❖◆❖◆❖◆❖◆❖

Texas Emergency Services Retirement System
Board Meeting

December 6, 2024

North Lamar Blvd. Building, Conference Room 170
4800 N. Lamar Blvd., Suite 370, Austin, TX 78756

❖◆❖◆❖◆❖◆❖

Texas Emergency Services Retirement System (TESRS)
BOARD MEETING AGENDA
December 6, 2024 1:00 p.m.
North Lamar Blvd. Building, Conference Room 170
4800 N. Lamar Blvd., Suite 370, Austin, TX 78756

This meeting may be held by videoconference call pursuant to Texas Government Code § 551.127. The member presiding over the meeting will be physically present at the location of the meeting listed above and will preside over the meeting at that location. The meeting will be accessible to the public at the physical location listed above. If the meeting is held by videoconference call, an audio recording of the meeting will be available on the TESRS website at www.tesrs.org.

The meeting will be accessible to the public at the physical location listed above. An audio recording of the meeting will be available upon request after December 6, 2024. To obtain a copy of the recording, please email: info@tesrs.texas.gov or call (512) 936-3422

The TESRS Board may discuss, consider, and act on any agenda item listed below. The TESRS Board may meet in closed session regarding any agenda item listed below as authorized by the Texas Open Meetings Act, Chapter 551, Texas Government Code.

1. Roll Call and Excuse of Board Member Absences

2. Invitation for Public Comment

3. Administration and Actuarial Committee Report

    A. Actuarial Evaluation

4. Adjourn

This agenda may be amended at the request of the Executive Director or a Board Member prior to the meeting to the extent allowed by the Open Meetings Act. Persons who do not speak English or persons with disabilities who plan to attend this meeting and who may need auxiliary aids or services, such as language interpreters or interpreters for the deaf or hearing impaired, readers, large print or Braille, are requested to contact the agency at (512) 936-3372 or info@tesrs.texas.gov no less than five weekdays prior to the meeting so that arrangements can be made.

Agenda Item: 1

This Page Intentionally Left Blank

Agenda Item: 2

This Page Intentionally Left Blank

Agenda Item: 3

Texas Emergency Services Retirement System

Actuarial Valuation
as of August 31, 2024

December 5, 2024

R&W

Rudd and Wisdom, Inc.

Consulting Actuaries

December 5, 2024

Board of Trustees
Texas Emergency Services
   Retirement System
Post Office Box 12577
Austin, TX 78711

Re: <u>Actuarial Valuation as of August 31, 2024</u>

Dear Board Members:

Enclosed is the report of the actuarial valuation of the Texas Emergency Services Retirement System (TESRS or the System) as of August 31, 2024.

Inadequate Contribution Arrangement with Expected State Contributions Even with Maximum Part Two Contributions

In order to have an adequate contribution arrangement, the Texas Pension Review Board guidelines say that contributions to a public retirement system should be expected to both pay the current normal cost and amortize the existing unfunded actuarial accrued liability (UAAL) in 30 years or less. In Section 2 of the report, we have determined that without appropriations from the state, the System has an inadequate contribution arrangement because the UAAL will never be amortized but instead will increase every year.

The expected contributions from the state are appropriations equal to (1) the maximum annual contribution (one-third of all contributions to the System by governing bodies of participating departments in a year) as needed in accordance with state law governing the System, and (2) approximately $825,000 each year to pay for part of the System's administrative expenses. Based on this August 31, 2024 actuarial valuation, we project that with the expected Part One contributions from the governing bodies of participating departments and $825,000 each year from the state for administrative expenses, the maximum annual contributions from the state for 30 years would be inadequate for the System to have a 30-year amortization period for its UAAL. **This valuation also determined that even if the board established the maximum Part Two contributions, the System still has an inadequate contribution arrangement because the UAAL will never be amortized but instead will increase every year.**

Comparison to Prior Actuarial Valuation

The prior actuarial valuation as of August 31, 2022 determined that the System had an adequate contribution arrangement with a 30-year amortization period for the UAAL, relying on expected future maximum annual contributions from the state for 21 years. In this current August 31, 2024 actuarial valuation, 30 years of maximum annual state contributions and the

maximum Part Two Contributions would still be inadequate. The primary reasons for this change in results were (1) very adverse investment experience, and (2) a change in the investment return assumption from 7.5% to 7.25%.

Key Provisions of State Law Regarding State Contributions to the System

Three subsections from the state law governing the System (Title 8, Government Code, Subtitle H) are relevant to our assessment of the System's contribution arrangement and our evaluation of future contributions from the state, and they read as follows:

> **Section 861.001(1)** "Actuarially sound pension system" means a system in which the amount of contributions is sufficient to cover the normal cost and amortize the unfunded actuarial accrued liability in a period that does not exceed 30 years.

> **Section 865.015** The state shall contribute the amount necessary to make the pension system actuarially sound each year, except that the state's contribution may not exceed one-third of the total of all contributions by governing bodies in a particular year.

> **Section 864.002(a)(2)** A service retirement annuity is payable in monthly installments based on a formula adopted by the state board by rule that allows the pension system, assuming maximum state contributions are provided under Section 865.015, to be maintained as actuarially sound.

Our interpretation of these three subsections is that the state law calls for the state to contribute the maximum amount, defined in Section 865.015, to the System each year as is necessary for the System to amortize its UAAL with the expected total contributions from the state and the governing bodies of the participating departments in a period that does not exceed 30 years. **Even with these expected future annual contributions from the state for 30 years, the System has an inadequate contribution arrangement.**

Board Rule about Participating Department Contributions

The board rule defining contributions by a participating department for each month a member performs emergency services for the department (Section 310.6) was amended in 2014 to allow the board to establish Part Two contributions that would be applied to reduce the UAAL if the expected future annual contributions from the state are not enough with the legacy Part One contributions to pay the normal cost and amortize the UAAL in 30 years. The provisions for Part Two contributions are more thoroughly described in item 13 of Section 5. Section 5 outlines the eligibility, benefit and contribution provisions of the System. This valuation determined that even the maximum Part Two contributions would not be enough for an adequate contribution arrangement.

Actuarial Assumptions

We reviewed the actuarial assumptions used in the prior valuation as of August 31, 2022, which were based on an experience study of the System for the six plans years ending

August 31, 2018. In an August 23, 2024 letter to the board, we documented our review and recommended a change in the investment return assumption from 7.5% to 7.25%. The board approved the 7.25% assumption. Appendix A from that letter summarizes our review of the investment return assumption.   All actuarial methods and assumptions are described in Section 4 of this report.

Actuarial Value of Assets vs. Market Value of Assets

The actuarial valuation was based on a method to determine the actuarial value of assets (AVA) that dampens the volatility of the changes in the market value of assets (MVA) from year to year. This method phases in over a five-year period the investment gains or losses that the System has had in each of the previous four fiscal years. The AVA used in this valuation was $144.2 million, while the MVA was $138.5 million. The $5.7 million difference between the MVA and the AVA is the deferred net investment loss that will be recognized in the next two biennial actuarial valuations.

The theory behind the AVA method is to allow time for annual investment gains and losses in the MVA to partially offset each other and thereby dampen the volatility associated with the progression of the MVA over time. In practice, the timing and amounts of investment gains and losses can result in irregular effects on the AVA in a given year. However, as intended, the pattern of the AVA is smoother over time than the pattern of the market value of assets, as seen on page 15.

Variability in Future Actuarial Measurements

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following:

> Plan experience differing from that anticipated by the current economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; changes in economic or demographic assumptions; and changes in plan provisions.

Analysis of the potential range of such future measurements resulting from the possible sources of measurement variability is typically outside the scope of the biennial actuarial valuation. Sensitivity analysis could be performed in a subsequent report if desired by the board of trustees.

Summary

In our opinion, the Texas Emergency Services Retirement System has an inadequate contribution arrangement, even assuming that the state will appropriate (1) the maximum annual contribution in accordance with the state law governing the System for amortizing the UAAL and (2) approximately $825,000 each year to pay for part of the System's administrative expenses. These state contributions in addition to the legacy Part One contributions and the maximum Part Two contributions from the participating departments are not enough to have an adequate contribution arrangement. **We recommend that the System either (1) request from the Legislature additional appropriations from the state that with the legacy Part One contributions from the participating departments would be expected to provide an**

Board of Trustees
Page 4
<u>December 5, 2024</u>

adequate contribution arrangement that would pay the normal cost each year and amortize the UAAL in 30 years or less or (2) establish the maximum 15% Part Two contributions and request Rudd and Wisdom to study potential reductions in the benefit formula that together would result in an amortization period of 30 years or less. The actuarial valuation of the System reported herein has been performed both in accordance with appropriate actuarial methodology and standards of practice and in accordance with guidelines established by the Texas State Pension Review Board applicable to Texas public employee retirement systems.

