

**Teacher Retirement System  
of Texas**

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**ACTUARIAL VALUATION  
August 31, 2004**



**GABRIEL, ROEDER, SMITH & COMPANY**  
**Consultants & Actuaries**

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November 8, 2004

Board of Trustees  
Teacher Retirement System of Texas  
1000 Red River Street  
Austin, TX 78701-2698

**Subject: Actuary's Certification of the Actuarial Valuation as of August 31, 2004**

We certify that the information included herein and contained in the 2004 Actuarial Valuation Report is accurate and fairly presents the actuarial position of the Teacher Retirement System of Texas (TRS) as of August 31, 2004.

All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, the results presented comply with the requirements of the Texas statutes and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries. Mr. Carter and Mr. Newton are members of the American Academy of Actuaries, and are also Enrolled Actuaries. All are experienced in performing valuations for large public retirement systems.

***Actuarial Valuations***

The primary purpose of the valuation report is to determine the adequacy of the current State contribution rate through measuring the resulting funding period, to describe the current financial condition of the System, and to analyze changes in the System's condition. In addition, the report provides information required by the System in connection with Governmental Accounting Standards Board Statement No. 25 (GASB No. 25), and it provides various summaries of the data.

Valuations are prepared annually, as of August 31 of each year, the last day of the System's plan and fiscal year.

***Financing Objective of the Plan***

Contribution rates are established by Law that, over time, are intended to remain level as a percent of payroll. The employee and State contribution rates have been set by Law and are intended to provide for the normal cost plus the level percentage of payroll required to amortize the unfunded actuarial accrued liability over a period not in excess of 31 years.

***Progress Toward Realization of Financing Objective***

The actuarial accrued liability, the unfunded actuarial accrued liability (UAAL), and the calculation of the resulting funding period illustrate the progress toward the realization of financing objectives. Based on this actuarial valuation as of August 31, 2004, the System's underfunded status has increased because of the continued recognition of the investment results during the poor investment markets of fiscal years 2001 & 2002, and the UAAL is now \$7.953 billion.

This valuation shows a normal cost equal to 11.72% of pay. Since the State contribution rate of 6.00% of pay plus the member contribution rate of 6.40% of pay total 12.40% of pay, there is 0.68% of pay available to amortize the UAAL. However, the contributions provided by this portion of the contribution rate are not sufficient to amortize the unfunded actuarial accrued liabilities of the System. Therefore the funding period corresponding to the 6.00% State contribution rate is "never" or infinite, which is greater than the statutory limit of 31 years.

The actuarial valuation report as of August 31, 2004 reveals that while the System has an unfunded liability, it still has a funded ratio (the ratio of actuarial assets to actuarial accrued liability) of 91.8%. However, the System is still deferring \$4.6 billion in prior asset losses that will be recognized over the next two valuations. Even though the System earned an 11.9% return on a market value of assets basis for the plan year ending August 31, 2004, the System experienced a \$4.7 billion loss on the actuarial value of assets due to the recognition of prior investment losses.

In the absence of significant actuarial gains over the near term, the contribution rate to the System will need to increase to produce a funding period that does not exceed 31 years. The System would need to earn an average rate of return of 11.5% on a market value basis over the next three years to offset the deferred asset losses that are scheduled to be recognized over the next two valuations. Even if these losses were somehow offset, the current unfunded liability of \$8.0 billion would still require an increase in the contribution rate in order to be amortized. Using GASB Statement No. 25 as a guide, the State contribution rate would need to increase from 6.00% of pay to 7.31% of pay. This rate would fund the normal cost and amortize the UAAL as of August 31, 2004 over the 30-year period called for by GASB Statement No. 25.

It seems unlikely that the System will be able to generate the necessary gains in the short-term (either asset or liability gains) to offset these deferred asset losses and reduce the UAAL to a level that can be amortized by the current contribution rate. In fact, if the System earns 8% on a market value basis for the 2004/05 plan year, the System can expect to recognize a \$4.8 billion loss on the actuarial value of assets at the next valuation. Therefore, we believe the Board should begin laying the groundwork with the Legislature for an increase in the contribution rate.

Any increase in the State contribution rate, however, should be put in historical perspective. Except for non-actuarial issues (related to Texas budget reasons), the TRS State contribution rate has either

decreased or not increased since 1979. At 7.31%, the State contribution rate would be the same rate that was contributed by the State prior to the last reduction in the State contribution rate in 1995.

Caution is warranted over the next few years. There should be no benefit increases passed by the Legislature over the next several Legislative Sessions without adequate funding, and the funded status should be carefully monitored. As noted above, in the absence of significant actuarial gains over the near term, an increase in the State contribution rate will be necessary to maintain the actuarial soundness of the System.

### ***Plan Provisions***

The plan provisions used in the actuarial valuation are described in Table 20 of the valuation report. This valuation reflects the changes to plan provisions as enacted by the 78<sup>th</sup> Texas Legislature.

### ***Disclosure of Pension Information***

Effective for the fiscal year ending August 31, 1996, the Board of Trustees has adopted compliance with the requirements of Governmental Accounting Standards Board (GASB) Statement No. 25.

### ***Actuarial Methods and Assumptions***

The actuarial methods and assumptions have been selected by the Board of Trustees of the Teacher Retirement System of Texas based upon our analysis and recommendations. These assumptions and methods are detailed in Table 21 of the valuation report. The Board of Trustees has sole authority to determine the actuarial assumptions used for the plan. The actuarial methods and assumptions are based on a study of actual experience for the four year period ending August 31, 2003 and were adopted on May 21, 2004.

In our opinion, the actuarial assumptions used are appropriate for purposes of the valuation and are internally consistent and reasonably related to the experience of the System and to reasonable expectations.

**Data**

In preparing the August 31, 2004 actuarial valuation, we have relied upon member and asset data provided by the Teacher Retirement System of Texas. We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and for consistency with prior years' data.

The schedules shown in the actuarial section and the trend data schedules in the financial section of the TRS financial report include selected actuarial information prepared by TRS staff. Six year historical information included in these schedules was based upon our work. For further information please see the full actuarial valuation report.

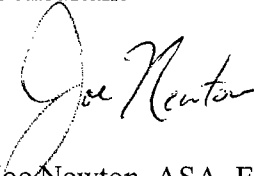
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EXECUTIVE SUMMARY

The actuarial valuation of the Teacher Retirement System of Texas (TRS) as of August 31, 2004, indicates that the System continues to have an unfunded actuarial accrued liability (UAAL). The UAAL increased from \$5.230 billion in 2003 to \$7.953 billion in 2004. The System will never be funded under the current contribution structure without developing future actuarial gains.

The key results of this valuation as of August 31, 2004, may be summarized as follows.

	2004	2003
	(1)	(2)
• Net Plan Assets		
— Market Value	\$ 84.203 billion	\$ 77.633 billion
— Actuarial Value	\$ 88.784 billion	\$ 89.033 billion
• Members		
— Actives for valuation purposes	729,411	754,715
— Actives in DROP (included above)	1,575	2,581
— Actives contributing in last year (included above)	661,235	677,504
— Actives not contributing in last year (included above)	9,570	9,173
— New entrants missing data (included above)	57,031	65,457
— Inactive, nonvested	72,234	60,755
— Inactive, vested	43,151	47,821
— Service retirees	223,125	200,472
— Disabled retirees	8,275	8,018
— Survivor benefit recipients	9,227	8,987
• Covered payroll	\$ 25.485 billion	\$ 25.756 billion
• Normal cost rate	11.72%	12.46%
• UAAL	\$ 7.953 billion	\$ 5.230 billion
• Actuarial assets as % of actuarial accrued liability	91.8%	94.5%
• Funding period	Never	Never
• State contribution rate	6.00%	6.00%
• Employee contribution rate	6.40%	6.40%
• Estimated yield on actuarial assets	2.6%	5.7%
• Employee contributions during year	\$ 1,530.3 million	\$ 1,516.8 million
• State contributions during year	\$ 1,242.3 million	\$ 1,239.5 million
• Employer contributions during year	\$ 192.4 million	\$ 182.5 million
• Benefit, refund, and expense payments	\$ 5,748.3 million	\$ 4,978.0 million
• GASB ARC as % of pay	7.31%	7.39%

	2004 (1)	2003 (2)
• Actuarial gains (losses)		
— Assets	\$(4,718.7) million	\$(1,965.3) million
— Assumption changes/Legislative changes	2,024.7 million	0.0 million
— Liability experience	<u>58.8 million</u>	<u>565.6 million</u>
— Total	\$(2,635.3) million	\$(1,399.7) million
• Net external cash flow	\$(2,592.1) million	\$(1,883.7) million
• GASB 25 disclosure		
— Funded ratio	91.8%	94.5%
— UAAL as % of pay	31.2%	20.3%
• Changes in funding period		

Item (1)	Change in Funding Period (2)	Funding Period (3)
1. 2003 valuation prior to assumption changes	--	Never
2. 2003 valuation after assumption changes	--	39.9 years
3. 2004 valuation using expected contributions and payroll	(1.0)	38.9 years
4. 2004 results using actual contributions and payroll	6.6	45.5 years
5. 2004 results using actual liabilities	(2.7)	42.8 years
6. 2004 results using actual assets	--	Never



## INTRODUCTION

The valuation of the Teacher Retirement System of Texas (TRS) as of August 31, 2004, reflects the following contribution rates: (a) a member contribution rate of 6.4%, and (b) a State contribution rate of 6.00%. Given legislative history since 1983 concerning the contribution rate, valuation results are determined assuming the current (6.00%) State contribution rate is the ultimate rate.

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

Section A contains an executive summary of the most significant valuation results. The basic results of the valuation are covered in Section C. Section D contains the necessary disclosure items required by the Governmental Accounting Standards Board (GASB). Section E provides analysis and discussion of changes in assets. Section F produces a determination of actuarial gains and losses for the year and an analysis of the change in the funding period since the prior year's valuation. Section G summarizes the findings of the valuation, and Section H provides the tables supporting the report.

This valuation utilizes actuarial assumptions and methods modified as a result of the Experience Study for the four-year period ending August 31, 2003. These assumptions and methods were adopted by the Board on May 21, 2004.

## FUNDED STATUS OF THE SYSTEM

Table 3 in Section H details the normal cost of the Retirement System by its various components. This normal cost is developed based on the valuation method known as the entry-age-normal actuarial cost method. The total normal cost for the Retirement System is 11.72% of pay, this amount being inclusive of the amount contributed by the employees. The net normal cost for the State is 5.32% of pay based on the member contribution rate of 6.40%.

Since the State contribution rate is 6.00%, this allows 0.68% of pay contributed by the State to be available to amortize any unfunded actuarial accrued liabilities.

As stated earlier, the funding period for the System is determined under the entry-age-normal actuarial cost method based on a level percentage of pay. The key points of this method are as follows:

1. The "normal cost" for the System is deemed to be equal to the cost of benefits for newly hired participants.
2. The "actuarial accrued liability" for benefits payable in the future to present active members is calculated as the present value of benefits payable in the future to present active members less the present value of future normal costs.
3. Funding of the unfunded actuarial accrued liability (UAAL) is a function of the rate of future growth in total covered payroll.

Table 5 develops the funding period under the above approach not only for the current valuation, but also for the valuation as of August 31, 2003. As shown in Item A3 of Table 5, the normal cost for the System consists of the entire 6.40% of pay contributed by the members plus 5.32% of pay from the State. As developed in Item A4, the 6.00% of pay contributed by the State is 0.68% of pay more than the State normal cost. In order to remain an actuarially sound system, the contribution rate in excess of the System's normal cost should be sufficient to amortize the UAAL over a reasonable period of time. However, the current contribution rate in excess of the System's normal cost (0.68%) is not sufficient to amortize the System's UAAL.

The UAAL as shown in Item B4 of Table 5 is \$7.953 billion for 2004, an increase from \$5.230 billion in 2003. As indicated in the table, the UAAL equals the difference between the total actuarial accrued liability (Item B2d) and current actuarial assets (Item B3). The excess contributions above the normal cost will be used to help reduce the UAAL. However, while the current contribution rate pays for the System's normal cost, the excess above the normal cost does not cover the interest payment on the UAAL, and therefore in the absence of actuarial gains or increased contributions the UAAL is expected to continue to increase.

In determining the number of years that will be required to amortize the UAAL, an assumption is made concerning future growth of the payroll of the System. GASB Statement No. 25 requires that the payroll growth assumption not consider growth in the active employee census. Under GASB 25 the appropriate payroll growth assumption is 3.00%.

As shown in Item B6 of Table 5 and using the assumed rate of increase in covered payroll of 3.00%, the period to fund the UAAL is now infinite, i.e., the UAAL will never be funded under the current contribution structure without future actuarial gains. An analysis of the change in the funding period since the 2003 valuation is provided in Section F.

