

EMPLOYEES RETIREMENT SYSTEM OF TEXAS
ANNUAL ACTUARIAL VALUATION – FUNDING
AS OF AUGUST 31, 2013



November 21, 2013

Board of Trustees
Employees Retirement System of Texas
200 East 18th Street
Austin, TX 78701

Re: Actuarial Valuation for Funding Purposes as of August 31, 2013

Members of the Board:

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the Employees Retirement System of Texas (ERS) as of August 31, 2013. This report was prepared at the request of the Board and is intended for use by ERS staff and those designated or approved by the Board. This report may be provided to parties other than ERS only in its entirety and only with the permission of the Board.

Actuarial Valuation

The primary purposes of the actuarial valuation report are to determine the adequacy of the current State and employer contribution rates, describe the current financial condition of ERS, analyze changes in the condition of ERS, and provide various summaries of the data.

It is important for the Board of Trustees to understand that the currently scheduled member, employer and State contributions are not expected to accumulate sufficient assets in order to pay all of the currently scheduled benefits when due.

Plan Provisions

Our actuarial valuation as of August 31, 2013 reflects the benefit and contribution provisions set forth in Chapters 811 through 815 of the Texas Government Code. The impact of Senate Bill 1459 passed by the 83rd Legislature of the State of Texas was reflected in the actuarial valuation. The current plan provisions, including the provisions of this bill, are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods used in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. Additionally, the actuarial valuation as of August 31, 2013 also incorporates all known across-the-board pay increases budgeted by the State Legislature for the upcoming biennium. The current actuarial assumptions and methods are outlined in Appendix II of this report.

Data

The valuation was based upon information as of August 31, 2013, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Internal Revenue Code and ERISA.

The signing actuaries are independent of the plan sponsor. They are all Enrolled Actuaries, Fellows of the Society of Actuaries, and Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, each of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



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SECTION A

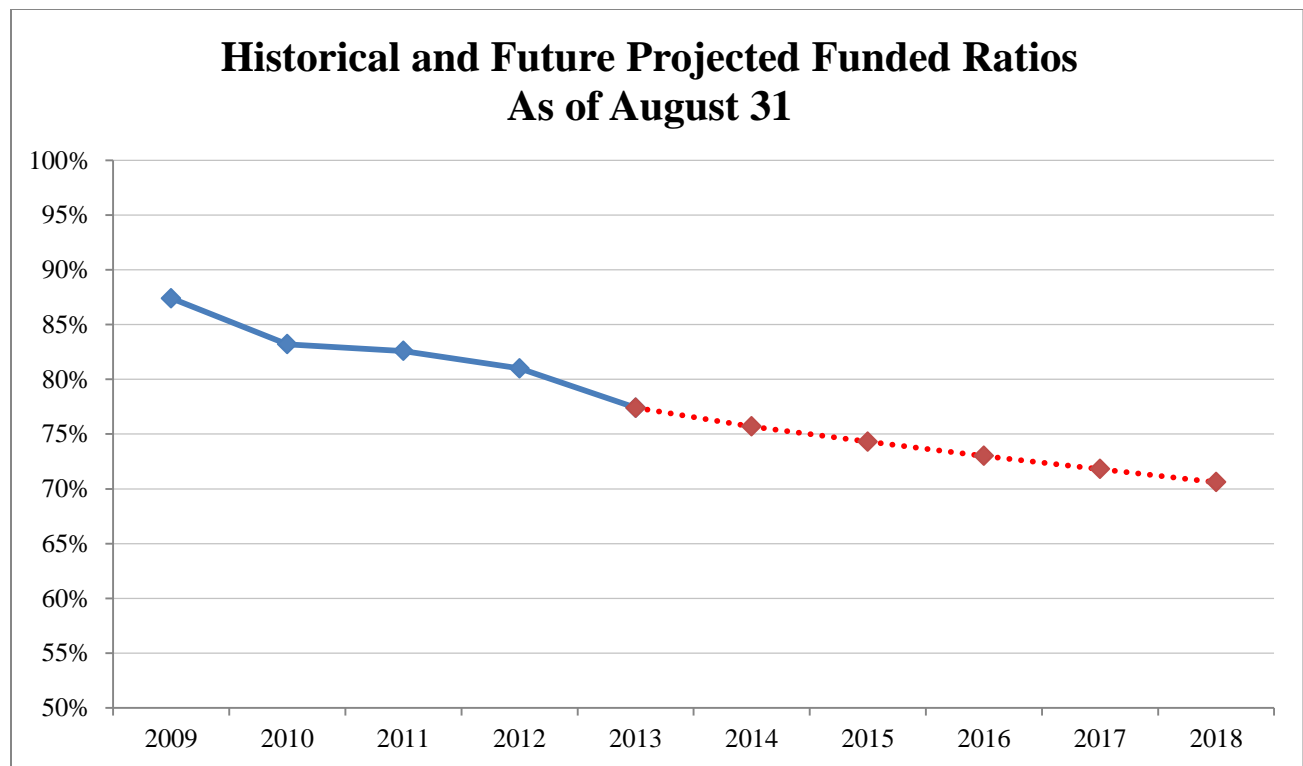
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

| Item | 2013 | 2012 |
|---|-------------------|-------------------|
| Membership | | |
| • Number of | | |
| - Active members | 133,669 | 132,669 |
| - Retirees and beneficiaries | 91,367 | 87,799 |
| - Inactive, vested | 17,014 | 16,535 |
| - Inactive, nonvested | 79,001 | 73,655 |
| - Total | 321,051 | 310,658 |
| • Valuation Payroll | \$ 5,959,473,223 | \$ 5,676,509,376 |
| Statutory contribution rates | FY 2014 | FY 2013 |
| • Members | 6.60% | 6.50% |
| • Employers | 0.50% | 0.00% |
| • State | 7.50% | 6.50% |
| Actuarially Sound Rate (funds normal cost and amortizes unfunded accrued liability over 31 years, per Section 811.006 of the Texas Government Code) | 18.73% | 18.25% |
| Assets | | |
| • Market value | \$ 22,868,542,011 | \$ 21,825,643,968 |
| • Actuarial value | \$ 24,667,639,104 | \$ 24,272,514,483 |
| • Return on market value* | 10.1% | 8.2% |
| • Return on actuarial value | 6.1% | 5.4% |
| Actuarial Information | | |
| • Normal cost % | 11.57% | 12.31% |
| • Total normal cost | \$ 689,511,052 | \$ 698,778,304 |
| • Actuarial accrued liability | \$ 31,886,026,375 | \$ 29,977,156,791 |
| • Unfunded actuarial accrued liability (UAAL) | \$ 7,218,387,271 | \$ 5,704,642,308 |
| • Funded ratio | 77.4% | 81.0% |
| • Funding period (years) | Never | Never |

* Provided by ERS Master Trust Custodian

The following chart illustrates the recent history and outlook of the funded status of ERS over the next five years:



| August 31, | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Funded Ratio | 87.4% | 83.2% | 82.6% | 81.0% | 77.4% | 75.7% | 74.3% | 73.0% | 71.8% | 70.6% |
| UAAL (in billions) | \$3.4 | \$4.8 | \$5.1 | \$5.7 | \$7.2 | \$8.0 | \$8.8 | \$9.5 | \$10.3 | \$11.1 |
| ASC | 15.84% | 17.07% | 17.47% | 18.25% | 18.73% | 19.27% | 19.79% | 20.27% | 20.66% | 21.04% |

The projections beyond 2013 are based on the same assumptions, methods and provisions used for the August 31, 2013 valuation, which include the impact of SB 1459, known across-the-board pay increases budgeted by the State Legislature, and the assumptions adopted by the Board in February 2013. Additionally, the market value of assets is expected to earn 8% per year.

The two primary sources of increases in the projected Unfunded Actuarial Accrued Liability (UAAL) and the Actuarially Sound Contribution rate per Section 811.006 of the Texas Government Code (ASC) are: (1) the scheduled contribution rates are not sufficient to cover the cost of accruing benefits (the Normal Cost) and the interest on the UAAL, and (2) the continued recognition of previously unrecognized losses on the market value of assets in the calculation of the actuarial value of assets.

Specifically, the expected increase in the UAAL and ASC over the next five years, attributable to these two sources, is:

| | From 2013 to 2014 | From 2014 to 2015 | From 2015 to 2016 | From 2016 to 2017 | From 2017 to 2018 |
|--------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| <u>Increase in UAAL</u> | | | | | |
| Insufficient contribution rate | \$0.4 billion | \$0.4 billion | \$0.5 billion | \$0.5 billion | \$0.6 billion |
| Recognition of Deferred Losses | \$0.4 billion | \$0.3 billion | \$0.3 billion | \$0.3 billion | \$0.2 billion |
| <u>Increase in ASC</u> | | | | | |
| Insufficient contribution rate | 0.13% | 0.15% | 0.16% | 0.15% | 0.17% |
| Recognition of Deferred Losses | 0.38% | 0.31% | 0.26% | 0.22% | 0.19% |

It is important for the Board of Trustees to understand that the currently scheduled member, employer and State contributions are not expected to accumulate sufficient assets in order to pay all of the currently scheduled benefits when due. Based on current expectations and assumptions, ERS is projected to remain solvent until the year 2052, after which the funding would revert to a pay-as-you-go status. Therefore, for the current benefit structure to be sustainable, the contribution levels will need to be increased further.

Given this outlook, we recommend the Legislature continue to make further increases in the contribution rates (State, employer, and/or member) to ERS to improve the overall financial health of the retirement system. As shown above, the UAAL is projected to increase by approximately \$0.8 billion and the ASC is projected to increase by approximately 0.28% of payroll over the current biennium resulting strictly from the currently scheduled contribution rates. Each successive biennium that ERS receives the currently scheduled contribution rates, the UAAL is projected to increase by over \$1 billion and the ASC is projected to increase by over 0.30% of payroll resulting strictly from the level of contributions.

SECTION B
DISCUSSION

DISCUSSION

Introduction

The results of the August 31, 2013 actuarial valuation of the Employees Retirement System of Texas (ERS) are presented in this report.

The primary purposes of this actuarial valuation report are to determine the adequacy of the current State and employer contribution rates, describe the current financial condition of ERS, analyze the changes in the condition of ERS, and provide various summaries of the data.

The total contribution rate for the current fiscal year exceeds the normal cost by 3.03% of payroll, but it is not sufficient to amortize the UAAL over a finite period of time. As a result, the UAAL is expected to grow indefinitely and the funding objective is not currently being realized. Based on current expectations and assumptions, ERS is projected to remain solvent until the year 2052, after which the funding would revert to a pay-as-you-go status. Therefore, for the current benefit structure to be sustainable, the contribution levels will need to be increased further.

All of the tables referenced in the following discussion appear in Section C of this report.

Plan Provisions

Senate Bill 1459 passed by the 83rd Legislature of the State of Texas (SB1459) made the following changes to the plan provisions of ERS.