<div align="right">

Respectfully submitted,

RUDD AND WISDOM, INC.

Mark R. Fenlaw

Mark R. Fenlaw, F.S.A.

Rebecca B. Morris

Rebecca B. Morris, A.S.A.

</div>

MRF/RBM:nm

Enclosures

i:\clients\fire\wd\2024\statewide\tesrs-val2024-draft.docx

TABLE OF CONTENTS

Section 1

Certification of Actuarial Valuation as of August 31, 2024

At the request of the Board of Trustees of the Texas Emergency Services Retirement System, we have performed an actuarial valuation of the System as of August 31, 2024. The purpose of this report is to present the results of our valuation, including our assessment of the adequacy or inadequacy of the current contribution arrangement.
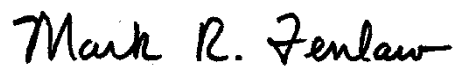
We have relied on and based our valuation on participant, retiree, and beneficiary data and asset information as of August 31, 2024 provided by the System. To the best of our knowledge, no material biases exist with respect to any imperfections in the data provided. We have not audited the data provided but have reviewed it for reasonableness and consistency relative to the data received for the August 31, 2022 actuarial valuation.

We have used the actuarial methods and assumptions described in Section 4 of this report. The actuarial valuation has been performed on the basis of the System eligibility, benefit, and contribution provisions described in Section 5.
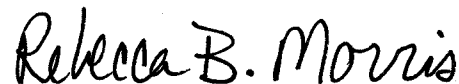
All emergency services personnel known to be eligible active participants in the System as of the valuation date and all other individuals who either were receiving a monthly benefit as of the valuation date or were known to be eligible to later receive a vested deferred monthly benefit from the System have been included in the valuation. Further, all System benefits have been considered in the valuation.

To the best of our knowledge, the actuarial information supplied in this report is complete and accurate. In our opinion the assumptions used, both in the aggregate and individually, are reasonably related to the experience of the System and to reasonable expectations. The assumptions represent a reasonable estimate of anticipated experience of the System over the long-term future, and their selection complies with the applicable actuarial standards of practice.

We certify that we are members of the American Academy of Actuaries who meet Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report.

Mark R. Fenlaw

Mark R. Fenlaw, F.S.A.
Member, American Academy of Actuaries

Rebecca B. Morris

Rebecca B. Morris, A.S.A.
Member, American Academy of Actuaries

Section 2

Summary of Actuarial Valuations

		August 31, 2022	August 31, 2024
1.	Actuarial Present Value of Future Benefits		
	a. Active participants	$ 73,963,282	$ 80,886,343
	b. Terminated Vested Participants	19,734,998	22,317,698
	c. Retirees and Beneficiaries – Advance Funded	79,848,935	96,277,987
	d. Retirees and Beneficiaries – Reimbursement Funded	1,271,964	1,062,261
	e. Total	$ 174,819.179	$ 200,544,289
2.	Actuarial Present Value of Future Normal Cost	$ 8,171,546	$ 9,671,169
3.	Actuarial Present Value of Future Reimbursements for (1d)	$ 1,271,964	$ 1,062,261
4.	Actuarial Accrued Liability [(1e) – (2) – (3)]	$ 165,375,669	$ 189,810,859
5.	Actuarial Value of Assets	$ 139,476,860	$ 144,234,911
6.	Unfunded Actuarial Accrued Liability (UAAL) [(4)-(5)]	$ 25,898,809	$ 45,575,948

Without State Appropriations

		August 31, 2022	August 31, 2024
7.	Annual Contributions Needed **without** Appropriations from State[1]		
	a. Normal Cost Contributions	$ 2,810,962	$ 3,270,937
	b. 30-Year UAAL Contributions[2]	2,166,257	3,721,226
	c. Total	$ 4,977,219	$ 6,992,163
8.	Expected Annual Part One Contributions	$ 3,127,200	$ 3,358,020
9.	Amount Available to Amortize UAAL [(8)-(7a)]	$ 316,238	$ 87,083
10.	Years to Amortize UAAL	infinity[3]	infinity[3]

With State Appropriations for 30-year Amortization Period

		August 31, 2022	August 31, 2024
11.	Appropriations from State for Administrative Expenses		
	a. Annual Appropriation	$ 675,000	$ 825,000
	b. Number of Years Required	every year	every year
12.	Expected Annual Part One Contributions **with** Appropriations from State[1]		
	a. Normal Cost Contributions	$ 2,094,148	$ 2,396,521
	b. UAAL Contributions	1,033,052	961,499
	c. Total	$ 3,127,200	$ 3,358,020
13.	Present Value of (12b) for 30 Years	$ 12,350,709	$ 11,776,018
14.	Appropriations from State for UAAL Amortization		
	a. Annual Appropriation Amounts[4]		
	b. Present Value of Appropriations Necessary [(6)-(13)]	$ 13,548,100	$ 33,799,930
	c. Present Value of Appropriations for up to 30 Years[4]	$ 13,548,100	$ 15,802,337
	d. Number of Years Appropriations Required	21 years	infinity[3]
15.	Part Two Contributions Required for 30-Year UAAL Amortization Period as a Percent of Part One Contributions[5]	0%	48%
16.	Funded Ratio [(5) ÷ (4)][6]	84.3%	76.0%

[1] See page 8.
[2] The UAAL contributions without state appropriations are calculated so that the UAAL would be amortized with a level annual dollar amount over a period of 30 years contributed semiannually.
[3] "Infinity" means the UAAL will never be amortized but will increase every year.
[4] See pages 9 and 10, respectively.
[5] See page 12.
[6] The funded ratio is not appropriate for assessing either the need for or the amount of future contributions or the adequacy of the assumed contributions. Using the market value of assets instead of the actuarial value of assets for Item 16 would have resulted in funded ratios of 75.2% as of August 31, 2022 and 73.0% as of August 31, 2024. **The best indicator of the System's health is whether the 30-year amortization period maximum can be met with state appropriations for 30 years or less (line 14d).**

Summary of Contributions Development

		August 31, 2022	August 31, 2024
1.	**Normal Cost Due September 1**		
	a. Total for Benefits	$ 1,621,989	$ 1,911,084
	b. Loading for Administrative Expenses		
	i. Total	1,025,000	1,175,000
	ii. Paid by State approximations	(675,000)	(825,000)
	iii. Net Paid by System	350,000	350,000
	c. Total		
	i. Without State Appropriations [(a)+(b.i)]	$ 2,646,989	$ 3,086,084
	ii. With State Appropriations [(a)+(b.iii)]	$ 1,971,989	$ 2,261,084
2.	**Periodic Payment Normal Cost[1]**		
	a. Without State Appropriations	$ 2,810,962	$ 3,270,937
	b. With State Appropriations	$ 2,094,148	$ 2,396,521
3.	**Expected Annual Part One Contributions[2]**	$ 3,127,200	$ 3,358,020
4.	**Periodic Payment UAAL Contributions**		
	a. Without State Appropriations[3]	$ 316,238	$ 87,083
	b. With State Appropriations[4]	$ 1,033,052	$ 961,499

---

[1]   The amount is the corresponding line (1c) amount due September 1 adjusted to an equivalent annual amount contributed semiannually. The adjustment factor is 1.061947 based on 7.5% assumed return (August 31, 2022) and 1.059899 based on 7.25% assumed return (August 31, 2024).

[2]   The expected contributions are based on the known rates of contributions as of the valuation date and on the census of active participants as of the valuation date, assuming that both the contribution rates and the number of active participants will remain constant in future years and be contributed semiannually.

[3]   The UAAL contributions with state appropriations are equal to line (3) minus line (2a).

[4]   The UAAL contributions with state appropriations are equal to line (3) minus line (2b).

