$76,839	\$82,754
Total	6	6	14	3	13	47	85	60	52	61	336	209	892
	\$80,376	\$118,376	\$68,000	\$97,940	\$84,988	\$95,620	\$91,949	\$94,449	\$98,815	\$115,749	\$66,821	\$71,292	\$79,676

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, Teachers  
As of 06/30/2015**

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	1 \$51,277	0 \$0	1 \$51,277						
40-44	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$63,408	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$63,408
45-49	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$84,163	2 \$46,767	0 \$0	0 \$0	0 \$0	0 \$0	3 \$59,232
50-54	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$144,341	0 \$0	4 \$79,872	0 \$0	5 \$92,766	
55-59	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3 \$137,962	4 \$73,544	3 \$99,771	51 \$80,034	5 \$100,717	66 \$84,738	
60-64	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$52,832	0 \$0	1 \$95,100	7 \$81,323	38 \$83,968	39 \$89,990	86 \$86,251	
65 & Over	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$69,960	0 \$0	2 \$68,714	2 \$148,910	17 \$91,067	49 \$92,536	71 \$92,783	
Total	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$51,277	2 \$61,396	5 \$112,292	10 \$76,458	12 \$97,200	110 \$83,092	93 \$91,908	233 \$87,357	

**Distribution of Active Members by Age and by Years of Service  
Contributory Members, Police and Firefighters  
As of 06/30/2015**

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	17 \$58,745	15 \$53,450	12 \$60,427	2 \$79,051	0 #DIV/0!	0 \$0	46 \$58,340						
25-29	58 \$56,922	54 \$57,745	77 \$61,240	49 \$68,150	54 \$74,209	71 \$74,360	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	363 \$65,458
30-34	41 \$56,693	31 \$59,130	80 \$61,469	36 \$69,901	80 \$69,970	314 \$75,108	62 \$78,041	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	644 \$70,825
35-39	24 \$56,713	18 \$60,703	47 \$59,843	24 \$64,351	53 \$69,424	318 \$74,703	306 \$81,466	65 \$89,485	0 \$0	0 \$0	0 \$0	0 \$0	855 \$76,013
40-44	8 \$57,608	9 \$58,948	17 \$61,539	14 \$70,767	24 \$69,059	156 \$74,196	319 \$83,969	395 \$92,780	70 \$106,241	0 \$0	0 \$0	0 \$0	1,012 \$86,098
45-49	4 \$54,103	5 \$62,070	6 \$57,406	7 \$75,927	7 \$70,326	63 \$74,504	168 \$81,750	295 \$93,230	339 \$103,998	126 \$113,650	0 \$0	0 \$0	1,020 \$95,491
50-54	0 \$0	3 \$60,350	1 \$53,784	3 \$58,575	3 \$67,382	24 \$79,884	38 \$81,991	94 \$92,758	241 \$105,685	235 \$112,437	41 \$114,544	0 \$0	683 \$103,886
55-59	0 \$0	0 \$0	0 \$0	1 \$67,360	1 \$65,826	5 \$74,630	8 \$86,418	34 \$92,387	85 \$101,968	116 \$117,277	56 \$118,209	8 \$118,928	314 \$108,858
60-64	0 \$0	0 \$0	0 \$0	0 \$0	1 \$55,488	2 \$82,879	5 \$92,901	9 \$86,323	17 \$98,550	34 \$108,982	16 \$123,093	6 \$144,036	90 \$107,523
65 & Over	1 \$60,332	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$92,657	1 \$80,027	3 \$109,893	2 \$103,086	3 \$99,090	6 \$116,340	17 \$103,775
Total	153 \$57,015	135 \$58,279	240 \$60,896	136 \$68,556	223 \$70,661	953 \$74,862	907 \$82,306	893 \$92,592	755 \$104,417	513 \$113,564	116 \$117,093	20 \$125,684	5,044 \$86,867