1. Changes to benefits for most ERS members hired on or after September 1, 2013:
 - a. Minimum unreduced retirement age of 62 with Rule of 80 retirement eligibility. Members retiring before age 62 (57 for members retiring under the special retirement eligibilities for CPO/CO members), receive a 5% per year permanent early retirement reduction factor,
 - b. Eliminates use of annual leave to increase annuity if the member opts to receive the unused annual leave as a lump-sum payment, and
 - c. Final Average Salary based on highest 60 months.
2. Reduces interest paid on retirement account balances to 2% prospectively starting January 1, 2014.
3. Member contribution rates were increased to 6.60% of payroll for fiscal year 2014, 6.90% of payroll for fiscal year 2015, 7.20% of payroll for fiscal year 2016, and 7.50% of payroll for all subsequent fiscal years. The ultimate member contribution rate is subject to the State maintaining a contribution rate at least as much as the State contribution rate set for fiscal year 2015. Legislators will continue to contribute 8.00% of payroll.

The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. We did not perform an independent analysis of the actuarial assumptions. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of ERS.

The actuarial valuation as of August 31, 2013 incorporates all known across-the-board pay increases budgeted by the State Legislature for the upcoming biennium. Specifically, the regular class employees are scheduled to receive a 1% increase on September 1, 2013 and a 2% increase on September 1, 2014. Additionally, the CPO/COs will receive increases in accordance with the scheduled changes to the State of Texas Salary Schedule C which exceed the actuarial assumption for the biennium of 3.5% per year.

The results of the actuarial valuation are dependent upon 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. A review of the impact of a different set of assumptions on the funded status of ERS is outside the scope of this actuarial valuation.

The current actuarial assumptions and methods are outlined in Appendix II of this report.

Funding Adequacy

The funding objective of ERS is to fund the sum of the normal cost and the amount necessary to amortize any unfunded actuarial accrued liability over a period that does not exceed 30 years by one or more years. Contribution rates should be established which, over time, will remain level as a percent of payroll.

The member and employer contribution rates are established by State statute and the State contribution rate is set by State statute and legislative appropriation. For the fiscal year beginning September 1, 2013, members contribute 6.60% of payroll and their employers contribute 0.50% of payroll. The State is scheduled to contribute 6.50% of payroll according to State statute, plus ERS was budgeted an additional appropriation of 1.00% of payroll for the fiscal year beginning September 1, 2013. The member and State contribution rates are scheduled to increase over time until they both reach an ultimate rate of 7.50% of payroll in fiscal year 2017. These ultimate rates are subject to future legislative appropriations.

The August 31, 2013 actuarial valuation of ERS incorporates the new assumptions adopted by the Board of Trustees on February 26, 2013 and the changes implemented by SB1459. The unfunded actuarial accrued liability (UAAL) of ERS increased from \$5.7 billion as of August 31, 2012 to \$7.2 billion as of August 31, 2013. Additionally, the funded ratio of ERS—actuarial value of assets divided by the actuarial accrued liability—decreased from 81.0% to 77.4% as of August 31, 2013.

The valuation shows that the total normal cost for funding purposes is 11.57% of payroll. The total contribution rate is 14.60% of payroll for the current fiscal year, and potentially increasing to 15.50% of payroll for future fiscal years. The total contribution rate for the current fiscal year exceeds the normal cost by 3.03% of payroll, but it is not sufficient to amortize the UAAL over a finite period of time. As a result, the UAAL is expected to grow indefinitely and the funding objective is not currently being realized.

Section 811.006 of the Texas Government Code limits the modifications to ERS that would, essentially, increase benefits or lower contributions to the trust unless the current level of benefits and contributions are considered actuarially sound. Section 811.006 defines actuarially sound as a retirement system that is receiving a total contribution rate sufficient to cover the normal cost, administrative expenses, and amortize the UAAL over a period of 31 years, or less. Based on the actuarial valuation as of August 31, 2013, the actuarially sound contribution rate for ERS is 18.73% of payroll.

System Assets

This report contains several tables that summarize key information with respect to the ERS assets.

The total market value of assets increased from \$21.8 billion to \$22.9 billion as of August 31, 2013. Table 5 reconciles the changes in the fund during the year. Total contributions increased slightly from \$758 million to \$798 million, due to an increase in active member payroll and an increase in the total contribution rate from 12.5% to 13.0%. Contributions for fiscal year 2014 are anticipated to increase due to an increase in active member payroll and a total contributed rate of 14.60% as of September 1, 2013.

Table 6 shows the development of the actuarial value of assets. Rather than use the ERS' market value of assets, the valuation reflects a smoothed asset value. This actuarial value is calculated by immediately reflecting 20% of the difference between the expected actuarial value and the current market value. The actuarial value is 7.9% more than the market value.

The approximate investment return for the fiscal year ending August 31, 2013 was 10.1% when measured on market value and 6.1% when measured on actuarial value. Table 7 shows a history of return rates for the past ten years. The ERS ten-year average market return, net of investment expenses, is 7.1%.

Table 8 provides a history of the contributions paid into ERS and the administrative expenses and benefit payments that have been paid out of ERS. This table shows that ERS paid administrative expenses and benefit payments, in excess of contributions received, of \$721 million (or 3.7% of assets) in fiscal year 2010 and that amount jumped to \$1,055 million (or 4.6% of assets) in fiscal year 2013. The increase in the deficit is primarily attributable to the lower State contribution rate over the past biennium. The scheduled increases in contribution rates over the next few years should mitigate

the growth in this deficit; however, ERS should continue to monitor this deficit as it could impact the future liquidity needs of ERS.

Data

The valuation was based upon information as of August 31, 2013, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

All of the actuarial valuation results stated as of August 31, 2012 are based on the prior actuary's actuarial valuation report. Any values not explicitly stated in the prior actuarial valuation report are denoted with an "N/A".

The tables in Appendix III show key census statistics for the various groups included in the valuation.

SECTION C

TABLES

Development of Employer Cost

| | August 31, 2013 | August 31, 2012 |
|---|-------------------|-------------------|
| 1. Payroll | | |
| a. Reported Payroll (August Payroll of Active Members) | \$ 5,689,458,320 | \$ 5,597,099,000 |
| b. Valuation Payroll (Expected Covered Payroll for Following Plan Year) | 5,959,473,223 | 5,676,509,376 |
| 2. Present Value of Future Pay | \$ 38,480,728,190 | N/A |
| 3. Total Normal Cost Rate | | |
| a. Gross normal cost rate | 11.32% | 12.06% |
| b. Administrative expenses | 0.25% | 0.25% |
| c. Total (Item 3a + Item 3b) | 11.57% | 12.31% |
| 4. Actuarial Accrued Liability for Active Members | | |
| a. Present value of future benefits for active members | \$ 18,779,950,789 | \$ 17,686,209,923 |
| b. Less: present value of future normal costs (Item 3a * Item 2) | (4,356,018,431) | (4,183,271,881) |
| c. Actuarial accrued liability | \$ 14,423,932,358 | \$ 13,502,938,042 |
| 5. Total Actuarial Accrued Liability for: | | |
| a. Retirees and beneficiaries | \$ 16,148,245,090 | \$ 15,243,956,208 |
| b. Inactive members | 1,313,848,927 | 1,230,262,541 |
| c. Active members (Item 4c) | 14,423,932,358 | 13,502,938,042 |
| d. Total | \$ 31,886,026,375 | \$ 29,977,156,791 |
| 6. Actuarial Value of Assets | \$ 24,667,639,104 | \$ 24,272,514,483 |
| 7. Unfunded Actuarial Accrued Liability (UAAL) (Item 5d - Item 6) | \$ 7,218,387,271 | \$ 5,704,642,308 |
| 8. Amortization of UAAL Over 31 Years as a Level Percentage of Payroll | 7.16% | 5.94% |
| 9. Contribution Rate Needed to Fund Normal Cost Plus Amortize the UAAL Over 31 Years (Item 3c + Item 8) | 18.73% | 18.25% |
| 10. Allocation of Contribution Rate | | |
| a. State and Employer rates | 8.00% | 6.50% |
| b. Member rate | 6.60% | 6.50% |
| c. Total contribution rate | 14.60% | 13.00% |
| d. Total normal cost rate | 11.57% | 12.31% |
| e. Available contribution rate to amortize UAAL | 3.03% | 0.69% |
| f. Total contribution rate | 14.60% | 13.00% |
| 11. Funding period based on statutory contribution rates (years) | Never | Never |

Prior year information from prior actuary. "N/A" indicates information not disclosed in prior reports.

Actuarial Present Value of Future Benefits

| | <u>August 31, 2013</u> | <u>August 31, 2012</u> |
|---|------------------------|------------------------|
| 1. Active Members | | |
| a. Service Retirement | \$ 17,420,045,143 | \$ 16,307,981,214 |
| b. Disability Benefits | 249,714,199 | 363,202,214 |
| c. Death Before Retirement | 276,614,667 | 220,434,644 |
| d. Termination | <u>833,576,780</u> | <u>794,591,851</u> |
| e. Total | \$ 18,779,950,789 | \$ 17,686,209,923 |
| 2. Inactive Members | \$ 1,313,848,927 | \$ 1,230,262,541 |
| 3. Annuitants | \$ 16,148,245,090 | \$ 15,243,956,208 |
| 4. Total Actuarial Present Value of Future Benefits | \$ 36,242,044,806 | \$ 34,160,428,672 |

Analysis of Normal Cost

| | <u>August 31, 2013</u> | <u>August 31, 2012</u> |
|------------------------------|------------------------|------------------------|
| 1. Gross Normal Cost Rate | | |
| a. Service Retirement | 8.58% | N/A |
| b. Disability Benefits | 0.27% | N/A |
| c. Death Before Retirement | 0.23% | N/A |
| d. Termination | <u>2.24%</u> | <u>N/A</u> |
| e. Total | 11.32% | 12.06% |
| 2. Administrative Expenses | <u>0.25%</u> | <u>0.25%</u> |
| 3. Total Normal Cost | 11.57% | 12.31% |
| 4. Less: Member Rate | <u>6.60%</u> | <u>6.50%</u> |
| 5. Employer Normal Cost Rate | 4.97% | 5.81% |

Historical Summary of Active Member Data

| Valuation as of August 31, | Active Members | | Covered Payroll | | 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) |
| 2008 | 134,626 | 1.6% | 5,313 | 5.3% | 39,468 | 3.6% | 43.7 | 9.4 |
| 2009 | 141,223 | 4.9% | 5,677 | 6.8% | 40,202 | 1.9% | 43.6 | 9.2 |
| 2010 | 142,490 | 0.9% | 5,845 | 3.0% | 41,022 | 2.0% | 43.8 | 9.2 |
| 2011 | 137,293 | -3.6% | 5,714 | -2.2% | 41,620 | 1.5% | 44.1 | 9.5 |
| 2012 | 132,669 | -3.4% | 5,597 | -2.0% | 42,188 | 1.4% | 44.3 | 9.7 |
| 2013 | 133,669 | 0.8% | 5,689 | 1.7% | 42,564 | 0.9% | 44.3 | 9.6 |