Present Value of State Appropriations for the Next
30 Years as of August 31, 2022

Fiscal Year Ending 8/31	Expected Contributions[1]	Maximum State Contribution[2]		Present Value of Column (2) as of 8/31/22[5]	Cumulative Present Value As of 8/31/22
		Assumed State Appropriations	Basis for Assumption		
	(1)	(2)	(3)	(4)	(5)
2023	$3,750,000	$1,262,764	Actually Paid[3]	$1,262,764	$ 1,262,764
2024	3,700,000	1,262,764	LAR[4]	1,174,664	2,437,428
2025	3,650,000	1,262,764	LAR[4]	1,092,711	3,530,139
2026	3,600,000	1,200,000	1/3 of (1)	965,952	4,496,091
2027	3,600,000	1,200,000	1/3 of (1)	898,561	5,394,652
2028	3,600,000	1,200,000	1/3 of (1)	835,870	6,230,522
2029	3,600,000	1,200,000	1/3 of (1)	777,554	7,008,076
2030	3,600,000	1,200,000	1/3 of (1)	723,306	7,731,382
2031	3,600,000	1,200,000	1/3 of (1)	672,843	8,404,225
2032	3,600,000	1,200,000	1/3 of (1)	625,900	9,030,125
2033	3,600,000	1,200,000	1/3 of (1)	582,233	9,612,358
2034	3,600,000	1,200,000	1/3 of (1)	541,612	10,153,970
2035	3,600,000	1,200,000	1/3 of (1)	503,825	10,657,795
2036	3,600,000	1,200,000	1/3 of (1)	468,674	11,126,469
2037	3,600,000	1,200,000	1/3 of (1)	435,976	11,562,445
2038	3,600,000	1,200,000	1/3 of (1)	405,559	11,968,004
2039	3,600,000	1,200,000	1/3 of (1)	377,265	12,345,269
2040	3,600,000	1,200,000	1/3 of (1)	350,944	12,696,213
2041	3,600,000	1,200,000	1/3 of (1)	326,459	13,022,672
2042	3,600,000	1,200,000	1/3 of (1)	303,683	13,326,355
2043	3,600,000	1,200,000	1/3 of (1)	282,496	13,608,851
2044	3,600,000	1,200,000	1/3 of (1)	262,786	13,871,637
2045	3,600,000	1,200,000	1/3 of (1)	244,453	14,116,090
2046	3,600,000	1,200,000	1/3 of (1)	227,398	14,343,488
2047	3,600,000	1,200,000	1/3 of (1)	211,533	14,555,021
2048	3,600,000	1,200,000	1/3 of (1)	196,775	14,751,796
2049	3,600,000	1,200,000	1/3 of (1)	183,046	14,934,842
2050	3,600,000	1,200,000	1/3 of (1)	170,276	15,105,118
2051	3,600,000	1,200,000	1/3 of (1)	158,396	15,263,514
2052	3,600,000	1,200,000	1/3 of (1)	147,345	15,410,859

[1] The rounded expected contributions are based on the Part One contributions in the fiscal year ending August 31, 2022 and on a conservative projection that the sum of (a) new departments and active members participating, (b) prior service contributions, and (c) increases in contribution rates will offset a gradual decline in active members participating and the expected decline in the reimbursement contributions for the closed group of pensioners.

[2] The maximum state contribution is "one-third of the total of all contributions by governing bodies in a particular year."

[3] This amount was paid in early September 2022.

[4] The amount in column (2) is the amount in the formal Legislative Appropriation Request (LAR) submitted to the Legislative Budget Board in September 2022.

[5] The present value is based on the assumption that each assumed appropriated amount is paid on the first day of the fiscal year, September 1, discounted at 7.5% per year.

Present Value of State Appropriations for the Next
30 Years as of August 31, 2024

| Fiscal Year Ending 8/31 | Expected Contributions[1] | Maximum State Contribution[2] | | Present Value of Column (2) as of 8/31/24[5] | Cumulative Present Value As of 8/31/24 |
		Assumed State Appropriations	Basis for Assumption		
	(1)	(2)	(3)	(4)	(5)
2025	$3,900,000	$1,262,764	Actually Paid[3]	$1,262,762	$1,262,764
2026	3,800,000	1,290,000	LAR[4]	1,202,797	2,465,561
2027	3,700,000	1,290,000	LAR[4]	1,121,489	3,587,050
2028	3,600,000	1,200,000	1/3 of (1)	972,724	4,559,774
2029	3,600,000	1,200,000	1/3 of (1)	906,968	5,466,742
2030	3,600,000	1,200,000	1/3 of (1)	845,658	6,312,400
2031	3,600,000	1,200,000	1/3 of (1)	788,492	7,100,892
2032	3,600,000	1,200,000	1/3 of (1)	735,191	7,836,083
2033	3,600,000	1,200,000	1/3 of (1)	685,493	8,521,576
2034	3,600,000	1,200,000	1/3 of (1)	639,154	9,160,730
2035	3,600,000	1,200,000	1/3 of (1)	595,948	9,756,678
2036	3,600,000	1,200,000	1/3 of (1)	555,662	10,312,340
2037	3,600,000	1,200,000	1/3 of (1)	518,100	10,830,440
2038	3,600,000	1,200,000	1/3 of (1)	483,077	11,313,517
2039	3,600,000	1,200,000	1/3 of (1)	450,421	11,763,938
2040	3,600,000	1,200,000	1/3 of (1)	419,973	12,183,911
2041	3,600,000	1,200,000	1/3 of (1)	391,584	12,575,495
2042	3,600,000	1,200,000	1/3 of (1)	365,113	12,940,608
2043	3,600,000	1,200,000	1/3 of (1)	340,432	13,281,040
2044	3,600,000	1,200,000	1/3 of (1)	317,419	13,598,459
2045	3,600,000	1,200,000	1/3 of (1)	295,961	13,894,420
2046	3,600,000	1,200,000	1/3 of (1)	275,955	14,170,375
2047	3,600,000	1,200,000	1/3 of (1)	257,300	14,427,675
2048	3,600,000	1,200,000	1/3 of (1)	239,907	14,667,582
2049	3,600,000	1,200,000	1/3 of (1)	223,690	14,891,272
2050	3,600,000	1,200,000	1/3 of (1)	208,569	15,099,841
2051	3,600,000	1,200,000	1/3 of (1)	194,469	15,294,310
2052	3,600,000	1,200,000	1/3 of (1)	181,324	15,475,634
2053	3,600,000	1,200,000	1/3 of (1)	169,066	15,644,700
2054	3,600,000	1,200,000	1/3 of (1)	157,637	15,802,337

[1] The rounded expected contributions are based on the Part One contributions in the fiscal year ending August 31, 2024 and on a conservative projection that the sum of (a) new departments and active members participating, (b) prior service contributions, and (c) increases in contribution rates will offset a gradual decline in active members participating and the expected decline in the reimbursement contributions for the closed group of pensioners.

[2] The maximum state contribution is "one-third of the total of all contributions by governing bodies in a particular year."

[3] This amount was paid in early September 2024.

[4] The amount in column (2) is the amount in the formal Legislative Appropriation Request (LAR) submitted to the Legislative Budget Board in September 2024.

[5] The present value is based on the assumption that each assumed appropriated amount is paid on the first day of the fiscal year, September 1, discounted at 7.25% per year.

Change in the Unfunded Actuarial Accrued Liability (UAAL)
From August 31, 2022 Valuation to August 31, 2024 Valuation

1. August 31, 2022 UAAL $25,898,809 [1]

2. Normal cost for two years   3,943,978 [2]

3. Expected Part One contributions for two years   (6,254,400)[3]

4. State appropriated contributions for UAAL
    a. September 2022   (1,262,763)
    b. September 2023   (1,292,763)

5. Expected 7.5% per year net increase on lines (1)-(4) during two years   3,877,518

6. Expected August 31, 2024 UAAL $24,910,379

7. Experience (gains)/losses and other changes since August 31, 2022
    a. Investment return on the actuarial value of assets   8,676,703 [4]
    b. Increase due to changes in contribution rates   2,140,492 [5]
    c. Demographic experience and data corrections   4,020,971 [6]
    d. Change in investment return assumption   5,827,403 [7]

8. August 31, 2024 UAAL $45,575,948

---

[1] See page 7, line 6, under the August 31, 2022 column.
[2] The annual normal cost from the August 31, 2022 actuarial valuation was $1,971,989 due on September 1, 2022 and 2023, line (1.c.ii.) on page 8.
[3] The expected Part One contributions amount was $3,127,200 in the August 31, 2022 actuarial valuation. It was assumed to be the same every year.
[4] This is the difference between the actuarial value of assets as of August 31, 2024 and the amount expected as of that date if the actuarial value of assets as of August 31, 2022, together with the cash flows of the following two years, had returned 7.5% per year net of investment expenses.
[5] Changes in contribution rates since the August 31, 2022 actuarial valuation increased the actuarial accrued liability.
[6] This amount includes the results of actual rates of termination, mortality, disability, and retirement different from the actuarial assumptions used in the August 31, 2022 actuarial valuation. In addition, there were a number of data corrections since the prior actuarial valuation.
[7] The investment return assumption was lowered from 7.5% to 7.25%.

