



# North Carolina Firefighters' and Rescue Squad Workers' Pension Fund

Principal Results of Actuarial Valuation as of December 31, 2022

October 26, 2023, Board of Trustees Meeting

Michael Ribble, FSA, EA, MAAA, FCA

Elizabeth Wiley, FSA, EA, MAAA, FCA

# Valuation input

## Member data

<b>Membership Data</b>	<b>Asset Data</b>	<b>Benefit Provisions</b>	<b>Assumptions</b>	<b>Funding Methodology</b>
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The table below provides a summary of the membership data used in this valuation compared to the prior valuation.

<b>Number as of</b>	<b>12/31/2022</b>	<b>12/31/2021</b>
Active members	25,263	25,713
Lapsed members	18,005	16,661
Disabled members eligible for deferred pensions	111	108
Retired members and survivors of deceased members killed in the Line of Duty currently receiving benefits	<u>15,014</u>	<u>14,741</u>
Total	58,393	57,223

The number of fully active members decreased by 1.8% from the previous valuation date.

The number of retired members increased by 1.9% from the previous valuation date.

A detailed summary of the membership data used in this valuation is provided in Section 2 and Appendix A.

# Valuation results

## Net actuarial gain or loss

Actuarial Value of Assets	Actuarial Accrued Liability	Net Actuarial Gain or Loss	Funded Ratio	Employer Contributions
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The table below provides a reconciliation of the prior year's unfunded actuarial accrued liability to the current year's unfunded actuarial accrued liability.

(in millions)	
Unfunded actuarial accrued liability (UAAL) as of 12/31/2021	\$ (12.0)
Normal cost and administrative expense during 2022	8.3
Reduction due to actual contributions during 2022	(22.2)
Interest on UAAL, normal cost, and contributions	(1.0)
Asset (gain) / loss	9.8
Actuarial accrued liability (gain) / loss	(3.3)
Impact of assumption changes	0.0
Impact of legislative changes	0.0
Unfunded actuarial accrued liability (UAAL) as of 12/31/2022	\$ (20.4)

During 2022, the UAAL decreased by \$22.2 million due to SCRSP contributions exceeding the actuarially determined contribution.

Additionally, the UAAL increased due to the asset loss of \$9.8 million.

A detailed summary of the net actuarial gain or loss is provided in Section 4.

# Valuation results

## Employer contributions

Actuarial Value of Assets	Actuarial Accrued Liability	Net Actuarial Gain or Loss	Funded Ratio	Employer Contributions
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The table below provides a reconciliation of the actuarially determined employer contribution.

Fiscal year ending June 30, 2024 Preliminary ADEC (estimated based on December 31, 2021 valuation)	\$ 3,253,378
Impact of Legislative Changes	<u>0</u>
Fiscal year ending June 30, 2024 Final ADEC	\$ 3,253,378
Change Due to Demographic (Gain)/Loss	(696,154)
Change Due to Payoff of Unfunded Liability Base established in June 30, 2011, valuation	(1,057,068)
Change Due to Investment (Gain)/Loss	1,396,777
Change Due to Contributions Greater than ADEC	(726,805)
Impact of Assumption Changes	0
Impact of Direct Rate Smoothing	<u>180,831</u>
Fiscal year ending June 30, 2025 Preliminary ADEC (estimated based on December 31, 2022 valuation)	\$ 2,350,959

The change in the ADEC due to investment loss is based on the actuarial value of assets return of 4.56%, which was less than the 6.50% assumed return.

Change due to Contributions Greater than ADEC is due to application of the SCRSP.

A detailed summary of the actuarially determined employer contribution rates is provided in Section 5.

# Valuation results

## State Contribution Rate Stabilization Policy

### Benefit Enhancements

### Additional Disclosures

### Projections

- Session Law 2016-108 requires that the Board develop a State Contribution Rate Stabilization Policy (SCRSP) for the FRSWPF
- Below is a summary of the SCRSP that the Board adopted on April 29, 2021
- State Contributions
  - Board will recommend to the General Assembly the higher of the underlying ADEC or \$350,000 greater than the current year's recommendation
  - SCRSP Minimum Contribution Rate for FYE 2025 is \$20,402,208 (Greater of ADEC of \$2,350,959 and FYE 2024 recommendation of \$20,052,208 plus \$350,000)
- Board considerations for Benefit and Member Contribution Increases:
  - Recommended benefit increase is no greater than the CPI-U increase
  - Sufficient funding is available to meet the Benefit Improvement Funding Requirement (BIFR)
  - With a goal of a 50/50 split between member and state contributions toward the normal cost portion of the annual contribution, the Board will recommend that monthly member contributions be set at the \$5 increment closest to a 50/50 share of the Fund's normal cost, along with any recommendation to provide a benefit increase.
  - See next slides for metrics the Board must use to recommend benefit and/or member contribution increases

A detailed summary of the actuarially determined employer contribution rates is provided in Section 5.

# Valuation results

## State Contribution Rate Stabilization Policy

### Benefit Enhancements

### Additional Disclosures

### Projections

Metrics the Board must consider to recommend a benefit increase to the General Assembly based on the results of the December 31, 2022 valuation:

- The most recent June-over-June increase in the CPI-U is 2.97%. Consequently, the maximum benefit improvement<sup>1</sup> is \$5.
- The increase in the AAL and Normal Cost for certain proposed benefit improvements:

	\$ Improvement				
	\$1	\$2	\$3	\$4	\$5
Increase in AAL	\$ 2,914,232	\$ 5,828,464	\$ 8,742,696	\$ 11,656,929	\$ 14,571,161
% increase in AAL	0.58%	1.16%	1.74%	2.32%	2.90%
Increase in Normal Cost	\$ 38,593	\$ 77,187	\$ 115,780	\$ 154,374	\$ 192,967

- The BIFR for certain proposed benefit improvements:

	\$ Improvement				
	\$1	\$2	\$3	\$4	\$5
(1) Full Actuarial Cost of Proposed Benefit Improvement	\$ 2,952,826	\$ 5,905,651	\$ 8,858,477	\$ 11,811,303	\$ 14,764,128
(2) FRSWPF Actuarial Accrued Liability as of 12/31/2022	501,766,052	501,766,052	501,766,052	501,766,052	501,766,052
(3) FRSWPF Actuarial Value of Assets as of 12/31/2022	522,126,681	522,126,681	522,126,681	522,126,681	522,126,681
(4) Underlying ADEC for FYE 6/30/2025	2,350,959	2,350,959	2,350,959	2,350,959	2,350,959
(5) Policy Contribution without Benefit Increase FYE 6/30/2025	20,402,208	20,402,208	20,402,208	20,402,208	20,402,208
(6) Total Adjustment (2)-(3)+(4)-(5), only if less than \$0	(38,411,878)	(38,411,878)	(38,411,878)	(38,411,878)	(38,411,878)
BIFR: (1) + (6), not less than \$0	\$ -	\$ -	\$ -	\$ -	\$ -

- Any of these benefit improvements trigger a member contribution increase from \$10 per month to \$15 per month
  - The \$5 increase is sufficient to pay for the increase in normal cost for permissible improvement
  - This increases the member percent share of total normal cost from 32.80% to 48.96% for a \$1 improvement or from 32.80% to 48.02% for the maximum \$5 improvement, inclusive of benefit and member contribution increases

<sup>1</sup>An increase in the monthly benefit, from the current \$170 monthly benefit, for participants who are already retired as well as those who retire in the future.

# Valuation results

## State Contribution Rate Stabilization Policy Metrics

Benefit Enhancements	Additional Disclosures	Projections
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Metrics the Board must use in recommending benefit improvements and member contribution increases based on the December 31, 2022 valuation are as follows:

	Valuation	\$ Improvement				
		\$1	\$2	\$3	\$4	\$5
Total normal cost	7,006,052	7,044,645	7,083,239	7,121,832	7,160,426	7,199,019
Normal cost rate	326.26	328.05	329.85	331.65	333.45	335.24
Expense rate	39.60	39.60	39.60	39.60	39.60	39.60
Total normal cost rate	365.86	367.65	369.45	371.25	373.05	374.84
State's rate	245.86	247.65	249.45	251.25	253.05	254.84
Employee rate (\$10 per month)	120.00	120.00	120.00	120.00	120.00	120.00
Employee rate as a % of the total rate	32.80%	32.64%	32.48%	32.32%	32.17%	32.01%
Increase in EE rate to get close to a 50/50						
State/EE split in the rate (\$15 per month)		180.00	180.00	180.00	180.00	180.00
EE cont as a % of the total rate		48.96%	48.72%	48.48%	48.25%	48.02%

# Key takeaways

- Key results of the December 31, 2022 valuation were:
  - Market value returns of (10.40%) during calendar year 2022 compared to 6.5% assumed
  - Continuation of direct-rate smoothing of the change in the employer contribution rate due to the changes in assumptions and methods over a 5-year period
  - Employer contributions under the State Contribution Rate Stabilization Policy (SCRSP) significantly exceeded the actuarially determined employer contribution (ADEC)



# Key takeaways (continued)

- When compared to the December 31, 2021 actuarial valuation, the previous resulted in:
  - A higher funded ratio (104.1% in the December 31, 2022 valuation compared to 102.4% in the December 31, 2021 valuation)
  - A lower actuarially determined employer contribution (\$2,350,959 for fiscal year ending June 30, 2025 compared to \$3,253,378 for fiscal year ending June 30, 2024)
- Recommended contribution under the State Contribution Rate Stabilization Policy (SCRSP) of \$20,402,208 for FYE 2025, which is the greater of:
  - The ADEC of \$2,350,959 and
  - The FYE 2024 recommendation of \$20,052,208, plus \$350,000

# Key takeaways (continued)

FRSWPF is well funded compared to its peers. This is due to:

- Stakeholders working together to keep FRSWPF well-funded since inception
- A history of appropriating and contributing the recommended contribution requirements
- Implementation of SCRSP, which provides additional funding
- Assumptions that in aggregate are more conservative than peers
- A funding policy that aggressively pays down unfunded liability over a 12-year period
- Modest changes in benefits when compared to peers

Continued focus on these measures will be needed to maintain the solid status of FRSWPF well into the future.

