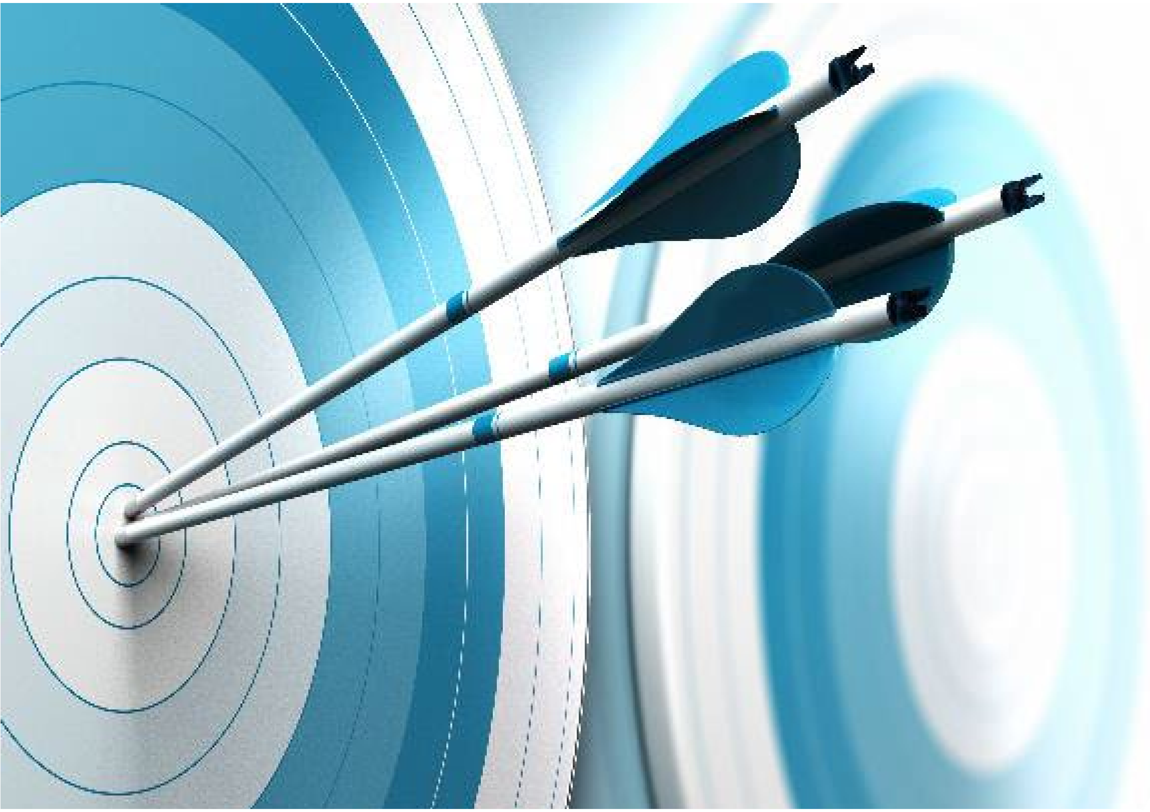

# Wisconsin Retirement System

43rd Annual Actuarial Valuation as of December 31, 2023 and Gain/Loss Analysis

June 2024

# Funding Objectives

1

Intergenerational equity with respect to plan costs

2

Stable or increasing ratio of assets to liabilities

3

Stable pattern of contribution rates