Reconciliation of Plan Net Assets

| | Year Ending | |
|--|------------------------|------------------------|
| | August 31, 2013 (1) | August 31, 2012 (2) |
| 1. Market value of assets at beginning of year | \$ 21,825,643,968 | \$ 21,204,091,002 |
| 2. Revenue for the year | | |
| a. Contributions for the year | | |
| i. State (including membership fees) | \$ 375,736,733 | \$ 347,081,275 |
| ii. Member (including penalty interest) | 422,588,192 | 411,065,743 |
| iii. Total | \$ 798,324,925 | \$ 758,147,018 |
| b. Net investment income | \$ 2,097,611,759 | \$ 1,614,830,155 |
| c. Total revenue | \$ 2,895,936,684 | \$ 2,372,977,173 |
| 3. Disbursements for the year | | |
| a. Benefit payments and refunds | 1,893,525,810 | \$ 1,789,650,629 |
| b. Net transfers from TRS | (59,148,104) | (56,045,735) |
| c. Administrative expenses | 18,660,935 | 17,819,313 |
| d. Total expenditures | 1,853,038,641 | 1,751,424,207 |
| 4. Increase in net assets (Item 2c - Item 3d) | \$ 1,042,898,043 | \$ 621,552,966 |
| 5. Market value of assets at end of year (Item 1 + Item 4) | \$ 22,868,542,011 | \$ 21,825,643,968 |

Development of Actuarial Value of Assets

| | <u>Year Ending August 31, 2013</u> |
|---|--|
| 1. Actuarial value of assets at beginning of year | \$ 24,272,514,483 |
| 2. Net new investments | |
| a. Contributions for the year (Table 5) | \$ 798,324,925 |
| b. Disbursements for the year (Table 5) | <u>(1,853,038,641)</u> |
| c. Subtotal | (1,054,713,716) |
| 3. Assumed investment return rate | 8.00% |
| 4. Expected return | \$ 1,899,612,610 |
| 5. Expected actuarial value of assets at end of year (Item 1 + Item 2c + Item 4) | \$ 25,117,413,377 |
| 6. Market value of assets at end of year | \$ 22,868,542,011 |
| 7. Excess earnings/(shortfall) (Item 6 - Item 5) | \$ (2,248,871,366) |
| 8. Excess earnings/(shortfall) recognized (20% x Item 7) | \$ (449,774,273) |
| 9. Actuarial value of assets (Item 5 + Item 8) | \$ 24,667,639,104 |
| 10. Estimated rate of return | 6.1% |
| 11. Actuarial value as percentage of market value | 107.9% |

History of Investment Return Rates

| Year Ending August 31 of | Market* | Actuarial |
|-----------------------------|---------|-----------|
| (1) | (2) | (3) |
| 2003 | 9.2% | 5.4% |
| 2004 | 11.7% | 6.4% |
| 2005 | 12.7% | 7.5% |
| 2006 | 8.8% | 7.7% |
| 2007 | 13.9% | 8.6% |
| 2008 | -4.6% | 5.7% |
| 2009 | -6.6% | 3.2% |
| 2010 | 6.7% | 3.6% |
| 2011 | 12.6% | 5.0% |
| 2012 | 8.2% | 5.4% |
| 2013 | 10.1% | 6.1% |
| Average Returns | | |
| Last Five Years: | 6.0% | 4.7% |
| Last Ten Years: | 7.1% | 5.9% |

* Market Value Rates of Return provided by the ERS Master Trust Custodian.

History of Cash Flow

| Year Ending August 31, | Contributions | Distributions and Expenditures | | | External Cash Flow for the Year | Market Value of Assets | External Cash Flow as Percent of Market Value |
|---------------------------|---------------|---------------------------------|----------------------------|-----------|---------------------------------------|---------------------------|---|
| | | Benefit Payments and Refunds | Administrative Expenses | Total | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) |
| 2007 | 657.7 | (1,333.2) | (16.0) | (1,349.2) | (691.5) | 23,480 | -2.9% |
| 2008 | 678.8 | (1,383.9) | (16.2) | (1,400.1) | (721.3) | 21,464 | -3.4% |
| 2009 | 716.1 | (1,449.0) | (17.3) | (1,466.3) | (750.2) | 19,098 | -3.9% |
| 2010 | 810.4 | (1,512.4) | (19.0) | (1,531.4) | (721.0) | 19,581 | -3.7% |
| 2011 | 839.9 | (1,612.5) | (18.8) | (1,631.3) | (791.4) | 21,204 | -3.7% |
| 2012 | 758.1 | (1,733.7) | (17.8) | (1,751.5) | (993.4) | 21,826 | -4.6% |
| 2013 | 798.3 | (1,834.4) | (18.7) | (1,853.1) | (1,054.8) | 22,869 | -4.6% |

Dollar amounts in millions

Column (7) = Column (2) + Column (6).

Total Experience Gain or Loss

| Item (1) | Year Ending August 31, 2013 (2) | Year Ending August 31, 2012 (3) |
|--|---------------------------------------|---------------------------------------|
| A. Calculation of total actuarial gain or loss | | |
| 1. Unfunded actuarial accrued liability (UAAL), previous year | \$ 5,704,642,308 | \$ 5,052,682,797 |
| 2. Normal cost for the year (excluding administrative expenses) | \$ 684,587,031 | N/A |
| 3. Actual Administrative expenses | \$ 18,660,935 | N/A |
| 4. Contributions for the year (excluding service purchases) | \$ (733,977,817) | N/A |
| 5. Interest at 8% | | |
| a. On UAAL | \$ 456,371,385 | N/A |
| b. On normal cost and administrative expenses | 28,129,919 | N/A |
| c. On contributions | (29,359,113) | N/A |
| d. Total | \$ 455,142,191 | N/A |
| 6. Assumption Change (Gains)/Losses | \$ (85,061,862) | \$ (317,387,289) |
| 7. Legislative changes: | | |
| a. Across-the-board pay increases budgeted for upcoming biennium by the State Legislature | \$ 95,155,795 | \$ 0 |
| b. Senate Bill 1459 | 305,659,246 | 0 |
| c. Total | \$ 400,815,041 | \$ 0 |
| 8. Expected UAAL (Sum of Items 1 through 7) | \$ 6,444,807,827 | \$ 5,127,872,769 |
| 9. Actual UAAL | \$ 7,218,387,271 | \$ 5,704,642,308 |
| 10. Total (gain)/loss for the year (Item 9 - Item 8) | \$ 773,579,444 | \$ 576,769,539 |
| B. Source of gains and losses | | |
| 11. Asset (gain)/loss for the year | \$ 449,774,273 | \$ 611,717,629 |
| 12. Pay Increases (Less)/Greater than Expected | 295,306,850 | (4,222,402) |
| 13. Non-Retired Demographic (Gains)/Losses | (38,400,529) | 1,233,358 |
| 14. Post-Retirement Mortality (Gains)/Losses | 15,094,428 | 11,921,733 |
| 15. Other Demographic (Gains)/Losses | 51,804,423 | (43,880,779) |
| 16. Total (Sum of Items 11 through 15) | \$ 773,579,444 | \$ 576,769,539 |

Solvency Test

Actuarial Accrued Liability and Percent of Active Member Payroll for:

| August 31, | Accumulated Member Contributions Including Interest | | Retirees and Beneficiaries Currently Receiving Benefits | | Employer Financed Portion of Vested and Nonvested Benefits | | Actuarial Value of Assets | Portion of Accrued Liabilities Covered by Assets | | |
|------------|---|--------------|---|--------------|--|--------------|---------------------------|--|------|-----|
| | (1) | % of Payroll | (2) | % of Payroll | (3) | % of Payroll | | (1) | (2) | (3) |
| 2007 | \$ 4,059.7 | 77% | \$11,519.9 | 219% | \$ 8,407.5 | 160% | \$ 22,938.9 | 100% | 100% | 88% |
| 2008 | 4,256.2 | 79% | 12,195.8 | 227% | 8,951.2 | 166% | 23,511.9 | 100% | 100% | 79% |
| 2009 | 4,460.6 | 77% | 12,648.2 | 218% | 9,799.0 | 169% | 23,509.6 | 100% | 100% | 65% |
| 2010 | 4,719.7 | 80% | 13,407.8 | 226% | 10,284.3 | 173% | 23,628.6 | 100% | 100% | 54% |
| 2011 | 4,943.7 | 85% | 14,325.2 | 247% | 9,781.3 | 169% | 23,997.4 | 100% | 100% | 48% |
| 2012 | 5,075.2 | 89% | 15,244.0 | 269% | 9,658.0 | 170% | 24,272.5 | 100% | 100% | 41% |
| 2013 | 5,201.0 | 91% | 16,148.2 | 284% | 10,536.8 | 185% | 24,667.6 | 100% | 100% | 31% |

Note : Dollar amounts in millions

APPENDICES

SUMMARY OF PLAN PROVISIONS FOR EMPLOYEES RETIREMENT SYSTEM OF TEXAS

Classes of Membership

1. Elected Class Membership:
 - a. Membership is optional and limited to:
 - i. Elected State officials not covered by either of the Judicial Retirement Systems
 - ii. Members of the Legislature; and
 - iii. District and Criminal District Attorneys paid by the State general revenue fund.
2. Employee Class Membership:
 - a. Membership is mandatory for all employees and appointed officers of every department, commission, board, agency, or institution of the State except for:
 - i. Independent contractors;
 - ii. Persons covered by the Teacher Retirement System or either of the Judicial Retirement Systems; and
 - iii. Employee Class Members already receiving retirement benefits under the System.
 - b. Includes two types of Employee Class service:
 - i. CPO/CO: Certified Peace Officer / Custodial Officer – in general, service rendered while a law enforcement officer, custodial officer, parole officer or caseworker; and
 - ii. Regular: Non-CPO/CO service.
 - c. Membership begins after a 90-day waiting period.

Member Contributions

1. Elected Class:
 - a. *Legislators*: 8.00% of compensation
 - b. *Non-legislators*:
 - i. *Fiscal year 2013*: 6.50% of compensation
 - ii. *Fiscal year 2014 and beyond*: 6.60% of compensation in fiscal year 2014, increased 0.30% per year until the ultimate rate of 7.50% is reached in fiscal year 2017. Beginning in fiscal year 2018, the 7.50% will be reduced one-tenth of one percent for each one-tenth of one percent that the State contribution rate for the fiscal year to which the service relates is less than the State contribution rate established for the 2015 fiscal year.