# Certification

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: fund experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Such changes in law may include additional costs resulting from future legislated benefit improvements or cost-of-living pension increases or supplements, which are not anticipated in the actuarial valuation. Because of limited scope, Buck performed no analysis of the potential range of such future differences, except for some limited analysis in financial projections or required disclosure information. Information contained in our report for plan years from December 31, 2017, to December 31, 2020, is based on valuations performed by the prior actuarial firm.

The purpose of this presentation is to provide a summary of the actuarial valuation results to the Board at the October 26, 2023 meeting attended by the actuaries. Use of this report for any other purposes may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of this presentation for that purpose. This presentation should not be provided without a copy of the full valuation report. Because of the risk of misinterpretation of actuarial results, you should ask Buck, A Gallagher Company (Buck) to review any statement you wish to make on the results contained in this presentation. Buck will not accept any liability for any such statement made without prior review.

This presentation is considered part of the annual actuarial valuation report. Please see below for full description of data, actuarial assumptions and methods, plan provisions, and other applicable disclosures.

This report was prepared under our supervision and in accordance with all applicable Actuarial Standards of Practice. We are Fellows of the Society of Actuaries, Enrolled Actuaries, Members of the American Academy of Actuaries, and Fellows of the Conference of Consulting Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. We are available to discuss this report with you at your convenience.

Michael A. Ribble, FSA, EA, MAAA, FCA

Elizabeth A. Wiley, FSA, EA, MAAA, FCA

# Appendix

Supplemental Information

# Valuation input

## Market value

Membership Data	Asset Data	Benefit Provisions	Assumptions	Funding Methodology
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The table below provides details of the Market Value of Assets for the current and prior year's valuations.

Asset data as of	12/31/2022	12/31/2021
Beginning of year market value of assets	\$ 538,379,184	\$ 499,936,606
Employer contributions	19,702,208	19,002,208
Employee contributions	2,467,349	2,525,870
Benefit payments other than refunds	(30,415,565)	(29,999,134)
Refunds	(215,355)	(206,237)
Administrative expenses	(890,168)	(989,669)
Investment income	<u>(55,522,426)</u>	<u>48,109,540</u>
Net increase / (decrease)	(64,873,957)	38,442,578
End of year market value of assets	\$ 473,505,227	\$ 538,379,184
Estimated net investment return on market value (annualized)	(10.40%)	9.72%

FRSWPF assets are held in trust and are invested for the exclusive benefit of plan members.

Incoming contributions currently cover over 70% of the outgoing benefit payments and administrative expenses.

Over the long term, benefit payments and administrative expenses not covered by contributions are expected to be covered with investment income, illustrating the benefits of following actuarial pre-funding since inception.

A detailed summary of the market value of assets is provided in Section 3.





# **North Carolina Firefighters' and Rescue Squad Workers' Pension Fund**

Report on the Actuarial Valuation  
Prepared as of December 31, 2022

October 2023



110 West Berry Street  
Suite 1300  
Fort Wayne, IN 46802

October 13, 2023

Board of Trustees  
Local Governmental Employees'  
Retirement System of North Carolina  
3200 Atlantic Avenue  
Raleigh, NC 27604

Members of the Board:

We submit herewith our report on the annual valuation of the North Carolina Firefighters' and Rescue Squad Workers' Pension Fund (referred to as "FRSWPF") prepared as of December 31, 2022. The report has been prepared in accordance with North Carolina General Statute 58-86-1 through 58-86-101. Information contained in our report for plan years from December 31, 2017, to December 31, 2020, is based on valuations performed by the prior actuarial firm.

The primary purpose of the valuation report is to determine the required member and employer contribution rates, to describe the current financial condition of FRSWPF, and to analyze changes in such condition. Use of this report for any other purposes or by anyone other than North Carolina Retirement Systems Division (RSD) or Department of State Treasurer staff may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. Because of the risk of misinterpretation of actuarial results, you should ask Buck, A Gallagher Company (Buck) to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without prior review.

The valuation is based upon membership data and financial information as furnished by RSD and the Financial Operations Division and as summarized in this report. Although we reviewed for reasonableness and consistency with the prior valuation, these elements have not been audited by Buck and we cannot certify as to the accuracy and completeness of the data supplied. Sometimes assumptions are made by Buck to interpret membership data that is imperfect. The valuation is also based on benefit and contribution provisions as presented in this report. If you have reason to believe that the plan provisions are incorrectly described that important plan provisions relevant to this valuation are not described, or that conditions have changed since the calculations were made, you should contact the authors of this actuarial report prior to relying on this information.

The valuation is further based on the actuarial valuation assumptions, approved by the Board of Trustees, as presented in this report. We believe that these assumptions are reasonable and comply with the Actuarial Standards of Practice ("ASOPs") 27 and 35. We prepared this valuation in accordance with the requirements of this standard and in accordance with all applicable ASOPs.

The assumptions used for the December 31, 2022, actuarial valuation are based on the experience study prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021. All assumptions are discussed annually with the appropriate parties, and actuarial gain/loss experience is reviewed during each valuation, to see if any changes are needed. The economic assumptions with respect to investment yield and inflation have been based upon a review of the existing portfolio structure as well as recent and anticipated experience. All assumptions represent an estimate of future experience.



ASOPs 27 and 35 ask the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the plan sponsor do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. In the case of the Board's selection of the investment return assumption, the signing actuaries have used economic information and tools provided by Buck's Financial Risk Management ("FRM") practice. A spreadsheet tool created by the FRM team converts averages, standard deviations, and correlations from Buck's Capital Markets Assumptions ("CMA") that are used for stochastic forecasting into approximate percentile ranges for the arithmetic and geometric average returns. It is intended to suggest possible reasonable ranges for the investment return assumption without attempting to predict or select a specific best estimate rate of return. It takes into account the duration (horizon) of investment and the target allocation of assets in the portfolio to various asset classes. Based on the actuaries' analysis, including consistency with other assumptions used in the valuation, the percentiles generated by the spreadsheet described above, and review of actuarial gain/loss analysis, the actuaries believe the assumptions, in the actuaries' professional judgment, are reasonable for the purpose of the measurement.

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented may be appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities. In various places in the report the results also show funded ratios and unfunded liabilities based upon varying sets of assumptions as well as market values of assets as that is required for certain disclosure information required per accounting rules or statutes. Where this has been done it has been clearly indicated.

Actuarial Standard of Practice No. 56 ("ASOP 56") provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. In addition to the spreadsheet model discussed above, Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the Plan using data and assumptions as of the measurement date under the accounting rules specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable accounting rules to the liabilities derived and other inputs, such as Plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other accounting outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. The review is performed by experts within the company who are familiar with applicable accounting rules as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked and reviewed by multiple experts within the company who are familiar with the details of the required changes.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: fund experience differing from that anticipated by the economic or demographic

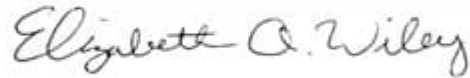
assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Such changes in law may include additional costs resulting from future legislated benefit improvements or cost-of-living pension increases or supplements, which are not anticipated in the actuarial valuation. Because of limited scope, Buck performed no analysis of the potential range of such future differences, except for some limited analysis in financial projections or required disclosure information.

This report was prepared under our supervision and in accordance with all applicable Actuarial Standards of Practice. We are Fellows of the Society of Actuaries, Enrolled Actuaries, Members of the American Academy of Actuaries, and Fellows of the Conference of Consulting Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. We are available to discuss this report with you at your convenience.