Although there was favorable investment experience on a market value basis during the year, there was very unfavorable experience on an actuarial value of assets (AVA) basis. This result is due to the asset smoothing methodology that is used for determining the actuarial value of assets. Because of the asset smoothing methodology, as may be seen in Item 2e of Table 4b, the AVA methodology is deferring \$4.581 billion in investment losses to the next four valuations.

The unfavorable actuarial investment experience (2.6% yield based on actuarial assets) has resulted in an increase in the TRS underfunded status.

Table 7 offers a comparative view of the unfunded actuarial accrued liability (UAAL). It compares the UAAL with three items: the covered payroll for the year, the total actuarial value of present assets at the end of the year, and the total actuarial liabilities (or, equivalently, the total present value of future benefits) as of the valuation date.

The actuarial value of assets is developed in Table 4b. It should be remembered that the intent of the actuarial asset valuation method is to smooth out year-to-year fluctuations in market rates of return. It accomplishes this smoothing effect by recognizing the excess or shortfall in total market return over the expected return at the rate of 20% per year over a five year period. The excess or shortfall of investment income attributable to the most recent four years is shown in Table 4a.

While the design of the actuarial asset valuation method is to smooth out year-to-year fluctuations in market rates of return, the method is also designed to not allow the actuarial value of assets to drift too far from the actual market value of assets. To accomplish this goal a corridor is established around the market value of assets (not less than 80% nor more than 120% of the market value of

assets). If the actuarial value of assets using the smoothing technique produces a preliminary actuarial value of assets that is outside of the corridor, then the actuarial value of assets is set equal to the nearest corridor threshold. The 2002 valuation was the first time this corridor had impacted the actuarial value of assets. At the 2003 valuation the actuarial value of assets returned to a value that was inside the corridor, and it has remained there since. The preliminary actuarial value of assets is \$88.784 billion as shown in Item 4 of Table 4b. This number is equal to 105.4% of the market value of assets. Since that lies within our 80% to 120% corridor, the preliminary actuarial value of assets becomes the final actuarial value of assets as shown in Item 6 of Table 4b.

Table 2 provides an overall summary of key actuarial data for the 2004 valuation, with comparative data for 2003. This information is summarized from the other tables, which supply more detail. Its value is in providing in one convenient place key comparative valuation results.

The fact that the total contribution rate is not sufficient to amortize the current UAAL combined with the System's unrecognized investment losses creates a period of extreme caution for TRS. As noted above, the System has an unfunded liability of \$7.953 billion and another \$4.6 billion in unrecognized investment losses deferred into plan years 2005-2008.

If these amounts are not offset by actuarial gains, the System will not achieve an acceptable funding period without an increase in its contribution rate. As of this valuation the State contribution rate would need to increase to 7.31% of pay in order to pay the normal cost and amortize the \$8.0 billion UAAL over 30 years.

The severity of the market turmoil on TRS is significant. While the asset performance (on a market value basis) during last two fiscal years helped to reduce the impact of the prior investment markets of fiscal years 2001 & 2002, there is still \$4.6 billion in deferred investment losses to be recognized over the next several valuations. In addition, there is virtually no way that TRS can absorb any benefit enhancements over at least the next four years without an increase in the State contribution rate to a level in excess of 7.31% of pay.

## GASB DISCLOSURE

The Governmental Accounting Standards Board (GASB) has issued Statement No. 25 which provides the manner in which the actuarial condition of a public sector retirement plan is to be disclosed and which replaces GASB No. 5.

TRS elected to comply with GASB No. 25 beginning with the fiscal and plan year ending August 31, 1996. The required actuarial disclosure tables are represented by Tables 14a – 14c.

GASB No. 25 provides for a calculation of an annual required contribution (ARC). The ARC for TRS is greater of the 6% state contribution rate or the 30-year funding cost. Since the System is now underfunded, the 30-year funding cost exceeds 6.00%. For the 2004 valuation it is 7.31% of pay.

If TRS's auditors consider TRS a "special situation multi-employer plan" under GASB 27, then the State may need to establish a Net Pension Obligation for the State's 2004/2005 fiscal year to reflect the difference between its 6.00% contribution rate and the 7.31% ARC.

## CHANGE IN ASSETS DURING THE YEAR

This section provides an analysis of the change in the Plan Net Assets during the year and an estimate of the yield on mean assets of the total System. Table 8a shows a rearrangement of some of the tables included in the annual financial statements of the System. Table 8b shows the estimated yield on a market value basis and on the actuarial asset valuation method.

To determine estimated yield on "mean assets", the traditional insurance company formula for yield rates is used. The estimated yield is derived by dividing the appropriate income by the corresponding mean assets.

As indicated by Item A4 of Table 8b, the estimated yield on mean market value is 11.9%, up from the 11.0% return in 2003. The actuarial asset yield (Item B4) is 2.6%, compared to 5.7% in 2003, and compared to the 8% assumption rate. This difference in the estimated yield on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

As mentioned in Section C, the investment results on an actuarial value basis are unfavorable for the 2003/2004 plan year. On an actuarial value basis the System fell short of its 8% assumption rate. As a result, the System suffered an actuarial investment loss of \$4.719 billion. It should be noted, however, that the asset valuation method is deferring another \$4.581 billion in unrecognized losses into future years. This deferred loss will be recognized over the next four actuarial valuations. If there are offsetting investment gains during these four years, the funded status of the System may not deteriorate further. If there are no offsetting gains, the funded position will worsen.

## ACTUARIAL GAINS (LOSSES) AND THE FUNDING PERIOD

Section C has noted that the unfunded actuarial accrued liability (UAAL) has increased from \$5.230 billion in 2003 to \$7.953 billion in 2004. The funding period has remained at “never”. The purpose of this section is to determine the source of the gains and losses and the impact of those gains and losses on the funding period.

Section E has discussed the change in assets for the year. Table 8b develops the estimated yield for the year based on two measures of asset values. Table 9 takes the information contained in Table 8 and develops the expected value of actuarial assets for this valuation, based on the investment return assumption of 8%.

As shown in Item 7 of Table 9, the expected value of actuarial assets as of August 31, 2004 is \$93.503 billion. As developed in Table 4, the actual value of actuarial assets as of the valuation date is \$88.784 billion (as repeated in Item 8 of Table 9). Thus the asset loss for the year is the difference between the actual value and the expected value, or \$(4.719) billion (as shown in Item 9). Item 10 indicates that this loss represents –5.31% of this year's actuarial assets. This asset loss for the year is a direct reflection of the estimated yield for the year based on the value of actuarial assets, namely 2.6% (as shown in Item B4 of Table 8b).

Table 10 develops the total actuarial gain (loss) for the year and separates it between the asset gain (loss) and the liability gain (loss). The items in Table 10 that are used to develop the expected UAAL as of August 31, 2004 are derived from Table 5 and Table 8. The total actuarial loss for the year is seen to be \$(4.660) billion. It should be noted that this \$(4.660) billion loss excludes the impact of the change in the actuarial assumptions.

Since the asset loss for the year is \$(4.719) billion, this means that there is an overall actuarial gain associated with the liability experience of the System in an amount equal to \$58.8 million. While the liability gain was not significant in size it must be pointed out that the small gain was a result of a large gain being mostly offset by a large loss. There was a significant liability loss due to significantly more retirements than expected. We believe that this large number of retirements was due to the federal government's closure of the loophole regarding social security benefits for TRS retirees. Since this is a one-time event, we would expect the retirement pattern to return to more normal patterns once the impact of this aberration has passed.

As stated previously, the large number of retirements produced a large actuarial loss. However, this loss was offset by an equally large liability gain. This gain was a result of lower than expected salary increases.

Table 11 traces the changes in the funding period from the valuation as of August 31, 2003, to August 31, 2004. As may be seen, in the absence of the loss on the actuarial value of assets the

System would have a funding period. This result would have occurred because the new assumptions adopted by the Board in May of 2004 reduced the unfunded liability by a significant enough margin to allow the current contribution pattern to amortize the UAAL over a period of 39.9 years as of August 31, 2003). The other changes that occurred during the year would have increased the funding period, but the System would still have had a funding period if not for the impact of the asset loss.

Item 3 of Table 11 shows the funding status if there had been no actuarial gains or losses in the areas of assets, liabilities, or growth in covered payroll. The UAAL would have increased during the year to \$3,279 million.

Item 5 of Table 11 illustrates that the liability experience gain decreased the UAAL to \$3.234 billion but that the asset loss (shown in Item 6) increased the UAAL to \$7.953 billion. When the UAAL is positive and the contribution rate in excess of the normal cost rate is not sufficient to amortize the UAAL, the funding period is “never” (or “infinite”).

Given the unprecedented volatility and uncertainty that currently exists in the investment markets, the substantial investment losses that occurred (from a market value basis) during the 2000/2001 and 2001/2002 plan years, and the relatively mild recovery experienced in the 2003 and 2004 plan years, extreme caution should be exercised relative to possible future benefit enhancements.

Referring to Item 2e of Table 4b, there are \$4.581 billion of investment losses being deferred as of August 31, 2004. The asset valuation method will recognize these losses over the next four years. If there are not sufficient offsetting market gains during this time, the recognition of these deferred losses will significantly increase the System’s unfunded liability and will necessitate an increase in the contribution rate.



## SUMMARY AND CLOSING COMMENTS

To summarize the results of the actuarial valuation of the Teacher Retirement System as of August 31, 2004, it is our opinion that for the System to remain actuarially sound, significant actuarial gains must be generated. In the absence of these gains, contribution rates will need to increase. It is our opinion that the Board should begin preparing the Legislature for a recommended increase in the contribution rate for the next biennium.

The funding period is determined as “never” based on the 3.00% payroll growth assumption and based on the current 6.00% State contribution rate.

Because of this situation, extreme caution is warranted. The System’s contribution rate exceeds its normal cost rate by only 0.68% of pay. This small excess contribution rate over the normal cost is not sufficient to amortize the current UAAL. Additional liabilities would only exacerbate the situation. The biggest obstacle is the turmoil that has existed in the investment markets. The System is underfunded by \$8.0 billion and has \$4.6 billion in deferred investment losses that will be recognized over the next four years under the actuarial asset valuation method.

In order for the System to again become fully funded during this period of time, it must generate sufficient market gains (or liability gains) to offset the recognition of those deferred losses and reduce the \$8.0 billion UAAL to a level that the current contribution rate can support. Otherwise the System will require an increase in its contribution rate. Given the likelihood that the System will not be able to generate these gains, we believe the Board should be laying the groundwork for an increase in the contribution rate at the next biennium.

Any increase in the State contribution rate, however, should be put in historical perspective. Except for non-actuarial issues (related to Texas budget reasons), the TRS State contribution rate has either decreased or not increased since 1979. At 7.31%, the State contribution rate would be the same rate that was contributed during fiscal years 1992-1995.

For the foreseeable future, no benefit enhancements, including ad hoc increases, should be considered without significant contribution rate increases. The starting point for any proposed enhancements would be an increase of 1.31% of pay in the contribution rate.