**Distribution of Active Members by Age and by Years of Service  
Hybrid Members, All  
As of 06/30/2015**

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	330 \$37,067	224 \$37,129	47 \$36,143	23 \$33,289	6 \$44,996	1 \$40,894	0 \$0	631 \$36,964						
25-29	804 \$41,063	870 \$42,102	692 \$45,019	428 \$47,925	245 \$48,183	291 \$45,238	0 \$0	3,330 \$43,927						
30-34	684 \$44,330	766 \$45,099	665 \$47,210	585 \$49,500	473 \$50,874	1,937 \$51,572	115 \$53,728	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	5,225 \$48,872
35-39	444 \$42,919	598 \$46,524	542 \$49,801	471 \$54,571	367 \$52,096	1,911 \$52,699	969 \$58,218	90 \$57,868	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	5,392 \$52,118
40-44	339 \$42,407	451 \$46,554	433 \$47,142	357 \$53,367	281 \$52,460	1,625 \$54,041	998 \$58,978	787 \$63,274	128 \$58,621	2 \$47,417	0 \$0	0 \$0	0 \$0	5,401 \$54,370
45-49	299 \$45,273	373 \$46,550	310 \$47,543	305 \$51,538	274 \$53,048	1,441 \$52,854	844 \$58,312	753 \$62,954	1,017 \$68,028	156 \$62,361	0 \$0	0 \$0	0 \$0	5,772 \$56,754
50-54	236 \$44,414	333 \$45,538	281 \$48,471	267 \$54,472	195 \$52,266	1,478 \$51,609	757 \$55,909	558 \$62,048	960 \$64,771	1,035 \$69,815	123 \$65,389	2 \$83,965	2 \$85,965	6,225 \$57,811
55-59	195 \$51,753	267 \$48,254	272 \$49,375	223 \$51,427	187 \$56,475	1,216 \$51,121	776 \$56,566	566 \$59,111	776 \$64,898	986 \$69,461	463 \$74,742	95 \$67,916	95 \$67,916	6,022 \$59,425
60-64	103 \$49,123	156 \$50,549	175 \$50,872	163 \$58,280	138 \$58,845	940 \$52,923	655 \$57,017	504 \$61,038	570 \$62,462	636 \$71,385	358 \$80,658	320 \$80,689	320 \$80,689	4,718 \$62,108
65 & Over	43 \$45,716	65 \$56,225	93 \$59,076	69 \$62,931	80 \$50,565	550 \$54,672	386 \$55,626	241 \$64,573	243 \$70,790	246 \$74,904	131 \$85,289	255 \$96,834	255 \$96,834	2,402 \$65,820
Total	3,477 \$43,180	4,103 \$45,152	3,510 \$47,817	2,891 \$52,080	2,246 \$52,294	11,390 \$52,331	5,500 \$57,401	3,499 \$61,965	3,694 \$65,521	3,061 \$70,042	1,075 \$76,927	672 \$85,019	672 \$85,019	45,118 \$55,323

**Distribution of Active Members by Age and by Years of Service  
Hybrid Members, General Employees  
As of 06/30/2015**

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	178 \$33,493	147 \$33,033	40 \$33,628	23 \$33,289	6 \$44,996	1 \$40,894	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	395 \$33,517
25-29	525 \$38,830	565 \$40,159	411 \$42,713	238 \$46,544	133 \$46,513	194 \$42,632	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2,066 \$41,706
30-34	479 \$42,538	571 \$43,304	472 \$45,367	385 \$48,138	296 \$50,551	1,105 \$49,825	79 \$51,380	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	3,387 \$46,982
35-39	311 \$39,561	433 \$43,026	396 \$47,932	345 \$53,147	259 \$51,507	1,285 \$51,073	485 \$55,738	58 \$54,506	0 \$0	0 \$0	0 \$0	0 \$0	3,572 \$49,668
40-44	254 \$39,866	349 \$43,807	331 \$44,137	246 \$50,229	197 \$50,490	1,163 \$51,323	652 \$56,584	360 \$59,278	95 \$54,721	2 \$47,417	0 \$0	0 \$0	3,649 \$50,847
45-49	234 \$43,092	298 \$44,498	234 \$44,531	230 \$48,509	213 \$52,426	1,129 \$50,304	630 \$54,990	469 \$59,739	570 \$65,503	130 \$59,728	0 \$0	0 \$0	4,137 \$53,334
50-54	195 \$43,684	268 \$42,809	230 \$45,421	212 \$52,885	146 \$49,819	1,197 \$49,069	593 \$52,724	414 \$59,312	706 \$62,476	659 \$66,070	107 \$62,789	2 \$83,965	4,729 \$54,560
55-59	156 \$50,945	224 \$46,147	232 \$47,792	188 \$50,503	149 \$54,189	1,009 \$48,292	612 \$52,220	423 \$55,185	608 \$62,029	719 \$66,412	330 \$70,951	84 \$65,503	4,734 \$56,052
60-64	83 \$47,339	138 \$48,969	149 \$49,869	139 \$56,985	115 \$57,139	792 \$50,301	506 \$54,425	377 \$55,510	432 \$56,916	453 \$66,088	243 \$75,950	244 \$76,979	3,671 \$57,935
65 & Over	35 \$44,865	55 \$57,640	72 \$56,399	56 \$65,789	67 \$49,373	446 \$52,119	325 \$52,380	182 \$60,760	161 \$63,008	161 \$69,279	81 \$79,113	151 \$84,844	1,792 \$60,066
Total	2,450 \$41,307	3,048 \$43,041	2,567 \$45,715	2,062 \$50,697	1,581 \$51,297	8,321 \$49,997	3,882 \$54,203	2,283 \$57,995	2,572 \$61,854	2,124 \$66,027	761 \$72,268	481 \$77,473	32,132 \$52,465