Determination of Part Two Contributions[1]

	August 31, 2022	August 31, 2024
1. Present value of state appropriations for UAAL amortization required to have a 30-year amortization period [line (14b) on page 7]	$13,548,100	$33,799,930
2. Present value of projected state appropriations for UAAL for up to 30 years [pages 9 and 10, respectively]	$13,548,100	$15,802,337
3. Present value of Part Two contributions required to have a 30-year amortization period [(1) – (2)]	$ 0	$17,997,593
4. Annual amount of Part Two contributions		
a. Paid September 1 [(3) ÷ annuity factor[2]]	$ 0	$ 1,502,156
b. Paid periodically [(4a) x adjustment factor[3]]	$ 0	$ 1,592,133
5. Expected annual Part One contributions paid as billed (semiannually) [line (12c) on page 7]	$ 3,127,200	$ 3,358,020
6. Part Two contributions as a percent of Part One contributions [(4b) ÷ (5), rounded up to next whole percent]	0%	48%

[1]   The board may establish Part Two contributions that would be applied to reduce the UAAL if the expected future annual contributions from the state are not enough with the Part One contributions to pay the normal cost and amortize the UAAL in 30 years.

[2]   The annuity factor for 29 equal payments beginning one year after the August 31, 2024 valuation date (11.981178 based on 7.25%).

[3]   The adjustment factor for the August 31, 2024 actuarial valuation (1.059899) results in an annual amount paid semiannually, with the first payment assumed to be received March 31, 2025, that is equivalent to $1,502,156 paid September 1, 2024.

Section 3

System Investment Information
Statement of Changes in Assets[1]

		Year Ended August 31, 2024	Year Ended August 31, 2023
Additions			
1.	Contributions		
	a. Part One contributions	3,980,912	3,597,585
	b. Prior service	18,484	10,288
	c. Reimbursement contributions	172,841	128,573
	d. State appropriation toward UAAL	1,292,763	1,262,763
		$ 5,465,000	$ 4,999,209
2.	Net Investment Income		
	a. Investment income	3,080,758	3,228,159
	b. Net appreciation in fair value	12,097,529	4,097,422
	c. Investment expenses	(401,853)	(446,822)
		$ 14,776,434	$ 6,878,759
3.	Other additions	$ 5,384	$ 43,223
Total Additions		$ 20,246,818	$ 11,921,191
Deductions			
4.	Benefits	$ 8,855,023	$ 8,531,319
5.	Administrative expenses	307,475	350,249
Total Deductions		$ 9,162,498	$ 8,881,568
Net Increase in Assets		$ 11,084,320	$ 3,039,623
Market Value of Assets (Fiduciary Net Position)			
	Beginning of year	$127,384,133	$124,344,510
	End of year	138,468,453	127,384,133
Rate of Return[2]			
	Net of investment expenses	11.85%	5.68%
	Gross	12.19%	6.06%

[1] Preliminary information in final draft.
[2] Money-weighted rate of return calculated by Rudd and Wisdom, Inc., reflecting the timing of the contributions received and the benefits paid during the year.

## Development of Actuarial Value of Assets as of August 31, 2024

Calculation of Actuarial Investment Gain/(Loss) Based on Market Value for Fiscal Years				
	2023-2024	2022-2023	2021-2022	2020-2021
1. Market Value of Assets as of Beginning of Year	$ 127,384,133	$ 124,344,510	$ 144,969,613	$ 125,229,661
2. Contributions and Other Additions	5,465,000	4,999,209	5,311,856	5,142,972
3. Benefit Payments and Administrative Expenses	(9,162,498)	(8,881,568)	(8,192,511)	(7,702,512)
4. Expected Investment Return *	9,359,431	9,134,286	10,722,344	9,250,839
5. Expected Market Value of Assets as of End of Year	$ 133,046,066	$ 129,596,437	$ 152,811,302	$ 131,920,960
6. Actual Market Value of Assets as of End of Year	138,468,453	127,384,133	124,344,510	144,969,613
7. Actuarial Investment Gain/(Loss) [(6) – (5)]	$ 5,422,387	$ (2,212,304)	$ (28,466,792)	$ 13,048,653
8. Market Value Rate of Return Net of Investment Expenses (Calculated by Rudd and Wisdom)*	11.85%	5.68%	(12.41)%	18.08%
9. Rate of Actuarial Investment Gain/(Loss)	4.35%	(1.82)%	(19.91)%	10.58%

* Based on a money-weighted rate of return net of investment expenses, reflecting the effect of the timing of the contributions received and the benefits paid during the year. The expected rate of return was 7.5% each year.

Deferred Gain/(Loss) to be Recognized in Future Years			
Fiscal Year	Investment Gain/(Loss)	Deferral Percentage	Deferred Gain/(Loss) Amount as of as of August 31, 2024
2023 – 2024	$ 5,422,387	80%	$ 4,337,910
2022 – 2023	(2,212,304)	60%	(1,327,382)
2021 – 2022	(28,466,792)	40%	(11,386,717)
2020 – 2021	13,048,653	20%	2,609,731
Total			$ (5,766,458)

Actuarial Value of Assets as of August 31,2024	
10. Market Value of Assets as of August 31, 2024	$138,468,453
11. Deferred Gain/(Loss) to be Recognized in Future	(5,766,458)
12. Preliminary Value (Item 10 – Item 11)	$144,234,911
13. Corridor for Actuarial Value of Assets	
a. 80% of Market Value as of August 31, 2024 (minimum)	$110,774,762
b. 120% of Market Value as of August 31, 2024 (maximum)	$166,162,144
14. Actuarial Value as of August 31, 2024	$144,234,911
15. Write Up/(Down) of Assets (Item 14 – Item 10)	$ 5,766,458

**Texas Emergency Services Retirement System
Historical Market Value and Actuarial Value of Assets
(Values as of August 31)**
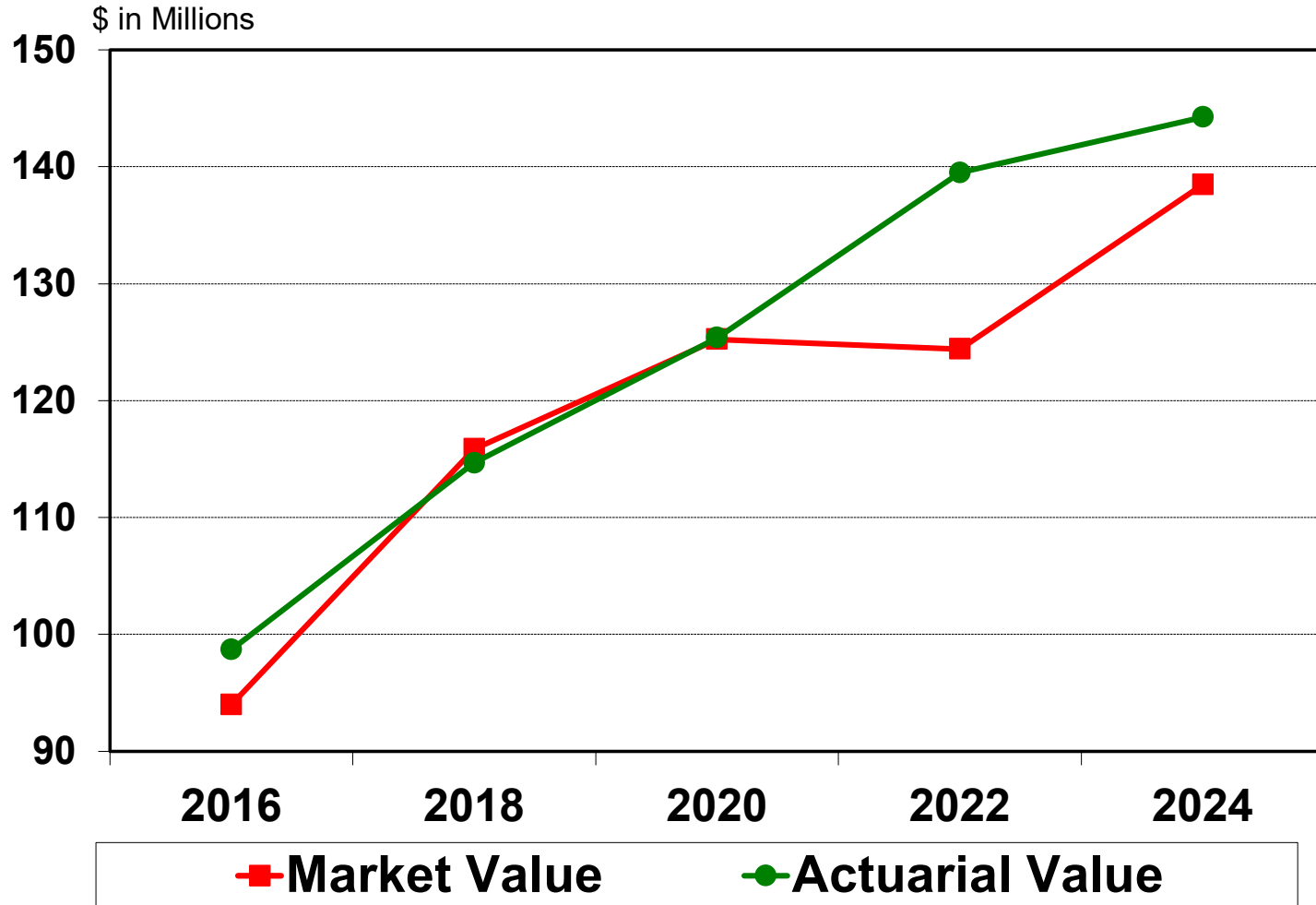
Section 4