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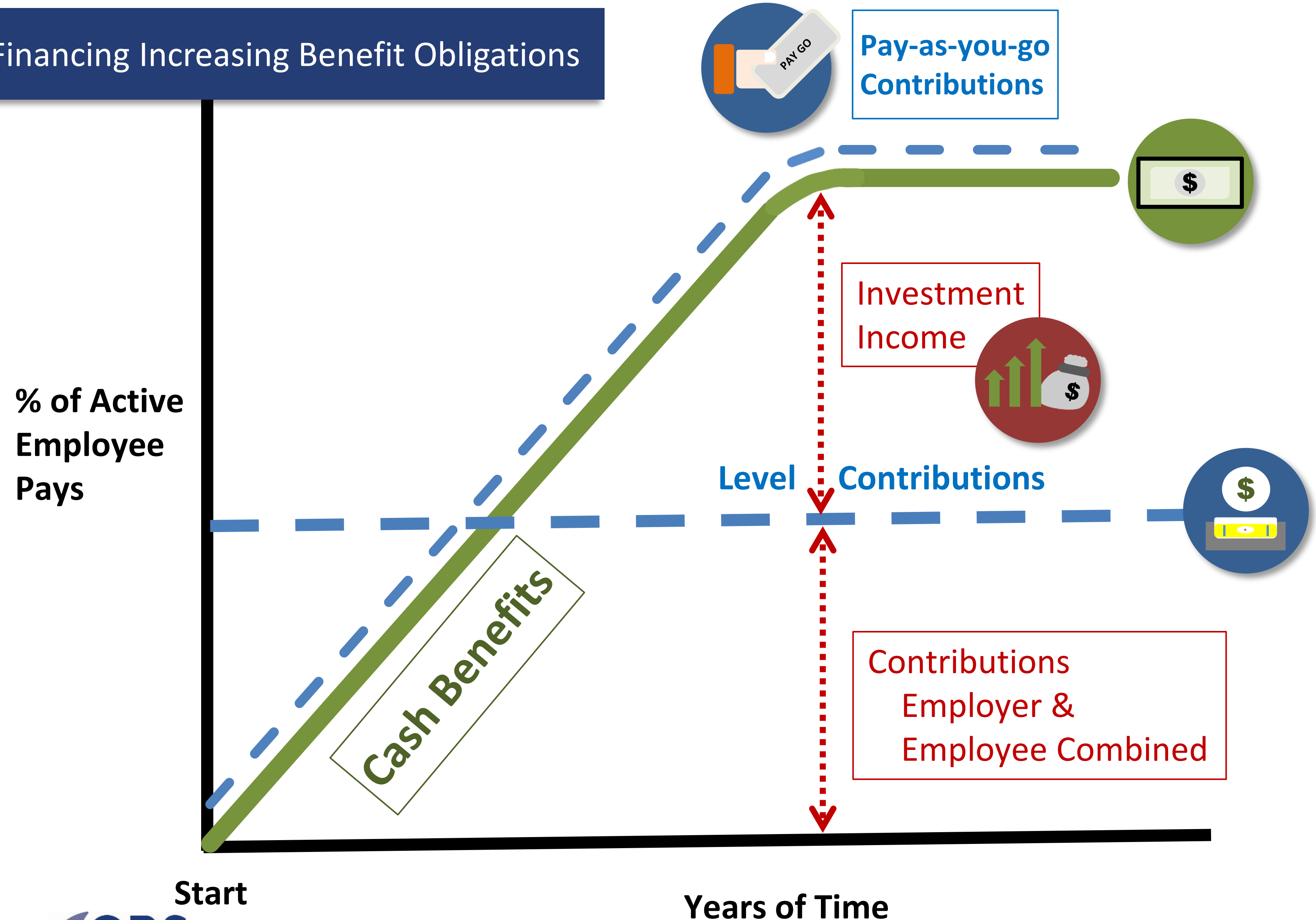
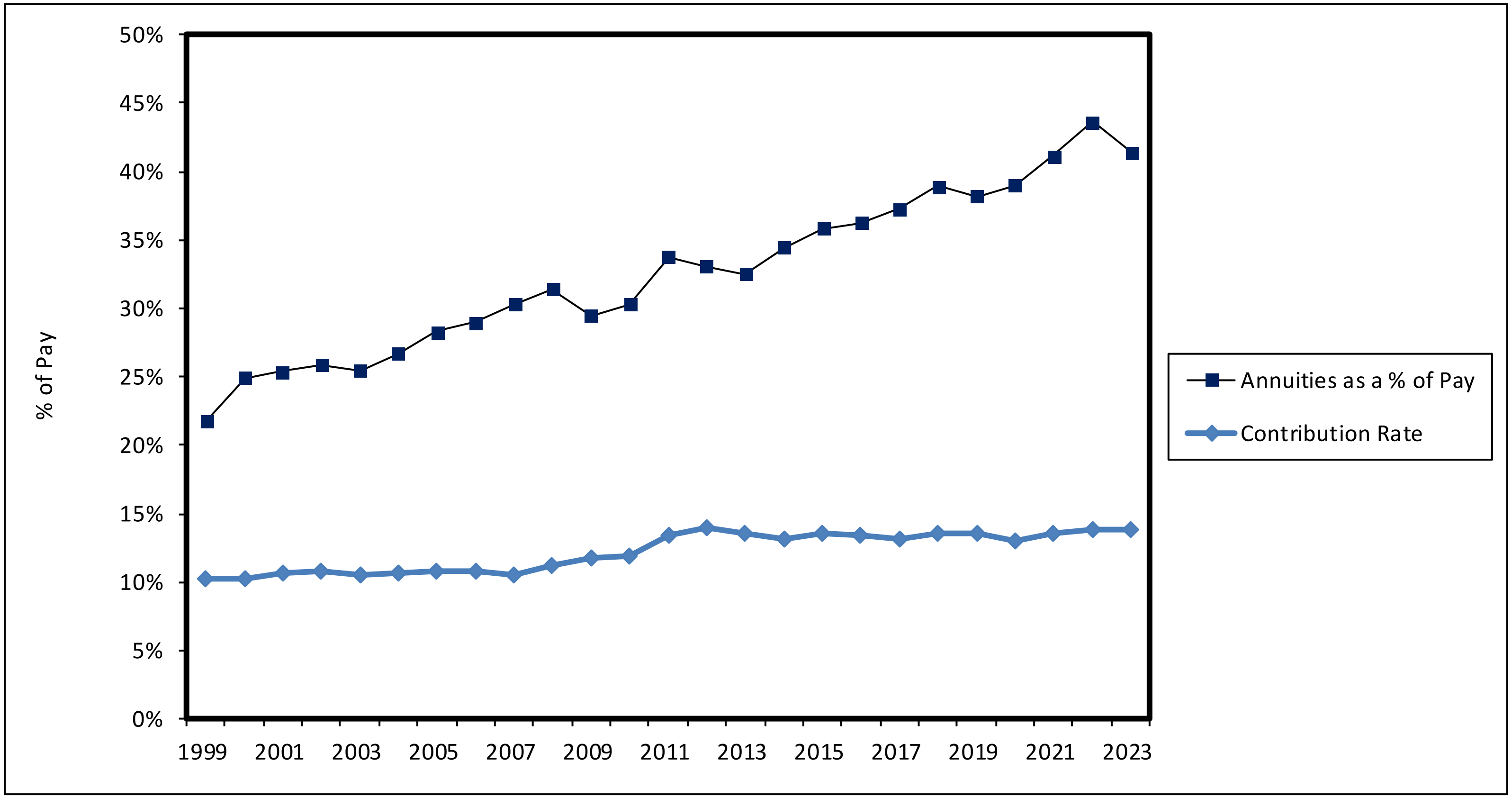
# Financing Increasing Benefit Obligations



# Annuities as a % of Payroll and WRS Average Total Contribution Rate*




Annuities are expected to continue to increase as a percent of payroll for several more decades.