Respectfully submitted,



Michael A. Ribble, FSA, EA, MAAA, FCA  
Principal, Retirement Actuary  
Buck, A Gallagher Company



Elizabeth A. Wiley, FSA, EA, MAAA, FCA  
Senior Consultant, Retirement Actuary  
Buck, A Gallagher Company

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# Executive Summary

## Overview

The RSD was established in 1941 to provide retirement benefits for public servants in the State of North Carolina. Today, under the management of the Department of State Treasurer, RSD administers seven public pension plans (defined benefit plans), three supplemental retirement plans (voluntary defined contributions plans), a health trust fund, a disability income plan, death benefit funds and a number of other benefit programs. As of December 31, 2022, the RSD defined benefit plans cover over one million current and prior public servants of the state of North Carolina. During the fiscal year ending June 30, 2023, RSD paid over \$7.5 billion in pensions to more than 350,000 retirees. And as of June 30, 2023, RSD's defined benefit plan assets were valued at over \$114 billion.

Under the supplemental retirement plans, the amount of contributions in any given year is defined by law. The amount of benefits derived is dependent on the investment returns the individual achieves. Conversely, under the pension plans, the amount of the benefit paid to a member upon retirement, termination, death or disability is defined by law. The amount of contributions needed to fund these benefits cannot be known with certainty. In North Carolina, like other states, these contributions are paid during a public servant's career so that upon retirement, termination, death, or disability, there are funds available to pay these benefits. These amounts are determined through an actuarial valuation. Actuarial valuations are performed for each of the pension plans administered by RSD and the results are contained in actuarial valuation reports like this.

The Firefighters' and Rescue Squad Workers' Pension Fund ("FRSWPF") provides benefits to all paid and volunteer certified firefighters and rescue squad workers. FRSWPF has approximately \$474 million in assets and over 58,000 members as of December 31, 2022. This actuarial valuation report is our annual analysis of the financial health of FRSWPF. This report, prepared as of December 31, 2022, presents the results of the actuarial valuation of the Retirement System.

## Purpose

An actuarial valuation will be performed on FRSWPF annually as of the end of the calendar year. The actuary determines the amount of contributions to be made to FRSWPF during each member's career that, when combined with investment return, will be sufficient to pay for retirement benefits.

In addition, the annual actuarial valuation is performed to:

- Determine the progress on funding FRSWPF,
- Explore why the results of the current valuation differ from the results of the valuation of the previous year, and
- Satisfy regulatory and accounting requirements.

A detailed summary of the valuation process and a glossary of actuarial terms are provided in the supplementary document, "State of North Carolina Retirement Systems Actuarial Valuation Report Process and Actuarial Terms Glossary" dated October 2023.

# Executive Summary (continued)

## Actuarial Comments and Observations

### Membership

As with any estimate, the actuary collects information that we know now. Under the actuarial valuation process, current information about FRSWPF members is collected annually by RSD staff at the direction of the actuary. Membership data will assist the actuary in estimating benefits that could be paid in the future. Information about benefit provisions and assets held in the trust as of the valuation date is also collected.

The member information the actuary collects includes data elements such as current service, salary and benefit group identifier for members that have not separated service, and actual benefit amounts and form of payment for members that have separated service. Data elements such as gender and date of birth are used to determine when a benefit might be paid and for how long.

The table below provides a summary of the membership data used in this valuation compared to the prior valuation.

Number as of	12/31/2022	12/31/2021
Active members	25,263	25,713
Lapsed members	18,005	16,661
Disabled members eligible for deferred pensions	111	108
Retired members and survivors of deceased members killed in the Line of Duty currently receiving benefits	<u>15,014</u>	<u>14,741</u>
Total	58,393	57,223

The total number of fully active and lapsed members increased approximately 2.1% overall from the previous valuation date. The number of retired members increased 1.9% from the previous valuation date.

Members who are not in receipt of benefits and who have not received a refund of employee contributions are split into active members and lapsed members. Lapsed members include members who did not contribute or accrue a year of service in the past year. The return to service assumption assumes that a lapsed member returns to active service at a rate based on the number of years that the member has been lapsed.

The number of retired members and the benefits paid to these members has been increasing steadily, as expected based on plan assumptions.

A detailed summary of the membership data used in this valuation is provided in Section 2 and Appendix A of this report.

# Executive Summary (continued)

## Assets

FRSWPF assets are held in trust and are invested for the exclusive benefit of plan members. The market value of assets is \$474 million as of December 31, 2022 and \$538 million as of December 31, 2021. The investment return for the market value of assets for calendar year 2022 was (10.40)%.

Market value returns during 2022 were lower than the 6.50% assumed rate of return, resulting in a higher required contribution and lower funded ratio than anticipated.

The actuarial value of assets smooths investment gains and losses. The actuarial value of assets is \$522.1 million as of December 31, 2022 and \$508.5 million as of December 31, 2021. The market value of assets is less than the actuarial value of assets, which is used to determine employer contributions. This indicates that overall, there are unrecognized asset losses to be recognized in future valuations.

Lower than expected market returns in 2022 resulted in an actuarial value of asset return for calendar year 2022 of 4.56% and a recognized actuarial asset loss of \$9.8 million during 2022. After recognizing this loss, the assets at actuarial value were \$20.4 million more than the actuarial accrued liability as of December 31, 2022.

Based on historical market returns, the current asset allocation, the current investment policy, and the expectation of future asset returns, as reviewed in the last experience study, the 6.50% discount rate used in this valuation is reasonable and appropriate.

A detailed summary of asset information is provided in Section 3 of this report.

## Benefit Provisions

Many Public Sector Retirement Systems in the United States have undergone pension reform where the benefits of members (active or future members) have been reduced. Because of the well-funded status of the Retirement System due to the legislature contributing the actuarially required contribution, benefit cuts have not been needed in North Carolina as they have been in most other states. However, if North Carolina's investment policy shifts substantively, the system should review likely impacts of the shift and consider corresponding changes to actuarial assumptions, funding policy and/or benefit levels.

A detailed summary of the benefit provisions is provided in Appendix B of this report.

## Actuarial Assumptions

Actuarial assumptions bridge the gap between the information that we know with certainty as of the valuation date (age, gender, service, and benefits of the members) and what may happen in the future. The actuarial assumptions of the Retirement System are reviewed at least every five years. Based on this review, the actuary will make recommendations on the demographic and economic assumptions.

Demographic assumptions describe future events that relate to people such as retirement rates, termination rates, disability rates, and mortality rates. Economic assumptions describe future events that relate to the Retirement System's assets such as the interest rate and the real return.

The assumptions used for the December 31, 2022 actuarial valuation are based on the experience study prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021.

The assumptions and methods were not changed since the prior valuation.

# Executive Summary (continued)

## Funding Methodology

When compared to other Public Sector Retirement Systems in the United States, the funding policy for FRSWPF is quite aggressive in that the policy pays down the unfunded actuarial accrued liability over a much shorter period of time (12 years) compared to most other Public Sector Retirement Systems. As such it is a best practice in the industry.

A detailed summary of the actuarial methods is provided in Appendix C of this report.

## Liabilities

The actuarial accrued liability (AAL) increased from \$496.5 million to \$501.8 million during 2022. FRSWPF is an open plan, which means that new members enter the plan each year. In an open plan, liabilities are expected to grow from one year to next as more benefits accrue and the membership approaches retirement. The AAL was \$3.3 million, or 0.7%, less than expected AAL.

A detailed summary of the AAL is provided in Section 4 of this report.

## Funded Ratio

The funded ratio is a measure of the progress that has been made in funding the plan as of the valuation date. It is the ratio of how much money the Retirement System actually has in the fund to the amount the FRSWPF should have in the fund.

The ratio of assets to liabilities shows the health of the plan on an accrued basis. The funded ratio on an actuarial basis increased from 102.4% as of December 31, 2021 to 104.1% at December 31, 2022.

## Unfunded Actuarial Accrued Liability

The unfunded actuarial accrued liability (UAAL) is the portion of actuarial accrued liability that is not covered by the assets of the Retirement System. The actuarial value of assets basis is used for computing contributions to alleviate contribution volatility. The difference in the actuarial accrued liability and the actuarial value of assets is the amount of unfunded actuarial accrued liability to be paid off over a 12-year period.

The UAAL decreased from \$(12.0) million as of December 31, 2021 to \$(20.4) million as of December 31, 2022. A detailed reconciliation of the UAAL can be found in Section 4 of this report.

## Contributions

The December 31, 2021 valuation suggested that the preliminary total employer contribution be set at \$3,253,378 for the fiscal year ending June 30, 2024 subject to the SCRSP (which would suggest a contribution of at least \$20,052,208) and the impact of any future legislative changes effective during that fiscal year. As a result of the December 31, 2022 valuation, the preliminary actuarially determined employer contribution is \$2,350,959 for the fiscal year ending June 30, 2025, subject to the SCRSP (which would suggest a contribution of at least \$20,402,208) and the impact of any future legislative changes effective during that fiscal year.

The actuarially determined employer contribution is the amount needed to pay for the cost of the benefits accruing and to pay off the unfunded actuarial accrued liability over a 12-year period, offset for the \$10 monthly contribution the members make until they attain 20 years of service. The 12-year period is a relatively short period for Public Sector Retirement Systems in the United States, with the funding period for most of these systems much longer. The shorter period results in higher contributions and more benefit security.

A detailed summary of the actuarially determined employer contributions rates is provided in Section 5 of this report.