2. Employee Class:

- a. *Fiscal year 2013:* 6.50% of compensation
 - b. *Fiscal year 2014 and beyond:* 6.60% of compensation in fiscal year 2014, increased 0.30% per year until the ultimate rate of 7.50% is reached in fiscal year 2017. Beginning in fiscal year 2018, the 7.50% will be reduced one-tenth of one percent for each one-tenth of one percent that the State contribution rate for the fiscal year to which the service relates is less than the State contribution rate established for the 2015 fiscal year.
 - c. Additional member contributions may be allowable for service purchases.
3. Member contributions cease when a member's benefit accrual has reached 100% of Average Monthly Compensation.
 4. Member contributions accumulate interest at 5.00% per year through December 31, 2013 and 2.00% interest per year, thereafter.

State of Texas and Employer Contributions

State and Employer contributions are set biennially by the legislature. The current projected contribution rates, as a percentage of compensation, are shown below. In addition, the State makes contributions for lump-sum death benefits, establishing service not previously established, and annual membership fees. State payroll contributions cease when a member's benefit accrual has reached 100% of Average Monthly Compensation.

| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 and beyond |
|--------------------------|---------------|---------------|---------------|---------------|------------------------------|
| Employer | N/A | 0.50% | 0.50% | 0.50% | 0.50% |
| State | 6.50% | 6.50% | 7.50% | 7.20% | 7.50% |
| Additional Appropriation | N/A | 1.00% | N/A | N/A | N/A |

State contributions after the 2015 fiscal year are subject to future legislative appropriations.

Return to Work Surcharge

For members who, on or after September 1, 2009, retire from the employee class and are rehired as a retiree into a position that would otherwise include membership in the employee class, the department or agency that employs the member must remit to the retirement system an amount equal to the amount of the State contribution that the department or agency would remit for an active member employed in the person's position.

Compensation

Compensation includes base salary, longevity and hazardous duty pay and excludes overtime pay. This amount is limited by Section 401(a)(17) of the Internal Revenue Code for members hired after August 31, 1996.

Average Monthly Compensation (AMC)

1. Elected Class Service: The State salary, excluding longevity pay, of a district judge, as adjusted from time to time.
2. Employee Class Service:
 - a. *Members hired prior to September 1, 2009*: Average of the 36 highest months of compensation for service in the employee class of membership
 - b. *Members hired on or after September 1, 2009 and prior to September 1, 2013*: Average of the 48 highest months of compensation for service in the employee class of membership
 - c. *Members hired on or after September 1, 2013*: Average of the 60 highest months of compensation for service in the employee class of membership

Creditable Service

The types of service creditable in ERS are membership service, military service and equivalent membership service. Equivalent membership service includes: previously cancelled service, service not previously established, waiting period service, and Additional Service Credit.

Unused Sick and Annual Leave

In many cases, unused sick and annual leave can be used to establish Creditable Service. Members hired prior to September 1, 2009 can use unused sick and annual leave to satisfy service requirements for Retirement and Death Benefit Plan eligibility as well as to calculate plan benefits. Members hired on or after September 1, 2009 can only use unused sick and annual leave to calculate plan benefits. However, members hired on or after September 1, 2013 cannot use unused annual leave to calculate plan benefits if the member opts to receive the unused annual leave as a lump-sum payment. Elected Class service is not granted for unused sick and annual leave.

Standard Service Retirement Annuity

1. Elected Class:
 - a. *Eligibility*:
 - i. Age 60 and eight years of elected class service; or
 - ii. Age 50 and 12 years of elected class service.
 - b. *Benefits*: 2.3% of AMC times years of Creditable Service, adjusted automatically based on the State salary of a district judge. Alternatively, an elected class member may elect to transfer their elected class service to the employee class in order to have their AMC based on actual compensation. However, if the elected service is transferred to the employee class, the member forfeits increases based on changes in the State salary of a district judge unless the service is transferred back to the elected class.

2. Employee Class:

a. *Eligibility:*

- i. Members hired prior to September 1, 2009: Age 60 with five years of employee class service;
- ii. Members hired on or after September 1, 2009: Age 65 with 10 years of employee class service;
- iii. Five years of service and age plus employee class service is at least 80 (Rule of 80)
- iv. Age 55 with 10 years of CPO/CO service
- v. Any age with 20 years of CPO/CO service

b. *Benefits:* 2.3% of AMC times years of Creditable Service

c. *Applicable Reductions for eligibility 2.a.iii.:*

- i. For members hired prior to September 1, 2009, none.
- ii. For members hired on or after September 1, 2009, but prior to September 1, 2013, reduced five percent for each year the member retires prior to age 60, with a maximum possible reduction of 25 percent.
- iii. For members hired on or after September 1, 2013, reduced five percent for each year the member retires prior to age 62, with no maximum possible reduction.

d. *Applicable Reductions for eligibilities 2.a.iv. and 2.a.v.:*

- i. For members hired prior to September 1, 2009, retiring after attaining age 50 or after attaining Rule of 80, there is not reduction. Otherwise, the member receives the percentage of the benefit stated in the following table:

| Attained Age at Retirement | Reduction Percentage | Attained Age at Retirement | Reduction Percentage |
|----------------------------|----------------------|----------------------------|----------------------|
| 36 | 31.5% | 43 | 55.5% |
| 37 | 34.1% | 44 | 60.2% |
| 38 | 37.0% | 45 | 65.5% |
| 39 | 40.1% | 46 | 71.2% |
| 40 | 43.4% | 47 | 77.4% |
| 41 | 47.1% | 48 | 84.2% |
| 42 | 51.1% | 49 | 91.7% |

- ii. For members hired after on or after September 1, 2009, but prior to September 1, 2013, reduced five percent for each year the member retires prior to age 55, with a maximum possible reduction of 25 percent.
- iii. For members hired on or after September 1, 2013, reduced five percent for each year the member retires prior to age 57, with no maximum possible reduction.

3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Non-Occupational Disability Annuity

1. Elected Class:
 - a. *Eligibility*:
 - i. 8 years of elected class service; or
 - ii. 6 years of elected class service plus 2 years of pre-1978 military service; and
 - iii. Not eligible for a Standard Service Retirement Annuity.
 - b. *Benefits*: 2.3% of AMC times years of Creditable Service, adjusted automatically based on the State salary of a district judge.
2. Employee Class:
 - a. *Eligibility*:
 - i. 10 years of employee class service; and
 - ii. Not eligible for a Standard Service Retirement Annuity on the basis of Rule of 80 or age 55 and 10 years of CPO/CO Service.
 - b. *Benefits*: 2.3% of AMC times years of Creditable Service
 - c. *Applicable Reductions*: Actuarially reduced from the age that the member would have been eligible for Standard Service Retirement Annuity
3. Normal Form of Payment: Annuity payable for life or until member is no longer incapacitated for the performance of duty. Any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Occupational Disability Annuity:

1. Elected Class:
 - a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to employment
 - b. *Benefits*: 2.3% of AMC times years of Creditable Service, but not less than 18.4% of AMC, adjusted automatically based on the State salary of a district judge
2. Employee Class (Regular Class Service):
 - a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to employment
 - b. *Benefits*: 2.3% of AMC times years of Creditable Service, but not less than 35% of AMC
3. Employee Class (CPO/CO Members):
 - a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to law enforcement or custodial duties

-
- i. Total: Incapable of substantial gainful activity and eligible for Social Security disability benefits
 - ii. Non-total: Does not satisfy definition of Total Disability
 - b. *Benefits:*
 - i. Non-total with less than 20 years of CPO/CO Service: 2.3% of AMC times years of Creditable Service, but not less than 50% of AMC. 15% of AMC payable from LECOSRF and the remaining 35% of AMC is payable from the ERS trust
 - ii. Non-total with 20 years of CPO/CO Service: 2.3% of AMC times years of Creditable Service
 - iii. Total: 2.3% of AMC times years of Creditable Service, but not less than 35% of AMC
 - 4. Normal Form of Payment: Annuity payable for life or until member is no longer incapacitated for the performance of duty. Any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Occupational Disability Lump-Sum Death Benefit

If a member receiving an occupational disability retirement annuity dies and it is determined that the death was an occupational death, a lump-sum death benefit is payable in an amount equal to one year's salary, computed on the basis of the retiree's rate of compensation at the time of disability retirement, and payable to a surviving spouse or dependent minor child.

Death Benefit Plan (DBP) Annuity

1. Eligibility:
 - a. 10 years of employee class service; or
 - b. Eligible for Standard Service Retirement Annuity at time of death.
2. Benefits: Benefits are calculated as if the member had elected an optional form of payment, received a standard service retirement annuity, and died immediately thereafter. If the member dies before becoming eligible for the Standard Service Retirement Annuity, the benefit is reduced for early retirement as follows:
 - a. With 12 years of elected class service, the benefit is actuarially reduced from the member's age 50,
 - b. With 10 years of CPO/CO service, the benefit is actuarially reduced from the member's age 55,
 - c. With five years of employee class service for members hired before September 1, 2009 or eight years of elected class service, the benefit is actuarially reduced from the member's age 60, and
 - d. With 10 years of employee class service for members hired on or after September 1, 2009, the benefit is actuarially reduced from the member's age 65.

Pre-Retirement Death Refund Alternative

A refund of accumulated contributions is payable in cases of pre-retirement death where the member did not meet the eligibility requirements for a Death Benefit Plan Annuity, or the eligible beneficiary chooses to receive a refund of the member account balance in lieu of an annuity. This amount is increased by 5% of the member's account balance at death, times full years of service credit at death, to a maximum of 100%.

Occupational Death Lump-Sum Benefit

If an active member dies and it is determined that the death was an occupational death, a lump-sum death benefit is payable in an amount equal to one year's salary, computed on the basis of the member's rate of compensation at the time of death and payable to a surviving spouse or dependent minor child in addition to any other death benefits.

Post-Retirement Death General Lump-Sum Benefit

\$5,000 upon the death of a retired member. This amount is funded separately by the State and not reflected in this valuation.

Deferred Service Retirement Annuity

1. Elected Class:
 - a. *Eligibility*: Eight years of elected class service
 - b. *Benefits*: Standard Service Retirement Annuity payable at age 60 (or 50 with 12 years of elected class service)
2. Employee Class:
 - a. *Eligibility*:
 - i. Members hired prior to September 1, 2009: Five years of employee class service
 - ii. Members hired on or after September 1, 2009: 10 years of employee class service
 - b. *Benefits*:
 - i. For members hired prior to September 1, 2009: Standard Service Retirement Annuity payable at age 60
 - ii. For members hired on or after September 1, 2009: Standard Service Retirement Annuity payable at age 65
 - iii. For members with 10 years of CPO/CO service: Standard Service Retirement Annuity payable at age 55
3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Refund of Accumulated Contributions

A refund of accumulated contributions is payable in cases where a terminated member did not meet the eligibility requirements for an annuity, or a terminated member chooses to receive a refund of his or her account balance in lieu of an annuity.

Maximum Benefits

Annuity benefits are limited to 100% of Average Monthly Compensation. For members with CPO/CO service, this benefit limitation includes benefits from all sources (ERS and the Law Enforcement and Custodial Officer Supplemental Retirement Fund).