**Distribution of Active Members by Age and by Years of Service  
Hybrid Members, Teachers  
As of 06/30/2015**

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	152 \$41,252	77 \$44,948	7 \$50,511	0 \$0	236 \$42,733									
25-29	279 \$45,264	305 \$45,703	281 \$48,392	190 \$49,655	112 \$50,166	97 \$50,449	0 \$0	1,264 \$47,558						
30-34	205 \$48,517	195 \$50,353	193 \$51,715	200 \$52,122	177 \$51,413	832 \$53,892	36 \$58,881	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1,838 \$52,355
35-39	133 \$50,773	165 \$55,705	146 \$54,870	126 \$58,471	108 \$53,510	626 \$56,038	484 \$60,703	32 \$63,963	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1,820 \$56,928
40-44	85 \$49,999	102 \$55,952	102 \$56,894	111 \$60,322	84 \$57,079	462 \$60,885	346 \$63,490	427 \$66,643	33 \$69,849	0 \$0	0 \$0	0 \$0	0 \$0	1,752 \$61,706
45-49	65 \$53,125	75 \$54,702	76 \$56,816	75 \$60,829	61 \$55,217	312 \$62,081	214 \$68,090	284 \$68,263	447 \$71,247	26 \$75,527	0 \$0	0 \$0	0 \$0	1,635 \$65,408
50-54	41 \$47,887	65 \$56,788	51 \$62,223	55 \$60,586	49 \$59,558	281 \$62,431	164 \$67,425	144 \$69,914	254 \$71,150	376 \$76,380	16 \$82,775	0 \$0	0 \$0	1,496 \$68,090
55-59	39 \$54,984	43 \$59,231	40 \$58,555	35 \$56,392	38 \$65,435	207 \$64,912	164 \$72,785	143 \$70,723	168 \$75,280	267 \$77,671	133 \$84,147	11 \$86,343	11 \$86,343	1,288 \$71,822
60-64	20 \$56,529	18 \$62,658	26 \$56,622	24 \$65,783	23 \$67,373	148 \$66,956	149 \$65,817	127 \$77,449	138 \$79,821	183 \$84,496	115 \$90,606	76 \$92,601	76 \$92,601	1,047 \$76,740
65 & Over	8 \$49,436	10 \$48,438	21 \$68,256	13 \$50,618	13 \$56,710	104 \$65,620	61 \$72,923	59 \$76,335	82 \$86,069	85 \$85,558	50 \$95,294	104 \$114,242	104 \$114,242	610 \$82,723
Total	1,027 \$47,648	1,055 \$51,252	943 \$53,538	829 \$55,521	665 \$54,665	3,069 \$58,659	1,618 \$65,073	1,216 \$69,417	1,122 \$73,926	937 \$79,142	314 \$88,218	191 \$104,024	191 \$104,024	12,986 \$62,395