ACTUARIAL TABLES

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ACTUARIAL PRESENT VALUE OF FUTURE BENEFITS

	August 31,	
	2004	2003
	(1)	(2)
<b>A. Present Value of Benefits Presently Being Paid:</b>		
1. Service retirement benefits	\$ 43,990,300,273	\$ 39,855,845,308
2. Disability retirement benefits	\$ 852,998,580	829,882,596
3. Death benefits	\$ 765,767,599	629,445,482
4. Present survivor benefits	\$ 187,208,198	159,810,826
5. Total present value of benefits presently being paid	<u>\$ 45,796,274,650</u>	<u>\$ 41,474,984,212</u>
<b>B. Present Value of Benefits Payable In the Future</b>		
<i>To Present Active Members:</i>		
1. Service retirement benefits	\$ 67,393,286,035	\$ 72,627,163,340
2. Disability retirement benefits	\$ 842,184,439	1,334,277,382
3. Termination benefits	\$ 3,851,143,498	4,703,320,045
4. Death and survivor benefits	\$ 1,230,447,990	1,636,283,604
5. Total active member liabilities	<u>\$ 73,317,061,962</u>	<u>\$ 80,301,044,371</u>
<b>C. Present Value of Benefits Payable In the Future To</b>		
<i>Present Inactive Members:</i>		
1. Inactive vested participants		
a. Retirement benefits	\$ 1,070,395,666	\$ 979,820,873
b. Death benefits	\$ 81,136,565	59,399,100
c. Total inactive vested benefits	<u>\$ 1,151,532,231</u>	<u>\$ 1,039,219,973</u>
2. Refunds of contributions to inactive nonvested members	\$ 176,633,650	166,059,923
3. Future survivor benefits payable on behalf of present annuitants	\$ 825,824,580	695,568,135
4. Total inactive liabilities	<u>\$ 2,153,990,461</u>	<u>\$ 1,900,848,031</u>
<b>D. Total Actuarial Present Value of Future Benefits:</b>	<u>\$ 121,267,327,073</u>	<u>\$ 123,676,876,614</u>

SUMMARY OF COST ITEMS

	Valuation as of August 31, 2004		Valuation as of August 31, 2003	
	Cost Item	Cost as % of Pay	Cost Item	Cost as % of Pay
	(1)	(2)	(3)	(4)
1. Participants				
a. Active contributing members				
1. Not in DROP	661,235		677,504	
2. In DROP	1,575		2,581	
b. Active noncontributing members				
1. Assumed to be active	9,570		9,173	
2. Assumed to be inactive vested	26,490		32,697	
3. Assumed to be inactive nonvested	59,637		49,858	
4. Total	95,697		91,728	
c. New entrants missing data	57,031		65,457	
d. Active subtotal	815,538		837,270	
e. Inactive members w/deferred benefits	16,659		15,124	
f. Retired members and beneficiaries	240,627		217,477	
g. Subtotal, members	1,072,824		1,069,871	
h. Inactive nonvested members due refunds	12,597		10,897	
i. Total membership	1,085,421		1,080,768	
2. Covered Payroll	\$ 25,484,585,232		\$ 25,756,162,962	
3. Average for Active Members				
a. Average age	43		43	
b. Average years of service	9		9	
c. Average pay	\$ 34,939		\$ 34,127	
4. Present Value of Future Pay	\$ 209,307,180,913		\$ 236,066,204,433	
5. Normal Cost Rate				
a. Gross normal cost	11.72%		12.46%	
b. Less employee contribution rate	(6.40%)		(6.40%)	
c. State normal cost	5.32%		6.06%	
6. Present Value of Future Benefits				
a. Retired members - in pay or deferred	\$ 45,796,274,650		\$ 41,474,984,212	
b. Retired members - future survivor benefits	825,824,580		695,568,135	
c. Vested inactive members	1,151,532,231		1,039,219,973	
d. Active members	73,317,061,962		80,301,044,371	
e. Inactive nonvested members	176,633,650		166,059,923	
f. Total	\$ 121,267,327,073	475.8%	\$ 123,676,876,614	480.2%
7. Present Value of Future Normal Costs (employee plus employer)	\$ 24,530,801,603	96.3%	\$ 29,413,849,072	114.2%
8. Actuarial Accrued Liability	\$ 96,736,525,470	379.6%	\$ 94,263,027,542	366.0%
9. Actuarial Value of Assets	\$ 88,783,870,893	348.4%	\$ 89,033,023,666	345.7%
10. Unfunded Actuarial Accrued Liability	\$ 7,952,654,577	31.2%	\$ 5,230,003,876	20.3%
11. Employer Contribution Rate	6.00%		6.00%	
12. Funding Period	Never		Never	
13. Estimated Yield on Actuarial Assets	2.6%		5.7%	
14. GASB 25 Funded Ratio	91.8%		94.5%	
15. GASB Annual Required Contribution Rate (ARC) for State	7.31%		7.39%	

ANALYSIS OF NORMAL COST BY COMPONENT

Benefit Component (1)	8/31/2004 Cost as % of Pay (2)	8/31/2003 Cost as % of Pay (3)
1. Retirement Benefits	9.23%	10.11%
2. Disability Benefits	0.16%	0.24%
3. Death Benefits (including survivor benefits)	0.36%	0.36%
4. Termination benefits	1.97%	1.75%
5. Gross Normal Cost	11.72%	12.46%
6. Less Employee Contribution Rate	(6.40%)	(6.40%)
7. State Normal Cost	5.32%	6.06%

**TABLE 4a**

**Teacher Retirement System of Texas**  
**Actuarial Valuation – August 31, 2004**

Item	Plan Year Ending August 31,			
	2004	2003	2002	2001
(1)	(2)	(3)	(4)	(5)
<b>CALCULATION OF EXCESS INVESTMENT INCOME FOR ACTUARIAL VALUE OF ASSETS</b>				
1. Actual net investment income based on market value of assets	\$ 9,121,019,840	\$ 7,782,851,430	\$ (6,098,932,157)	(9,389,167,977)
2. Market value of assets, beginning of year	77,633,002,461	71,695,802,361	79,428,239,521	89,987,158,209
3. Contributions during year				
a. Employee	1,530,276,750	1,516,801,535	1,450,311,521	1,364,689,388
b. State and employer	1,434,701,368	1,422,068,354	1,359,729,851	1,279,396,301
c. Membership fees/legislative appropriation for expenses	0	-	-	(38,522)
d. Reinstatements	191,227,695	155,410,852	110,388,581	68,348,425
e. Total	3,156,205,813	3,094,280,741	2,920,429,953	2,712,395,592
4. Benefits paid during year	(5,486,849,698)	(4,753,849,401)	(4,366,038,505)	(3,667,711,511)
5. Refunds paid during year	(220,396,709)	(186,082,670)	(186,421,065)	(214,434,792)
6. Expenses for year	N/A	N/A	N/A	N/A
7. Expected net investment income at 8%				
a. Market value of assets, beginning of year	6,210,640,197	5,735,664,189	6,354,259,162	7,198,972,657
b. Contributions	126,248,233	123,771,230	116,817,198	108,495,824
c. Benefits	(219,473,988)	(190,153,976)	(174,641,540)	(146,708,460)
d. Refunds	(8,815,868)	(7,443,307)	(7,456,843)	(8,577,392)
e. Expenses	N/A	N/A	N/A	N/A
f. Total	6,108,598,574	5,661,838,136	6,288,977,977	7,152,182,629
8. Excess investment income for year (Item 1 - Item 7f)	\$ 3,012,421,266	\$ 2,121,013,294	\$ (12,387,910,134)	\$ (16,541,350,606)

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

Item (1)	Plan Year Ending August 31, 2004 (2)	Plan Year Ending August 31, 2003 (3)
1. Excess (Shortfall) of invested income for current and previous 3 years		
a. Current year	\$ 3,012,421,266	\$ 2,121,013,294
b. Current year - 1	2,121,013,294	(12,387,910,134)
c. Current year - 2	(12,387,910,134)	(16,541,350,606)
d. Current year - 3	(16,541,350,606)	4,762,272,408
e. Total for four years	\$ (23,795,826,180)	\$ (22,045,975,038)
2. Deferral of excess (shortfall) of invested income		
a. Current year (80%)	\$ 2,409,937,013	\$ 1,696,810,635
b. Current year - 1 (60%)	1,272,607,976	(7,432,746,080)
c. Current year - 2 (40%)	(4,955,164,054)	(6,616,540,242)
d. Current year - 3 (20%)	(3,308,270,121)	952,454,482
e. Total deferred for year	\$ (4,580,889,186)	\$ (11,400,021,205)
3. Market value of plan net assets, end of year	\$ 84,202,981,707	\$ 77,633,002,461
4. Preliminary actuarial value of plan assets, end of year (Item 3 - Item 2e)	\$ 88,783,870,893	\$ 89,033,023,666
5. Actuarial value of assets corridor		
a. 80% of market value, end of year	\$ 67,362,385,366	\$ 62,106,401,969
b. 120% of market value, end of year	\$ 101,043,578,048	\$ 93,159,602,953
6. Final actuarial value of plan net assets, end of year (Item 4, but not less than Item 5a, and not more than Item 5b)	\$ 88,783,870,893	\$ 89,033,023,666

DEVELOPMENT OF YEARS TO FUND THE UNFUNDED  
ACTUARIAL ACCRUED LIABILITY

	As of August 31, 2004 (1)	As of August 31, 2003 (2)
A. Basic Data		
1. Covered payroll	\$ 25,484,585,232	\$ 25,756,162,962
2. Present value of future pay	\$ 209,307,180,913	\$ 236,066,204,433
3. Normal cost rate of benefits		
a. Total normal cost rate	11.72%	12.46%
b. Less employee contribution rate	<u>(6.40%)</u>	<u>(6.40%)</u>
c. State normal cost rate	5.32%	6.06%
4. State contribution rate for funding unfunded actuarial accrued liability		
a. Total State contribution rate	6.00%	6.00%
b. Less State normal cost rate	<u>(5.32%)</u>	<u>(6.06%)</u>
c. State contribution rate available	0.68%	(0.06%)
5. Actuarial accrued liability for present active members		
a. Present value of benefits payable in the future to present members	\$ 73,317,061,962	\$ 80,301,044,371
b. Less present value of future normal costs	<u>(24,530,801,603)</u>	<u>(29,413,849,072)</u>
c. Actuarial accrued liability	\$ 48,786,260,359	\$ 50,887,195,299
B. Development of Funding Period		
1. Normal cost		
a. Employee normal cost (Item A3b x Item A1)*	\$ 1,679,943,859	\$ 1,697,846,263
b. State normal cost (Item A3c x Item A1)*	<u>1,396,453,332</u>	<u>1,607,648,179</u>
c. Total normal cost	\$ 3,076,397,191	\$ 3,305,494,442
2. Total actuarial accrued liability		
a. Present value of benefits presently being paid	\$ 45,796,274,650	\$ 41,474,984,212
b. Actuarial accrued liability for present active members (Item A5c)	48,786,260,359	50,887,195,299
c. Present value of benefits for inactive members	<u>\$ 2,153,990,461</u>	<u>\$ 1,900,848,031</u>
d. Total	\$ 96,736,525,470	\$ 94,263,027,542
3. Current actuarial assets	88,783,870,893	89,033,023,666
4. Unfunded actuarial accrued liability (UAAL) (Item B2d - Item B3)	\$ 7,952,654,577	\$ 5,230,003,876
5. Amount of State contribution available to fund unfunded actuarial accrued liability (Item A4c x Item A1)	\$ 173,295,180	\$ (15,453,698)
6. Years to fund unfunded actuarial accrued liability	Never	Never
	<u>Rate of Increase in Covered Payroll</u>	
	0.00%	Never
	3.00%	Never
	4.00%	Never
	4.75%	Never
	6.00%	94.9
7. Annual Required Contribution Rate (ARC) (Normal cost + 30-year amortization of UAAL, but not less than 6.00% of pay)	7.31%	7.39%

\*Also adjusted for payroll growth rate assumption.



**TABLE 6**

**Teacher Retirement System of Texas  
Actuarial Valuation – August 31, 2004**

**GROWTH OF COVERED PAYROLL AND ACTIVE MEMBERS**

Year Ending August 31, (1)	Covered Payroll		Active Members			Average Salary		
	Amount in \$ Millions (2)	Percent Increase (3)	Number (4)	Percent Increase (5)	Compound Increase Between Year Indicated and 08-31-2004 (6)	Average Salary (7)	Percent Increase (8)	Compound Increase Between Year Indicated and 08-31-2004 (9)
1976	\$ 2,875	11.3%	331,049	--	2.9%	\$ 8,685	--	5.1%
1977	3,246	12.9%	348,969	5.4%	2.8%	9,303	7.1%	5.0%
1978	3,636	12.0%	361,487	3.6%	2.7%	10,058	8.1%	4.9%
1979	3,928	8.0%	374,078	3.5%	2.7%	10,500	4.4%	4.9%
1980	4,378	11.5%	385,332	3.0%	2.7%	11,363	8.2%	4.8%
1981	4,970	13.5%	389,735	1.1%	2.8%	12,751	12.2%	4.5%
1982	5,616	13.0%	395,578	1.5%	2.8%	14,196	11.3%	4.2%
1983	6,378	13.6%	404,656	2.3%	2.8%	15,761	11.0%	3.9%
1984	6,652	4.3%	404,976	0.1%	3.0%	16,427	4.2%	3.8%
1985	7,547	13.5%	413,938	2.2%	3.0%	18,234	11.0%	3.5%
1986	8,237	9.1%	432,749	4.5%	2.9%	19,034	4.4%	3.4%
1987	8,646	5.0%	443,593	2.5%	3.0%	19,492	2.4%	3.5%
1988	9,166	6.0%	455,460	2.7%	3.0%	20,124	3.2%	3.5%
1989	9,764	6.5%	470,042	3.2%	3.0%	20,772	3.2%	3.5%
1990	10,446	7.0%	483,262	2.8%	3.0%	21,616	4.1%	3.5%
1991	11,181	7.0%	502,625	4.0%	2.9%	22,245	2.9%	3.6%
1992	11,961	7.0%	521,661	3.8%	2.8%	22,928	3.1%	3.8%
1993	13,391	12.0%	575,088	10.2%	2.2%	23,285	1.6%	3.8%
1994	14,167	5.8%	600,484	4.4%	2.0%	23,593	1.3%	4.0%
1995	14,888	5.1%	625,878	4.2%	1.7%	23,788	0.8%	4.4%
1996	15,983	7.4%	652,197	4.2%	1.4%	24,506	3.0%	4.5%
1997	17,044	6.6%	678,749	4.1%	1.0%	25,112	2.5%	4.8%
1998	18,325	7.5%	705,447	3.9%	0.6%	25,977	3.4%	5.1%
1999	19,529	6.6%	736,058	4.3%	-0.2%	26,533	2.1%	5.7%
2000	21,920	12.2%	766,906	4.2%	-1.2%	28,583	7.7%	5.1%
2001	23,365	6.6%	797,339	4.0%	-2.9%	29,303	2.5%	6.0%
2002	24,818	6.2%	745,923	-6.4%	-1.1%	33,272	13.5%	2.5%
2003	25,756	3.8%	754,715	1.2%	-3.4%	34,127	2.6%	2.4%
2004	25,485	-1.1%	729,411	-3.4%	--	34,939	2.4%	--

Note: Beginning August 31, 1993, the above amounts include counts and estimated pay for new entrants with incomplete data. Beginning August 31, 2002, the definition of active member was changed.