Limit on Plan Modifications

According to Section 811.006 of the Texas Government Code – a rate of member or State contributions to or a rate of interest required for the establishment of credit in the retirement system may not be reduced or eliminated, a type of service may not be made creditable in the retirement system, a limit on the maximum permissible amount of a type of creditable service may not be removed or raised, a new monetary benefit payable by the retirement system may not be established, and the determination of the amount of a monetary benefit from the system may not be increased, if, as a result of the particular action, the time, as determined by an actuarial valuation, required to amortize the UAAL of the retirement system would be increased to a period that exceeds 30 years by one or more years.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation that covered the five-year period from September 1, 2006 through August 31, 2011.

I. Valuation Date

The valuation date is August 31 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 actuarial valuation is used to determine the adequacy of the State contribution rate (established by Legislative appropriation) and employer contribution rate (established by statute) and to describe the current financial condition of ERS.

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: (i) the member's contribution rate, and (ii) the remaining portion of the normal cost rate which is the employer's normal cost rate. The total normal cost rate is based on the benefits payable to a new member and the entry age characteristics of the current active membership.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of (i) the actuarial value of assets, and (ii) the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The funding period is calculated as the number of years required to fully amortize the UAAL, assuming that: (a) future market earnings, net of investment-related expenses, will equal 8.00% per year, (b) there will be no liability gains/losses or changes in assumptions, (c) the number of active members will remain unchanged, (d) active members who leave employment will be replaced by new entrants each year, and (e) State and employer contributions will remain the same percentage of payroll as described in Appendix I.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. Actuarial Value of Assets

The actuarial value of assets is determined as the expected value of plan assets as of the valuation date plus 20% of the difference between the market-related value and the expected value. The expected value equals the actuarial value of plan assets as of the prior valuation date, plus contributions, less benefit payments and administrative expenses, all accumulated at the assumed rate of interest to the current valuation date.

IV. Actuarial Assumptions

Investment Return: 8.00% per year, net of investment-related expenses (composed of an assumed 3.50% inflation rate and a 4.50% real rate of return)

Administrative Expenses: 0.25% of valuation payroll per year

Salary Increases: Increases are assumed to occur at the beginning of the valuation year and vary by employee group. The components of the annual increases are:

| Employee Group | Inflation *** | Real Wage Growth | Merit, Promotion and Longevity |
|--|---------------|------------------|--------------------------------|
| Legislators | 0% | 0% | 0% |
| Elected Class other than Legislators | 3.5% | 0% | 0% |
| Employee Class | 3.5% | 0% | See sample rates |
| State Salary of a District Judge* | 3.5% | 0% | 0% |
| Inactive members who transfer to TRS** | 3.5% | 0% | 1.5% |

* The State salary of a district judge is the compensation used to determine benefit amounts for Legislators. It is also used for benefits for other Elected Class members if it provides a more valuable benefit amount than actual average compensation.

** Assumed in estimating benefits of former members who transfer to the Teacher Retirement System of Texas (TRS).

*** Total liabilities for this valuation reflect all known pay increases appropriated by the State legislature for the biennium.

Sample Rates:

| Annual Salary Increases for Merit, Promotion and Longevity Male and Female Regular Employee Class Members | | | | | | | |
|--|--------------------------------|--------|--------|--------|---------|---------|--------|
| Age | Years of ERS Decrement Service | | | | | | |
| | 0 | 1 | 2 - 4 | 5 - 9 | 10 - 14 | 15 - 19 | 20+ |
| 20 | 6.80 % | 5.25 % | 4.75 % | 4.30 % | | | |
| 25 | 6.40 | 5.25 | 4.75 | 3.50 | 2.50 % | | |
| 30 | 5.90 | 5.25 | 4.75 | 3.00 | 2.50 | 2.00 % | |
| 35 | 5.40 | 4.75 | 4.00 | 3.00 | 2.50 | 2.00 | 1.90 % |
| 40 | 4.90 | 4.75 | 4.00 | 3.00 | 2.50 | 1.90 | 1.80 |
| 45 | 4.40 | 4.25 | 3.75 | 3.00 | 2.40 | 1.90 | 1.70 |
| 50 | 3.90 | 3.70 | 3.20 | 2.70 | 2.20 | 1.70 | 1.60 |
| 55 | 3.40 | 3.20 | 2.80 | 2.40 | 1.90 | 1.60 | 1.50 |
| 60+ | 2.90 | 2.70 | 2.30 | 2.00 | 1.60 | 1.40 | 1.30 |

| Annual Salary Increases for Merit, Promotion and Longevity Male and Female CPO/CO Employee Class Members | | | | | | | |
|---|--------------------------------|--------|--------|--------|--------|--------|--------|
| Age | Years of ERS Decrement Service | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 - 9 | 10+ |
| All | 8.00 % | 5.00 % | 4.50 % | 4.00 % | 3.50 % | 2.00 % | 1.50 % |

Payroll Growth: 3.50% per year, compounded annually (for projecting valuation payroll).

Post-Retirement Increases for Elected Class Members: If benefits are based on the State salary of a district judge, the benefits are assumed to increase 3.50% per year during retirement (each September 1), compounded annually, consistent with the assumed Salary Increase for a district judge. Increases are assumed to also occur during deferral periods (if any). Otherwise, no increases are assumed.

Age and Service Assumptions and Methods:

Rounding of ages:

Current and projected ages rounded to the nearest year are used for all purposes – determining eligibility for benefits, present value factors, early retirement reductions, option factors, salary increase rates, and decrements.

Benefit Service:

Current Benefit Service in years and months as of the valuation date was provided by ERS. This service plus Future Earned Service, Service Credit at Retirement, and Eligibility Service at Retirement were used to project benefit amounts.

Future Earned Service:

Active members were assumed to earn one additional year of service credit in each future year employed based on their current class of membership (but not beyond the

amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

Service Credit at Retirement:

For members hired before September 1, 2009, service credit when eligible for service retirement is assumed to be increased by:

- 0 years for members retiring from the Elected Class;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 78;
- 0.5 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 78;
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 18 years; and
- 0.5 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 18 years.

(but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

For members hired on or after September 1, 2009, service credit when eligible for service retirement is assumed to be increased by:

- 0 years for members retiring from the Elected Class;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 79;
- 0.5 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 79;
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 19 years; and
- 0.5 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 19 years.

(but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

Service for Decrements:

The method of calculating ERS Decrement Service and CPO/CO Decrement Service on the valuation date is shown below. Decrement service is assumed to increase by one year for each future year employed based on their current class of membership.

- Valuation Age: Age rounded to the nearest year on valuation date
- ERS Benefit Service: Years and months of all creditable ERS service on the valuation date
- CPO/CO Benefit Service: Years and months of creditable CPO/CO service on the valuation date
- Date 1: (Valuation Date) minus (ERS Benefit Service)
- ERS Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 1)
- ERS Funding Entry Age (age at hire for the entry age normal cost method): (Valuation Age) minus (ERS Decrement Service)
- Date 2: (Valuation date) minus (CPO/CO Benefit Service)

- CPO/CO Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 2)

Eligibility Service at Retirement:

For members hired before September 1, 2009, eligibility service is assumed to be increased by the following to reach eligibility for service retirement:

- 0 years for members retiring from the Elected Class;
- 2.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 78;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 78;
- 2.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 18 years; and
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 18 years.

For members hired on or after September 1, 2009, eligibility service is assumed to be increased by the following to reach eligibility for service retirement:

- 0 years for members retiring from the Elected Class;
- 1.0 years for members retiring from regular employee class service ; and
- 1.0 years for members retiring from CPO/CO class service.

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the beginning of the valuation year.

Mortality Decrements:

Active Members, Service Retirees, Beneficiaries, and Inactive Members

1994 Group Annuity Mortality with no setback for males and set forward two years for females. Generational mortality improvements in accordance with Scale AA are projected from the year 2000.

Disability Retirees

RP-2000 Disabled Retiree Mortality set forward six years for males and setback one year for females.

Occupational Death

2.0% of male and 0.3% of female active member deaths are assumed to be occupational.

Service Retirement Decrements: Graded tables based on ERS experience.

Active Regular Employee Class Members – hired before September 1, 2009

ERS Decrement Service is used to determine when the rates apply:

- Age 60 with four years of service
- 78 points with five years of service

Sample rates for eligible members:

| Annual Service Retirement Rates per 100 Participants Regular Employee Class Members | | | | | | | | | | | | |
|--|---|------|------|------|------|------|---|------|------|------|------|------|
| Age | Males - Years of ERS Decrement Service | | | | | | Females - Years of ERS Decrement Service | | | | | |
| | 5 | 10 | 15 | 20 | 25 | 30 | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | | | | | | 35 | | | | | | 45 |
| 51 | | | | | | 25 | | | | | | 40 |
| 52 | | | | | | 25 | | | | | | 25 |
| 53 | | | | | 35 | 25 | | | | | 40 | 25 |
| 54 | | | | | 60 | 25 | | | | | 60 | 25 |
| 55 | | | | | 22.5 | 25 | | | | | 40 | 25 |
| 56 | | | | | 20 | 25 | | | | | 25 | 25 |
| 57 | | | | | 20 | 25 | | | | | 25 | 25 |
| 58 | | | | 35 | 20 | 25 | | | | 40 | 25 | 25 |
| 59 | | | | 60 | 20 | 25 | | | | 60 | 25 | 25 |
| 60 | 10 | 15 | 17.5 | 37.5 | 20 | 27.5 | 10 | 15 | 15 | 35 | 20 | 20 |
| 65 | 20 | 45 | 45 | 35 | 35 | 35 | 20 | 45 | 45 | 32.5 | 32.5 | 32.5 |
| 70 | 20 | 37.5 | 27.5 | 32.5 | 32.5 | 32.5 | 20 | 37.5 | 27.5 | 32.5 | 32.5 | 32.5 |
| 75 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Active Regular Employee Class Members – hired on or after September 1, 2009

ERS Decrement Service is used to determine when the rates apply:

- Age 65 with nine years of service
- 79 points with five years of service

Sample rates for eligible members:

| Annual Service Retirement Rates per 100 Participants Regular Employee Class Members | | | | | | | | | | | | |
|--|---|-----|------|-----|------|------|---|-----|------|------|------|------|
| Age | Males - Years of ERS Decrement Service | | | | | | Females - Years of ERS Decrement Service | | | | | |
| | 5 | 10 | 15 | 20 | 25 | 30 | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | | | | | | 15 | | | | | | 20 |
| 51 | | | | | | 15 | | | | | | 25 |
| 52 | | | | | | 7.5 | | | | | | 10 |
| 53 | | | | | | 7.5 | | | | | | 10 |
| 54 | | | | | 5 | 7.5 | | | | | 12.5 | 10 |
| 55 | | | | | 25 | 7.5 | | | | | 30 | 10 |
| 56 | | | | | 12.5 | 7.5 | | | | | 15 | 10 |
| 57 | | | | | 7.5 | 7.5 | | | | | 10 | 10 |
| 58 | | | | | 7.5 | 7.5 | | | | | 10 | 10 |
| 59 | | | | 5 | 7.5 | 7.5 | | | | 12.5 | 10 | 10 |
| 60 | | | | 25 | 57.5 | 67.5 | | | | 25 | 45 | 45 |
| 65 | | 85 | 37.5 | 30 | 45 | 40 | | 85 | 37.5 | 17.5 | 35 | 30 |
| 70 | | 80 | 60 | 90 | 35 | 35 | | 80 | 60 | 90 | 32.5 | 32.5 |
| 75 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Active Elected Class Members