Actuarial Methods and Assumptions

1. Actuarial Cost Method

    The entry age actuarial cost method is used in determining the contribution requirements for the System. The actuarial cost method is the procedure by which the actuary annually identifies a series of annual contributions which, along with current assets and future investment earnings, will fund the expected benefits. The entry age cost method compares the excess of the present value of expected future benefits over the current actuarial value of assets. This difference represents the expected present value of current and future contributions that will be paid into the System. The contributions are divided into two components: an annual normal cost (or current cost) and an annual amortization cost for the unfunded actuarial accrued liability.

    The System's normal cost is the current contribution in a series of annual contributions determined as a level dollar amount. The normal cost is the portion of the cost which is allocated to a plan year by the entry age actuarial cost method. The normal cost is determined as a level dollar amount for each active participant as the actuarial present value at entry of projected benefits divided by the actuarial present value at entry of anticipated future service. The allocation of the actuarial present values of projected benefits and of future service is over the period from entry age to the last age before 100% assumed retirement. These individual normal cost contribution amounts are the level dollar amounts which, if contributed throughout the participants' qualified service careers, would fund their projected qualified service benefits.

    The System's current actuarial accrued liability is the excess of the present value of expected future benefits over the present value of all future remaining normal cost contributions. The unfunded actuarial accrued liability is the amount by which the actuarial accrued liability exceeds the current actuarial value of assets. The unfunded actuarial accrued liability is recalculated each time a valuation is performed. Experience gains and losses, which represent deviations of the unfunded actuarial accrued liability from its expected value based on the prior valuation, are determined at each valuation and are amortized as part of the newly calculated unfunded actuarial accrued liability.

    Since the contributions are determined by the governing bodies of the participating departments and by the state law and Board rules governing the System, the unfunded actuarial accrued liability is expected to be amortized with level dollar contributions each year equal to the excess of the total contributions over the normal cost contributions.

2. Actuarial Value of Assets Method

    All assets are valued at market value as determined by the System Board of Trustees, with an adjustment made to uniformly spread the recognition of actuarial gains or losses (as measured by actual market value investment return vs. assumed market value investment return) over a five-year period. The total adjustment amount shall be limited as necessary such that the actuarial value of assets shall not be less than 80% of market value nor greater than 120% of market value.

3. Maximum State Contributions Methodology

The state law governing the System calls for the state to "contribute the amount necessary to make the pension System actuarially sound each year, except that the state's contribution may not exceed one-third of the total of all contributions by governing bodies in a particular year." The state law defines "actuarially sound pension system" to be a system in which the amount of contributions is sufficient to pay the normal cost and amortize the UAAL in a period that does not exceed 30 years. The methodology for recognizing maximum state contributions is (1) to project the maximum state contributions equal to one-third of a projection of total contributions to the System year by year, then (2) to calculate the present value of projected maximum state contributions for up to 30 years as is necessary for the System to have a 30-year amortization period, and then (3) to subtract this present value from the UAAL for determining the System's amortization period.

4. Reimbursement Funded Benefits Methodology

There are a number of participating departments in the System that previously had Texas Local Fire Fighters' Retirement Act (TLFFRA) plans that had been financed primarily or totally on a pay-as-you-go basis. When those departments entered the System, there evidently were no plan assets or insufficient plan assets to merge into the System to fully fund the present value of future benefits for their annuitants. The System's history was to agree to take over the administration and payment of those annuitants' monthly benefits in exchange for the agreement of the governing body of the department to reimburse the System for these benefits on a pay-as-you-go basis.

A separate account within the System had been used for a number of years to reflect both the payment of the annuities associated with former TLFFRA plans and the pay-as-you-go revenue from the governing bodies of the departments now participating in the System. The annuities paid through this separate account are sometimes referred to as "pass-throughs". This separate account and its activity had historically been excluded from the biennial actuarial valuations of the System. Beginning with the August 31, 2012 actuarial valuation, the board of trustees decided that it would be appropriate to reflect the actuarial present value of the future monthly benefits (PVFB) for the "pass-throughs" associated with former TLFFRA plans as a liability of the System in the biennial actuarial valuations.

The actuarial present value of the pay-as-you-go reimbursement payments is virtually identical to the PVFB for the "pass-throughs" at any point in time. Therefore, it was decided to also show the actuarial present value of the pay-as-you-go reimbursement payments equal to the PVFB for the "pass-throughs". Since these two actuarial present values offset each other, the System's funded ratio is unaffected and the present value of future appropriations from the state necessary to amortize the UAAL is unaffected.

5. Actuarial Assumptions

As a part of each actuarial valuation, we review the reasonableness of the actuarial assumptions used in the prior actuarial valuation. The investment return assumption is reviewed using the building block approach that includes several asset allocations, assumed real rates of return for each asset class, an assumed rate of investment-related expenses, and an assumed rate of inflation, with all assumptions for the long-

term future. Our economic assumptions are influenced both by long-term historical experience and by future expectations of investment consultants and economists, but we select the economic assumptions and discuss them with the board of trustees before completing the actuarial valuation.

We review the termination, disability, and retirement assumptions in a more rigorous way periodically in experience studies, the most recent of which was completed in 2020. For the mortality assumptions, we use an appropriate published mortality table with projections for improvement beyond the valuation date. We are guided in our review and selection of assumptions by the relevant actuarial standards of practice. As a result of our review, we have selected actuarial assumptions we consider to be reasonable and appropriate for the System for the long-term future.

a. Investment Return: Current and future System assets are assumed to yield an annual investment return of 7.25% net of investment expenses, 4.5% net real rate of return plus 2.75% inflation.

b. Salary Increase Rates: Not applicable.

c. Termination: The active members are assumed to terminate their membership for causes other than death, disability or retirement in accordance with annual rates per 1,000 members shown below. The termination rates stop at the later of attaining age 55 or 10 years of qualified service.

Years of Service	Entry Age Group					
	20	25	30	35	40	45, 50, 55
0 - 4	250	250	200	200	170	150
5 - 9	120	130	130	130	100	100
10 - 14	80	90	100	100	90	0
15 - 19	80	80	90	90	0	0
20 - 24	70	70	70	0	0	0
25 - 29	70	70	0	0	0	0
30 - 34	70	0	0	0	0	0
35+	0	0	0	0	0	0

d. Mortality: The active, terminated members, retirees and surviving spouses of the System are assumed to exhibit mortality in accordance with the following:

   i. Pre-retirement Mortality:

   - off duty — PubS-2010 (public safety) below-median income mortality table for employees, projected for mortality improvement generationally using projection scale MP-2019

   - on duty — additional annual mortality rate of 0.015% added to the base mortality table

ii. Post-retirement Mortality: PubS-2010 (public safety) below-median income mortality table for retirees, projected for mortality improvement generationally using projection scale MP-2019

iii. Post-disability Mortality: Same as for post-retirement mortality

e. <u>Retirement</u>: Active members eligible for early or normal retirement are assumed to retire based on rates that vary by age as shown below.