**Average total rate shown is for General Participants.*

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# Actuarial Valuation Process

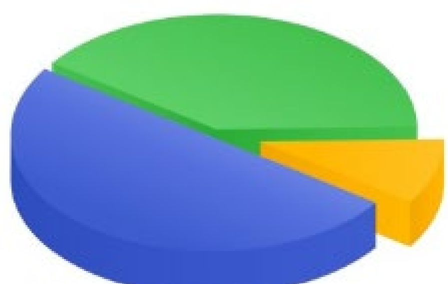
**Member Data**

**Financial Data**


**Actuarial Valuation**

**Plan Provisions**


**Actuarial Cost Method**



**Actuarial Assumptions**

# Active Participants at December 31, 2023

| Valuation Group | Number | Annual Earnings ($ Millions) | Group Averages | | | |
|---|---|---|---|---|---|---|
| | | | Earnings | Age | Years of Service | Contribs. |
| General | 240,319 | $15,075.2 | $62,730 | 44.7 | 10.6 | $70,421 |
| Executive Group & Elected Officials | 1,208 | 125.1 | 103,550 | 54.3 | 14.4 | 140,421 |
| Protective Occupation with Social Security | 19,338 | 1,670.0 | 86,358 | 39.3 | 11.5 | 84,092 |
| Protective Occupation without Social Security | 2,872 | 265.9 | 92,586 | 39.4 | 12.5 | 98,521 |
| **Total Active Participants** | **263,737** | **$17,136.2** | **$64,974** | **44.2** | **10.7** | **$72,050** |
| Prior Year | 259,592 | $16,025.9 | $61,735 | 44.4 | 10.9 | $69,712 |

# All Participants at December 31, 2023

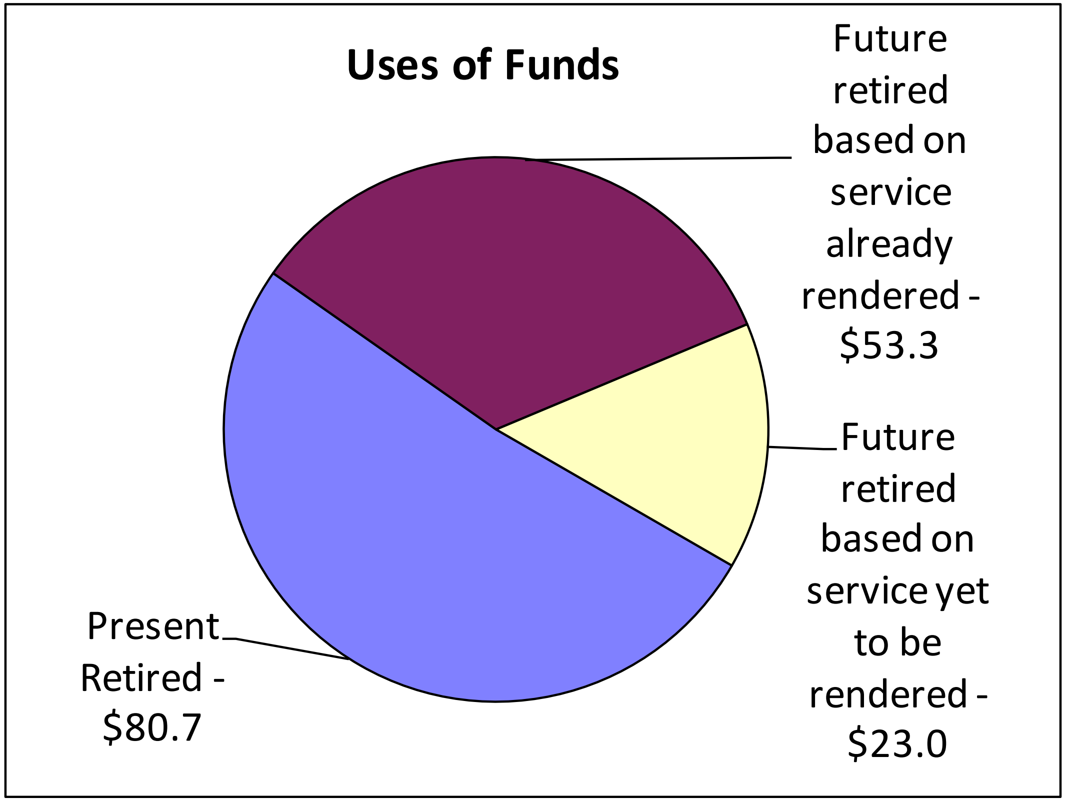
Active Lives
Valuation

| Valuation Group | Number | Average Annual Earnings/Benefits[1] |
|---|---|---|
| Actives | 263,737 | $64,974 |
| Inactives | 186,977 | $22,026 |
| Retirees & Beneficiaries | 238,111 | $29,805 |
| **Total Participants** | **688,825** | |

Retired Lives
Valuation

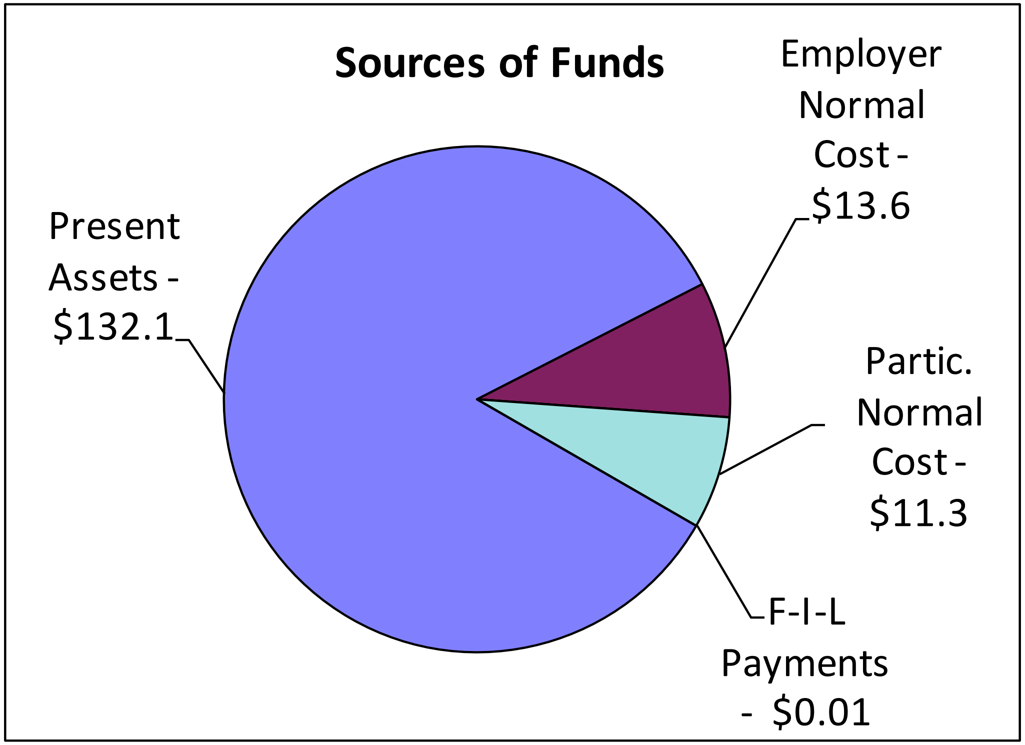
[1] *For inactives, average money purchase balance.*