ERS Decrement Service is used to determine when the rates apply:

- Age 60 with eight years of service
- Age 50 with 12 years of service

| Annual Service Retirement Rates per 100 Participants Elected Class Members | |
|---|-----------------|
| Age | Male and Female |
| 50 - 64 | 10 |
| 65 - 74 | 20 |
| 75+ | 100 |

Active CPO/CO Employee Class Members – hired before September 1, 2009

CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 18 years of CPO/CO service
- Age 55 with nine years of CPO/CO service

Sample rates for eligible members:

| Annual Service Retirement Rates per 100 Participants CPO/CO Employee Class Members - Male and Female | | | | | | |
|---|-----------------------------------|-----|-----|-----|-----|-----|
| Age | Years of CPO/CO Decrement Service | | | | | |
| | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | | | | 45 | 55 | 55 |
| 51 | | | | 30 | 30 | 30 |
| 52 | | | | 30 | 30 | 30 |
| 53 | | | | 30 | 30 | 30 |
| 54 | | | | 30 | 30 | 30 |
| 55 | | 12 | 12 | 45 | 35 | 35 |
| 56 | | 10 | 10 | 45 | 35 | 35 |
| 57 | | 10 | 10 | 45 | 45 | 45 |
| 58 | | 10 | 10 | 45 | 35 | 35 |
| 59 | | 13 | 13 | 45 | 35 | 35 |
| 60 | 6 | 16 | 16 | 55 | 35 | 35 |
| 65 | 15 | 35 | 35 | 50 | 60 | 60 |
| 70 | 50 | 50 | 50 | 50 | 50 | 50 |
| 75 | 100 | 100 | 100 | 100 | 100 | 100 |

Active CPO/CO Employee Class Members – hired on or after September 1, 2009

CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 19 years of CPO/CO service
- Age 55 with nine years of CPO/CO service

Sample rates for eligible members:

| Annual Service Retirement Rates per 100 Participants CPO/CO Employee Class Members - Male and Female | | | | | | |
|---|-----------------------------------|-----|-----|------|------|------|
| Age | Years of CPO/CO Decrement Service | | | | | |
| | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | | | | 5 | 5 | 5 |
| 51 | | | | 5 | 5 | 5 |
| 52 | | | | 5 | 5 | 5 |
| 53 | | | | 5 | 5 | 5 |
| 54 | | | | 5 | 5 | 5 |
| 55 | | 12 | 12 | 82.5 | 65 | 65 |
| 56 | | 10 | 10 | 37.5 | 30 | 30 |
| 57 | | 10 | 10 | 37.5 | 37.5 | 37.5 |
| 58 | | 10 | 10 | 37.5 | 30 | 30 |
| 59 | | 13 | 13 | 37.5 | 30 | 30 |
| 60 | | 16 | 16 | 55 | 35 | 35 |
| 65 | | 35 | 35 | 50 | 60 | 60 |
| 70 | | 50 | 50 | 50 | 50 | 50 |
| 75 | 100 | 100 | 100 | 100 | 100 | 100 |

Disability Retirement Decrements: Graded Tables Based on ERS Experience

Active Regular Employee Class Members

ERS Decrement Service is used to determine when the rates apply:

- The rates do not apply before someone is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- 10 years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Active Elected Class Members

ERS Decrement Service is used to determine when the rates apply:

- The rates do not apply before someone is eligible for the benefit.
- No occupational disabilities are assumed for the elected class.
- Eight years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Sample rates for eligible regular employee class and elected class members:

| Annual Disability Rates per 100 Participants | | |
|--|---|---------|
| Age | Regular Employee Class and Elected Class | |
| | Males | Females |
| 30 | 0.0366 | 0.0180 |
| 35 | 0.0867 | 0.0589 |
| 40 | 0.0999 | 0.1195 |
| 45 | 0.1369 | 0.1940 |
| 50 | 0.1979 | 0.2762 |
| 55 | 0.3302 | 0.4651 |
| 60 | 0.4986 | 0.7444 |

99% of the disability rates stated above are assumed to be attributable to non-occupational disabilities and 1% are assumed to be attributable to occupational disabilities. No occupational disabilities are assumed for the elected class.

Active CPO/CO Employee Class Members

ERS Decrement Service and CPO/CO Decrement Service are used to determine when the rates apply:

- The rates do not apply before a member is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- 10 years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Sample rates for members:

| Annual Disability Rates per 100 Participants CPO/CO Employee Class Members | |
|---|-------------------|
| Age | Males and Females |
| 30 | 0.0123 |
| 35 | 0.0418 |
| 40 | 0.0781 |
| 45 | 0.1307 |
| 50 | 0.2365 |
| 55 | 0.3280 |
| 60 | 0.4200 |

95% of the disability rates stated above are assumed to be attributable to non-occupational disabilities, 4% are assumed to be attributable to non-total occupational disabilities, and 1% are assumed to be attributable to total occupational disabilities.

Termination Decrements for Reasons Other Than Death or Retirement: Graded Tables Based on ERS Experience.

Rates of termination are zero for members eligible for service retirement.

Sample rates for members not eligible for service retirement:

Active Regular Employee Class Members – hired before September 1, 2009

| Annual Rates of Termination per 100 Participants Regular Employee Class Members | | | | | | | | | |
|--|--|----|----|----|----|----|----|----|----|
| Age | Male and Female - Years of ERS Decrement Service | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 |
| 20 | 50 | 40 | 30 | 30 | | | | | |
| 25 | 35 | 30 | 26 | 22 | 20 | 15 | | | |
| 30 | 28 | 23 | 19 | 15 | 14 | 12 | 6 | | |
| 35 | 27 | 21 | 16 | 14 | 11 | 10 | 6 | 3 | |
| 40 | 25 | 18 | 13 | 11 | 10 | 9 | 6 | 3 | 3 |
| 45 | 25 | 18 | 13 | 11 | 9 | 8 | 4 | 3 | 1 |
| 50 | 22 | 17 | 13 | 10 | 9 | 7 | 4 | 2 | 1 |
| 55 | 21 | 15 | 11 | 9 | 7 | 7 | 4 | 2 | 1 |
| 60 | 20 | 15 | 10 | 8 | | | | | |

Active CPO/CO Employee Class Members – hired before September 1, 2009

| Annual Rates of Termination per 100 Participants CPO/CO Employee Class Members | | | | | | | | |
|---|--|----|----|----|----|----|----|----|
| Age | Male and Female - Years of ERS Decrement Service | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 10 | 15 |
| 20 | 23 | 19 | 17 | 17 | | | | |
| 25 | 20 | 17 | 14 | 14 | 14 | 13 | | |
| 30 | 16 | 13 | 12 | 11 | 10 | 10 | 8 | |
| 35 | 16 | 11 | 9 | 9 | 8 | 7 | 6 | 4 |
| 40 | 14 | 10 | 8 | 7 | 7 | 7 | 5 | 2 |
| 45 | 13 | 10 | 7 | 6 | 6 | 6 | 3 | 2 |
| 50 | 12 | 9 | 7 | 6 | 6 | 6 | 3 | 2 |
| 55 | 12 | 7 | 5 | 5 | 4 | 4 | | |
| 60 | 13 | 7 | 5 | 5 | | | | |

Active Regular Employee Class Members – hired on or after September 1, 2009

| Annual Rates of Termination per 100 Participants Regular Employee Class Members | | | | | | | | | |
|--|--|----|----|----|----|----|----|----|----|
| Age | Male and Female - Years of ERS Decrement Service | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 |
| 20 | 52 | 42 | 32 | 27 | | | | | |
| 25 | 42 | 32 | 29 | 25 | 22 | 18 | | | |
| 30 | 32 | 27 | 21 | 18 | 15 | 14 | 6 | | |
| 35 | 31 | 25 | 19 | 16 | 12 | 11 | 6 | 4 | |
| 40 | 30 | 21 | 15 | 13 | 11 | 9 | 6 | 2 | 2 |
| 45 | 27 | 21 | 13 | 12 | 10 | 8 | 4 | 2 | 1 |
| 50 | 26 | 19 | 13 | 11 | 10 | 7 | 4 | 2 | 1 |
| 55 | 25 | 17 | 12 | 10 | 7 | 7 | 4 | 2 | 1 |
| 60 | 24 | 17 | 11 | 9 | 6 | 6 | 4 | 1 | |
| 65 | 22 | 16 | 10 | 6 | | | | | |

Active CPO/CO Employee Class Members – hired on or after September 1, 2009

| Annual Rates of Termination per 100 Participants CPO/CO Employee Class Members | | | | | | | | |
|---|--|----|----|----|----|----|----|----|
| Age | Male and Female - Years of ERS Decrement Service | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 10 | 15 |
| 20 | 24 | 20 | 17 | 17 | | | | |
| 25 | 22 | 19 | 16 | 16 | 16 | 15 | | |
| 30 | 17 | 15 | 14 | 12 | 12 | 12 | 8 | |
| 35 | 18 | 12 | 11 | 11 | 10 | 8 | 6 | 4 |
| 40 | 15 | 11 | 9 | 8 | 8 | 8 | 5 | 2 |
| 45 | 14 | 11 | 8 | 7 | 7 | 7 | 3 | 2 |
| 50 | 13 | 11 | 8 | 7 | 7 | 6 | 3 | 2 |
| 55 | 13 | 8 | 5 | 5 | 4 | 4 | | |
| 60 | 15 | 8 | 5 | 5 | | | | |

Elected Class Members: 4 per 100 participants for members not eligible for service retirement

Rates of Withdrawal of Employee Contributions

- 100% of members that terminate without a vested benefit are assumed to withdraw their employee contributions.
- Members that terminate with a vested benefit are assumed to withdraw their employee contributions based on the rates summarized in the following table.

| Annual Rates of Withdrawal of Employee Contributions per 100 New Vested Terminations Male and Female | | | | | | | | | | | | |
|---|---|-------|-------|-----|--|-------|-------|-----|------------------------|-------|-------|-----|
| Age | Regular Employee Class ERS Decrement Service | | | | CPO/CO Employee Class ERS Decrement Service | | | | Elected Class Members* | | | |
| | 5-9 | 10-14 | 15-19 | 20+ | 5-9 | 10-14 | 15-19 | 20+ | 5-9 | 10-14 | 15-19 | 20+ |
| 20-24 | 100 | 100 | | | 100 | | | | | | | |
| 25-29 | 75 | 65 | 60 | | 75 | 60 | 60 | | | | | |
| 30-34 | 65 | 60 | 50 | | 75 | 60 | 50 | | | | | |
| 35-39 | 65 | 50 | 50 | 35 | 70 | 60 | 50 | | | | | |
| 40-44 | 65 | 50 | 45 | 35 | 70 | 60 | 50 | | | | | |
| 45-49 | 60 | 45 | 35 | 25 | 60 | 40 | 20 | | | | | |
| 50-54 | 55 | 40 | 30 | 20 | 55 | 40 | 20 | | | | | |
| 55+ | 50 | 30 | 25 | 15 | 50 | 30 | 20 | | | | | |

* Elected Class Members are assumed not to withdraw employee contributions.