Teacher Retirement System of Texas  
Actuarial Valuation - August 31, 2004

TABLE 7

RELATIVE SIZE OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

Year Ending August 31, (1)	Unfunded Actuarial Accrued Liability in \$ Millions (2)	Relative to Covered Payroll		Relative to Actuarial Value of Assets		Relative to Total Actuarial Liabilities (Present Value of Future Benefits)	
		Covered Payroll In \$ Millions (3)	Percent of Covered Payroll (4)	Assets in \$ Millions (5)	Percent of Assets (6)	Actuarial Liabilities in \$ Millions (7)	Percent of Actuarial Liabilities (8)
1969	\$ 1,312	\$ 1,299	101.0%	\$ 1,364	96.2%	\$ 3,960	33.1%
1970	1,444	1,528	94.5%	1,534	94.1%	4,384	32.9%
1971	1,632	1,758	92.8%	1,726	94.6%	5,100	32.0%
1972	1,720	1,904	90.5%	1,937	88.8%	5,551	31.0%
1973	1,633	2,079	78.5%	2,171	75.2%	5,733	28.5%
1974	1,739	2,246	77.4%	2,394	72.6%	6,207	28.0%
1975	1,998	2,583	77.4%	2,764	72.3%	7,143	28.0%
1976	2,445	2,875	85.0%	3,103	78.8%	8,067	30.3%
1977	2,879	3,246	88.7%	3,531	81.5%	9,626	29.9%
1978	2,422	3,636	66.6%	4,016	60.3%	9,858	24.6%
1979	3,322	3,928	84.6%	4,529	73.3%	12,336	26.9%
1980	2,785	4,378	63.6%	5,342	52.1%	12,181	22.9%
1981	3,300	4,970	66.4%	6,386	51.7%	13,890	23.8%
1982	3,864	5,616	68.8%	7,373	52.4%	16,135	23.9%
1983	4,549	6,378	71.3%	8,586	53.0%	20,277	22.4%
1984	4,849	6,652	72.9%	9,851	49.2%	22,456	21.6%
1985	6,474	7,547	85.8%	12,096	53.5%	29,618	21.9%

RELATIVE SIZE OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

Year Ending August 31, (1)	Unfunded Actuarial Accrued Liability in \$ Millions (2)	Relative to Covered Payroll		Relative to Actuarial Value of Assets		Relative to Total Actuarial Liabilities (Present Value of Future Benefits)	
		Covered Payroll In \$ Millions (3)	Percent of Covered Payroll (4)	Assets in \$ Millions (5)	Percent of Assets (6)	Actuarial Liabilities in \$ Millions (7)	Percent of Actuarial Liabilities (8)
1986	5,365	8,237	65.1%	14,939	35.9%	32,273	16.6%
1987	4,096	8,646	47.4%	18,055	22.7%	34,801	11.8%
1988	3,890	9,166	42.4%	20,096	19.4%	37,332	10.4%
1989	3,489	9,764	35.7%	23,302	15.0%	41,084	8.5%
1990	3,343	10,446	32.0%	26,111	12.8%	45,685	7.3%
1991	3,429	11,181	30.7%	28,860	11.9%	49,515	6.9%
1992	3,441	11,959	28.8%	31,201	11.0%	53,123	6.5%
1993	3,440	13,391	25.7%	35,179	9.8%	59,210	5.8%
1994	825	14,167	5.8%	38,843	2.1%	58,351	1.4%
1995	1,956	14,888	13.1%	43,442	4.5%	65,259	3.0%
1996	1,813	15,983	11.3%	47,487	3.8%	68,948	2.6%
1997	146	17,044	0.9%	53,760	0.3%	74,677	0.2%
1998	(2,463)	18,325	-13.4%	60,357	-4.1%	79,603	-3.1%
1999	(2,190)	19,529	-11.2%	69,435	-3.2%	91,563	-2.4%
2000	(5,446)	21,920	-24.8%	79,328	-6.9%	100,414	-5.4%
2001	(2,135)	23,365	-9.1%	86,352	-2.5%	113,663	-1.9%
2002	3,287	24,818	13.2%	86,035	3.8%	118,100	2.8%
2003	5,230	25,756	20.3%	89,033	5.9%	123,677	4.2%
2004	7,953	25,485	31.2%	88,784	9.0%	121,267	6.6%

CHANGE IN PLAN NET ASSETS

	Year Ending August 31, 2004	
		(1)
<b>I. <u>Revenue for the Year</u></b>		
<b>A. Contribution and fees</b>		
1. Member contributions	\$ 1,530,276,750	
2. State contributions - State of Texas	1,241,789,167	
3. State contributions - 415 Excess Plan	516,529	
4. State contributions - Employers	192,395,672	
5. Reinstatement of withdrawals	124,360,457	
6. Reinstatement fees	66,867,238	
7. Appropriation for expenses	-	
8. Total		\$ 3,156,205,813
<b>B. Income</b>		
1. Interest	\$ 1,103,782,108	
2. Dividends	1,005,620,107	
3. Net appreciation in fair value of investments	7,024,439,015	
4. Income from Securities Lending	28,270,646	
5. Investment expenses	(16,252,645)	
6. Total		9,145,859,231
<b>C. Other Adjustments</b>	\$ -	
<b>D. Total Revenue</b>		\$ 12,302,065,044
<b>II. <u>Expenditures for the Year</u></b>		
<b>A. Refund of Contributions</b>		\$ 220,396,709
<b>B. Benefit Payments</b>		
1. Service retirements	\$ 4,289,249,761	
2. DROP payments	139,047,656	
3. Partial Lump Sum Option payments	696,201,755	
4. 415 Excess Plan payments	516,529	
5. Disability retirements	125,992,690	
6. Death and survivor benefits	203,373,043	
7. Net ERS/TRS transfer payments		
a. Transfer to ERS	38,068,440	
b. Transfer from ERS	(5,600,176)	
c. Net transfer	\$ 32,468,264	
8. Total benefits		\$ 5,486,849,698
<b>C. Expenses</b>		
1. Gross expenses		
a. Administrative expenses	\$ 24,841,300	
2. Miscellaneous reimbursements	(1,909)	
3. Total expenses		24,839,391
<b>D. Total Expenditures</b>		\$ 5,732,085,798
<b>III. <u>Net Increase in Plan Net Assets (Item I.D. - Item II.D.)</u></b>		\$ 6,569,979,246

ESTIMATION OF YIELDS

Item (1)	Year Ending August 31, 2004 (2)	Year Ending August 31, 2003 (3)
A. Market value yield		
1. Beginning of year net market assets	\$ 77,633,002,461	\$ 71,695,802,361
2. Investment income	\$ 9,121,019,840	\$ 7,782,851,430
3. End of year market assets	\$ 84,202,981,707	\$ 77,633,002,461
4. Estimated market value yield	11.9%	11.0%
B. Actuarial value yield		
1. Beginning of year actuarial assets	\$ 89,033,023,666	\$ 86,034,962,833
2. Investment income	\$ 2,301,887,821	\$ 4,843,712,163
3. End of year actuarial assets	\$ 88,783,870,893	\$ 89,033,023,666
4. Estimated actuarial value yield	2.6%	5.7%

ACTUAL VERSUS EXPECTED ACTUARIAL ASSETS

Item (1)	Year Ending August 31, 2004 (2)	Year Ending August 31, 2003 (3)
1. Actuarial assets, beginning of year	\$ 89,033,023,666	\$ 86,034,962,833
2. Total contributions during year	3,156,205,813	3,094,280,741
3. Benefits paid during year (including DROP)	(5,486,849,698)	(4,753,849,401)
4. Refunds paid during year	(220,396,709)	(186,082,670)
5. Expenses for the year	N/A	N/A
6. Assumed net investment income at 8%		
a. Beginning of year assets	\$ 7,122,641,893	\$ 6,882,797,027
b. Contributions	\$ 126,248,233	123,771,230
c. Benefits	\$ (219,473,988)	(190,153,976)
d. Refunds	\$ (8,815,868)	(7,443,307)
e. Expenses	N/A	N/A
f. Total	\$ 7,020,600,270	\$ 6,808,970,974
7. Expected actuarial assets, end of year (Sum of Items 1 through 6)	\$ 93,502,583,342	\$ 90,998,282,477
8. Actual actuarial assets, end of year	\$ 88,783,870,893	\$ 89,033,023,666
9. Asset gain (loss) for year (Item 8 - Item 7)	\$ (4,718,712,449)	\$ (1,965,258,811)
10. Asset gain (loss) as % of actual actuarial assets	-5.31%	-2.21%

GAIN OR LOSS FOR THE YEAR

Item (1)	Year Ending August 31, 2004 (2)	Year Ending August 31, 2003 (3)
<b>A. CALCULATION OF TOTAL GAIN OR LOSS</b>		
1. Unfunded actuarial accrued liability (UAAL),		
a. Previous year, before Assumption & Method changes	\$ 5,230,003,876	\$ 3,287,442,769
b. Previous year, after Assumption & Method changes	3,205,339,710	\$ 3,287,442,769
2. Normal cost for the year	2,802,450,005	3,238,828,196
3. Contributions for the year	(2,964,978,118)	(3,094,280,741)
4. Interest at 8%		
a. On UAAL	256,427,177	262,995,422
b. On normal cost	112,098,000	259,106,256
c. On contributions	<u>(118,599,125)</u>	<u>(123,771,230)</u>
d. Total	249,926,052	398,330,448
5. Expected UAAL (Sum of Items A1 through A4)	3,292,737,649	3,830,320,672
6. Actual UAAL	7,952,654,577	5,230,003,876
7. Gain (loss) for the year (Item A5 - Item A6)	\$ (4,659,916,928)	\$ (1,399,683,204)
<b>B. SOURCE OF GAINS AND LOSSES</b>		
1. Asset gain (loss) for the year (Table 9)	\$ (4,718,712,449)	\$ (1,965,258,811)
2. Asset gain (loss) as a % of actuarial assets	-5.31%	-2.21%
3. Total actuarial accrued liability gain (loss) for year (Item A7 - Item B1)	58,795,521	565,575,607
4. Analysis of actuarial accrued liability loss		
a. Legislative changes	-	-
b. Liability experience	<u>58,795,521</u>	<u>565,575,607</u>
c. Total	\$ 58,795,521	\$ 565,575,607
5. Experience liability gain (loss) as % of total actuarial accrued liability (Item B4b as % of total actuarial accrued liability)	0.06%	0.60%

ANALYSIS OF CHANGE IN FUNDING PERIOD

	Basis (1)	UAAL (\$ Millions) (2)	Normal Cost Rate (3)	Total Contribution Rate (4)	Funding Period (5)	Change in Funding Period (6)
1. 2003 Valuation		5,230	12.46%	12.40%	Never	-
2. 2003 UAAL after Experience Study		3,205	11.72%	12.40%	39.9	-
3: Expected 2004 UAAL*		3,279	11.72%	12.40%	38.9	(1.0)
4. Expected 2004 UAAL using actual contributions		3,293	11.72%	12.40%	45.5	6.6
5. 2004 UAAL using expected assets and actual liabilities		3,234	11.72%	12.40%	42.8	(2.7)
6. 2004 UAAL using actual assets and liabilities		7,953	11.72%	12.40%	Never	-

\* The funding period for this entry uses the expected UAAL based on expected contributions and expected payroll. The expected payroll is the prior year's valuation payroll, rolled forward at the 3% payroll growth rate.