**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	21,087	\$ 2,621	13,648	\$ 1,611	5,922	\$ 2,114
	<u>Service</u>		<u>Service</u>		<u>Service</u>	
Total	20,597	\$ 2,652	12,792	\$ 1,661	5,674	\$ 2,152
General Employees - male	4,462	2,334	4,150	1,603	1,629	2,244
General Employees - female	6,675	1,724	4,889	1,242	2,387	1,830
Teachers - male	1,733	3,275	1,282	2,387	491	2,867
Teachers - female	4,460	2,991	2,471	2,209	1,167	2,379
Police and Firefighters	3,267	4,189	-	-	-	-
	<u>Ordinary Disability</u>		<u>Ordinary Disability</u>		<u>Ordinary Disability</u>	
Total	202	\$ 928	696	\$ 893	216	\$ 1,267
General Employees - male	68	951	334	881	104	1,224
General Employees - female	70	702	278	788	79	1,218
Teachers - male	8	1,379	32	1,410	8	1,269
Teachers - female	26	1,193	52	1,218	25	1,599
Police and Firefighters	30	1,057	-	-	-	-
	<u>Accidental Disability</u>		<u>Accidental Disability</u>		<u>Accidental Disability</u>	
Total	288	\$ 1,608	160	\$ 766	32	\$ 1,231
General Employees - male	113	1,495	90	772	20	1,259
General Employees - female	64	1,346	59	708	10	1,100
Teachers - male	2	1,510	4	734	-	-
Teachers - female	4	2,654	7	1,196	2	1,604
Police and Firefighters	105	1,851	-	-	-	-

## Summary of Pensions in Force by Age and Type

General Employees

Age	Type of Pension			
	Total	Service	Ordinary Disability	Accidental Disability
Total	25,481	24,192	933	356
	Contributory			
Total	11,452	11,137	138	177
30-39	-	-	-	-
40-44	1	-	-	1
45-49	2	2	-	-
50-54	24	13	3	8
55-59	270	249	10	11
60-64	771	737	20	14
65-69	1,274	1,230	21	23
70-74	1,591	1,549	15	27
75-79	1,785	1,736	22	27
80-84	2,279	2,233	22	24
85-89	2,003	1,961	16	26
90-94	1,137	1,117	7	13
95-99	287	282	2	3
100 & over	28	28	-	-
	Noncontributory			
Total	9,800	9,039	612	149
30-39	-	-	-	-
40-44	4	-	4	-
45-49	12	-	9	3
50-54	45	-	37	8
55-59	310	198	88	24
60-64	1,184	985	168	31
65-69	2,819	2,633	160	26
70-74	2,810	2,673	109	28
75-79	1,583	1,534	30	19
80-84	721	711	6	4
85-89	262	256	1	5
90-94	49	48	-	1
95-99	1	1	-	-
100 & over	-	-	-	-
	Hybrid			
Total	4,229	4,016	183	30
30-39	1	-	-	1
40-44	2	-	1	1
45-49	6	-	6	-
50-54	24	-	22	2
55-59	294	252	36	6
60-64	1,348	1,267	72	9
65-69	1,790	1,749	36	5
70-74	616	602	8	6
75-79	115	113	2	-
80-84	25	25	-	-
85-89	6	6	-	-
90-94	2	2	-	-
95-99	-	-	-	-
100 & over	-	-	-	-

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

**Teachers**

Age	Type of Pension			
	Total	Service	Ordinary Disability	Accidental Disability
Total	11,774	11,604	151	19
	Contributory			
Total	6,233	6,193	34	6
30-39	-	-	-	-
40-44	3	3	-	-
45-49	2	2	-	-
50-54	8	8	-	-
55-59	82	81	1	-
60-64	299	298	1	-
65-69	988	979	8	1
70-74	1,220	1,212	7	1
75-79	1,227	1,222	5	-
80-84	1,231	1,225	3	3
85-89	768	764	3	1
90-94	301	298	3	-
95-99	89	86	3	-
100 & over	15	15	-	-
	Noncontributory			
Total	3,848	3,753	84	11
30-39	-	-	-	-
40-44	-	-	-	-
45-49	4	1	3	-
50-54	9	3	5	1
55-59	49	38	10	1
60-64	301	276	20	5
65-69	1,291	1,265	25	1
70-74	1,275	1,255	18	2
75-79	621	618	3	-
80-84	217	217	-	-
85-89	63	62	-	1
90-94	16	16	-	-
95-99	2	2	-	-
100 & over	-	-	-	-
	Hybrid			
Total	1,693	1,658	33	2
30-39	-	-	-	-
40-44	2	-	2	-
45-49	2	1	1	-
50-54	2	-	2	-
55-59	85	79	5	1
60-64	511	496	15	-
65-69	752	743	8	1
70-74	269	269	-	-
75-79	54	54	-	-
80-84	11	11	-	-
85-89	4	4	-	-
90-94	1	1	-	-
95-99	-	-	-	-
100 & over	-	-	-	-