Age	Rate per Year
55	25%
56-64	14
65-69	20
70+	100

Terminated members entitled to deferred benefits are assumed to begin their benefits at age 58 or their age on the valuation date, if older.

f. <u>Disability</u>: Active members are assumed to become disabled as defined by the System provisions during the performance of emergency service duties based on rates that vary by age as illustrated below:

Age	Rate per Year
20	0.0020%
25	0.0024
30	0.0037
35	0.0050
40	0.0069
45	0.0087
50	0.0119
55	0.0173
60	0.0255
65	0.0279

g. <u>Marital Status</u>: 90% of all active male members and 50% of all active female members are assumed to be married at the time benefits commence. Males are assumed to be two years older than female spouses.

h. <u>Administrative Expenses</u>: The normal cost under the actuarial cost method is increased by an assumed amount to reflect the average annual administrative expenses expected to be incurred and paid by the System in the years following the valuation date. The assumed amount is based on input from the System about some of the details of (1) the budgeted administrative expenses for the year following the valuation date and (2) the estimated administrative expenses for the second year following the valuation date, reduced by the amount appropriated by the State of

Texas for the System to pay part of the administrative expenses for the year following the valuation date.

i.   Contributions: The total annual Part One contributions to be paid by all governing bodies for the participating departments for qualified service as it is earned is assumed to be the total contributions based on the number of active members in the valuation in each department and known monthly contribution rates for each department as of the valuation date.

j.   Pensioner Data: If the marital status field provided in the data was "married", "unknown", or was missing, then the annuity payment form was assumed to be a joint and two-thirds to spouse annuity. For all other marital status codes, the payment form was assumed to be a life annuity. Missing spouse date of birth was assumed to be two years from the retiree's date of birth, with females two years younger.

6.   Changes in Methods and Assumptions Since the August 31, 2022 Valuation

a.   There was one change in a method. In previous actuarial valuations, we used each department's contribution rate history to determine the accumulated contributions for each active participant assuming their qualified service was uninterrupted. In this actuarial valuation, we used the database accumulated contributions for each active participant.

b.   There were four changes in assumptions: (1) the investment return assumption was lowered from 7.5% to 7.25%, (2) the underlying inflation assumption was lowered from 3% to 2.75%, (3) the assumed annual total administrative expense was increased from $1,025,000 to $1,175,000, and (4) the assumed annual administrative expense paid by state appropriations was increased from $675,000 to $825,000. The assumed annual administrative expenses paid by the System was unchanged at $350,000.

Section 5

Outline of Principal Eligibility, Benefit, and Contribution Provisions
Reflected in the Actuarial Valuation as of August 31, 2024

1. Effective Date

    The **Texas Statewide Emergency Services Retirement Act (TSESRA)** was established effective November 1, 1977 under Senate Bill No. 411 ("SB411"). It has been amended several times, with the most significant changes in a recodification by the 79th Legislature, Regular Session, 2005. In the recodification, the pension system was renamed the **Texas Emergency Services Retirement System** (System). In the 2013 Regular Session, the System was made a state agency with an Executive Director hired by the System Board of Trustees.

2. Fund

    The **Texas Emergency Services Retirement Fund (Fund)** was created by TSESRA and is a trust fund for providing retirement, disability and death benefits to eligible members and their surviving spouses.

3. Eligibility Requirements

    All emergency services personnel who provide services related to fire, rescue and emergency medical services and who serve without monetary remuneration while members in good standing of a participating department are eligible. In addition, auxiliary employees who receive limited compensation from a political subdivision of Texas and who are certified by the political subdivision as being regularly engaged in the performance of duties for a participating department are eligible.

4. Qualified Service

    A member is credited with a year of qualified service for each year following the member's date of entry into the System in which the member is present for at least 20 hours of annual training and 25% of the department's emergencies in a calendar year. The participating department must conduct a minimum of 48 hours of training in a calendar year.

    In addition, the governing body may purchase additional qualified service for a member who becomes covered by the System and who has service with the participating department before the department began participating in the System. These "buy-back" years of qualified service are determined as the number of years of service (satisfying the qualified service requirements mentioned above) from the member's date of entry in the department but not more than 15 years prior to the date the department began participating in the System. (The maximum was 10 years before the change to 15 years in 2020.)

5. Vesting of Benefits

    A member became vested upon completing at least five years of qualified service through December 31, 2006. The vesting percent was determined in accordance with the table below. A member whose retirement benefit met a partial vesting requirement as it existed

on December 31, 2006, retains the eligibility for that benefit as it existed on that date. Effective January 1, 2007, a member must have at least ten years of qualified service to become vested. The vesting percent is determined in accordance with the right half of the table below. The monthly benefit payable to the vested terminated member upon attainment of age 55 is computed in the same manner as for retirement except that the benefit and vesting percent are based upon the years of qualified service at the date of termination of service.

Years of Qualified Service	Vesting Percent 12/31/2006 and earlier	1/1/2007 and later	Years of Qualified Service	Vesting Percent
less than 5	0%	0%	10	50%
5	25%	0%	11	60%
6	30%	0%	12	70%
7	35%	0%	13	80%
8	40%	0%	14	90%
9	45%	0%	15 or more	100%

6. Retirement Benefits

A member is eligible to retire at age 55 or above. Early retirement requires the completion of at least five years of qualified service through December 31, 2006 and ten years thereafter, while normal retirement requires the completion of at least 15 years of qualified service. The only reduction for early retirement is the vesting percent. The monthly retirement benefit payable to the member is equal to the vesting percent multiplied by six times the governing body's average monthly contribution over the member's years of qualified service. For each year of qualified service in excess of 15 years, the monthly retirement benefit is increased at the rate of 6.2% compounded annually. (The rate was 7% per year before December 31, 2006.)

In addition, the governing body may have purchased prior service credit for service with the participating department before the department began participating in the System that is not buy-back service and that does not count as qualified service. There is a separate benefit formula for this prior service, referred to as accrued time, and the member is assumed to be 100% vested in the accrued time benefit. The maximum amount of accrued time is 20 years, and the monthly benefit is usually $1.25 per year of accrued time.

A member electing to retire and receive a monthly retirement benefit from the System may continue to serve as a volunteer fire fighter for his governing body. However, the member is no longer considered an active member of the System; so he is not credited with any additional qualified service or contributions.

7. Disability Benefits

A member who becomes disabled **during the performance of emergency service duties** is considered 100% vested. A disability benefit is payable during each month that the member is unable to perform his duties for the member's participating department or the duties of any other occupation for which the member is reasonably suited by education, training, and experience.

The monthly disability benefit payable to the member is equal to at least $400. The monthly disability benefit increases $50 for every $12 in monthly contributions above the first $12 in monthly contributions being paid to the System by the governing body at the time of the disability. A member must elect between retirement or disability benefits if eligible for both.

A member whose service terminates as a result of becoming disabled while **not performing emergency service duties** shall not be eligible for a disability benefit. Instead, the member is eligible to receive an immediate or deferred benefit based on his age, years of qualified service and vesting percent. The monthly benefit payable to the member beginning on the later of the date of disability or the date the member attains age 55 is computed in the same manner as for retirement.

8. On-Duty Death Benefits Prior to Retirement

A member whose death **is the result of performance of emergency service duties** is considered 100% vested. A lump sum death benefit as well as a monthly death benefit are payable to the member's spouse (a lifetime benefit) and dependent children (payable until age 19 unless disabled) beginning in the month after the member's death.

The lump sum benefit is equal to $100,000.

The monthly death benefit is equal to 2/3 of the retirement benefit the member would have been entitled to receive based on the greater of 15 years or actual years of qualified service and is payable to the member' spouse and dependent children. An additional amount of 1/3 of the member's retirement pension is payable to the member's dependents as long as both the spouse and at least one dependent child survives.

9. Off-Duty Death Benefits Prior to Retirement

A member **eligible to retire** whose death is **not the result of performance of emergency service duties** shall be treated as if the member had retired on the date of death. The surviving spouse shall be entitled to a monthly benefit provided the member qualified by both age and service for retirement benefits at the time of death. The monthly death benefit is equal to 2/3 of the member's retirement benefit and is payable to the member's spouse beginning in the month after the member's death.