TABLE 12

Teacher Retirement System of Texas  
Actuarial Valuation - August 31, 2004

HISTORY OF CASHFLOW

Year Ending August 31, (1)	Expenditures During the Year							Market Value of Assets (9)	External Cash Flow as Percent of Market Value (10)
	Contributions for the Year (2)	Benefit Payments (3)	Refund of Contributions (4)	Transfer to Employees Retirement System (5)	Expenses (6)	Total (7)	External Cash Flow for the Year (8)		
1988	\$ 1,271,996,942	\$ (874,560,122)	\$ (113,178,276)	\$ -	\$ (15,155,899)	\$ (1,002,894,297)	\$ 19,188,847,074	1.4%	
1989	1,356,713,827	(935,943,118)	(118,507,638)	(899,352)	(14,314,799)	(1,069,664,907)	23,941,442,793	1.2%	
1990	1,502,302,663	(1,084,811,284)	(127,848,570)	-	(17,093,847)	(1,229,753,701)	24,555,334,041	1.1%	
1991	1,600,092,649	(1,185,833,198)	(133,870,775)	-	(21,115,074)	(1,340,819,047)	29,695,711,781	0.9%	
1992	1,663,664,046	(1,361,265,788)	(130,032,827)	-	(22,150,155)	(1,513,448,770)	32,766,914,759	0.5%	
1993	1,792,999,133	(1,446,714,384)	(122,114,590)	-	(25,779,705)	(1,594,608,679)	37,981,853,461	0.5%	
1994	1,887,530,125	(1,604,046,513)	(133,227,183)	-	(25,975,865)	(1,763,249,561)	39,277,226,893	0.3%	
1995	1,980,678,842	(1,731,747,042)	(146,099,978)	-	(25,896,749)	(1,903,743,769)	45,965,182,547	0.2%	
1996	1,927,100,219	(2,105,423,164)	(162,257,383)	-	(25,457,726)	(2,293,138,273)	50,101,367,986	(0.7)%	
1997	2,052,261,338	(2,217,173,754)	(166,125,695)	-	(24,468,347)	(2,407,767,796)	62,160,927,516	(0.6)%	
1998	2,197,477,431	(2,503,386,682)	(183,430,398)	-	(26,803,767)	(2,713,620,847)	66,456,822,943	(0.8)%	
1999	2,334,197,510	(2,639,947,187)	(206,354,473)	-	(29,146,859)	(2,875,448,519)	79,910,553,792	(0.7)%	
2000	2,569,218,427	(3,360,116,181)	(214,999,991)	-	(31,133,307)	(3,606,249,479)	89,987,158,209	(1.2)%	
2001	2,712,395,592	(3,667,711,511)	(214,434,792)	-	(32,641,273)	(3,914,787,576)	79,428,239,521	(1.5)%	
2002	2,920,429,953	(4,366,038,505)	(186,421,065)	-	(37,518,541)	(4,589,978,111)	71,695,802,361	(2.3)%	
2003	3,094,280,741	(4,753,849,401)	(186,082,670)	-	(38,030,992)	(4,977,963,063)	77,633,002,461	(2.4)%	
2004	3,156,205,813	(5,486,849,698)	(220,396,709)	-	(41,092,036)	(5,748,338,443)	84,202,981,707	(3.1)%	

<sup>1</sup> Column (2) includes employee and employer contributions, as well as any service purchase or account reinstatement receipts during the year

<sup>2</sup> Column (8) = Column (2) - Column (7)

HISTORY OF CONTRIBUTION RATES

<u>Fiscal Year</u>	<u>GASB 25 Annual Required Contribution Rate</u>	<u>State Contribution Rate</u>	<u>Member Contribution Rate</u>	<u>Total Contribution Rate</u>
(1)	(2)	(3)	(4)	(5)
1976/77		6.00%	6.00%	12.00%
1977/78		7.50%	6.65%	14.15%
1978/79		7.50%	6.65%	14.15%
1979/80		8.50%	6.65%	15.15%
1980/81		8.50%	6.65%	15.15%
1981/82		8.50%	6.65%	15.15%
1982/83		8.50%	6.65%	15.15%
1983/84		7.10%	6.00%	13.10%
1984/85		7.10%	6.00%	13.10%
1985/86		8.00%	6.40%	14.40%
1986/87		8.00%	6.40%	14.40%
1987/88		7.20%	6.40%	13.60%
1988/89		7.20%	6.40%	13.60%
1989/90		7.65%	6.40%	14.05%
1990/91		7.65%	6.40%	14.05%
1991/92		7.31%	6.40%	13.71%
1992/93		7.31%	6.40%	13.71%
1993/94		7.31%	6.40%	13.71%
1994/95		7.31%	6.40%	13.71%
1995/96		6.00%	6.40%	12.40%
1996/97	6.00%	6.00%	6.40%	12.40%
1997/98	6.00%	6.00%	6.40%	12.40%
1998/99	6.00%	6.00%	6.40%	12.40%
1999/00	6.00%	6.00%	6.40%	12.40%
2000/01	6.00%	6.00%	6.40%	12.40%
2001/02	6.00%	6.00%	6.40%	12.40%
2002/03	7.15%	6.00%	6.40%	12.40%
2003/04	7.39%	6.00%	6.40%	12.40%
2004/05	7.31%	6.00%	6.40%	12.40%

Teacher Retirement System of Texas  
Actuarial Valuation – August 31, 2004

TABLE 14a

SCHEDULE OF FUNDING PROGRESS  
(as required by GASB No. 25)

Valuation As of August 31, (1)	Actuarial Value of Assets (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded AAL (UAAL) (3) - (2) (4)	Funding Ratio Assets as % of AAL (2) / (3) (5)	Annual Covered Payroll (6)	UAAL As a % of Covered Payroll (4) / (6) (7)
2004	\$ 88,784	\$ 96,737	\$ 7,953	91.8%	\$ 25,485	31.2%
2003	89,033	94,263	5,230	94.5%	25,756	20.3%
2002	86,035	89,322	3,287	96.3%	24,818	13.2%
2001	86,352	84,217	(2,135)	102.5%	23,365	(9.1%)
2000	79,328	73,882	(5,446)	107.4%	21,920	(24.8%)
1999	69,435	67,245	(2,190)	103.3%	19,529	(11.2%)
1998	60,357	57,893	(2,463)	104.3%	18,325	(13.4%)
1997	53,760	53,906	146	99.7%	17,044	0.9%
1996	47,487	49,300	1,813	96.3%	15,983	11.3%
1995	43,442	45,398	1,956	95.7%	14,888	13.1%
1994	38,843	39,668	825	97.9%	14,167	5.8%
1993	35,179	38,619	3,440	91.1%	13,391	25.7%
1992	31,201	34,643	3,441	90.1%	11,959	28.8%
1991	28,860	32,289	3,429	89.4%	11,181	30.7%
1990	26,111	29,455	3,343	88.6%	10,446	32.0%
1989	23,301	26,790	3,488	87.0%	9,764	35.7%
1988	20,095	23,985	3,890	83.8%	9,166	42.4%
1987	18,055	22,151	4,096	81.5%	8,646	47.4%

Note: Amount in \$ millions.  
Actuarial assumptions were modified effective August 31, 2004.

**SCHEDULE OF EMPLOYER CONTRIBUTIONS**  
 (As required by GASB No. 25)

Fiscal Year Ended	Annual Required Contribution	Percentage Contributed
(1)	(2)	(3)
2004	7.39%	81%
2003	7.15%	84%
2002	6.00%	100%
2001	6.00%	100%
2000	6.00%	100%
1999	6.00%	100%
1998	6.00%	100%
1997	6.00%	100%
1996	6.00%	100%
1995	7.31%	100%
1994	7.31%	100%
1993	7.31%	100%
1992	7.31%	100%
1991	7.65%	100%

NOTES TO REQUIRED SUPPLEMENTARY INFORMATION  
 (as required by GASB No. 25)

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	August 31, 2004
Actuarial cost method	Entry Age Normal
Amortization method	Level percent, open
Remaining amortization period	Never
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return **	8.00%
Projected salary increases **	4.25% to 26.40%
Weighted-average at valuation date	6.46%
**Includes inflation at	3.0%
Cost-of-living adjustments	None

\* The current employer contribution of 6.00% is not sufficient to amortize the unfunded liability of the System. Consequently, the amortization period is never. The Annual Required Contribution (ARC) of 7.31% shown on Table 13 has an amortization period of 30 years.

STATISTICAL INFORMATION

	August 31,	
	2004	2003
	(1)	(2)
A. Number		
1. Active Members		
a. Total active members	729,411	754,715
b. Average age	43	43
c. Average service	9	9
2. Inactive Vested Members		
a. Male members	8,594	9,494
b. Female members	34,557	38,327
c. Total inactive vested members	43,151	47,821
3. Inactive Nonvested Members	72,234	60,755
B. Annualized Salaries		
1. Active members		
a. Total active members	\$ 25,484,585,232	\$ 25,756,162,962
b. Average annual salary	34,939	34,127
C. Accumulated Members Contributions		
1. Total Active Members	16,613,462,919	16,444,962,353
2. Inactive Vested Members		
a. Male members	\$ 249,359,379	\$ 273,546,141
b. Female members	821,850,816	898,461,074
c. Total inactive vested members	\$ 1,071,210,195	\$ 1,172,007,215
3. Inactive Nonvested Members	\$ 176,633,650	\$ 166,059,923
D. Active Members in DROP (included in above totals)		
1. Number	1,575	2,581
2. DROP Balance	\$ 222,892,923	\$ 301,698,574
E. Members With No Contributions in Most Recent Plan Year, but With Contributions During Last Five Plan Years *		
1. Treated as active members		
a. Number	9,570	9,173
b. Annualized salaries	\$ 22,421,633	\$ 20,719,428
2. Treated as inactive vested members		
a. Number	26,490	32,697
b. Accumulated contributions	\$ 654,383,383	\$ 797,265,435
3. Treated as inactive nonvested members		
a. Number	59,637	49,858
b. Accumulated contributions	\$ 156,790,750	\$ 149,730,916

\* The counts and amounts in item E are included in items A, B and C above.

STATISTICAL INFORMATION

	August 31,	
	2004	2003
	(1)	(2)
F. Persons Receiving Benefits		
1. Number		
a. Life annuities*	221,782	199,188
b. Annuities certain	1,343	1,284
c. Disability annuities - less than 10 years of service	325	314
d. Disability annuities - 10 or more years of service	7,950	7,704
e. Incomplete Data Records	0	0
f. Survivor annuities		
1) Currently in pay	8,387	8,165
2) Deferred	840	822
3) Total	9,227	8,987
g. Total persons receiving benefits	240,627	217,477
2. Annual Annuities		
a. Life annuities **	\$ 4,760,452,393	\$ 4,234,112,569
b. Annuities certain **	13,721,881	13,609,317
c. Disability annuities - less than 10 years of service	683,216	648,893
d. Disability annuities - 10 or more years of service	113,591,163	110,577,871
e. Survivor annuities		
1) Currently in pay	24,619,665	22,174,838
2) Deferred	210,110	231,311
3) Total	24,829,776	22,406,150
f. Total persons receiving benefits	\$ 4,913,278,428	\$ 4,381,354,800
g. Average monthly annuities		
1) Life annuities **	\$ 1,789	\$ 1,771
2) Annuities certain **	851	883
3) Disability annuities - 10 or more years of service	1,191	1,196
h. DROP Lump Sum payments during year	\$ 139,047,656	\$ 89,305,527
i. Partial Lump Sum Option payments during year	\$ 696,201,755	\$ 427,944,774

\* Includes 1,471 disabled annuitants who are receiving a retirement benefit

\*\* Annual and average life annuity amounts represent values after Partial Lump Sum Option Elections.