# Executive Summary (continued)

## Risk

Actuarial Standard of Practice No. 51 (“ASOP 51”) requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Measuring pension obligations and actuarially determined contributions requires the use of assumptions regarding future economic and demographic experience. Whenever assumptions are made about future events, there is risk that actual experience will differ from expected. Actuarial valuations include the risk that actual future measurements will deviate from expected future measurements due to actual experience that is different than the actuarial assumptions.

The primary areas of risk in this actuarial valuation are:

- Investment Risk – the potential that investment returns will be different than expected.
- Longevity and Other Demographic Risks – the potential that mortality or other demographic experience will be different than expected.
- Interest Rate Risk – To the extent market rates of interest affect the expected return on assets, there is a risk of change to the discount rate which determines the present value of liabilities and actuarial valuation results.
- Contribution Risk – The potential that actual contributions are different than the actuarially determined contributions.

Annual actuarial valuations are performed for RSD which re-measure the assets and liabilities and compute a new actuarially determined contribution. RSD also has experience studies performed every five years to analyze the discrepancies between actuarial assumptions and actual experience and determine if the actuarial assumptions need to be changed. Annual actuarial valuations and periodic experience studies are practical ways to monitor and reassess risk.



# Executive Summary (continued)

## Key Takeaways

The actuarial valuation is performed each year to replace the estimates the actuary assumed for the prior valuation with the actual events that happened. This past year, as expected, some of the assumptions used in the prior valuation were not realized. Key results of the December 31, 2022 valuation were:

- Market value returns of (10.40)% during calendar year 2022 compared to 6.50% assumed
- Continuation of direct-rate smoothing of the change in the employer contribution rate due to the changes in assumptions and methods over a 5-year period
- Employer contributions under the State Contribution Rate Stabilization Policy (SCRSP) significantly exceeded the actuarially determined employer contribution (ADEC)
- Recommended contribution under SCRSP of \$20,402,208 for FYE 2025, which is the greater of:
  - The ADEC of \$2,350,959 and
  - The FYE 2024 recommendation of \$20,052,208, plus \$350,000

When compared to the December 31, 2021 actuarial valuation, the above resulted in:

- A higher funded ratio (104.1% in the December 31, 2022 valuation compared to 102.4% in the December 31, 2021 valuation)
- A lower actuarially determined employer contribution (\$2,350,959 for fiscal year ending June 30, 2025 compared to \$3,253,378 for fiscal year ending June 30, 2024)

FRSWPF is well funded compared to its peers. This is due to:

- Stakeholders working together to keep FRSWPF well-funded
- A history of appropriating and contributing a minimum of the recommended contribution requirements
- Implementation of SCRSP, which provides additional funding
- Assumptions that in aggregate are more conservative than peers
- A funding policy that aggressively pays down unfunded liability over a 12-year period
- Modest changes in benefits when compared to peers

Continued focus on these measures will be needed to maintain the solid status of FRSWPF well into the future.

This report, prepared as of December 31, 2022, presents the results of the annual valuation of the system. The principal results of the valuation and a comparison with the preceding year's results are summarized in the following table.

# Section 1: Principal Results

This report, prepared as of December 31, 2022, presents the results of the actuarial valuation of the system. The principal results of the valuation and a comparison with the preceding year's results are summarized below.

**Table 1: Summary of Principal Results**

Valuation results as of	12/31/2022	12/31/2021
Active Members		
Non-lapsed Members	25,263	25,713
Lapsed Members	18,005	16,661
Retired Members and Survivors of Deceased Members Killed in the Line of Duty Currently Receiving Benefits		
Number	15,014	14,741
Annual Allowances	\$ 30,628,183	\$ 30,071,640
Number of Deferred Members	111	108
Assets		
Actuarial Value (AVA)	\$ 522,126,681	\$ 508,510,376
Market Value	\$ 473,505,227	\$ 538,379,184
Actuarial Accrued Liability (AAL)	\$ 501,766,052	\$ 496,483,247
Unfunded Accrued Liability (AAL-AVA)	\$ (20,360,629)	\$ (12,027,129)
Funded Ratio* (AVA/AAL)	104.1%	102.4%
Results for Fiscal Year Ending	6/30/2025	6/30/2024
Actuarially Determined Employer Contribution (ADEC)		
Normal Cost	\$ 5,526,195	\$ 5,732,168
Accrued Liability	(2,813,572)	(1,936,295)
Total	\$ 2,712,623	\$ 3,795,873
Total Based on Direct Rate Smoothing	\$ 2,350,959	\$ 3,253,378
Impact of Legislative Changes	N/A	0
Final ADEC	N/A	\$ 3,253,378
SCRSP Minimum Contribution Rate	\$ 20,402,208	\$ 20,052,208
Appropriations Act for Fiscal Year Ending	6/30/2025	6/30/2024
Legislative Appropriation	Not Final	\$ 20,052,208

\* The Funded Ratio on a Market Value of Assets basis is 94.4% as of December 31, 2022.

## Section 2: Membership Data

The RSD provided membership data as of the valuation date for each member of the Retirement System. The membership data assists the actuary in estimating benefits that could be paid in the future. The tables below provide a summary of the membership data used in this valuation. Detailed tabulations of data are provided in Appendix A.

**Table 2: Summary of Member Data**

Number as of	12/31/2022	12/31/2021
Active Members	25,263	25,713
Lapsed members	18,005	16,661
Disabled members eligible for deferred pensions	111	108
Retired members and survivors of deceased members killed in the Line of Duty currently receiving benefits	<u>15,014</u>	<u>14,741</u>
Total	58,393	57,223

**Table 3: Active Member Data**

	Member Count	Average Age	Average Service
Lapsed Members	18,005	42.13	5.84
Active Members	<u>25,263</u>	<u>39.57</u>	<u>11.18</u>
Total	43,268	40.64	8.95

The table above includes members who are not in receipt of benefits and who have not received a refund of employee contributions. Lapsed members include members who did not contribute or accrue a year of service in the past year.

**Table 4: Data for Members Currently Receiving Benefits**

Member Count	Average Age	Annual Retirement Allowances
15,014	69.07	\$ 30,628,183

**Table 5: Data for Disabled Members Eligible for Deferred Pensions**

Member Count	Average Age	Annual Retirement Allowances
111	51.79	\$ 226,440

## Section 3: Asset Data

Assets are held in trust and are invested for the exclusive benefit of FRSWPF members. The tables below provide the details of the market value of assets for the current and prior years' valuations.

**Table 6: Market Value of Assets**

Asset Data as of	12/31/2022	12/31/2021
Beginning of Year Market Value of Assets	\$ 538,379,184	\$ 499,936,606
Employer Contributions	19,702,208	19,002,208
Employee Contributions	2,467,349	2,525,870
Benefit Payments Other than Refunds	(30,415,565)	(29,999,134)
Refunds	(215,355)	(206,237)
Administrative Expenses	(890,168)	(989,669)
Investment Income	(55,522,426)	48,109,540
Net Increase/(Decrease)	(64,873,957)	38,442,578
End of Year Market Value of Assets	\$ 473,505,227	\$ 538,379,184
Estimated Net Investment Return on Market Value (Annualized)	(10.40)%	9.72%

**Table 7: Allocation of Investments by Category of the Market Value of Assets**

Category	12/31/2022	12/31/2021
Allocation by Dollar Amount		
Public Equity	\$ 158,533,849	\$ 193,440,605
Fixed Income (LTIF)	109,807,697	129,206,999
Cash and Receivables	75,936,806	77,372,302
Other*	129,226,875	138,359,278
Total Market Value of Assets	\$ 473,505,227	\$ 538,379,184
Allocation by Percentage of Asset Value		
Public Equity	33.5%	35.9%
Fixed Income (LTIF)	23.2%	24.0%
Cash and Receivables	16.0%	14.4%
Other*	<u>27.3%</u>	<u>25.7%</u>
Total Market Value of Assets	100.0%	100.0%

\* Real Estate, Alternatives, Inflation and Credit

## Section 3: Asset Data (continued)

In order to reduce the volatility that investment gains and losses can have on the required contributions and funded status of FRSWPF, the Board adopted an asset valuation method to determine the Actuarial Value of Assets used for funding purposes. The table below provides the calculation of the Actuarial Value of Assets at the valuation date.

**Table 8: Actuarial Value of Assets**

Asset Data as of	12/31/2022
Beginning of Year Actuarial Value of Assets	\$ 508,510,376
Beginning of Year Market Value of Assets	\$ 538,379,184
Contributions	22,169,557
Benefit Payments, Refunds and Administrative Expenses	<u>(31,521,088)</u>
Net Cash Flow	(9,351,531)
Expected Investment Return	34,695,507
Expected End of Year Market Value of Assets	563,723,160
End of Year Market Value of Assets	473,505,227
Excess of Market Value over Expected Market Value of Assets	(90,217,933)
80% of 2022 Asset Gain/(Loss)	(72,174,346)
60% of 2021 Asset Gain/(Loss)	9,553,735
40% of 2020 Asset Gain/(Loss)	7,651,435
20% of 2019 Asset Gain/(Loss)	6,347,722
Total Deferred Asset Gain/(Loss)	(48,621,454)
Preliminary End of Year Actuarial Value of Assets	522,126,681
Final End of Year Actuarial Value of Assets (not less than 80% and not greater than 120% of Market Value)	522,126,681
Estimated Net Investment Return on Actuarial Value	4.56%

**Commentary:** The actuarial value of assets smooths investment gains/losses on the market value of assets over a five-year period resulting in less volatility in the actuarially determined employer contribution. The asset valuation recognizes asset returns in excess of or less than the expected return on the market value of assets over a five-year period.