# $157.0 Billion* of Benefit Promises to Present Active and Retired Members

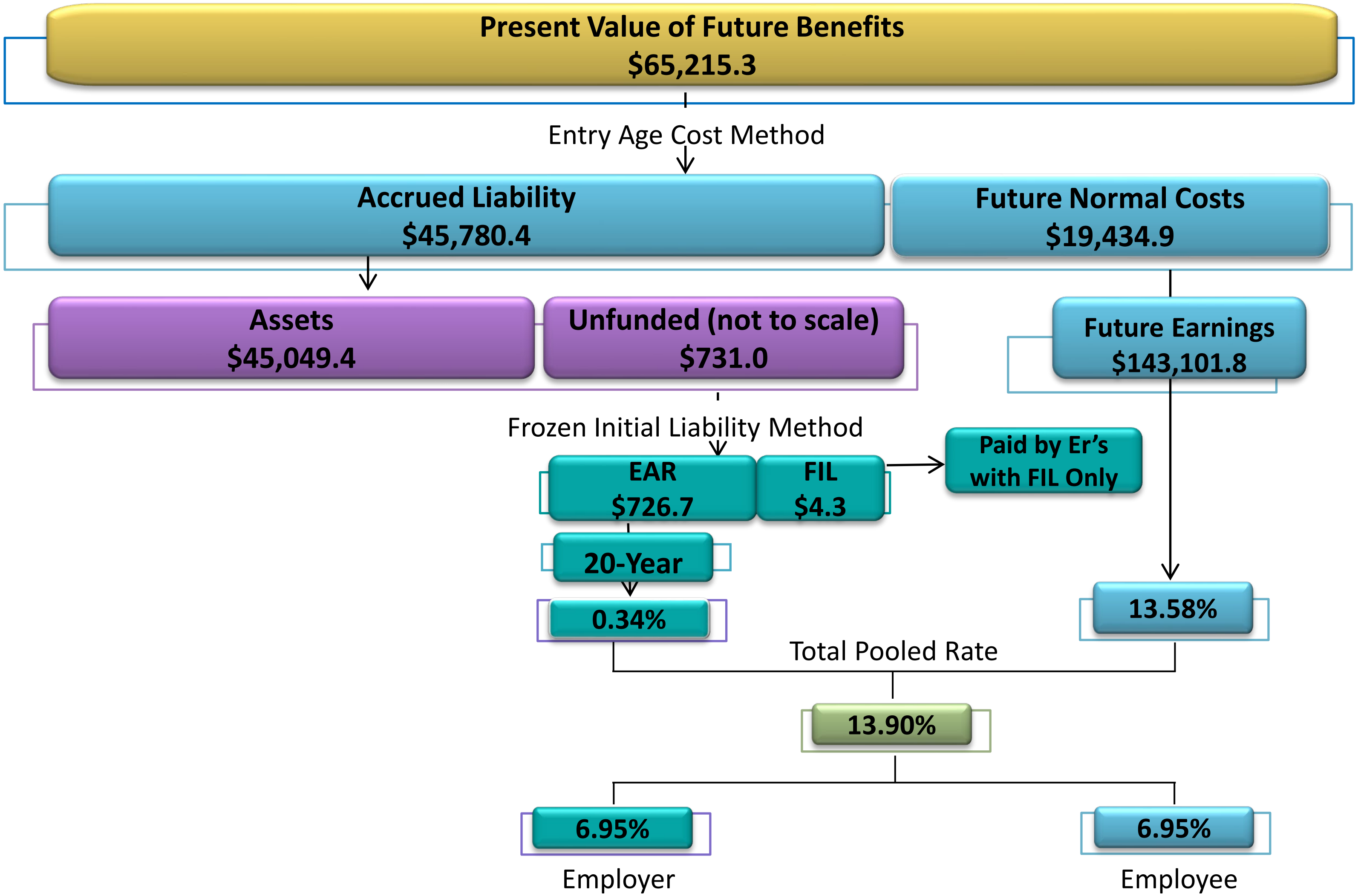



* *Present value of future benefits; all divisions combined.*

# Sources of Funds for Financing $157.0 Billion of Benefit Promises



## Actuarial Valuation Process
## Illustration for General/Elected Group ($ Millions)



# Summary of December 31, 2023 Valuation Results

| | General, Executive & Elected Officials | | Protective Occupation With Soc. Sec. | | Protective Occupation Without Soc. Sec. | | Average |
|---|---|---|---|---|---|---|---|
| | 2025 | 2024 | 2025 | 2024 | 2025 | 2024 | 2025 |
| Employer Normal Cost | 6.95% | 6.90% | 14.95% | 14.30% | 18.95% | 19.10% | 7.90% |
| Participant Normal Cost | 6.95% | 6.90% | 6.95% | 6.90% | 6.95% | 6.90% | 6.95% |
| **Total Normal Cost** | **13.9%** | **13.8%** | **21.9%** | **21.2%** | **25.9%** | **26.0%** | **14.9%** |
| **Estimated Total NC ($ millions)*** | **$2,241.5** | **$2,089.0** | **$388.0** | **$337.7** | **$73.1** | **$70.5** | |

** Based on payroll projected from valuation date to fiscal year using the payroll growth assumption.*

# Comparative Statement of Total Average Contribution Rates

| Valuation 12/31 | General | Executive & Elected | Protective with Soc. Sec. | Protective without Soc. Sec. |
|---|---|---|---|---|
| 2003 | 10.50% | 11.20% | 13.00% | 14.60% |
| 2008 | 11.15% | 11.95% | 14.14% | 15.46% |
| 2013 | 13.60% | 15.40% | 16.30% | 20.20% |
| 2018 | 13.54% | 13.54% | 18.41% | 23.02% |
| 2019 | 13.53% | 13.53% | 18.51% | 23.11% |
| 2020 | 13.00% | 13.00% | 18.52% | 23.86% |
| 2021 | 13.60% | 13.60% | 20.03% | 24.90% |
| 2022 | 13.81% | 13.81% | 21.20% | 26.00% |
| 2023 | 13.90% | 13.90% | 21.90% | 25.90% |

Executive and Elected employee and employer rates for CY 2016 and beyond are made in accordance with the combined General/Executive & Elected results.