STATEMENT OF PLAN NET ASSETS

	<u>August 31, 2004</u>	<u>August 31, 2003</u>
	(1)	(2)
<b>A. ASSETS</b>		
1. Current Assets		
a. Cash and short term investments		
1) Cash on hand and State Treasury	\$ 818,010,906	\$ 1,038,117,534
2) Short term investments	3,027,270,138	649,509,232
b. Accounts Receivable		
1) Member contributions	68,366,077	47,656,393
2) School districts	14,441,468	11,757,750
3) Employees Retirement System	524,267	0
4) State	5,691,155	45,081,175
5) Sale of investments	1,121,927,507	1,021,223,979
6) Interest and dividends	267,375,621	305,842,250
7) Other	1,058,589	369,531
c. Prepaid assets	0	0
2. Long Term Investments		
a. Fixed income	\$ 23,069,878,184	\$ 21,282,297,734
b. Real estate mortgages	2,478,290,579	1,990,765,080
c. Equities	55,835,694,440	52,697,198,670
d. Real estate held for sale		
e. Total long term investments	<u>\$ 81,383,863,203</u>	<u>\$ 75,970,261,484</u>
3. Other Assets		
a. Land	\$ 1,658,310	\$ 1,658,310
b. Building and equipment after depreciation	29,721,218	30,533,007
c. Deferred assets	0	0
d. Total other assets	<u>\$ 31,379,528</u>	<u>\$ 32,191,317</u>
4. Total Assets	<u>\$ 86,739,908,459</u>	<u>\$ 79,122,010,645</u>
<b>B. LIABILITIES</b>		
1. Current Liabilities		
a. Accounts payable	\$ 3,845,067	\$ 3,371,476
b. Benefits payable	511,716,180	447,463,997
c. Due to Employees Retirement System	3,364,305	0
d. Due to State's General Revenue Fund	0	0
e. Investments purchased payable	1,983,555,284	1,008,854,827
f. Total current liabilities	<u>\$ 2,502,480,836</u>	<u>\$ 1,459,690,300</u>
2. Deferred Credits	34,445,916	29,317,884
3. Total Liabilities and Deferred credits	2,536,926,752	1,489,008,184
4. Net Assets Held in Trust	\$ 84,202,981,707	\$ 77,633,002,461
<b>C. ASSET ALLOCATION FOR CASH &amp; LONG TERM INVESTMENTS</b>		
1. Cash	4.5%	2.2%
2. Fixed Income	27.1%	27.4%
3. Real Estate Mortgages	2.9%	2.6%
4. Equities	65.5%	67.8%
5. Real Estate Held for Sale	<u>0.0%</u>	<u>0.0%</u>
6. Total	100.0%	100.0%



**TABLE 17**

**Teacher Retirement System of Texas  
Actuarial Valuation – August 31, 2004**

**Distribution of Active Members by Age and by Years of Service  
As of 08/31/2004**

Attained Age	Years of Credited Service											Total	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34		35-39
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 25		7,482 \$26,530	3,897 \$25,573	1,583 \$19,809	782 \$19,717	337 \$21,917							14,081 \$25,020
25-29	3 \$7,072	12,149 \$31,067	14,141 \$33,009	12,583 \$34,279	9,877 \$35,097	12,704 \$34,909	134 \$28,019						61,591 \$33,600
30-34	2 \$6,375	8,142 \$27,898	9,363 \$30,212	9,000 \$31,581	8,307 \$33,323	34,638 \$38,162	6,968 \$39,260	121 \$32,315					76,541 \$34,888
35-39	2 \$11,186	12,381 \$25,259	11,124 \$27,616	8,527 \$28,750	7,277 \$29,663	26,384 \$34,089	21,877 \$42,363	5,107 \$43,038	149 \$33,752				92,828 \$33,739
40-44	2 \$16,067	6,581 \$24,013	7,878 \$26,491	7,965 \$27,311	7,259 \$27,835	26,207 \$31,207	18,058 \$38,226	16,750 \$46,815	6,005 \$47,406	188 \$38,412			96,893 \$34,786
45-49	3 \$8,092	5,327 \$24,339	6,372 \$27,245	6,708 \$28,007	6,497 \$29,064	25,849 \$31,428	20,061 \$36,484	14,329 \$43,961	15,322 \$51,218	6,817 \$52,786	128 \$42,554		107,413 \$37,279
50-54	73 \$5,476	3,963 \$25,938	4,929 \$28,872	5,098 \$29,588	4,698 \$30,710	20,801 \$32,653	19,478 \$36,940	16,324 \$42,582	12,078 \$47,669	14,481 \$55,686	3,846 \$59,652	28 \$51,709	105,797 \$40,147
55-59	430 \$5,026	2,794 \$25,589	3,213 \$28,158	3,303 \$29,112	3,022 \$30,706	13,067 \$32,443	12,637 \$36,547	12,495 \$41,196	9,127 \$45,558	5,697 \$51,979	5,531 \$62,246	954 \$67,553	72,270 \$39,771
60-64	353 \$5,055	1,356 \$22,990	1,576 \$25,695	1,673 \$26,271	1,579 \$27,902	6,280 \$28,973	5,603 \$33,817	5,234 \$39,523	3,288 \$42,569	2,366 \$46,955	1,409 \$56,047	1,129 \$68,627	31,846 \$36,026
65 +	122 \$5,000	685 \$18,969	845 \$19,007	875 \$18,580	894 \$20,420	2,960 \$22,896	2,255 \$26,896	1,602 \$32,368	1,058 \$36,525	797 \$39,346	484 \$47,431	543 \$64,996	13,120 \$28,407
Total	990 \$5,119	60,860 \$23,389	63,338 \$27,290	57,315 \$29,195	50,192 \$30,475	169,227 \$33,374	107,071 \$37,898	71,962 \$43,166	47,027 \$47,731	30,346 \$53,121	11,398 \$59,754	2,654 \$67,320	672,380 \$36,052

Note: Table includes contributing members (except for the new entrant data errors) and those noncontributing members assumed to be active.

DISTRIBUTION OF LIFE ANNUITIES BY AGE

<u>Age</u> (1)	<u>Number</u> (2)	<u>Annual Annuities</u> (3)	<u>Monthly Average Annuity</u> (4)
Up to 35	328	\$ 4,189,966	\$ 1,065
35-40	170	2,743,863	1,345
40-44	287	3,703,807	1,075
45-49	532	7,830,020	1,227
50-54	8,690	248,563,531	2,384
55-59	32,089	810,514,640	2,105
60-64	43,220	958,460,456	1,848
65-69	41,316	837,629,020	1,689
70-74	35,750	722,957,408	1,685
75-79	26,754	526,755,852	1,641
80-84	17,689	335,797,524	1,582
85-89	9,497	177,114,741	1,554
90-94	4,290	81,628,145	1,586
95 & up	1,169	23,389,492	1,667
 TOTAL	 221,781	 \$ 4,741,278,465	 \$ 1,782

DISTRIBUTION OF DISABLED ANNUITIES BY AGE

<u>Age</u> (1)	<u>Number</u> (2)	<u>Annual Annuities</u> (3)	<u>Monthly Average Annuity</u> (4)
Up to 35	6	\$ 41,082	\$ 571
35-40	34	270,389	649
40-44	150	1,641,151	912
45-49	427	5,641,793	1,101
50-54	926	13,570,471	1,221
55-59	1,350	17,914,859	1,106
60-64	1,273	16,130,923	1,056
65-69	1,149	16,571,938	1,202
70-74	1,162	19,115,424	1,371
75-79	778	12,050,045	1,291
80-84	446	6,189,575	1,156
85-89	187	2,309,214	1,029
90-94	53	573,189	901
95 & up	9	88,381	818
 TOTAL	 7,950	 \$ 112,108,434	 \$ 1,175

**SUMMARY OF THE BENEFIT PROVISIONS OF THE  
RETIREMENT SYSTEM AS OF AUGUST 31, 2004**

The Teacher Retirement System of Texas makes retirement, disability, and death and survivor benefits to all employees of the public school system of Texas. The major provisions of the System may be summarized as follows:

A. RETIREMENT BENEFITS

1. Normal Retirement Date:

- (a) end of month following age 65 and 5 years of creditable service,
- (b) end of month following age 60 and 20 years of creditable service, or
- (c) end of month following attainment of "Rule of 80".

2. Standard Annuity:

The product of 2.3% of the member's best 3-year average compensation multiplied by years of creditable service.

3. Normal Retirement Benefits:

Greater of standard annuity, or \$150 per month.

4. Early Retirement:

- (a) after age 55 with 5 or more years of creditable service, or
- (b) after 30 years of creditable service, regardless of age.

5. Early Retirement Benefits:

- (a) If at least age 55 with 5 to 19 years of creditable service, normal retirement benefit earned to the date of retirement, reduced according to the following table:

Years of Service	AGE AT DATE OF RETIREMENT										
	55	56	57	58	59	60	61	62	63	64	65
5-19	47%	57%	55%	59%	63%	67%	73%	80%	87%	93%	100%

- (b) If at least 55 and 20 or more years of creditable service, or any age and at least 30 years of creditable service, normal retirement benefit earned to the date of retirement, reduced according to the following table:

Years of Service	AGE AT DATE OF RETIREMENT					
	55	56	57	58	59	60
20	90%	92%	94%	96%	98%	100%
21	92%	94%	96%	98%	100%	100%
22	94%	96%	98%	100%	100%	100%
23	96%	98%	100%	100%	100%	100%
24	98%	100%	100%	100%	100%	100%
25	100%	100%	100%	100%	100%	100%
26	100%	100%	100%	100%	100%	100%
27	100%	100%	100%	100%	100%	100%
28	100%	100%	100%	100%	100%	100%
29	100%	100%	100%	100%	100%	100%
30 or more	100%	100%	100%	100%	100%	100%

6. Normal Form of Benefit:

Straight life annuity payable monthly with benefits commencing at end of month following retirement with the last payment payable on behalf of the annuitant in the month of death.

7. Optional Forms:

**Option 1** - joint and 100% survivor, benefit reverts to normal form following the death of the joint annuitant.

**Option 2** - joint and 50% contingent survivor, benefit reverts to normal form following the death of the joint annuitant.

**Option 3** - 5 years certain and life.

**Option 4** - 10 years certain and life.

**Option 5** - Joint and 75% contingent survivor, benefit reverts to normal form following the death of the joint annuitant.

**Partial Lump**

**Sum Option** - Members, eligible for unreduced retirement and not participating in the DROP program, may select a partial lump-sum distribution not to exceed an amount equal to 36 months of a standard service retirement annuity. When this option is selected, the member's annuity will be actuarially reduced to reflect that distribution and will be computed so that no actuarial loss results to TRS.

8. Deferred Retirement Option Plan (DROP):

A. Eligibility:

- 1) Must be an active contributing member.
- 2) Must be eligible for a standard service retirement annuity that is not reduced for retirement at an early age.
- 3) Must have at least 25 years of creditable service.

B. Program Summary:

- 1) Participation begins the 1st of the month following the member's application and TRS approval of the application. Participation may begin in any month.
- 2) Participation may range from a minimum of one year to a maximum of five years, in 12-month increments. The member elects the period of participation at the outset.

- 3) The amount of the member's standard annuity is established as of the date of participation in the DROP. This amount is also used in determining the monthly deposit to the DROP account. A member will not accumulate further retirement annuity benefits during DROP participation, i.e., no further credit will be achieved from years of service or compensation changes.
  - 4) Any special service credit that a member wishes to purchase must be paid in full prior to DROP participation.
  - 5) A separate DROP account will be established for each participating member. Each month, an amount equal to 60 percent of the calculated standard annuity will be deposited into the account. At retirement, the account plus interest at the rate of five percent per annum will be distributed.
  - 6) Member and employer contributions continue during DROP participation. Contributions are not deposited into the member's DROP account and will not be refunded.
  - 7) Three events terminate participation - death, retirement or expiration of the participation period.
  - 8) Upon retirement, participating members will receive their retirement annuity plus the balance in their DROP account including interest. DROP balances may be paid by TRS in a lump sum or on a time payout selected by the member.
9. Partial Lump-Sum Option Program:

Members, eligible for unreduced retirement and not participating in the DROP program, may select a partial lump-sum distribution not to exceed an amount equal to 36 months of a standard service retirement annuity. When this option is selected, the member's annuity will be actuarially reduced to reflect that distribution and will be computed so that no actuarial loss results to TRS.

Percentages shown in the table below will be applied to reduce a member's standard annuity when he or she elects a partial lump-sum distribution.

The percentage shown in the following table will be applied to reduce the standard annuity when the partial lump-sum option is elected.