Percentage of Members Electing Various Benefit Options:

| Sex/ Benefit | Standard Life Annuity | Option 1 | Option 4 |
|--------------------|--------------------------|----------|----------|
| Male Member | | | |
| Disability | 50% | 40% | 10% |
| Service Retirement | 100% | 0% | 0% |
| Death Benefit Plan | 0% | 75% | 25% |
| Female Member | | | |
| Disability | 75% | 20% | 5% |
| Service Retirement | 100% | 0% | 0% |
| Death Benefit Plan | 0% | 50% | 50% |

Beneficiary Characteristics: Male member is assumed to be three years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Transfers from ERS to TRS:

Contributing ERS members:

It is assumed that 10% of regular and CPO/CO employee class members who cease contributing to ERS and do not withdraw employee contributions will transfer ERS service credit to TRS at retirement.

Noncontributing ERS Members:

Records of ERS and TRS are matched by ERS staff to determine former ERS members who are currently contributing under TRS.

TRS Retirement Age:

Former ERS members who are, or are assumed to become, contributing TRS members are assumed to continue to earn service credit under TRS until first eligible for unreduced service retirement benefits, retire at that time, and transfer ERS service credit to TRS.

Census Data and Assets

- The valuation was based on members of ERS as of August 31, 2013 and does not take into account future members.
- All census data was supplied by ERS and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.
- Asset data was supplied by ERS.

Other Actuarial Valuation Procedures

- No provision was made in this actuarial valuation for the limitations of Internal Revenue Code Sections 415 or 401(a)17.
- Valuation payroll (earnings applied to the current valuation year) is the expected payroll for the fiscal year following the valuation date. It is based on reported payroll determined from August member contributions increased to reflect the across-the-board salary increases appropriated by the State legislature, effective on or after September 1, and projected according to the actuarial assumptions for the upcoming fiscal year.
- No liability was included for benefits which are funded by special State appropriations.
- State appropriations for membership fees have been ignored.

DETAILED SUMMARIES OF MEMBERSHIP DATA

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TABLE A
SUMMARY OF MEMBERSHIP DATA

Active Members

| Item | Regular Members | Elected Class | LECOS Members | Total |
|-------------------------|-----------------|---------------|---------------|-----------|
| Number of Members | 95,934 | 320 | 37,415 | 133,669 |
| Average Annual Salaries | \$ 43,708 | \$ 61,369 | \$ 39,469 | \$ 42,564 |
| Average Age | 45.1 | 51.3 | 42.4 | 44.3 |
| Average Service | 9.8 | 8.3 | 9.1 | 9.6 |

Annuitants

| Item | Number | Annual Annuities | Average Annuities | Average Age |
|------------------------------------|--------|------------------|-------------------|-------------|
| Service Retirees and Beneficiaries | 88,773 | \$ 1,706,531,736 | 19,224 | 68.4 |
| Disability Retirees | 2,594 | \$ 24,462,012 | 9,430 | 64.5 |
| Total | 91,367 | \$ 1,730,993,748 | \$ 18,946 | 68.3 |

Inactive Members Assumed Eligible for Deferred Annuities

| Item | Number | Annual Annuities | Average Annuities | Average Age |
|--|--------|------------------|-------------------|-------------|
| Vested Members who are not Active at TRS | 14,540 | \$ 147,439,824 | \$ 10,140 | 48.9 |
| Vested Members who are Active at TRS | 2,474 | \$ 44,566,584 | \$ 18,014 | 51.4 |
| Total | 17,014 | \$ 192,006,408 | \$ 11,285 | 49.2 |
| Non-vested Members who are Active at TRS | 6,398 | \$ 20,413,512 | \$ 3,191 | 45.9 |

Non-vested Inactive Members

| Item | Number | Account Balances | Average Account Balance | Average Age |
|--|--------|------------------|-------------------------|-------------|
| Non-vested Members who are not Active at TRS | 72,603 | \$ 174,172,039 | \$ 2,399 | 39.9 |
| Non-vested Members who are Active at TRS (this group assumed eligible for deferred annuities) | 6,398 | \$ 24,070,178 | \$ 3,762 | 45.9 |
| Total | 79,001 | \$ 198,242,217 | \$ 2,509 | 40.4 |

TABLE B
ACTIVE MEMBERS – ALL MEMBERS
DISTRIBUTION BY AGE AND SERVICE

| Age | Years of Service | | | | | | | | | Total |
|--------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|------------------|-----------------|----------------------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | |
| Under 25 | 6,035 \$ 27,885 | 75 \$ 32,215 | | | | | | | | 6,110 \$ 27,938 |
| 25 - 29 | 9,860 \$ 33,316 | 2,387 \$ 36,879 | 58 \$ 38,430 | | | | | | | 12,305 \$ 34,031 |
| 30 - 34 | 8,414 \$ 35,437 | 4,996 \$ 42,479 | 1,482 \$ 43,115 | 76 \$ 42,079 | | | | | | 14,968 \$ 38,581 |
| 35 - 39 | 6,341 \$ 36,669 | 4,146 \$ 43,536 | 3,171 \$ 48,656 | 1,342 \$ 47,748 | 55 \$ 54,789 | 1 \$ 38,575 | | | | 15,056 \$ 42,138 |
| 40 - 44 | 5,909 \$ 36,489 | 3,891 \$ 42,566 | 3,512 \$ 47,847 | 3,636 \$ 50,811 | 1,476 \$ 52,626 | 81 \$ 54,098 | | | | 18,505 \$ 44,101 |
| 45 - 49 | 5,008 \$ 36,475 | 3,618 \$ 41,228 | 2,999 \$ 45,847 | 3,555 \$ 48,948 | 3,280 \$ 54,190 | 1,800 \$ 57,287 | 110 \$ 58,505 | | | 20,370 \$ 45,686 |
| 50 - 54 | 4,452 \$ 36,584 | 3,334 \$ 41,588 | 2,900 \$ 44,980 | 3,196 \$ 48,480 | 2,744 \$ 53,934 | 2,024 \$ 62,129 | 542 \$ 64,411 | 24 \$ 61,349 | | 19,216 \$ 46,682 |
| 55 - 59 | 3,454 \$ 37,814 | 3,002 \$ 41,103 | 2,652 \$ 44,420 | 2,693 \$ 46,583 | 1,968 \$ 53,795 | 1,017 \$ 59,916 | 494 \$ 65,244 | 114 \$ 59,942 | 6 \$ 51,406 | 15,400 \$ 45,677 |
| 60 - 64 | 1,764 \$ 39,013 | 1,987 \$ 42,520 | 1,685 \$ 44,154 | 1,530 \$ 47,454 | 917 \$ 54,899 | 448 \$ 58,829 | 175 \$ 61,536 | 86 \$ 65,284 | 32 \$ 53,125 | 8,624 \$ 45,813 |
| Over 64 | 612 \$ 41,165 | 825 \$ 42,271 | 660 \$ 44,846 | 487 \$ 52,506 | 295 \$ 55,094 | 129 \$ 59,138 | 43 \$ 60,468 | 38 \$ 64,793 | 26 \$ 62,951 | 3,115 \$ 46,811 |
| Total | 51,849 \$ 34,972 | 28,261 \$ 41,731 | 19,119 \$ 45,933 | 16,515 \$ 48,719 | 10,735 \$ 53,926 | 5,500 \$ 59,674 | 1,364 \$ 63,744 | 262 \$ 62,528 | 64 \$ 56,956 | 133,669 \$ 42,564 |

TABLE C
ACTIVE MEMBERS – REGULAR CLASS MEMBERS
DISTRIBUTION BY AGE AND SERVICE

| Age | Years of Service | | | | | | | | | Total |
|--------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|--------------------|------------------|-----------------|---------------------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | |
| Under 25 | 3,328 \$ 25,689 | 43 \$ 28,770 | | | | | | | | 3,371 \$ 25,728 |
| 25 - 29 | 6,896 \$ 32,904 | 1,447 \$ 35,787 | 25 \$ 39,049 | | | | | | | 8,368 \$ 33,421 |
| 30 - 34 | 6,210 \$ 35,787 | 3,558 \$ 42,751 | 843 \$ 42,516 | 43 \$ 41,083 | | | | | | 10,654 \$ 38,666 |
| 35 - 39 | 4,651 \$ 37,318 | 3,011 \$ 44,600 | 2,142 \$ 49,563 | 697 \$ 49,163 | 36 \$ 54,699 | | | | | 10,537 \$ 42,731 |
| 40 - 44 | 4,298 \$ 37,072 | 2,814 \$ 43,505 | 2,437 \$ 49,043 | 2,115 \$ 52,800 | 976 \$ 53,575 | 65 \$ 52,851 | | | | 12,705 \$ 44,760 |
| 45 - 49 | 3,684 \$ 37,143 | 2,585 \$ 42,080 | 2,163 \$ 47,583 | 2,223 \$ 51,445 | 2,359 \$ 55,639 | 1,214 \$ 58,358 | 90 \$ 58,850 | | | 14,318 \$ 46,814 |
| 50 - 54 | 3,311 \$ 37,396 | 2,484 \$ 42,695 | 2,069 \$ 46,956 | 2,123 \$ 51,368 | 2,400 \$ 54,411 | 1,744 \$ 62,221 | 480 \$ 63,897 | 22 \$ 57,820 | | 14,633 \$ 48,324 |
| 55 - 59 | 2,594 \$ 38,869 | 2,327 \$ 42,189 | 2,075 \$ 45,798 | 1,912 \$ 48,838 | 1,737 \$ 54,511 | 934 \$ 60,016 | 452 \$ 64,066 | 110 \$ 59,032 | 6 \$ 51,406 | 12,147 \$ 47,247 |
| 60 - 64 | 1,319 \$ 40,110 | 1,499 \$ 44,426 | 1,339 \$ 45,696 | 1,123 \$ 49,770 | 813 \$ 56,432 | 421 \$ 59,367 | 171 \$ 61,724 | 85 \$ 65,248 | 31 \$ 54,607 | 6,801 \$ 47,823 |
| Over 64 | 452 \$ 43,718 | 588 \$ 44,896 | 512 \$ 47,453 | 367 \$ 55,434 | 261 \$ 56,527 | 115 \$ 61,363 | 41 \$ 62,215 | 38 \$ 64,793 | 26 \$ 62,951 | 2,400 \$ 49,691 |
| Total | 36,743 \$ 35,427 | 20,356 \$ 42,633 | 13,605 \$ 47,268 | 10,603 \$ 50,998 | 8,582 \$ 54,931 | 4,493 \$ 60,294 | 1,234 \$ 63,234 | 255 \$ 61,858 | 63 \$ 57,746 | 95,934 \$ 43,708 |