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

Age	Type of Pension			
	Total	Service	Ordinary Disability	Accidental Disability
Total	3,402	3,267	30	105
30-39	-	-	-	-
40-44	3	-	-	3
45-49	39	32	4	3
50-54	208	197	5	6
55-59	499	485	3	11
60-64	674	650	6	18
65-69	798	770	3	25
70-74	583	556	4	23
75-79	333	323	3	7
80-84	160	154	1	5
85-89	67	65	-	2
90-94	32	30	1	1
95-99	6	5	-	1
100 & over	-	-	-	-

**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	12,792	\$ 1,660	9,039	\$ 1,407	3,753	\$ 2,269
Less than 5	2	1,169	1	1,324	1	1,014
5-9	14	533	12	509	2	678
10-14	2,600	549	2,144	517	456	697
15-19	1,848	896	1,468	847	380	1,085
20-24	1,969	1,164	1,514	1,076	455	1,455
25-29	1,416	1,718	1,002	1,542	414	2,143
30-34	2,940	2,450	1,676	2,235	1,264	2,736
35 and over	2,003	3,107	1,222	2,821	781	3,556

**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	12,792	\$ 1,661	9,039	\$ 1,408	3,753	\$ 2,270
Less than 5	3,404	1,451	2,555	1,291	849	1,931
5-9	3,741	1,670	2,756	1,444	985	2,302
10-14	3,339	1,788	2,188	1,463	1,151	2,405
15-19	1,347	1,588	956	1,273	391	2,359
20-24	902	2,064	547	1,807	355	2,460
25 and over	59	1,493	37	1,117	22	2,125

**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	20,597	\$ 2,652	11,137	\$ 1,968	6,193	\$ 3,071	3,267	\$ 4,189
Less than 5	8	1,117	5	959	2	699	1	2,738
5-9	693	384	531	359	155	461	7	582
10-14	1,324	728	1,031	624	247	1,089	46	1,108
15-19	1,732	1,194	1,336	1,028	332	1,712	64	1,975
20-24	2,371	1,681	1,708	1,442	523	2,139	140	2,891
25-29	6,236	2,847	2,669	2,114	1,639	2,787	1,928	3,914
30-34	5,875	3,476	2,432	2,825	2,463	3,473	980	5,101
35 and over	2,358	3,880	1,425	3,321	832	4,645	101	5,474

**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	5,674	\$ 2,152	4,016	\$ 1,998	1,658	\$ 2,523
Less than 5	1	319	-	-	1	319
5-9	587	587	477	580	110	619
10-14	623	854	476	820	147	965
15-19	641	1,243	440	1,161	201	1,423
20-24	979	1,599	652	1,456	327	1,883
25-29	692	2,197	477	2,024	215	2,581
30-34	1,194	3,054	849	2,966	345	3,273
35 and over	957	3,972	645	3,742	312	4,448

**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	20,597	\$ 2,652	11,137	\$ 1,968	6,193	\$ 3,071	3,267	\$ 4,189
Less than 5	1,667	4,123	703	2,919	299	4,395	665	5,274
5-9	2,501	3,549	1,259	2,657	646	3,989	596	4,957
10-14	3,263	3,155	1,528	2,418	1,101	3,652	634	4,065
15-19	2,559	2,463	1,412	1,815	723	3,035	424	3,645
20-24	4,992	2,624	2,670	2,062	1,730	3,126	592	3,686
25-29	3,203	1,819	1,906	1,463	1,074	2,252	223	2,782
30-34	1,744	1,480	1,214	1,255	457	1,907	73	2,547
35 and over	668	1,152	445	998	163	1,299	60	1,898

**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	5,674	\$ 2,152	4,016	\$ 1,998	1,658	\$ 2,523
Less than 5	3,811	2,087	2,700	1,938	1,111	2,449
5-9	1,863	2,285	1,316	2,122	547	2,675