## Section 3: Asset Data (continued)

The valuation assumes that the funds will earn a 6.50% asset return in all future years. The table below provides a history of the Actuarial Value and Market Value of Asset returns.

**Table 9: Historical Asset Returns**

Year*	Actuarial Value of Asset Return	Market Value of Asset Return
2013	7.43%	12.42%
2014	7.42%	6.24%
2015	5.87%	0.35%
2016	5.33%	6.24%
2017	6.54%	13.33%
2018	5.08%	(1.40%)
2019	6.19%	14.87%
2020	8.80%	11.22%
2021	9.18%	9.72%
2022	4.56%	(10.40%)
10-Year Average	6.63%	5.98%
10-Year Range	4.62%	25.27%

\* The 2013 asset return is the annualized return for the 18-month period from June 30, 2012 to December 31, 2013. Asset returns for years after 2013 are for the calendar year.

**Commentary:** The average investment return recognized for purposes of determining the annual change in contribution each year is the actuarial value of assets return. Currently, the average actuarial return over the last 10 years of 6.63% compares with an average market return of 5.98%. But the range of returns on market value is markedly more volatile, 25.27% versus 4.62%. This results in much lower actuarially determined employer contribution volatility using the actuarial value of assets versus market, while ensuring that the actuarial needs of FRSWPF are met.

## Section 4: Liability Results

Using the provided membership data, benefit provisions, and actuarial assumptions, future benefit payments of FRSWPF are estimated. These projected future benefit payments are discounted into today's dollars using the assumed rate of investment return assumption to determine the Present Value of Future Benefits. The Present Value of Future Benefits is allocated to past, current, and future service, respectively known as the actuarial accrued liability, normal cost and present value of future normal costs. The table below provides these liability numbers for the current and prior years' valuations.

**Table 10: Liability Summary**

Valuation Results as of	12/31/2022	12/31/2021
(a) Present Value of Future Benefits		
(1) Active Members*	\$ 259,946,460	\$ 261,360,121
(2) Members Currently Receiving Benefits and Members with Deferred Benefits	<u>292,774,098</u>	<u>287,180,992</u>
(3) Total	\$ 552,720,558	\$ 548,541,113
(b) Present Value of Future Normal Costs		
(1) Employee Future Normal Costs	\$ 18,240,313	\$ 18,433,484
(2) Employer Future Normal Costs	<u>32,714,193</u>	<u>33,624,382</u>
(3) Total	\$ 50,954,506	\$ 52,057,866
(c) Actuarial Accrued Liability: (a3) - (b3)	\$ 501,766,052	\$ 496,483,247
(d) Actuarial Value of Assets	\$ 522,126,681	\$ 508,510,376
(e) Unfunded Accrued Liability: (c) - (d)	\$ (20,360,629)	\$ (12,027,129)

\*Includes present value of future members for lapsed members whose service did not increase during 2022.

The table below provides an allocation of the total present value of future benefits by funding source.

**Table 11: Funding Allocation**

	12/31/2022	12/31/2021
Allocation by Dollar Amount		
Assets (Actuarial Value)	\$ 522,126,681	\$ 508,510,376
Future Employee Contributions	18,240,313	18,433,484
Future Normal Contributions	<u>32,714,193</u>	<u>33,624,382</u>
Present Value of Funded Benefits	\$ 573,081,187	\$ 560,568,242
Present Value of Unfunded Benefits	<u>(20,360,629)</u>	<u>(12,027,129)</u>
Total Present Value of Benefits	\$ 552,720,558	\$ 548,541,113
Allocation by Percentage of PVB		
Assets (Actuarial Value)	94.5%	92.7%
Future Employee Contributions	3.3%	3.4%
Future Normal Contributions	<u>5.9%</u>	<u>6.1%</u>
Present Value of Funded Benefits	103.7%	102.2%
Present Value of Unfunded Benefits	<u>(3.7%)</u>	<u>(2.2%)</u>
Total Present Value of Benefits	100.0%	100.0%

## Section 4: Liability Results (continued)

The table below provides a reconciliation of the prior year's unfunded actuarial accrued liability to the current year's unfunded actuarial accrued liability.

**Table 12: Reconciliation of Unfunded Actuarial Accrued Liability (in millions)**

(in millions)	
Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2021	\$ (12.0)
Normal Cost and Administrative Expenses during 2022	8.3
Reduction due to Actual Contributions during 2022	(22.2)
Interest on UAAL, Normal Cost, and Contributions	(1.0)
Asset (Gain)/Loss	9.8
Actuarial Accrued Liability (Gain)/Loss	(3.3)
Impact of Assumption Changes	0.0
Impact of Legislative Changes	<u>0.0</u>
Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2022	\$ (20.4)

**Commentary:** During 2022, the UAAL is greater than expected due an asset loss during the year that increased the UAAL by \$9.8 million offset by a gain of \$22.2 million due to SCRSP contributions, which exceeded the actuarially determined contribution and a demographic experience gain of \$3.3 million.



## Section 5: Actuarially Determined Employer Contribution

The actuarially determined employer contribution consists of a normal cost contribution and an accrued liability contribution. The normal cost contribution is the employer's portion of the cost of benefits accruing during the year after reducing for the member contribution. The accrued liability contribution is the payment toward the unfunded actuarial accrued liability in order to pay off the unfunded actuarial accrued liability over 12 years.

The State Contribution Rate Stabilization Policy (SCRSP) adopted by the Board of Trustees on April 29, 2021, requires that recommended contributions for a given fiscal year will be the greater of:

- (1) The underlying actuarially determined employer contribution rate (ADEC) for the fiscal year, or
- (2) The appropriation that the Board recommended for the current fiscal year plus \$350,000

Appendix D contains a full description of the SCRSP policy.

The table below provides the calculation of the actuarially determined employer contribution for the current and prior years' valuations.

**Table 13: Calculation of Actuarially Determined Employer Contribution (ADEC) Payable per Active Member**

Valuation Date	12/31/2022	12/31/2021
ADEC for Fiscal Year Ending	6/30/2025	6/30/2024
Normal Cost Rate Calculation		
(a) Total Normal Rate	\$ 326.26	\$ 329.34
(b) Employee Normal Cost	\$ 120.00	\$ 120.00
(c) Employer Normal Cost: (a) - (b)	\$ 206.26	\$ 209.34
(d) Expenses Rate*	\$ 39.60	\$ 43.68
(e) Total Normal Cost Rate: (c) + (d)	\$ 245.86	\$ 253.02
Accrued Liability Rate Calculation		
(f) Total Annual Amortization Payments**	\$ (2,813,572)	\$ (1,936,295)
(g) Active Member Count***	22,477	22,655
(h) Accrued Liability Rate: (f) / (g)	\$ (125.18)	\$ (85.47)
Total ADEC (e) + (h)	\$ 120.68	\$ 167.55

\* Based on actual expenses during the previous year.

\*\* See Table 17 for more detail.

\*\*\* The active member count reflects the number of currently active or lapsed members who are expected to accrue additional benefits in the next year.

## Section 5: Actuarially Determined Employer Contribution (continued)

**Table 14: Actuarially Determined Employer Contribution (ADEC)**

The tables below provide the calculation of the actuarially determined employer contribution (ADEC) for the current and prior years' valuations.

Valuation Date ADEC for Fiscal Year Ending	12/31/2022 6/30/2025	12/31/2021 6/30/2024
(a) Current Active Member Count*	22,477	22,655
(b) Normal Cost Rate	\$ 245.86	\$ 253.02
(c) Normal Cost Contribution: (a) x (b)	\$ 5,526,195	\$ 5,732,168
(d) Accrued Liability Contribution	<u>(2,813,572)</u>	<u>(1,936,295)</u>
(e) Total ADEC: (c) + (d)	\$ 2,712,623	\$ 3,795,873
(f) ADEC: Direct Rate Smoothing	\$ 2,350,959	\$ 3,253,378
Impact of Legislative Changes	N/A	0
Final ADEC	N/A	\$ 3,253,378
SCRSP Minimum Contribution	\$ 20,402,208	\$ 20,052,208

\*The active member count reflects the number of currently active or lapsed members who are expected to accrue additional benefits in the next year.

The table below provides a reconciliation of the actuarially determined employer contribution (ADEC).