Alternatively, the surviving spouse may elect to receive a lump sum death benefit. The lump sum benefit is equal to the greater of the sum contributed to the System on behalf of the member or the sum that would have been contributed to the System after 15 years if the member had not completed 15 years at the time of death. If there is no surviving spouse, the beneficiary would receive the lump sum death benefit.

If a member whose death is **not the result of performance of emergency service duties** was **not eligible to retire** at the time of death, his beneficiary shall receive a lump sum benefit. The amount of the lump sum benefit is the same as that described above for a member who dies while eligible to retire.

If a member whose death is not the result of performance of emergency service duties was under age 55 at the time of death but had a vested benefit, then the surviving spouse may elect, in lieu of the lump sum death benefit, a deferred monthly death benefit beginning the month after the decedent would have turned 55. The monthly benefit would

be equal to 2/3 of the monthly retirement benefit to which the decedent would have been entitled on that date if he had lived to 55.

10. Death During Permanent Disability

If a member dies while receiving a disability benefit, his surviving spouse shall receive a monthly benefit equal to 2/3 of the monthly disability benefit which the disabled member was receiving at the time of death.

11. Death After Retirement

The surviving spouse of a retired member who dies shall receive a monthly benefit equal to 2/3 of the monthly benefit which the retiree was receiving at time of death.

12. Death While a Vested Terminated Participant

The surviving spouse of a deceased member who dies after terminating service with a vested benefit but before attaining age 55 is entitled to a monthly benefit, beginning on the date the decedent would have attained 55, that is 2/3 of the monthly benefit to which the decedent would have been entitled.

13. Contributions by Governing Bodies

Contributions are made by the governing body for the participating department. No contributions are required from the individuals who are members of the System. Each participating department shall make a contribution for each month a member performs emergency services for the department. The monthly contribution is composed of two parts. The Part One contribution directly impacts future retiree annuities and reflects a minimum amount set by the state board. The Part Two contribution may be established by the System Board of Trustees to help amortize the UAAL if the expected future annual contributions from the state are not enough with the Part One contributions to provide an adequate contribution arrangement to pay the normal cost and amortize the UAAL in 30 years. If Part Two contributions are needed for the System to have an adequate contribution arrangement, the Part Two contributions are actuarially determined based on the most recent biennial actuarial valuation to be effective beginning on September 1 following the board's approval for the remainder of the 30-year amortization period. The Part Two portion, which is determined as a percent of the Part One portion (not to exceed 15%), may subsequently may be modified based on the then-most recent actuarial valuation.

A Part One contribution of at least the minimum amount per month of service is payable on behalf of each active member. The minimum monthly contribution rate per member for a department participating in the System on September 1, 2005 was increased from $12 to $36 in $4 annual increments, beginning September 1, 2006 and became $36 September 1, 2011. The minimum monthly contribution rate for a department that began participation in the System after September 1, 2005 is $36. Contributions higher than the minimum Part One contribution rate may be made at the discretion of the governing body in order to provide higher monthly benefits.

The total required contributions by the governing body are equal to the sum of the Part One and Part Two contributions and any special contributions made in order to purchase buy-back years of qualified service and other prior service benefits. The special

contributions to purchase buy-back years of qualified service and other prior service benefits shall be determined before the second anniversary of a department's entry into the System. These special contributions (referred to as prior service contributions) shall be payable either in a lump sum or at least annually for a period not to exceed 10 years.

14.   Contributions by State of Texas

The State shall contribute the amount necessary to make the System "actuarially sound" each year. However, the State's contribution may not exceed one-third of the total of all contributions by governing bodies in a particular year. The state law governing the System defines an "actuarially sound pension system" as one in which the amount of contributions is sufficient to cover the normal cost and to amortize the unfunded actuarial accrued liability in a period that does not exceed 30 years.

15.   Minimum Benefit

Effective January 1, 2007, the TESRS Board of Trustees by board rule reduced the benefit formula for years of qualified service above 15 and eliminated partial vesting for members with less than 10 years of qualified service. The Board protected vested members by "grandfathering" accrued benefits as of December 31, 2006 for each vested active member for retirement, termination or death. The System calculated the amount of every member's vested accrued benefit as of December 31, 2006 and keeps a record of this amount as each person's minimum benefit. Upon termination, death, or retirement, the System will pay the larger of the benefit under the new reduced benefit formula and the minimum benefit. Vested terminated members at the effective date of the changes were not affected.

Section 6

Summary of Participant Data

Distribution of Active Participants
by Age and Service as of August 31, 2024

Current Age	Current Years of Qualified Service						Total	Percent of Total
	0-4	5-9	10-14	15-19	20-24	25 & Over		
Under 25	332	16	0	0	0	0	348	10.3%
25-29	273	128	8	0	0	0	409	12.1
30-34	212	134	59	5	0	0	410	12.1
35-39	178	141	80	65	6	0	470	13.8
40-44	129	113	85	64	24	4	419	12.3
45-49	110	85	69	47	45	18	374	11.0
50-54	78	54	63	62	48	51	356	10.5
55-59	56	25	40	42	20	56	239	7.0
60-64	35	21	30	28	18	40	172	5.1
65 & Over	53	30	28	26	13	47	197	5.8
Total	1,456	747	462	339	174	216	3,394	100.0%
Percent of Total	42.9%	22.0%	13.6%	10.0%	5.1%	6.4%	100.0%	

Summary of Participant Data (Continued)

	8/31/2016	8/31/2018	08/31/2020	08/31/2022	08/31/2024
Active Participants					
Number	3,634	3,927	3,634	3,379	3,394
Average age	41.8	41.0	41.1	41.3	41.5
Average qualified service	9.5	8.5	9.0	9.1	8.6
Percent male	93%	93%	92%	91%	91%
Terminated Vested Participants					
Number	2,200	1,927	1,787	1,813	1,806
Average age	51.0	51.0	51.9	52.6	53.7
Total annual deferred benefit	$2,505,659	$2,442,582	$2,411,569	$2,812,737	$2,998,746
Average annual deferred benefit	$1,139	$1,268	$1,350	$1,551	$1,660
Retirees and Beneficiaries (TESRS)					
Number					
Service retirees	2,223	2,677	2,960	3,097	3,217
Spouses	599	592	649	720	764
Disability retirees	10	10	8	8	7
Children	8	5	6	3	3
	2,840	3,284	3,623	3,828	3,991
Average age					
Service retirees	68.0	67.5	67.8	68.4	69.3
Spouses	77.4	77.1	76.8	77.2	77.5
Total annual benefit	$4,589,959	$5,709,153	$6,757,762	$7,851,594	$9,366,170
Average annual benefit	$1,616	$1,738	$1,865	$1,967	$2,347
Retirees and Beneficiaries (TLFFRA)					
Number					
Service retirees	129	121	101	79	63
Spouses	198	128	113	84	68
	327	249	214	163	131
Average age					
Service retirees	81.6	81.4	80.9	81.3	81.9
Spouses	85.6	86.8	86.2	86.2	86.6
Total annual benefit	$278,931	$234,430	$209,910	$182,048	$151,639
Average annual benefit	$853	$941	$981	$1,117	$1,158

Summary of Participant Data (Continued)

Participant Data Reconciliation

	Active Participants	Current Payment Status	Terminated Vested Participants	Total
1. As of August 31, 2022	3,379	3,991	1,813	9,183
2. Change of status				
a. retirement	(115)	263	(148)	0
b. disability	0	0	0	0
c. death	(2)	(284)	(3)	(289)
d. survivor payment begins	0	134	0	134
e. nonvested termination	(622)	0	0	(622)
f. vested termination	(161)	0	161	0
g. completion of payment	0	0	0	0
h. data corrections	(7)	18	0	11
i. net changes	(907)	131	10	(766)
3. New participants (or return)	922	0	(17)	905
4. As of August 31, 2024	3,394	4,122	1,806	9,322

Section 7

Glossary of Actuarial Terms

Actuarial Accrued Liability That portion, as determined by the particular actuarial cost method used, of the Actuarial Present Value of future pension plan benefits as of the Valuation Date that is not provided for by the Actuarial Present Value of future Normal Costs.

Actuarial Assumptions Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, termination, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation; and other relevant items.