**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
Total	25,481	\$ 1,724	24,192	\$ 1,764	933	\$ 912	356	\$ 1,131	-	\$ -
Contributory										
Total	11,452	\$ 1,946	11,137	\$ 1,968	138	\$ 825	177	\$ 1,441	-	\$ -
Maximum	1,455	2,005	1,419	2,026	18	1,251	18	1,107	-	-
Option 1	722	1,389	682	1,413	23	846	17	1,143	-	-
Option 2	619	2,199	592	2,231	10	1,319	17	1,602	-	-
Option 3	336	2,834	327	2,867	5	1,006	4	2,416	-	-
Option 4	4,854	2,212	4,733	2,237	45	779	76	1,553	-	-
Option 5	3,466	1,534	3,384	1,548	37	501	45	1,351	-	-
Noncontributory										
Total	9,800	\$ 1,362	9,039	\$ 1,408	612	\$ 838	149	\$ 747	-	\$ -
Maximum	5,306	1,369	4,998	1,403	229	834	79	787	-	-
Option A	1,929	1,454	1,809	1,488	96	993	24	700	-	-
Option B	2,021	1,248	1,733	1,326	248	784	40	728	-	-
Option C	544	1,396	499	1,451	39	831	6	525	-	-
Hybrid										
Total	4,229	\$ 1,959	4,016	\$ 1,998	183	\$ 1,222	30	\$ 1,206	-	\$ -
Maximum	1,617	1,867	1,563	1,886	43	1,294	11	1,336	-	-
Option 1	306	1,853	291	1,872	13	1,515	2	1,237	-	-
Option 2	935	1,902	852	1,975	71	1,154	12	1,155	-	-
Option 3	637	2,396	617	2,436	15	1,176	5	1,027	-	-
Option 4	459	2,079	435	2,126	24	1,229	-	-	-	-
Option 5	275	1,602	258	1,633	17	1,129	-	-	-	-

**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	11,774	\$ 2,713	11,604	\$ 2,733	151	\$ 1,329	19	\$ 1,482	-	\$ -
Contributory										
Total	6,233	\$ 3,060	6,193	\$ 3,071	34	\$ 1,236	6	\$ 2,273	-	\$ -
Maximum	919	3,384	912	3,398	7	1,633	-	-	-	-
Option 1	288	2,449	284	2,471	3	991	1	408	-	-
Option 2	275	3,430	274	3,436	-	-	1	1,881	-	-
Option 3	175	4,105	172	4,142	2	2,429	1	1,140	-	-
Option 4	2,406	3,390	2,392	3,401	12	1,272	2	2,800	-	-
Option 5	2,170	2,506	2,159	2,513	10	752	1	4,611	-	-
Noncontributory										
Total	3,848	\$ 2,245	3,753	\$ 2,270	84	\$ 1,291	11	\$ 1,028	-	\$ -
Maximum	2,467	2,303	2,407	2,329	53	1,315	7	1,071	-	-
Option A	640	2,335	632	2,349	7	1,282	1	1,120	-	-
Option B	531	1,925	507	1,959	21	1,254	3	897	-	-
Option C	210	2,087	207	2,101	3	1,156	-	-	-	-
Hybrid										
Total	1,693	\$ 2,503	1,658	\$ 2,523	33	\$ 1,519	2	\$ 1,604	-	\$ -
Maximum	722	2,427	712	2,439	10	1,579	-	-	-	-
Option 1	97	2,370	93	2,392	4	1,874	-	-	-	-
Option 2	348	2,352	339	2,377	7	1,347	2	1,604	-	-
Option 3	254	2,938	249	2,968	5	1,451	-	-	-	-
Option 4	142	2,722	137	2,774	5	1,314	-	-	-	-
Option 5	130	2,335	128	2,344	2	1,793	-	-	-	-

**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	3,402	\$ 4,090	3,267	\$ 4,189	30	\$ 1,057	105	\$ 1,851	-	\$ -
Maximum	106	4,034	90	4,402	-	-	16	1,962	-	-
Option 1	33	4,073	26	4,395	1	2,420	6	2,953	-	-
Option 2	139	4,146	125	4,398	7	1,522	7	2,264	-	-
Option 3	49	4,690	45	4,945	2	1,251	2	2,390	-	-
Option 4	2,029	4,498	1,990	4,554	12	997	27	1,954	-	-
Option 5	1,046	3,267	991	3,372	8	522	47	1,529	-	-