**Table 15: Reconciliation of the Change in the ADEC**

Fiscal year ending June 30, 2024 Preliminary ADEC (estimated based on December 31, 2021 Valuation)	3,253,378
Impact of Legislative Changes	<u>0</u>
Fiscal year ending June 30, 2024 Final ADEC	3,253,378
Change Due to Demographic (Gain)/Loss	(696,154)
Change Due to Payoff of Unfunded Liability Base established in June 30, 2011, valuation	(1,057,068)
Change Due to Investment (Gain)/Loss	1,396,777
Change Due to Contributions Greater than ADEC	(726,805)
Impact of Assumption Changes	0
Impact of Direct Rate Smoothing	<u>180,831</u>
Fiscal year ending June 30, 2025 Preliminary ADEC (estimated based on December 31, 2022 Valuation)	2,350,959

## Section 5: Actuarially Determined Employer Contribution (continued)

Amortization methods determine the payment schedule for the unfunded actuarial accrued liability. FRSWPF adopted a 12-year closed amortization period for fiscal year ending 2012. A new amortization base is created each year based on the prior years' experience. The tables below provide the calculation of the new amortization base and the amortization schedule for the current year's valuation.

**Table 16: Calculation of the New Amortization Base**

Calculation as of		12/31/2022	12/31/2021
(a)	Unfunded Actuarial Accrued Liability	\$ (20,360,629)	\$ (12,027,129)
(b)	Prior Years' Outstanding Balances	\$ (21,737,983)	\$ 12,738,297
(c)	New Amortization Base: (a) - (b)	\$ 1,377,354	\$ (24,765,426)
(d)	New Amortization Payment	\$ 179,791	\$ (3,232,723)

**Table 17: Amortization Schedule for Unfunded Actuarial Accrued Liability**

Date Established	Original Balance	12/31/2022 Outstanding Balance	Annual Payment Effective July 1, 2024
June 30, 2010	\$ 51,963,371	\$ 3,339,177	\$ -
June 30, 2011	8,122,313	1,512,827	-
June 30, 2012	3,813,072	1,144,155	494,704
December 31, 2013	(11,374,070)	(5,951,621)	(1,519,055)
December 31, 2014	(4,939,476)	(3,057,297)	(657,787)
December 31, 2015	14,577,214	10,322,387	1,935,502
December 31, 2016	5,571,626	4,405,390	737,095
December 31, 2017	5,881,084	5,101,240	775,156
December 31, 2018	(1,528,072)	(1,437,140)	(201,047)
December 31, 2019	(1,522,520)	(1,533,690)	(199,673)
December 31, 2020	(8,622,566)	(9,208,232)	(1,125,535)
December 31, 2021	(24,765,426)	(26,375,179)	(3,232,723)
December 31, 2022	<u>1,377,354</u>	<u>1,377,354</u>	<u>179,791</u>
Total		\$ (20,360,629)	\$ (2,813,572)

**Commentary:** This is the payment schedule for the unfunded actuarial accrued liability of FRSWPF.

## Section 5: Actuarially Determined Employer Contribution (continued)

The table below provides a history of the actuarially determined employer contribution and the corresponding appropriated rate.

**Table 18: History of Actuarially Determined Employer Contributions and Appropriated Rates**

Valuation Date	Fiscal Year Ending	Preliminary ADEC	Subsequent Changes to ADEC	Final ADEC	Appropriated Rate
12/31/2022	6/30/2025	\$ 2,350,959	N/A	N/A	Not Final
12/31/2021	6/30/2024	3,253,378	-	\$ 3,253,378	\$20,052,208
12/31/2020	6/30/2023	13,086,519	-	13,086,519	19,702,208
12/31/2019	6/30/2022	15,182,523	-	15,182,523	19,352,208
12/31/2018	6/30/2021	14,845,609	-	14,845,609	19,002,208

## Appendix A: Detailed Tabulations of Member Data

**Table A-1: The Number of Active and Lapsed Members Distributed by Age and Service as of December 31, 2022**

Age	Years of Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	
Under 25	515	2,001	265	0	0	0	0	0	0	0	2,781
25 to 29	672	2,602	1,826	249	1	0	0	0	0	0	5,350
30 to 34	741	2,383	1,872	1,385	252	0	0	0	0	0	6,633
35 to 39	561	1,929	1,477	1,196	1,113	172	1	0	0	0	6,449
40 to 44	334	1,551	1,184	900	974	849	108	2	0	0	5,902
45 to 49	256	1,194	939	750	755	956	633	103	0	0	5,586
50 to 54	205	1,027	796	627	649	1,039	819	570	81	1	5,814
55 to 59	131	660	488	418	380	290	140	84	28	2	2,621
60 to 64	60	282	266	234	209	116	16	11	3	2	1,199
65 to 69	28	125	118	102	107	40	5	1	0	1	527
70 & Up	32	110	88	83	61	24	3	4	1	0	406
<b>Total</b>	<b>3,535</b>	<b>13,864</b>	<b>9,319</b>	<b>5,944</b>	<b>4,501</b>	<b>3,486</b>	<b>1,725</b>	<b>775</b>	<b>113</b>	<b>6</b>	<b>43,268</b>

## Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-2: The Number of Active and Lapsed Members Distributed by Age as of December 31, 2022**

Age	Active Members	Lapsed Members
	Number	Number
18	7	
19	110	
20	263	21
21	393	53
22	431	83
23	478	173
24	551	218
25	560	291
26	687	351
27	697	451
28	677	484
29	681	471
30	733	494
31	750	539
32	773	557
33	810	604
34	782	591
35	748	547
36	752	578
37	767	540
38	779	526
39	708	504
40	758	526
41	717	502
42	679	478
43	634	477
44	652	479
45	636	506
46	661	495
47	588	473
48	644	453
49	666	464
50	652	497
51	675	496
52	707	532
53	621	521
54	600	513
55	399	415
56	243	275
57	220	258

## Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-2: The Number of Active and Lapsed Members Distributed by Age as of December 31, 2022 (continued)**

Age	Active Members	Lapsed Members
	Number	Number
58	168	252
59	184	207
60	161	153
61	131	166
62	108	121
63	94	103
64	77	85
65	82	61
66	46	65
67	48	53
68	52	44
69	36	40
70	36	30
71	23	30
72	25	28
73	23	17
74	26	18
75	10	16
76	9	9
77	8	8
78	6	6
79	4	15
80	7	6
81	3	8
82	3	4
83		5
84	2	2
85		6
86		3
87		1
88	1	2
89		1
90		1
91		2
92		1
99	1	
Total	25,263	18,005

## Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-3: The Number of Active and Lapsed Members Distributed by Service as of December 31, 2022**

Service	Active Members	Lapsed Members
	Number	Number
0	886	2,649
1	1,644	2,913
2	1,478	2,200
3	1,325	1,714
4	1,327	1,263
5	1,475	1,023
6	1,192	816
7	1,048	659
8	1,067	556
9	1,029	454
10	1,121	396
11	791	367
12	885	301
13	811	274
14	754	244
15	976	179
16	746	156
17	745	144
18	673	127
19	646	109
20	631	195
21	590	260
22	500	197
23	493	164
24	328	128
25	354	96
26	289	82
27	278	79
28	209	69
29	211	58
30	205	51
31	150	31
32	144	24
33	75	12
34	76	7



# Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-3: The Number of Active and Lapsed Members Distributed by Service as of December 31, 2022 (continued)**

Service	Active Members Number	Lapsed Members Number
35	51	5
36	35	2
37	10	1
38	7	
39	2	
40	2	
41	3	
47	1	
Total	25,263	18,005

## Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-4: The Number and Annual Retirement Allowances of Retired Members Distributed by Age as of December 31, 2022**

Age	Number	Allowances
55	273	\$ 556,920
56	490	999,600
57	487	993,480
58	534	1,089,360
59	599	1,221,960
60	569	1,160,760
61	597	1,217,880
62	618	1,260,720
63	560	1,142,023
64	626	1,277,040
65	530	1,081,200
66	628	1,281,120
67	556	1,134,240
68	632	1,289,280
69	604	1,232,160
70	592	1,207,680
71	555	1,132,200
72	538	1,097,520
73	496	1,011,840
74	448	913,920
75	467	952,680
76	489	997,560
77	331	675,240
78	354	722,160
79	340	693,600
80	352	718,080
81	254	518,160
82	241	491,640
83	215	438,600
84	174	354,960
85	149	303,960
86	129	263,160
87	138	281,520
88	118	240,720
89	89	181,560

## Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-4: The Number and Annual Retirement Allowances of Retired Members Distributed by Age as of December 31, 2022 (continued)**

Age	Number	Allowances
90	68	\$ 138,720
91	44	89,760
92	42	85,680
93	31	63,240
94	18	36,720
95	11	22,440
96	12	24,480
97	8	16,320
98	2	4,080
99	1	2,040
100	2	4,080
101	2	4,080
102	1	2,040
Total <sup>1</sup>	15,014	\$ 30,628,183

<sup>1</sup> Includes one participant whose monthly benefit is not equal to \$170.