TABLE D
ACTIVE MEMBERS – CPO/CO MEMBERS
DISTRIBUTION BY AGE AND SERVICE

| Age | Years of Service | | | | | | | | | Total |
|--------------|---------------------|--------------------|--------------------|--------------------|--------------------|------------------|------------------|-----------------|-----|---------------------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | |
| Under 25 | 2,707 \$ 30,585 | 32 \$ 36,845 | | | | | | | | 2,739 \$ 30,658 |
| 25 - 29 | 2,961 \$ 34,261 | 940 \$ 38,560 | 33 \$ 37,962 | | | | | | | 3,934 \$ 35,319 |
| 30 - 34 | 2,192 \$ 34,439 | 1,436 \$ 41,771 | 639 \$ 43,906 | 33 \$ 43,375 | | | | | | 4,300 \$ 38,363 |
| 35 - 39 | 1,665 \$ 34,239 | 1,131 \$ 40,623 | 1,028 \$ 46,806 | 645 \$ 46,220 | 19 \$ 54,960 | 1 \$ 38,575 | | | | 4,489 \$ 40,535 |
| 40 - 44 | 1,581 \$ 34,276 | 1,066 \$ 39,678 | 1,067 \$ 45,200 | 1,518 \$ 48,125 | 500 \$ 50,773 | 16 \$ 59,163 | | | | 5,748 \$ 42,467 |
| 45 - 49 | 1,298 \$ 33,805 | 1,021 \$ 38,317 | 830 \$ 41,179 | 1,330 \$ 44,837 | 920 \$ 50,526 | 586 \$ 55,067 | 20 \$ 56,952 | | | 6,005 \$ 42,748 |
| 50 - 54 | 1,121 \$ 33,763 | 842 \$ 37,839 | 823 \$ 39,665 | 1,064 \$ 42,328 | 340 \$ 50,768 | 280 \$ 61,558 | 62 \$ 68,391 | 2 \$ 100,165 | | 4,534 \$ 41,095 |
| 55 - 59 | 844 \$ 34,331 | 666 \$ 37,100 | 569 \$ 39,275 | 775 \$ 41,021 | 221 \$ 47,189 | 81 \$ 60,072 | 42 \$ 77,925 | 4 \$ 84,977 | | 3,202 \$ 39,579 |
| 60 - 64 | 433 \$ 34,376 | 479 \$ 36,235 | 338 \$ 38,225 | 404 \$ 41,023 | 99 \$ 44,712 | 26 \$ 52,101 | 4 \$ 53,494 | 1 \$ 68,393 | | 1,784 \$ 38,004 |
| Over 64 | 154 \$ 33,465 | 229 \$ 35,728 | 140 \$ 37,262 | 116 \$ 41,543 | 31 \$ 43,864 | 9 \$ 49,255 | 1 \$ 42,144 | | | 680 \$ 37,082 |
| Total | 14,956 \$ 33,543 | 7,842 \$ 39,133 | 5,467 \$ 42,612 | 5,885 \$ 44,546 | 2,130 \$ 49,949 | 999 \$ 57,212 | 129 \$ 69,056 | 7 \$ 86,947 | | 37,415 \$ 39,469 |

TABLE E
ACTIVE MEMBERS – ELECTED CLASS MEMBERS
DISTRIBUTION BY AGE AND SERVICE

| Age | Years of Service | | | | | | | | | Total |
|--------------|------------------|------------------|-----------------|-----------------|-----------------|----------------|---------------|-------|---------------|------------------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | |
| Under 25 | | | | | | | | | | |
| 25 - 29 | 3 \$ 46,466 | | | | | | | | | 3 \$ 46,466 |
| 30 - 34 | 12 \$ 36,650 | 2 \$ 66,100 | | | | | | | | 14 \$ 40,857 |
| 35 - 39 | 25 \$ 77,879 | 4 \$ 66,100 | 1 \$ 7,200 | | | | | | | 30 \$ 73,953 |
| 40 - 44 | 30 \$ 69,610 | 11 \$ 82,163 | 8 \$ 36,650 | 3 \$ 7,200 | | | | | | 52 \$ 63,594 |
| 45 - 49 | 26 \$ 75,161 | 12 \$ 105,366 | 6 \$ 66,100 | 2 \$ 7,200 | 1 \$ 7,200 | | | | | 47 \$ 77,378 |
| 50 - 54 | 20 \$ 60,210 | 8 \$ 92,425 | 8 \$ 80,824 | 9 \$ 94,655 | 4 \$ 36,650 | | | | | 49 \$ 73,238 |
| 55 - 59 | 16 \$ 50,594 | 9 \$ 56,389 | 8 \$ 52,937 | 6 \$ 46,466 | 10 \$ 75,380 | 2 \$ 7,200 | | | | 51 \$ 54,657 |
| 60 - 64 | 12 \$ 85,733 | 9 \$ 59,555 | 8 \$ 36,650 | 3 \$ 46,466 | 5 \$ 7,200 | 1 \$ 7,200 | | | 1 \$ 7,200 | 39 \$ 52,507 |
| Over 64 | 6 \$ 46,466 | 8 \$ 36,650 | 8 \$ 10,724 | 4 \$ 101,800 | 3 \$ 46,466 | 5 \$ 25,760 | 1 \$ 7,200 | | | 35 \$ 38,297 |
| Total | 150 \$ 65,933 | 63 \$ 73,665 | 47 \$ 45,661 | 27 \$ 63,455 | 23 \$ 47,087 | 8 \$ 18,800 | 1 \$ 7,200 | | 1 \$ 7,200 | 320 \$ 61,369 |

TABLE F

**RETIRED AND BENEFICIARY MEMBERS – EXCLUDING DEFERRED
 LECOSRF AND ERS REIMBURSING TRS ANNUITANTS**

DISTRIBUTION BY AGE AND CATEGORY

| Age Last Birthday | Number | Annual Benefit | Average Annual Benefit |
|--------------------------|--------|----------------|------------------------|
| Service Retirees | | | |
| Under 60 | 13,750 | 385,137,276 | 28,010 |
| 60 - 64 | 16,986 | 365,307,048 | 21,506 |
| 65 - 69 | 17,704 | 331,635,420 | 18,732 |
| 70 - 74 | 12,134 | 200,561,016 | 16,529 |
| 75 - 79 | 8,039 | 135,726,384 | 16,883 |
| Over 79 | 8,520 | 154,318,692 | 18,113 |
| Total | 77,133 | 1,572,685,836 | 20,389 |
| Beneficiaries | | | |
| Under 60 | 1,159 | 13,689,228 | 11,811 |
| 60 - 64 | 708 | 10,041,768 | 14,183 |
| 65 - 69 | 935 | 13,195,764 | 14,113 |
| 70 - 74 | 1,029 | 14,995,572 | 14,573 |
| 75 - 79 | 1,123 | 18,132,648 | 16,147 |
| Over 79 | 2,600 | 45,106,692 | 17,349 |
| Total | 7,554 | 115,161,672 | 15,245 |
| Disabled Retirees | | | |
| Under 60 | 764 | 6,734,604 | 8,815 |
| 60 - 64 | 548 | 5,635,788 | 10,284 |
| 65 - 69 | 491 | 5,094,096 | 10,375 |
| 70 - 74 | 287 | 2,918,556 | 10,169 |
| 75 - 79 | 189 | 1,855,080 | 9,815 |
| Over 79 | 176 | 1,786,536 | 10,151 |
| Total | 2,455 | 24,024,660 | 9,786 |
| Grand Total | 87,142 | 1,711,872,168 | 19,645 |

TABLE G

**RETIRED AND BENEFICIARY MEMBERS –
 LECOSRF ANNUITANTS DEFERRED IN ERS
 DISTRIBUTION BY AGE AND CATEGORY**

| Age Last Birthday | Number | Annual Benefit | Average Annual Benefit |
|-------------------------|--------|----------------|------------------------|
| All Participants | | | |
| Under 45 | 12 | 209,964 | 17,497 |
| 45 - 49 | 166 | 3,021,888 | 18,204 |
| Total | 178 | 3,231,852 | 18,156 |
| Grand Total | 178 | 3,231,852 | 18,156 |

TABLE H
RETIRED AND BENEFICIARY MEMBERS –
ANNUITANTS WHERE ERS IS REIMBURSING TRS
DISTRIBUTION BY AGE AND CATEGORY

| Age Last Birthday | Number | Annual Benefit | Average Annual Benefit |
|---|--------|----------------|------------------------|
| Service Retirees and Beneficiaries | | | |
| Under 60 | 502 | 2,721,768 | 5,422 |
| 60 - 64 | 1,081 | 4,565,400 | 4,223 |
| 65 - 69 | 1,164 | 4,492,656 | 3,860 |
| 70 - 74 | 737 | 2,529,504 | 3,432 |
| 75 - 79 | 318 | 915,696 | 2,880 |
| Over 79 | 106 | 227,352 | 2,145 |
| Total | 3,908 | 15,452,376 | 3,954 |
| Disabled Retirees | | | |
| Under 60 | 58 | 241,140 | 4,158 |
| 60 - 64 | 39 | 110,592 | 2,836 |
| 65 - 69 | 28 | 66,564 | 2,377 |
| 70 - 74 | 12 | 15,996 | 1,333 |
| 75 - 79 | 2 | 3,060 | 1,530 |
| Over 79 | 0 | 0 | 0 |
| Total | 139 | 437,352 | 3,146 |
| Grand Total | 4,047 | 15,889,728 | 3,926 |

GLOSSARY

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or Funding Method: A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ARC.

Actuarial Gain or Actuarial Loss: A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. 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 Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund'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.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

- a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),
- b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
- c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB 25, such as the funded ratio and the ARC.

Actuarial Value of Assets or Valuation Assets: The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.

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.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Annual Required Contribution (ARC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under GASB 25. The ARC consists of the Employer Normal Cost and the Amortization Payment

Closed Amortization Period: A specific number of years that is counted down by one each year and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: A retirement plan that is not a Defined Contribution Plan. Typically a defined benefit plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund 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.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, although GASB 25 reporting requires the use of the AVA.

Funding Period or Amortization Period: The term "Funding Period" is used in two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ARC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: Governmental Accounting Standards Board.

GASB 25 and **GASB 27**: Governmental Accounting Standards Board Statements No. 25 and No. 27. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.