**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
Total	1,508	\$ 1,614	1,449	\$ 1,633	49	\$ 1,126	10	\$ 1,246	-	\$ -
Contributory										
Total	134	\$ 2,921	133	\$ 2,929	-	\$ -	1	\$ 1,763	-	\$ -
Maximum	33	2,795	32	2,827	-	-	1	1,763	-	-
Option 1	7	2,143	7	2,143	-	-	-	-	-	-
Option 2	16	3,310	16	3,310	-	-	-	-	-	-
Option 3	10	3,355	10	3,355	-	-	-	-	-	-
Option 4	55	2,958	55	2,958	-	-	-	-	-	-
Option 5	13	2,687	13	2,687	-	-	-	-	-	-
Noncontributory										
Total	671	\$ 1,206	642	\$ 1,215	24	\$ 951	5	\$ 1,233	-	\$ -
Maximum	343	1,247	331	1,253	9	973	3	1,393	-	-
Option A	146	1,174	141	1,188	5	786	-	-	-	-
Option B	151	1,215	140	1,226	9	1,081	2	993	-	-
Option C	31	854	30	869	1	400	-	-	-	-
Hybrid										
Total	703	\$ 1,754	674	\$ 1,775	25	\$ 1,294	4	\$ 1,133	-	\$ -
Maximum	252	1,690	245	1,694	6	1,457	1	2,145	-	-
Option 1	45	1,708	44	1,696	1	2,248	-	-	-	-
Option 2	163	1,735	156	1,762	6	1,222	1	561	-	-
Option 3	102	2,063	98	2,107	2	1,014	2	913	-	-
Option 4	76	1,625	71	1,656	5	1,191	-	-	-	-
Option 5	65	1,747	60	1,792	5	1,210	-	-	-	-

**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	574	\$ 2,168	568	\$ 2,178	6	\$ 1,233	-	\$ -	-	\$ -
Contributory										
Total	56	\$ 4,421	56	\$ 4,421	-	\$ -	-	\$ -	-	\$ -
Maximum	13	4,486	13	4,486	-	-	-	-	-	-
Option 1	1	6,420	1	6,420	-	-	-	-	-	-
Option 2	6	5,204	6	5,204	-	-	-	-	-	-
Option 3	3	3,706	3	3,706	-	-	-	-	-	-
Option 4	26	4,536	26	4,536	-	-	-	-	-	-
Option 5	7	3,220	7	3,220	-	-	-	-	-	-
Noncontributory										
Total	222	\$ 1,600	218	\$ 1,608	4	\$ 1,207	-	\$ -	-	\$ -
Maximum	123	1,509	120	1,514	3	1,283	-	-	-	-
Option A	47	1,764	47	1,764	-	-	-	-	-	-
Option B	36	1,837	35	1,861	1	976	-	-	-	-
Option C	16	1,292	16	1,292	-	-	-	-	-	-
Hybrid										
Total	296	\$ 2,168	294	\$ 2,174	2	\$ 1,285	-	\$ -	-	\$ -
Maximum	124	2,254	124	2,254	-	-	-	-	-	-
Option 1	18	1,916	18	1,916	-	-	-	-	-	-
Option 2	59	2,122	57	2,151	2	1,285	-	-	-	-
Option 3	37	2,324	37	2,324	-	-	-	-	-	-
Option 4	29	2,170	29	2,170	-	-	-	-	-	-
Option 5	29	1,847	29	1,847	-	-	-	-	-	-

**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	109	\$ 4,887	109	\$ 4,887	-	\$ -	-	\$ -	-	\$ -
Maximum	6	6,506	6	6,506	-	-	-	-	-	-
Option 1	-	-	-	-	-	-	-	-	-	-
Option 2	15	4,368	15	4,368	-	-	-	-	-	-
Option 3	7	6,185	7	6,185	-	-	-	-	-	-
Option 4	77	4,818	77	4,818	-	-	-	-	-	-
Option 5	4	3,453	4	3,453	-	-	-	-	-	-

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**SECTION N**

DEFINITION OF ACTUARIAL TERMS

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### 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 21 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.