## Appendix A: Detailed Tabulations of Member Data (continued)

**Table A-5: The Number and Annual Retirement Allowances of Disabled Members Eligible for Deferred Pensions Distributed by Age of December 31, 2022**

Age	Number	Allowances
34	1	\$ 2,040
37	3	6,120
39	3	6,120
40	3	6,120
42	2	4,080
43	2	4,080
44	3	6,120
45	2	4,080
47	8	16,320
48	5	10,200
49	3	6,120
50	3	6,120
51	8	16,320
52	11	22,440
53	14	28,560
54	8	16,320
55	11	22,440
56	1	2,040
57	1	2,040
58	6	12,240
59	2	4,080
60	2	4,080
61	2	4,080
62	1	2,040
64	1	2,040
69	1	2,040
71	3	6,120
74	1	2,040
Total	111	\$ 226,440

## **Appendix B: Summary of Main Benefit and Contribution Provisions**

All regular and volunteer firefighters of the State of North Carolina whose qualifications are certified by their departments are eligible to be members of the Fund. All rescue squad workers who are members of rescue squads eligible for membership in the North Carolina Association of Rescue Squads, Inc. and meet training requirements are eligible to be members of the Fund. Credit for prior service (that is, service rendered prior to July 1, 1959) is granted to firefighters who were eligible on July 1, 1959 and became members on or before June 30, 1961. Credit may also be given for certain special purchased service.

### **Benefits**

#### **Service Retirement Pension**

##### Condition for Pension

A member who retires after he or she attained age 55 and has credit for 20 years of service as a firefighter or rescue squad worker in North Carolina is entitled to a monthly pension.

##### Amount of Pension

The amount of the pension is equal to \$170 per month.

#### **Deferred Early Retirement Pension**

##### Condition for Pension

A member whose service is terminated after the member has credit for 20 years of service as a firefighter or rescue squad worker in North Carolina but before the member has attained age 55 is eligible to receive a deferred retirement pension, starting at age 55, provided the member continues to make regular contributions until age 55 or until the member has contributed for a total of 20 years, whichever event occurs earlier. Any member who is totally and permanently disabled while in the discharge of official duties and leaves service as a result of such disability is eligible for a deferred retirement pension commencing at age 55 without continuing to make contributions. Any member who becomes totally and permanently disabled for any cause, other than line of duty, after 10 years of credited service under the Pension Fund may continue to make monthly contributions until he or she has paid \$2,400 into the Fund and receive a pension upon attainment of age 55.

##### Amount of Pension

The deferred pension is \$170 per month.

#### **Return of Contributions**

Upon the death (not in the line of duty) or withdrawal of a member prior to retirement, the member's aggregate contributions are refunded in a lump sum.

Upon the death (not in the line of duty) of a retired member, the excess, if any, of his or her aggregate contributions over the total of the pension payments he or she has received is refunded.

#### **Line of Duty Death Benefit**

Upon the death (in the line of duty) of a retired or active member, an amount of \$170 per month is payable to the member's beneficiary, if living, beginning the month following the month the member would have attained age 55, or if the member had already attained age 55, beginning the month following the member's death, payable until the beneficiary's death.

## **Appendix B: Summary of Main Benefit and Contribution Provisions (continued)**

### **Contributions**

#### By Members

Each member contributes \$10 per month until retirement or until the member has contributed for a total of 20 years, whichever event occurs earlier.

#### By State

The State makes annual contributions sufficient, with the members' contributions, to meet the cost of the benefits under the Fund.

### **Changes Since Prior Valuation**

None.

## Appendix C: Actuarial Assumptions and Methods

Assumptions are based on the experience investigation prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021 for use beginning with the December 31, 2020 annual actuarial valuation.

### Interest Rate

6.50% per annum, compounded annually.

### Price Inflation:

2.50% per annum, compounded annually.

### Separations from Active Service

Representative values of the assumed annual rates of withdrawal and vesting, retirement, death, and disability are as follows:

#### Annual Rates of Withdrawal

Age	Service		
	<5	5-19	20+
< 55	0.030	0.015	1.000
55	0.100	0.075	0.000
> 55	0.000	0.000	0.000

#### Annual Rates of Retirement

Age	Service		
	<20	20	21+
55	0.000	0.850	0.850
56-79	0.000	0.750	0.600
80	1.000	1.000	1.000

#### Annual Rates of Base Mortality and Disability

Age	Base Mortality*		Disability
	Male	Female	Male
25	.00037	.00020	.0005
30	.00041	.00027	.0005
35	.00047	.00036	.0008
40	.00059	.00049	.0010
45	.00082	.00067	.0022
50	.00120	.00091	.0024
55	.00175	.00123	.0035
60	.00264	.00168	.0061
65	.00410	.00228	
70	.00766	.00454	
75	.01432	.00903	
79	.02361	.01566	

\* Base mortality rates using Pub-2010 Safety Amount-Weighted mortality table

## Appendix C: Actuarial Assumptions and Methods (continued)

### Return to Service

The assumed rates in which a lapsed member returns to active service are based on the number of years that the member has been lapsed. These rates are as follows:

Number of Years Member has been Lapsed	Percentage of Members Assumed to Return to Active Service	Number of Years Member has been Lapsed	Percentage of Members Assumed to Return to Active Service*
1 Year	42.0%	5 Years	6.0%
2 Years	23.0%	6 Years	4.5%
3 Years	14.0%	7 Years	3.0%
4 Years	10.0%	8 Years	0.0%

\* Members who are assumed to return to service are assumed to do so at the valuation date. Members who are assumed to not return to service (and have not yet attained 20 years of service) are assumed to receive a refund of contribution at age 55.

### Post-Retirement Mortality

Representative values of the assumed post-retirement mortality rates are based on the Pub-2010 Safety Retirees Amount-Weighted mortality table for healthy retirees and the Pub-2010 General Disabled Retirees Amount-Weighted mortality table for disabled retirees, prior to any mortality improvements, are as follows:

Annual Rate of Death after Retirement				
Age	Healthy Retirees		Disabled Retirees	
	Male	Female	Male	Female
55	.00327	.00279	.01818	.01587
60	.00549	.00482	.02280	.01833
65	.00957	.00832	.02677	.02051
70	.01711	.01438	.03353	.02450
75	.03085	.02483	.04344	.03239
80	.05571	.04287	.05921	.04678

### Mortality Assumption

All mortality rates use Pub-2010 amount-weighted tables.

### Mortality Projection

All mortality rates are projected from 2010 using generational improvement with Scale MP-2019.

### Deaths After Retirement (Healthy at Retirement)

Mortality rates are based on the Safety Retirees Mortality table. Rates for all members are multiplied by 97% and Set Forward 1 year. Because the retiree tables have no rates prior to age 45, the Safety Mortality Table for Employees is used for ages less than 45.

### Death After Retirement (Disabled Members at Retirement)

Mortality rates are based on the General Mortality Table for Disabled Retirees. Rates for all members are Set Back 3 years.



## Appendix C: Actuarial Assumptions and Methods (continued)

### Deaths After Retirement (Survivors of Deceased Members)

Mortality rates are based on the Below-Median Teachers Mortality Table for Contingent Survivors. Rates for male members are Set Forward 3 years. Rates for female members are Set Forward 1 year. Because the contingent survivor tables have no rates prior to age 45, the Below- Median Teachers Mortality Table for Employees is used for ages less than 45.

### Deaths Prior to Retirement

Mortality rates are based on the Safety Mortality Table for all Employees.

### Line of Duty Death Assumption

10% of pre-retirement deaths are assumed to be in the line of duty.

### Marriage Assumption

90% of male members married and 50% of female members married with the male spouses three years older than female spouses.

### Missing Gender Code

For members reported on the data without a gender code, we use the prior year's code where available or assign a code based on inspection.

### Timing of Assumptions

All withdrawals, deaths, disabilities, and retirements are assumed to occur July 1 of each year. The timing of retirement changes from mid-year to beginning of year at and after the 100% retirement age.

### Future Expenses

Equal to prior year actual administrative expenses added to Normal Cost.

### Actuarial Cost Method

Entry age normal cost method. Entry age is established on an individual basis.

### Amortization Period

12-year closed, level-dollar amount. The first amortization base was created for the contribution payable for fiscal year ending 2012.

### Asset Valuation Method

Actuarial value, as developed in Table 8. The actuarial value of assets is based upon a smoothed market value method. Under this method, asset returns in excess of or less than the expected return on market value of assets will be reflected in the actuarial value of assets over a five-year period. The Actuarial Value of Assets was reset to the market value of assets as of December 31, 2014. The calculation of the Actuarial Value of Assets is based on the following formula:

$$MV = 80\% \times G/(L)_1 - 60\% \times G/(L)_2 - 40\% \times G/(L)_3 - 20\% \times G/(L)_4$$

MV = the market value of assets as of the valuation date

$G/(L)_i$  = the asset gain or (loss) for the i-th year preceding the valuation date

# Appendix C: Actuarial Assumptions and Methods (continued)

## Changes Since Prior Valuation

The assumptions and methods used for the December 31, 2021 actuarial valuation are based on the experience study prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021. No changes have been made since the prior valuation.