Pages B-5 & B-6

# Protective Contribution Rate Levels

- Higher contribution rates compared to General Employees
  - Higher Benefit Multipliers
    - Protective = 2% or 2.5% (with or without Soc. Security)
    - General & Executive/Elected = 1.6%
  - Earlier Normal Retirement Eligibility
    - Protective at Age 54 or Age 53 with 25 years of service
    - General & Executive/Elected at Age 65/62 or Age 57 with 30 years of service

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# Protective Contribution Rate Levels

- More volatile contribution rates compared to General Employees
  - Asset/Payroll ratios[1]
    - Protective = 301% - 409% (with or without Soc. Security)
    - General & Executive/Elected = 296%
  - Liability/Payroll ratios[2]
    - Protective = 362% - 454% (with or without Soc. Security)
    - General & Executive/Elected = 301%

*[1] Line 8 divided by line 2 from page B-2 in the active lives valuation*

*[2] Line 7 divided by line 2 from page B-2 in the active lives valuation*

# Reasons for Contribution Changes

| | General, Executive & Elected | Protective with Soc. Sec. | Protective without Soc. Sec. |
|---|---|---|---|
| 2024 Normal Cost Rate | 13.80% | 21.20% | 26.00% |
| Effect of Benefit Change | 0.00% | 0.00% | 0.00% |
| Effect of Assumption Change | 0.00% | 0.00% | 0.00% |
| Effect of Asset Performance | (0.20)% | (0.41)% | (0.65)% |
| Effect of Salary Experience | 0.25% | 1.01% | 0.37% |
| Effect of Money Purchase Benefit | 0.04% | 0.02% | 0.00% |
| Demographic and Other Experience | 0.01% | 0.08% | 0.18% |
| 2025 Normal Cost Rate | 13.90% | 21.90% | 25.90% |

**Generally zero when not an experience study year**

The effect of Asset Performance is different for each group because the ratio of assets to payroll is different for each group.

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# Impact of Asset Gains/Losses


- Asset gains and losses above or below the assumed rate of return are smoothed in over the current year and four future years
- Four years after a valuation date, all asset gains or losses known at valuation date are fully recognized
- Statutory smoothing method in WRS is referred to as the Market Recognition Account (MRA)

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# Operation of Market Recognition Account (MRA) - $ Millions

| | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|
| Actual Investment Return | $ 12,721 | | | | |
| Assumed Investment Return | 8,082 | | | | |
| Gain/(Loss) to be phased-in | 4,639 | | | | |
| | | | | | |
| Phased-in recognition | | | | | |
| • Current year | $ 928 | ? | ? | ? | ? |
| • First prior year | (5,068) | $ 928 | ? | ? | ? |
| • Second prior year | 2,495 | (5,068) | $ 928 | ? | ? |
| • Third prior year | 1,773 | 2,495 | (5,068) | $ 928 | ? |
| • Fourth prior year | 2,204 | 1,773 | 2,495 | (5,068) | $ 928 |
| Total recognized gain (loss) | $ 2,332 | $ 128 | $ (1,645) | $(4,140) | $ 928 |

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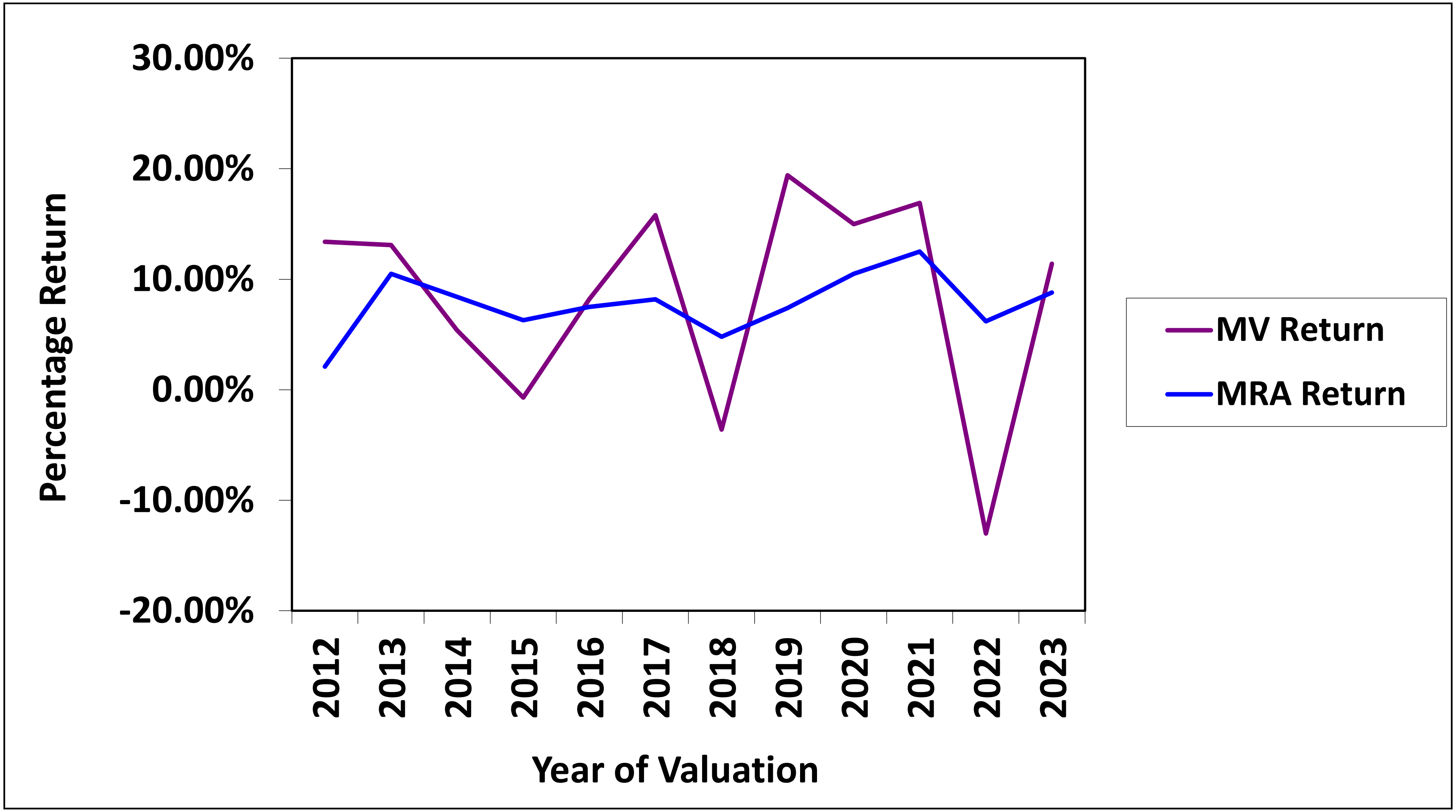
# Reconciliation of Market Recognition Account (MRA)