Actuarial Gain (Loss) A measure of the difference between actual experience and that expected based on the Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with the particular actuarial cost method used.

Actuarial Present Value The value of an amount or series of amounts payable or receivable at various times, determined as of a given date (the Valuation Date) by the application of the Actuarial Assumptions.

Actuarial Valuation The determination, as of a Valuation Date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets The value of cash, investments and other property belonging to a pension plan, as determined by a method and used by the actuary for the purpose of an Actuarial Valuation.

Entry Age Actuarial Cost Method An actuarial cost method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the compensation or service of the individual over the period from entry age to the last age before 100% assumed retirement. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a Valuation Date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability. Under this method, Actuarial Gains (Losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Fiscal Year A 12-month period beginning September 1 and ending August 31.

Glossary of Actuarial Terms, (Continued)

Normal Cost

That portion of the Actuarial Present Value of pension plan benefits that is allocated to a valuation year by the actuarial cost method.

Prior Service Contributions

Contributions for a department for purchasing credit for service before that department began participating in the System.

Projected Benefits

Those pension plan benefit amounts that are expected to be paid at various future times according to the Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future qualified service.

Overfunded Actuarial Accrued Liability

The excess, if any, of the Actuarial Value of Assets over the Actuarial Accrued Liability.

Unfunded Actuarial Accrued Liability

The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.

Unfunded Actuarial Accrued Liability Contributions

The level annual dollar amount to amortize the Unfunded Actuarial Accrued Liability.

Valuation Date

The date upon which the Normal Cost, Actuarial Accrued Liability and Actuarial Value of Assets are determined. Generally, the Valuation Date will coincide with the ending of a Fiscal Year.

Years to Amortize the Unfunded Actuarial Accrued Liability

The period is determined in each Actuarial Valuation as the number of years, beginning with the Valuation Date, to amortize the Unfunded Actuarial Accrued Liability with a level annual dollar amount that is the difference between the expected Part One contributions and the Normal Cost. The determination may also reflect the present value of maximum state contributions as needed to have an amortization period of 30 years. If the Part One contributions and 30 years of the maximum state contributions are not adequate for a 30-year amortization period, then the actuarial valuation will include the determination of Part Two contributions required to have a 30-year amortization period.

Appendix A

Review of the Actuarial Investment Return Assumption
for the August 31, 2024 Actuarial Valuation

Asset Allocation and Investment Return Assumption Development

	Gross Annual Real Rate of Investment Return (ROR)[1]	Estimated Investment Expenses[2]	Net Real ROR	Asset Allocation		
				12/31/23[3]	3/31/24[4]	12/31/23 Target
Domestic Equity						
Large cap growth (Alger)	6.5%	0.85%	5.65%	12.0%	13.5%	10%
Large cap value (Boston Partners)	6.5	0.74	5.76	11.4	12.4	10
SMID cap growth (Mainstay Fiera)	7.0	0.94	6.06	0.0	3.3	5
Mid cap blend (Clarkston)	7.0	1.10	5.90	5.7	5.7	5
				29.1	34.9	30
International Equity						
Developed growth (Invesco & Oakmark)	7.0	0.81	6.19	15.3	15.2	15
Emerging markets (Allspring)	8.5	1.12	7.38	3.8	3.7	5
				19.1	18.9	20
Fixed Income						
Core Plus (Garcia Hamilton)	2.5	0.35	2.15	10.6	10.1	10
Core (Richmond Capital)	2.0	0.35	1.65	11.1	10.6	10
Non-Core (Pimco Diversified)	3.0	0.89	2.11	9.2	9.0	10
				30.9	29.7	30
Alternatives						
Global Infrastructure (IFM)	7.5	0.87	6.63	4.6	4.4	5
Real Estate (Morgan Stanley)	5.5	1.00	4.50	9.8	9.2	10
Multi Asset Income (TBD)	4.5	0.75	3.75	0.0	0.0	5
				14.4	13.6	20
Cash	0.3	0.30	0.00	6.5	2.9	0
				100.0%	100.0%	100%

	12/31/23	3/31/24	12/31/23 Target
Weighted Average Net Real ROR Assumption	4.25%	4.43%	4.60%

Possible Theoretical Annual Investment Return Assumption
- Net Real ROR Plus Assumed Annual Rate of Inflation

	12/31/23	3/31/24	12/31/23 Target
Assumed 3.00% Inflation	7.25%	7.43%	7.60%
Assumed 2.75% Inflation	7.00%	7.18%	7.35%

---

[1] A gross annual real rate of investment return assumption is the long-term total average annual rate of investment return, before any expenses, that is in excess of the assumed annual inflation rate. These are assumptions made by Rudd and Wisdom, Inc.

[2] These assumed investment-related expenses as a percent of assets are based on information from investment consultant Mariner and include both direct and indirect expenses, with an addition of 0.03% for the fees of the custodial bank and 0.07% for the fees of Mariner (average annual fees as a percent of assets for consulting fee, any manager searches and an asset/liability study periodically).

[3] From the December 31, 2023 report of Mariner.

[4] From the March 31, 2024 report of Mariner.

Appendix A (continued)

Price Inflation in the USA
Average Annual Rates of Increase in the CPI-U

Years (Dec. to Dec.)	Number of Years	Average Annual Increase
1958 – 2023	65	3.70%
1963 – 2023	60	3.90
1968 – 2023	55	4.00
1973 – 2023	50	3.86
1978 – 2023	45	3.41
1983 – 2023	40	2.81
1988 – 2023	35	2.71
1993 – 2023	30	2.51
1998 – 2023	25	2.54
2003 – 2023	20	2.58

Most inflation forecasts are for 10 years or less. For example, the average 10-year forecast in the June 2024 Livingston Survey published by the Federal Reserve Bank of Philadelphia was 2.25%. However, 10 years is too short a forecast period for a public employee defined benefit pension plan. In the 2024 annual report of the OASDI Trust Funds (Social Security), the ultimate inflation assumptions for their 75-year projections are 3.0%, 2.4%, and 1.8% for the low-cost, intermediate, and high-cost assumptions, respectively. Looking at the average annual increase in the CPI-U over historical periods of 30 to 65 years above and considering the Social Security forecasts, we believe that reasonable assumed rates of inflation for the long-term future would range from 2.25% to 3.00%.

Appendix B

Other Disclosures as of August 31, 2024

Negative Amortization

- As of this actuarial valuation, the fund is expected to have negative amortization every year because even with the level dollar amortization method used, the maximum total expected contributions are inadequate to pay the normal cost and to amortize the unfunded liability. Therefore, the unfunded actuarial accrued liability is expected to gradually increase from one biennial actuarial valuation to the next.

Reasonable Actuarially Determined Contribution

- The actuarially determined contribution (ADC) in Section 2 on page 7 of the total annual contributions to pay the normal cost and to amortize the unfunded liability in 30 years on line 7 is a reasonable ADC consistent with actuarial standards of practice.

Actuarial Valuation Software

- We have utilized software licensed from Winklevoss Technologies, LLC in the development of the liabilities summarized in the report. We have independently confirmed the model developed by Winklevoss and have sufficiently tested it to ensure the model is an accurate representation of the system's liabilities.

Low-Default-Risk Obligation Measure (LDROM)

- The LDROM is a new required disclosure calculated as of the date of the actuarial valuation using a discount rate based on high quality bond yields instead of the expected return on the fund's diversified investment portfolio.

Low-Default-Risk Obligation Measure	$311,728,791
Actuarial Accrued Liability	$189,810,859

- The difference between the LDROM and the actuarial accrued liability determined in this actuarial valuation could be viewed as the expected savings from investing in the fund's diversified portfolio instead investing only in high quality bonds.

- For our calculation of the LDROM, we have used the same actuarial cost method and actuarial assumptions from this actuarial valuation summarized in Section 4, except for an assumed discount rate of 3.87% instead of the investment return assumption of 7.25%. To determine the assumed discount rate, we used the Bond Buyer Index of general obligation bonds with 20 years to maturity, which has an average rating roughly equivalent to Moody's Investors Services' Aa2 rating and Standard and Poor's Corporation AA. The weekly index closest to the August 31, 2024 measurement date was 3.87%.

- Because the System's assets are not invested only in high-quality bonds, the LDROM does not reflect the System's actuarial condition, nor does it offer insights into the total contribution required for an adequate contribution arrangement or the security of participant benefits.

Agenda Item: 4