# Appendix D: SCRSP Policy

## Local Governmental Employees' Retirement System Board of Trustees

### State Contribution Rate Stabilization Policy for the Firefighters' and Rescue Squad Workers' Pension Fund

#### Policy Purpose

This policy provides for the continued operation of a State Contribution Rate Stabilization Policy (SCRSP) for the Firefighters' and Rescue Squad Workers' Pension Fund (FRSWPF). The SCRSP was first adopted by the Local Governmental Employees' Retirement System (LGERS) Board of Trustees (Board) on January 26, 2017, as required by Section 5 of S.L. 2016-108. The 2017 version of the SCRSP provided that it would be in effect "until the next experience review and [would] then be reset based on the results of that review." Having adopted the Experience Study of the 2015-2019 calendar years on January 28, 2021, which will be effective for plan funding purposes for fiscal years ending 2023 and later, the Board wishes to institute an SCRSP effective for contributions during the five fiscal years ending 2023 through 2027.

#### Policy Objectives

This policy establishes how the Board will develop an annual appropriation amount to recommend to the General Assembly to fund the FRSWPF, and the conditions under which the Board will consider or recommend benefit improvements for the FRSWPF.

#### Definitions

**Actuarial Measurement:** The result of an analysis by the Board's consulting actuary, presented to the Board in a public report, based on actuarial assumptions and methods adopted by the Board for purposes of funding of the FRSWPF, without regard to any "direct rate smoothing" of changes in the Board's assumptions and methods.

**Benefit Improvement Funding Requirement:** An amount equal to

- (1) the Actuarial Measurement of the full increase in the FRSWPF actuarial accrued liability and normal cost expected from a proposed benefit increase, plus
- (2) the FRSWPF actuarial accrued liability according to the most recently accepted valuation report of the consulting actuary, less
- (3) the FRSWPF actuarial value of assets according to the most recently accepted valuation report of the consulting actuary, plus
- (4) the Underlying ADEC for the upcoming fiscal year, less
- (5) the Policy Contribution Without Benefit Increase for the upcoming fiscal year.

However, the Benefit Improvement Funding Requirement will be no less than \$0, and no greater than the amount in part (1) of the definition prior to adjustment for parts (2) through (5). The intention of parts (2) through (5) is to provide for a possible reduction in the Benefit Improvement Funding Requirement if there is a funding surplus (parts (2) and (3)) or if the Board's appropriation recommendation under this policy will exceed the Underlying ADEC (parts (4) and (5)).

**Policy Contribution Without Benefit Increase:** The State appropriation to be recommended by the Board under this policy, prior to any increase for the cost of benefit improvements that the Board may recommend under this policy.

# Local Governmental Employees' Retirement System Board of Trustees

## State Contribution Rate Stabilization Policy for the Firefighters' and Rescue Squad Workers' Pension Fund (continued)

**Target Member Contribution Rate:** The member contribution rate that would result in the total member contributions being closest to 50% of the Actuarial Measurement of the FRSWPF normal cost for the upcoming fiscal year, subject to the constraint that the monthly member contribution rate should be a multiple of \$5.

**Underlying Actuarially Determined Employer Contribution (Underlying ADEC):** The amount developed annually by the Board's consulting actuary, representing a funding requirement according to the Board's actuarial assumptions and methods before applying this policy.

### Annual Appropriation Recommendation

Changes in the Underlying ADEC from year to year can result in roller-coaster appropriations which are difficult for budget and appropriation planning. In particular, "V"-shaped underlying ADEC patterns create incentives within the appropriations process for programs that compete with FRSWPF over a limited pool of revenue to increase their recurring funding requirements, even though a reduction to the FRSWPF would effectively be nonrecurring due to the "V" shape. To avoid a roller-coaster pattern, this policy provides for continuing the pattern of minimum recommended increases to the annual recommended appropriation. This may result in an appropriation recommendation exceeding the Underlying ADEC.

Accordingly, for each year that this policy is in effect, the Policy Contribution Without Benefit Increase recommended by the Board for an upcoming fiscal year will be the greater of:

- (1) the appropriation that the Board recommended for the current fiscal year plus \$350,000<sup>1</sup>, or
- (2) the Underlying ADEC for the upcoming fiscal year.

In developing Parts (1) and (2) of this definition, this policy provides the following guidance:

- In Part (1), the appropriation that was recommended for the current fiscal year should exclude any portion of the Board's recommendation specifically intended to cover a one-year payment of the costs of a benefit improvement, as described below under "Further Increase to Fund Benefit Improvement."
- In Part (1), the appropriation that was recommended for the current fiscal year should be adjusted (increased) to include the cost of any benefit improvements enacted by the General Assembly, for which the General Assembly did not appropriate funding during the current fiscal year at least equal to the Benefit Improvement Funding Requirement. This increase should be equal to the Benefit Improvement Funding Requirement, reduced for any funding appropriated by the General Assembly during the current fiscal year toward the enacted benefit improvement.
- In Part (1), the appropriation that was recommended for the current fiscal year should be adjusted (either increased or reduced) for the effect of any changes in actuarial assumptions or methods adopted by the Board that were not incorporated in the Board's recommendation for the current fiscal year. The adjustment should be equal to the Actuarial Measurement of the effect on the Underlying ADEC, except that it may include direct rate smoothing to the extent the Board adopted direct rate smoothing of the relevant assumption or method change for FRSWPF funding purposes.

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<sup>1</sup> The amount of \$350,000 was described in the initial SCRSP adopted January 2017 as "designed to mirror the estimated growth rate of the tax on gross property insurance as provided for under G.S. 105-228.5(d)(3)... Currently the tax on premiums is 0.74% of 10% of the gross premiums for automobile physical damage coverage and 0.74% of 100% of the gross premiums for all other property coverage. Three other programs benefiting firefighters and rescue squad workers are paid for directly out of the proceeds of this tax, with the remainder being transferred to the General Fund to partially offset the cost of the FRSWPF."

# Local Governmental Employees' Retirement System Board of Trustees

## State Contribution Rate Stabilization Policy for the Firefighters' and Rescue Squad Workers' Pension Fund (continued)

- In Part (1), the appropriation that was recommended for the current fiscal year should be adjusted (reduced) for the effect of any increase to member contributions (\$10 per month as of April 2021) that was not incorporated in the Board's recommendation for the current fiscal year, but has since been enacted. The reduction should be equal to the Actuarial Measurement of the decrease in the State's share of FRSWPF normal cost that would have been incorporated in the Board's recommendation for the current fiscal year had it been enacted.
- In Part (2), the Underlying ADEC for the upcoming fiscal year should exclude any portion attributable to a one-year payment of costs of a benefit improvement.

Further Increase to Fund Benefit Improvement: The appropriation recommended by the Board for the upcoming fiscal year will be further adjusted if the Board recommends to the General Assembly a benefit improvement as described in Section V of this policy. Such adjustment will be at least equal to the Benefit Improvement Funding Requirement. It may be further increased by an amount to account for any prospective change to the statutory terms for tax on gross property insurance. Under such a recommendation, the full actuarial cost of any benefit improvement would be funded within one year through the upcoming year's appropriation, rather than amortized over multiple years.

The Policy Contribution Without Benefit Increase, added to the Benefit Improvement Funding Requirement associated with any benefit improvement enacted by the General Assembly effective for a fiscal year, will be deemed by the Board to be the annual actuarially determined employer contribution (funding ADEC) for the FRSWPF.

### Recommended Increases to Benefit Formula

As of April 2021, the FRSWPF provides a pension equal to \$170 per month. This section of the policy describes the conditions under which the Board may consider a recommendation of an improvement to the formula for calculating FRSWPF benefits in any year. The intent of the policy is that the satisfaction of all of the conditions described below would not bind the Board to recommend a benefit improvement, but rather, would allow the Board to consider recommending a benefit improvement.

Under this policy, the Board may consider a recommendation to the General Assembly that the benefit amount be improved, provided that all of the following conditions are met:

1. The increase in the benefit amount is not greater than the most recent June-over-June one-year change in the Consumer Price Index for all Urban Consumers (CPI-U), U.S. City Average, all items, not seasonally adjusted, standard reference base, as published by the Bureau of Labor Statistics of the U.S. Department of Labor.
2. The Benefit Improvement Funding Requirement is included in the appropriation recommended by the Board for the upcoming fiscal year.
3. Together with any recommended benefit improvement, the Board recommends to the General Assembly that the member contribution rate (which is \$10 per month as of April 2021) be increased or maintained at an amount at least equal to the Target Member Contribution Rate.
4. If there has been a change to the tax on gross property insurance from the statutory terms effective April 29, 2021, the Board has considered the anticipated effect on the funding of FRSWPF and recommends additional funding if necessary to account for the effect of this change.

# **Local Governmental Employees' Retirement System Board of Trustees**

## **State Contribution Rate Stabilization Policy for the Firefighters' and Rescue Squad Workers' Pension Fund (continued)**

### **Policy Effective Date**

This policy will be effective through the fiscal year ending June 30, 2027. The Board may vote to extend it for any period of time.