| | $ Millions |
|---|---|
| MRA at Beginning of Year | $121,173.3 |
| Non-Investment Cash Flow | (4,645.8) |
| Assumed Return (at 6.8%) | 8,081.8 |
| Phase-in of Gains/(Losses) | 2,331.8 |
| MRA at End of Year | $126,941.1 |
| MRA Rate of Return | 8.80% |
| Market Value Rate of Return | 11.40% |

Assets in MRA include non WRS programs such as Sick Leave, Duty Disability, etc.

Market value rate of return shown as calculated by GRS and may differ from returns calculated by SWIB and/or ETF.

# Market Value Return vs. Market Recognition (Actuarial) Return



# WRS Funded Status


| | Frozen Initial | Entry Age |
|---|---|---|
| 2019 | 100.0% | 98.6% |
| 2020 | 100.0% | 99.1% |
| 2021 | 100.0% | 99.3% |
| 2022 | 100.0% | 98.8% |
| 2023 | 100.0% | 98.6% |

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# Concluding Remarks

- There are $4.7 billion of unrecognized losses in the MRA
- Due to the cost sharing nature of WRS, asset gains/losses have been traditionally shared by:

| Employees | Employers | Retirees |
|---|---|---|
| ↑↓ Money Purchase Benefits | ↓↑ Contributions | ↑↓ Dividends |
| ↓↑ Contributions | | |

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# Gain/Loss Analysis

# 2023 Gain/Loss Analysis


A Gain/Loss Analysis measures differences between actual and assumed experience in each Risk Area.

# WRS Assumption Risk Areas

| Primary Risks | |
|---|---|
| **Demographic** | **Economic** |
| Normal retirement | Salary increases |
| Early retirement | Investment return |
| Death-in-service | |
| Disability | |
| Other separations | |

# Why Have a Gain/Loss Analysis?

1. To gain an understanding of reasons for contribution rate changes
2. It is a year-by-year measure of the operation of assumptions
3. To determine when assumption changes are needed
4. To understand the nature of risk

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# The Nature of Defined Benefit Plan Risk

| Investment Risk | Asset/Liability Mismatch | Contribution Risk |
| --- | --- | --- |
| • The risk that actual returns will differ from assumed returns. | • The potential that changes in assets are not offset by changes in liabilities. Because of the way assets are invested in most public plans, this is almost synonymous with investment risk. | • The risk that actual contributions will differ from expected contributions. This could occur, for example, if the plan's funding policy is not followed, or if there are changes in the covered population. |

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# Retirement Sustainability Equation - Asset/Liability Mismatch

$$C + I = B + E$$

**B** depends on

- Plan Provisions – at retirement, member receives x% of Final Average Pay times years of service
- Participant Experience – tenure, pay increases, etc.

**Most Systems do not have asset changes offset by liability changes**

# Retirement Sustainability Equation
# - Smaller Asset/Liability Mismatch in WRS

$$C + I = B + E$$

**B** depends on plan provisions, which incorporates **I** Experience

- Money Purchase DC benefit (changes with I results)
- Annual post-retirement adjustments to the monthly annuity benefit are based solely on investment returns
  - Dividends can increase or decrease

# The Nature of Defined Benefit Plan Risk

| Salary and Payroll Risk | Longevity Risk | Other Demographic Risks |
| --- | --- | --- |
| • Individual pays and/or total covered payroll may not grow at the assumed rate. If covered payroll grows more slowly than assumed, or shrinks, actual contributions may fall short of expected contributions. | • Members may live for more or fewer years than expected, affecting the amount of pension income they will receive from the plan. | • Members may terminate, retire, or become disabled at rates other than expected, affecting both contribution rates and funded status. |

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# Population Development During 2023

| | | Actual | Expected |
|---|---|---|---|
| **Beginning Census** | | 259,592 | |
| (-) | Normal Retirement | 4,067 | 4,767 |
| (-) | Early Retirement | 3,291 | 3,958 |
| (-) | Death | 127 | 272 |
| (-) | Disability Retirement | | |
| | - Total Approved | 203 | 150 |
| | - Less Pending | 66 | |
| | - Net New | 137 | |
| (-) | Other Separations | 16,842 | 14,383 |
| (-) | Transfers Out | 3,363 | |
| (+) | Transfers In | 3,363 | |
| (+) | New Entrants | 28,609 | |
| **Ending Census** | | 263,737 | |

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# Population Development During 2023

| | |
|---|---|
| Normal Retirements | Varied by group and gender. Overall, lower than expected, but net result on liabilities is a small loss. |
| Early Retirements | Lower than expected, overall producing a small loss. |
| Deaths | Among active participants were lower than expected. The net result for the past year was a small loss. |
| Disabilities | Slightly higher than expected, producing a small gain. |
| Other Separations | Varied by group, gender and service. Overall, higher than expected. The net result was a small loss. |