Age	Percentage of Standard Annuity		
	12 Months	24 Months	36 Months
45	91.66	83.32	74.98
46	91.62	83.23	74.85
47	91.57	83.13	74.70
48	91.51	83.03	74.54
49	91.46	82.92	74.37
50	91.40	82.79	74.19
51	91.33	82.66	73.99
52	91.26	82.52	73.78
53	91.18	82.37	73.55
54	91.10	82.20	73.31
55	91.01	82.03	73.04
56	90.92	81.84	72.75
57	90.81	81.63	72.44
58	90.70	81.41	72.11
59	90.58	81.17	71.75
60	90.46	80.91	71.37
61	90.32	80.64	70.95
62	90.24	80.48	70.71
63	90.01	80.03	70.04
64	89.85	79.69	69.54
65	89.67	79.34	69.01
66	89.48	78.96	68.44
67	89.28	78.56	67.84
68	89.06	78.13	67.19
69	88.84	77.67	66.51
70	88.59	77.18	65.77
71	88.32	76.65	64.97
72	88.03	76.07	64.10
73	87.72	75.43	63.15
74	87.37	74.74	62.12
75	87.00	74.00	61.00
76	86.59	73.19	59.78
77	86.15	72.31	58.46
78	85.68	71.35	57.03
79	85.16	70.31	55.47
80	84.59	69.18	53.78
81	83.98	67.96	51.94
82	83.32	66.64	49.96
83	82.61	65.21	47.82
84	81.83	63.67	45.50
85	81.00	62.00	42.99
86	80.09	60.18	40.27
87	79.09	58.19	37.28
88	78.00	56.00	34.00
89	76.81	53.62	30.43
90	75.52	51.04	26.56
91	74.13	48.26	22.39



10. Minimum Annuity Payments:

Total annuity payments shall in no case be less than the member's accumulated contributions at retirement. Upon the death of a retiree, the excess, if any, of accumulated contributions over total annuity payments received prior to death will be paid to the beneficiary.

B. DISABILITY BENEFITS

1. Less than 10 years of creditable service: \$150.00 per month for the shorter of:

- (a) disability, or
- (b) number of months of creditable service as of date of disability retirement.

2. At least 10 years of creditable service: the greater of accrued retirement income or \$6.50 per month per year of creditable service, payable for duration of disability; disability presumed continuous if it continues past age 60. The minimum disability payment made on behalf of a member will be no less than \$150.00 per month.

C. DEATH BENEFITS

1. Eligibility: applicable if death occurs:

- (a) in service,
- (b) while absent from service for good cause,
- (c) while not in service but eligible to retire,
- (d) while not in service but would be eligible to retire without additional service before April 15 of the sixth school year after last creditable year of service, or
- (e) while receiving a disability benefit, but only eligible for 2f, below.

2. Benefit: any one of the following, at the option of the beneficiary:

- (a) a lump sum (not to exceed \$80,000) equal to two times the rate of pay for the last year of service,
- (b) a lump sum (not to exceed \$80,000) equal to two times annual pay for the year preceding last year of service,

- (c) 60 monthly payments of accrued standard annuity,
- (d) a life annuity payable under Option 1 as if the member had retired on the last day of the month preceding death,
- (e) a refund of accumulated contributions, or
- (f) the survivor benefits, if eligible.

Note: Items (c) and (d) available only if member has at least 5 years of creditable service.

- 3. Benefit if Absent from Service Without Good Cause: return of accumulated contributions.

D. SURVIVOR BENEFITS

- 1. Benefits: (a) or (b) at the election of the beneficiary:

- (a) lump sum payment of \$10,000, or
- (b) lump sum payment of \$2,500 plus one of the following, if the designated beneficiary is eligible:
  - (i) if a spouse or dependent parent, \$250 per month commencing at age 65,
  - (ii) if a spouse with children under age 18, \$350 per month until youngest child reaches 18, then \$250 per month commencing at spouse's age 65, or
  - (iii) if dependent children, \$350 per month as long as at least two dependent children under 18, reducing to \$250 per month when there is only one child under 18.

If benefits are payable under (i) or (ii) above and eligible spouse or dependent dies, payments will revert in accordance with (iii) above.

- 2. Eligibility:

- (a) all employees eligible for a death benefit other than refund of accumulated contributions,
- (b) any retired member, in addition to any benefit provided by his or her option of payment, or

- (c) any disabled participant, in lieu of other death benefits (Item C2).

E. VESTING OF BENEFITS

1. Vesting: a member is fully vested after 5 years of creditable service.
2. Benefits upon Vesting: a fully vested member is entitled to the following:
  - (a) upon becoming inactive, not required to withdraw accumulated contributions within seven years,
  - (b) may apply at age 65 for normal retirement benefit equal to accrued standard annuity, or
  - (c) may apply for any other retirement benefits for which he or she is eligible upon satisfying age requirement (if applicable) if he or she satisfied the corresponding service requirement at time of last termination; benefit is based on his or her full accrued standard annuity.

F. MEMBER CONTRIBUTIONS

6.40% of compensation per year.

G. STATE CONTRIBUTIONS

6.00% of member compensation each year.

H. LEGISLATIVE CHANGES MADE BY THE 1991 STATE LEGISLATURE

1. The minimum retirement benefit increased from \$75 to \$100 per month.
2. The disability death benefit changed to the same as a service retirement death benefit.
3. An ad hoc cost of living increase was approved for members who retired prior to May 1, 1989. The increase does not apply to a survivor benefit or to a disability benefit for a member who had less than 10 years of service at the time of retirement or death. The amount of the increase is five-tenths of one percent of each full six-month period between the latest effective date of retirement (or date of death) and August 1, 1991. The increase begins August 1991.

I. LEGISLATIVE CHANGES MADE BY THE 1993 STATE LEGISLATURE

1. Increase in survivor benefit by \$50 per month.
2. Retroactive minimum benefit of \$6.50 per year of service for members retired as of November 1, 1991.
3. An ad hoc cost of living increase approximating a 25% CPI catch-up. The actual percentage increase varies by year of retirement and has a minimum increase of 5%. The increase begins with the January, 1994 annuity check and covers all benefit recipients who began receiving benefits before August 31, 1991, except that it does not apply to survivor benefits or to a disability benefit for a member who had less than 10 years of service at the time of retirement or death.
4. ERS/TRS transfer provisions.
  - (a) Service credit transfers allowed if the participant is a member of both ERS and TRS and has at least three years of service credit in the System from which the member is retiring.
  - (b) A member may reinstate or purchase service credit in the other System prior to making the transfer if that member has at least three years of service credit in the current System.
  - (c) TRS and ERS will jointly set rules for the assumptions used in computing asset transfer amounts. The transfer of funds between ERS and TRS takes place at the time of actual retirement.

J. LEGISLATIVE CHANGES MADE BY THE 1995 STATE LEGISLATURE

1. Unreduced benefits at retirement were expanded to include participants age 50 or older with 30 or more years of service.
2. Annuitants' benefits increased in an amount equal to the greater of:
  - (a) A recalculation of benefits based on
    - (i) January 1, 1995 law with all intervening ad hoc increases, plus
    - (ii) A CPI catch-up increase.

- (b) A recalculation of benefits for retirees who retired before September 1, 1993, based on a 2% multiplier and a minimum annual salary of a classroom teacher or full-time librarian as described by the Education Code. This annual salary is currently \$17,000 based on current Education Code.
- 3. Treat all Option 1 and Option 2 benefits as including the pop-up feature.
- 4. The annuity payment in the month of death is payable on behalf of the annuitant.
- 5. The disability benefit payable when a member has less than ten years of service increased from \$50 per month to \$150 per month for both current and future disabled members. The minimum disability payment made on behalf of a member with ten or more years of service shall be no less than \$150 per month.
- 6. The benefit increase reserve account in TRS was eliminated, resulting in the liability for all annuity benefits being included within the retired reserve account.
- 7. The maximum two-times-pay death benefit payable on behalf of a member would increase from \$60,000 to \$80,000.

K. LEGISLATIVE CHANGES MADE BY THE 1997 STATE LEGISLATURE

- 1. Driver's education pay is added to plan compensation for the determination of a member's best 3-year average compensation.
- 2. Disabled participants are allowed to select a Joint and Survivor annuity option after commencement of disability benefits, if they become married after date of disability.
- 3. Retirees are allowed to change the designated beneficiary for pension benefits payable after their death under certain conditions.
- 4. Adoption of "Rule of 80" criteria for unreduced standard retirement annuity (i.e., sum of member's age & credited service is greater than or equal to 80).
- 5. Elimination of \$6.50 per month per year of service minimum standard retirement annuity benefit.
- 6. Addition of \$50.00 to the minimum survivor benefit.
- 7. Creation of a Deferred Retirement Option Program (DROP), described in Item A8 above.

8. A CPI catch-up ad hoc cost-of-living increase for retired members.

L. LEGISLATIVE CHANGES MADE BY THE 1999 STATE LEGISLATURE

1. Increased multiplier from 2.0% to 2.2% effective September 1, 1999, and an equivalent 10% increase for all retirees.
2. A CPI catch-up ad hoc cost-of-living increase for retired members.
3. Established a partial lump-sum option at time of retirement.
4. DROP participant enrolled on or before August 31, 1999, have a one-year window from September 1, 1999 to revoke DROP participation.
5. For members entering DROP on or after September 1, 1999, the monthly DROP deposit will be reduced from 79% to 60% of the standard annuity.
6. Provides a lump-sum death benefit of \$160,000 for an active member employed by a school district who dies due to a physical assault during the performance of their regular duties.
6. Allows a return to teaching after being retired at least 12 months without a reduction in the retirement benefit under certain circumstances.

M. LEGISLATIVE CHANGES MADE BY THE 2001 STATE LEGISLATURE

1. Increased multiplier from 2.2% to 2.3% effective September 1, 2001, and an equivalent 4.5% increase for all retirees.
2. A 6% ad hoc increase for retired members.
3. Increase in survivor benefits of \$50 per month.
4. Allows a return to work as a bus driver with no reduction in the monthly benefit if retired with an unreduced benefit.
5. Permits purchase of up to 3 years of “air time” if the member has at least 7 years of actual membership service. Purchase price is the full actuarial cost of the purchased service.

N. LEGISLATIVE CHANGES MADE BY THE 2003 STATE LEGISLATURE

1. For employees hired on or after September 1, 2003, a 90-day waiting period is required for participation in TRS. Members may have the option to purchase this service. This provision is set to expire on September 1, 2005.
2. Limits the collection of overpayments to the three years prior to the overpayment discovery, except in cases of fraud or knowledge by the participant that the payments were incorrect.
3. Repealed the requirement that in order to reinstate service withdrawn after August 31, 2003, for the purposes of ERS/TRS transfer, the member must belong to the system from which the service is purchased.
4. Retirees who are employed by a third-party entity are considered to be employees of the school for return to work purposes unless the retiree does not perform duties or provide services in behalf of the school.
5. Retirees may work as a substitute and on a half-time basis during a single calendar month as long as the total days worked do not exceed the number of days for one-half time employment for that month.

**ACTUARIAL ASSUMPTIONS AND METHODS**  
**(Adopted May 21, 2004)**

**ACTUARIAL ASSUMPTIONS**

1. Investment Return Rate      8.00% per annum, compounded annually, composed of an assumed 3.00% inflation rate and a 5.00% real rate of return
  
2. Mortality, Withdrawal, Disability Retirement, and Service Retirement Rates:

Rates and scales developed in the actuarial investigation as of August 31, 2003, with values at specimen ages shown in the tables below:

a.

<u>Age</u>	<u>PROBABILITY OF DECREMENT DUE TO</u>	
	<u>Death</u>	<u>Disability Retirement</u>
<u>MALE MEMBERS</u>		
20	.000430	.000003
30	.000727	.000043
40	.000891	.000381
50	.001899	.001287
60	.005581	.002455
70	.018034	.000000
<u>FEMALE MEMBERS</u>		
20	.000242	.000006
30	.000294	.000065
40	.000512	.000234
50	.001033	.001256
60	.002563	.002436
70	.009694	.000000



b.

Probability of Decrement Due to Withdrawal – Male Members

Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	10+
20	0.2465	0.2458	0.1794	0.1329	0.1058	0.0897	0.0908	0.0934	0.0821	0.0719	0.0795
30	0.2060	0.1955	0.1514	0.1178	0.0900	0.0772	0.0700	0.0655	0.0593	0.0519	0.0565
40	0.1923	0.1831	0.1399	0.1063	0.0832	0.0756	0.0639	0.0549	0.0474	0.0395	0.0242
50	0.1640	0.1562	0.1162	0.0827	0.0620	0.0557	0.0508	0.0475	0.0451	0.0360	0.0151
60	0.1715	0.1633	0.1294	0.0925	0.0659	0.0526	0.0431	0.0380	0.0328	0.0244	0.0108
70	0.1954	0.1861	0.1563	0.1145	0.0795	0.0534	0.0381	0.0315	0.0257	0.0168	0.0079

Probability of Decrement Due to Withdrawal – Female Members

Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	10+
20	0.1957	0.1864	0.1486	0.1275	0.1109	0.1043	0.0967	0.0900	0.0818	0.0725	0.0644
30	0.1912	0.1821	0.1459	0.1199	0.1002	0.0956	0.0870	0.0806	0.0729	0.0642	0.0535
40	0.1682	0.1602	0.1194	0.0933	0.0774	0.0704	0.0643	0.0542	0.0493	0.0439	0.0255
50	0.1498	0.1427	0.1054	0.0841	0.0664	0.0591	0.0520	0.0484	0.0432	0.0371	0.0182
60	0.1767	0.1683	0.1315	0.1036	0.0784	0.0602	0.0534	0.0468	0.0409	0.0313	0.0092
70	0.2094	0.1994	0.1948	0.1521	0.1002	0.0596	0.0448	0.0354	0.0356	0.0303	0.0086

c.