# Comparative Schedule of Experience Gains/Losses by Decrement

**Divisions Combined (Millions)**

| | 2022 | 2023 |
|---|---|---|
| Normal Retirement | $ (36.4) | $ (14.7) |
| Early Retirement | (24.2) | (10.8) |
| Disability Retirement | 2.0 | 4.6 |
| Death with Benefit | (2.0) | (1.7) |
| Other Separations | 37.5 | (20.9) |
| Total | $ (23.1) | $ (43.5) |
| As % of Liabilities | -0.05% | -0.09% |

# Components of Total Gain/(Loss)

| | Gain/(Loss) in Millions | |
|---|---|---|
| | 2022 | 2023 |
| Economic Risk Areas | $(489) | $(320) |
| Decrement Risk Areas | (23) | (44) |
| Other Activity | (76) | (95) |
| Total Gain/(Loss) | $(588) | $(459) |

# Investment Earnings in 2023 (Active Participants)

| | $ Millions |
|---|---|
| A. Average balance on Participant and Employer Accumulation Reserves | $47,422 |
| B. Expected earnings: 6.8% | 3,225 |
| C. Earnings credited to Participant and Employer Accumulation Reserves | 4,649 |
| D. Gain (loss) from earnings: C - B | $ 1,424 |

# Investment Earnings in 2023 (Active Participants)

- $1,424 million is the total recognized asset gain for the year for active participants
- However, part of the total gain/loss is allocated to Variable Excess accounts
- Some of the gain/loss flows through to members via the operation of Money Purchase minimum benefits
- Must net these out to determine remaining core fund gain or loss
- Remaining portion affects contribution rates

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# Investment Earnings in 2023 (Active Participants)

| | $ Millions |
|---|---|
| Gross Gain/(Loss) for the Year (for Actives) | $1,424 |
| Less Estimated Gain/(Loss) due to Money Purchase | 387 |
| Less Estimated Gain/(Loss) due to Variable Excess | 453 |
| Net Core Fund Asset Gain/(Loss) | $584 |

# Salary Related Gain/Loss

- Pay increases were overall higher than expected, resulting in a loss


| | Gain/Loss $ Millions | % of Group Liabilities |
|---|---|---|
| General, Executive & Elected | $(567.2) | (1.3)% |
| Protective w/Soc. Sec. | (326.0) | (6.5)% |
| Protective w/o Soc. Sec. | (10.8) | (1.0)% |
| | $(904.0) | (1.8)% |

# Concluding Remarks

1. Recognition of remaining prior asset gains and losses are expected over the next few years

2. This Gain/Loss Analysis is the third in a regular 3-year experience cycle

3. This study, together with the 2021 and 2022 results, will form the basis for the next experience study to be performed after the December 31, 2023 valuation cycle

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# Current Events

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# Actuarial Standards “ASOPs” Generally

1

Actuarial Standards Board (ASB) develops standards for work in various actuarial practice areas (Life, Health, Pension, etc.)

2

Our work for the Wisconsin Retirement System (WRS) must follow actuarial standards

# Main Pension ASOPS

- ASOP 4: Measuring Pension Obligations
- ASOP 27: Selection of Economic Assumptions
- ASOP 35: Selection of Demographic and other non-economic Assumptions
- ASOP 44: Selection and use of Asset Valuation Methods
- ASOP 51 Assessment and disclosure of Risk

Today's discussion focuses on ASOP 4

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# Summary of Notable Changes to ASOP 4

**Point 1**

Actuaries now must calculate and disclose a reasonable Actuarially Determined Contribution (ADC)

**Point 2**

Actuaries must disclose a Low-Default-Risk Obligation Measure (LDROM) in funding valuations

**Revised standard effective for WRS' 12/31/2023 valuations**

# Summary of Notable Changes to ASOP 4

## Reasonable ADC

- Generally, plans which already develop an ADC following prior ASOP guidance are expected to meet the new reasonable ADC standard
- Plans which do not currently develop an ADC (some fixed rate plans, and some plans using statutory assumptions or methods) will be required to calculate a reasonable ADC

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# ASOP 4 – LDROM

Most Attention Getting  Addition to ASOP 4


- Actuaries must calculate and disclose a liability using a discount rate or rates derived from:
  - Low-default-risk fixed income securities
  - Whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future