Probability of Decrement Due to Retirement – Male Members

Age	Years of Service							
	0-4	5-9	10-14	15-18	19	20-24	25-29	30+
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300
55	0.000	0.010	0.010	0.010	0.010	0.070	0.220	0.220
60	0.000	0.020	0.020	0.020	0.020	0.300	0.300	0.300
65	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300
70	0.000	0.200	0.200	0.200	0.200	0.200	0.200	0.200
74	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Probability of Decrement Due to Retirement – Female Members

Age	Years of Service							
	0-4	5-9	10-14	15-18	19	20-24	25-29	30+
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300
55	0.000	0.020	0.020	0.020	0.020	0.080	0.230	0.230
60	0.000	0.030	0.030	0.030	0.030	0.300	0.300	0.300
65	0.000	0.320	0.320	0.320	0.320	0.320	0.320	0.320
70	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250
74	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

There is a minimum 0.1000 probability for retirement under Rule of 80.

3. Rates of Salary Increase

Inflation rate of 3.00%, plus productivity component of 1.25%, plus step-rate/promotional component as shown:

Years of Service	Annual Step Rate/ Promotional Rates of Increase		Total Annual Rate of Increase	
	Males	Females	Males	Females
(1)	(2)	(3)	(4)	(5)
1	22.15%	19.60%	26.40%	23.85%
2	3.25%	2.75%	7.50%	7.00%
3	2.55%	2.00%	6.80%	6.25%
4	2.35%	1.75%	6.60%	6.00%
5	2.15%	1.60%	6.40%	5.85%
6	1.85%	1.60%	6.10%	5.85%
7	1.65%	1.40%	5.90%	5.65%
8	1.50%	1.35%	5.75%	5.60%
9	1.25%	1.25%	5.50%	5.50%
10	1.05%	1.15%	5.30%	5.40%
11-19	0.65%	0.50%	4.90%	4.75%
20 or more	0.00%	0.00%	4.25%	4.25%

This weighted average projected salary increase rate is 6.46% based on the active member service distribution as of August 31, 2004.

**DISABILITY ANNUITANTS:**

1. Investment Return Rate: 8% per annum, compounded annually.
2. Mortality: The PBGC Male Disabled Mortality Table for plan terminations after December 1, 1980, with a six-year setback and the PBGC Female Disabled Mortality Table for plan terminations after December 1, 1980, with a four-year setback.

**SERVICE RETIREMENT ANNUITANTS, NOMINEES AND SURVIVORS:**

1. Investment Return Rate: 8% per annum, compounded annually (benefit increase reserve account eliminated by the 1995 legislative session).
2. Mortality: RP-2000 Male Mortality Table with a one-year setback and the RP-2000 Female Mortality Table with a two-year setback; used for service retirement annuitants, beneficiaries and survivors. These tables are selected to best reflect the experience developed in the actuarial investigation as of August 31, 2003.

**ERS/TRS TRANSFER ASSUMPTIONS:**

A liability for the present value of the potential asset transfer has been calculated assuming that the TRS members who will be eligible for the transfer benefit are approximated by 10% of the inactive TRS members who have at least five years of service and have left their contributions on deposit. The liability is based on the actuarial present value of the deferred benefit assuming future salary increases at the current salary scale rates and that they will retire at the earliest age for which an unreduced benefit will be received.

**HANDLING OF ACTIVE DATA WITH MISSING INFORMATION:**

As of the close of each fiscal year there is a large number of new TRS entrants for whom no statistical data has been received. The only information TRS has is social security number and initial contributions. Beginning with the valuation as of August 31, 1993, active member results have been imputed for this group according to the following procedures:

1. The count for this group has been added to the active member count.
2. Covered payroll and the present value of future pay have been increased by the product of the number of such members multiplied by average new entrant pay and present value of future pay.
3. The present value of future benefits for active members has been increased by the product of the new entrant normal cost rate multiplied by the imputed present value of future pay for this group, as determined under Item 2 above.

**ASSUMPTION FOR DROP PARTICIPATION**

It is assumed that no members will enter DROP.

**BENEFIT ELECTION OF VESTED TERMINATING MEMBERS:**

In determining the liabilities developed for future terminating vested members, it is assumed that the member elects either a refund or a deferred vested benefit, whichever is more valuable. The deferred benefit is assumed to commence at age 65.

**ELECTION RATES FOR ACTIVE MEMBER DEATH BENEFITS:**

It is assumed that the beneficiary will elect the death benefit option with the greatest value.

**CLASSIFICATION OF WHO ARE ACTIVE MEMBERS:**

For members who had no contribution postings during the just-completed plan year but did have a posting during one or more of the four preceding plan years:

1. 10% of such members will be assumed to return to contributing status in the new plan year (i.e., they will be assumed to be active for valuation purposes).
2. 90% of such members will be treated as inactives for the new plan year.
3. The 90% group will be valued as inactive vested or inactive nonvested depending on their years of service credit.
4. If they are considered inactive vested, their actuarial liability will be the present value of their accrued benefit assuming benefit commencement at age 65, plus the value of any death benefit.
5. If they are considered inactive nonvested, their actuarial liability will be their accumulated account balance.

**AVERAGE SURVIVOR BENEFIT LIABILITY:**

One of the options on the death of an active member, a disabled member, or a retired member is a survivor benefit. To determine the liability for this benefit the following average values are used.

	<u>Males</u>	<u>Females</u>
1. Active member	\$62,200	\$59,000
2. Disabled member	\$13,000	\$11,000
3. Retired member	\$12,000	\$12,000

**ACTUARIAL VALUE OF ASSETS:**

The actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income with the resulting value not being less than 80% or more than 120% of the market value of assets.

**PAYROLL GROWTH FOR FUNDING OF UNFUNDED ACTUARIAL ACCRUED LIABILITY:**

1. Total payroll growth rate: 3.00%.
2. Portion attributable to inflation: 3.00%.
3. Portion attributable to active member growth: No growth.

**ACTUARIAL COST METHOD:**

The funding period required to amortize the unfunded actuarial accrued liability (UAAL) is determined using the Entry Age Actuarial Cost Method. This method assigns the plan's total unfunded liabilities (the actuarial present value of future benefits less the actuarial value of assets) to various periods. The unfunded actuarial accrued liability is assigned to years prior to the valuation, and the normal cost is assigned to the year following the valuation. The remaining costs are assigned to future years.

The normal cost is determined as a level percentage of payroll for a group of new entrants, based on actual new entrant experience for the period 1995-1999. This percentage of payroll is then applied to the total compensation for the prior year for all active members, and is then adjusted for the payroll growth assumption.

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

Since the State statutes governing the System establish the current employee and State contribution rates, the actuarial valuation determines the number of years required to amortize (or fund) the UAAL on a level percentage of payroll basis, taking into account the payroll growth assumption and the normal cost expressed as a percent of pay.

Because of this amortization procedure, any change in the unfunded actuarial accrued liability due to (i) actuarial gains and losses, (ii) changes in actuarial assumptions, or (iii) amendments, affects the funding period. The statutory goal is that the State contribution rate be sufficient to keep the funding period below 31 years.

**FUNDING OF UNFUNDED ACTUARIAL ACCRUED LIABILITY:**

Funded by the excess of future State contributions required by Law over the amount of such contributions required to fund the normal cost of benefits. Based on a study of all new entrants hired in the period from 1999 through 2003 and taking into account all changes in benefit provisions, the normal cost for benefits provided by the System is 11.72% of payroll (6.40% by members plus 5.32% by the State), which is 0.68% of payroll less than the total contributions required by Law. It is intended that the excess amount of 0.68% of payroll will be used to amortize any unfunded actuarial accrued liabilities of the System, assuming that total payroll increases by 3.00% per year.

As of the valuation as of August 31, 2004, these excess contributions of 0.68% of pay are not sufficient to amortized the UAAL over any period of time. Therefore, the funding period for the System is considered never. Future funding of the UAAL will be dependent on either the generation of actuarial experience gains sufficient in size to return the System to an overfunded status or on an increase in the State contribution rate.

## DEFINITION OF ACTUARIAL TERMS

H.B. 2206 as passed by the 1979 Legislature requires that any actuarial study of a public retirement system include "a complete definition of each actuarial term used in the study". In our report we have attempted to avoid the use of a multitude of complex actuarial terminology, but we realize that different users of our reports may have differing opinions as to what constitutes an "actuarial term".

Accordingly, in keeping with the intent and the spirit of the law, we offer the following definitions of several terms contained in this report which might be considered actuarial in nature. Any qualified user of our report who believes that additional terms should be included is invited to communicate such terms either directly to us or through the Teacher Retirement System of Texas.

1. *Actuarial Accrued Liability* - for benefits payable in the future to present members, it will equal the present value of benefits payable in the future to them less the present value of future normal costs.
2. *Actuarial Assumptions* - assumptions as to future experience under the System. Current actuarial assumptions are detailed in Table 21 of the current annual valuation report. Assumptions include future fund earning rates, rates of future salary increases, and rates of death (both before and after retirement), disability, retirement, and withdrawal. Effective August 31, 1985, select and ultimate assumptions were adopted for retirement and withdrawal rates and the salary scale.
3. *Actuarial Gain or Actuarial Loss* - a measure of the difference between actual experience and assumed experience of the System. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, actuarial liabilities emerge which may be the same as forecasted, or they may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the System's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
4. *Actuarial Liabilities* - the actuarially determined present value of future benefits to be provided by the System. There are separate actuarially determined present values for retired members and non-retired members (either active or inactive). When applied to active members, it takes into account benefits which will be earned through future service and future salary increases.
5. *Actuarial Value of Present Assets* - the value of present System assets for valuation purposes. Prior to August 31, 1985, this value was the same as the book value of assets. Beginning

August 31, 1985, through August 31, 1993, this value was calculated under the “market over book adjusted asset valuation method.” Beginning August 31, 1993, this value is calculated under a five-year phase in of the excess (shortfall) between expected and actual income return on the market value of assets.

6. *Actuarially Determined* - values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
7. *Actuarially Sound* - a condition existing when the unfunded actuarial accrued liability can reasonably be expected to be funded or amortized over a determinable number of years. Such funding or amortization is accomplished as a result of the excess of total contributions over the normal cost of expected benefits. The Teacher Retirement System of Texas is considered actuarially sound as long as the length of time required to fund the unfunded actuarially accrued liability does not exceed 31 years.
8. *Decrements* - those types of activities by members of the System which cause them no longer to be members, i.e., death, retirement, disability, and withdrawal. It is a general term referring to any or all of these membership terminating events.
9. *Defined Benefits* - in a retirement plan, benefits which are defined by a specific formula applied to specific member compensation and/or specific years of service. The amount of the benefit is not a function of contributions or actual earnings on those contributions.
10. *Defined Contributions* - in a retirement plan, periodic contributions to the plan which are defined as a specific percent of compensation.
11. *Experience Study* - a periodic review and analysis of the actual experience of the System 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.
12. *Funding Period* - the number of years in the future that will be required to fund (i.e., pay off or eliminate) the unfunded actuarial accrued liability, based on the actuarial assumptions and assuming no future actuarial gains or losses.
13. *Future Benefits* - benefits specified in the law which will become payable at some time in the future when the member satisfies the requirement to receive such benefits.
14. *Future Contributions* - contributions to be made by the member or the State in the future, as required by the law.



15. *Normal Cost* - the actuarial cost to fund the benefits provided by the System were the funding to begin at date of hire. It is expressed as a percent of pay and is equal to the present value at hire of all possible benefits of the System divided by the present value of anticipated future compensation to be received by the new member. In the aggregate, it must be less than the total future contribution to the System if the unfunded actuarial accrued liability is to be amortized. Otherwise there must be a funding surplus sufficient in size to offset any contribution rate shortfall.
16. *Present Value* - the actuarially determined lump sum value as of the valuation date of a series of payments to be made in the future, where the lump sum value is equal to the sum of the discounted value of each future payment. The discounted value of each payment is the product of (a) the amount of the payment, (b) the probability that the payment will be made (based on the current actuarial assumptions as to future experience), and (c) the time value of money (based on the current assumed interest rate).
17. *Unfunded Actuarial Accrued Liability* - that portion of the actuarial accrued liability (including the present value of benefits presently being paid to retired members) that exceeds the value of current actuarial assets. A funding surplus exists if the actuarial accrued liability is less than the actuarial assets.