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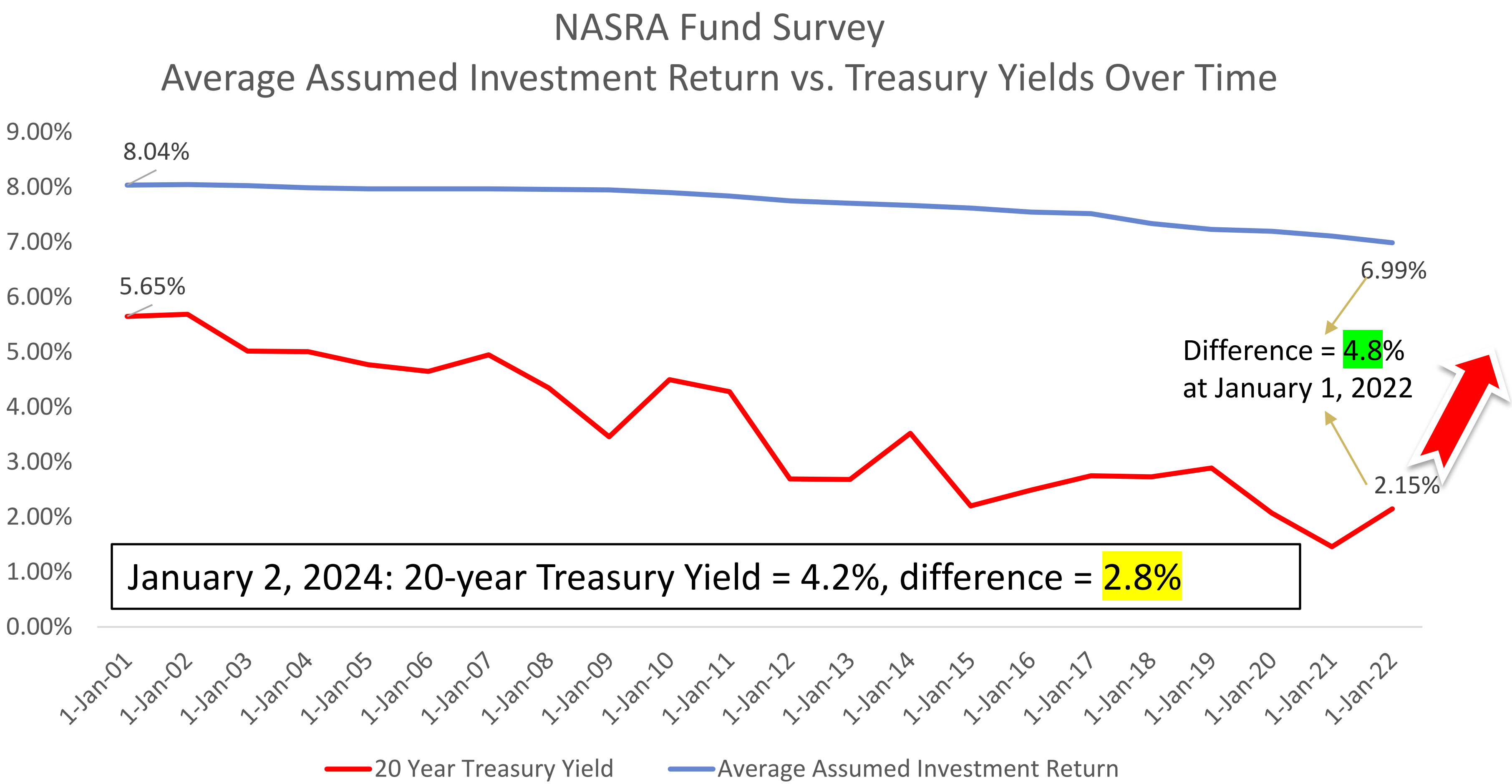
# Assumed Investment Returns vs. Risk-Free Yields

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# Understanding LDROM

## Calculation and Disclosure

LDROM discount rate examples:
• US Treasury Yields • Rates implicit in the settlement of pension obligations • Yields on corporate, or tax-exempt general obligations bonds • Non-stabilized ERISA funding rates • Multiemployer current liability rates

Other than discount rate – same assumptions as for funding the Retirement System

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# Understanding LDROM

## Calculation and Disclosure

- LDROM calculated and disclosed as of the measurement date
  - Not to be calculated and disclosed more than once per year
- Performed using an immediate-gain actuarial cost method:
  - • Entry-age normal • Projected Unit Credit • Unit Credit (Traditional)

# WRS AAL vs. LDROM as of December 31, 2023

Actuarial Accrued Liability vs. LDROM*

$133,994.4 Million | $149,400.2 Million

- AAL relates to funded ratio and contributions
- E[Future dividends] = 1.7%

- A market-based measure of pension obligation
- E[Future dividends] = 0%

** LDROM based on Entry Age Normal and Dec. 2023 Treasury Yield Curve Spot Rates (end of month)*

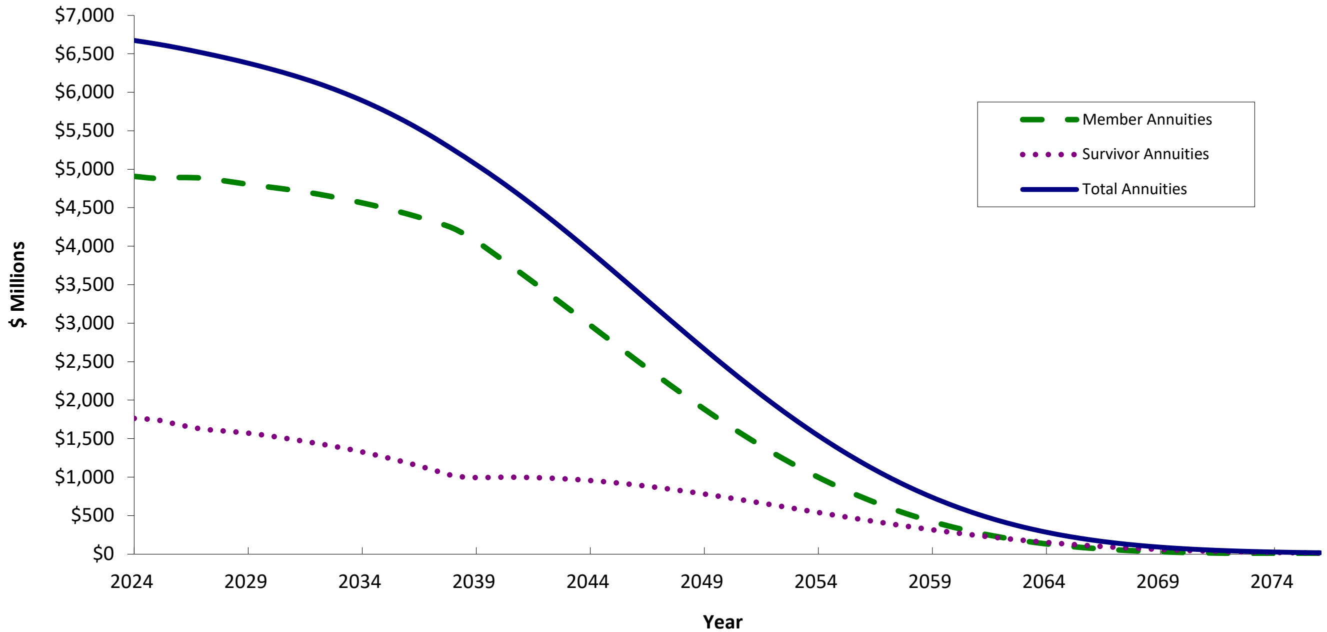
– 1-, 5-, 10-, 30-year rates = 4.96%, 4.06%, 3.94%, 4.15%

All Below 5% dividend threshold

# LDROM Summary


- Additional Liability measure based on a Low default risk investment program
- Will NOT impact contributions, funded ratio
- Intended to help stakeholders better understand the funded status of the plan and the risks involved

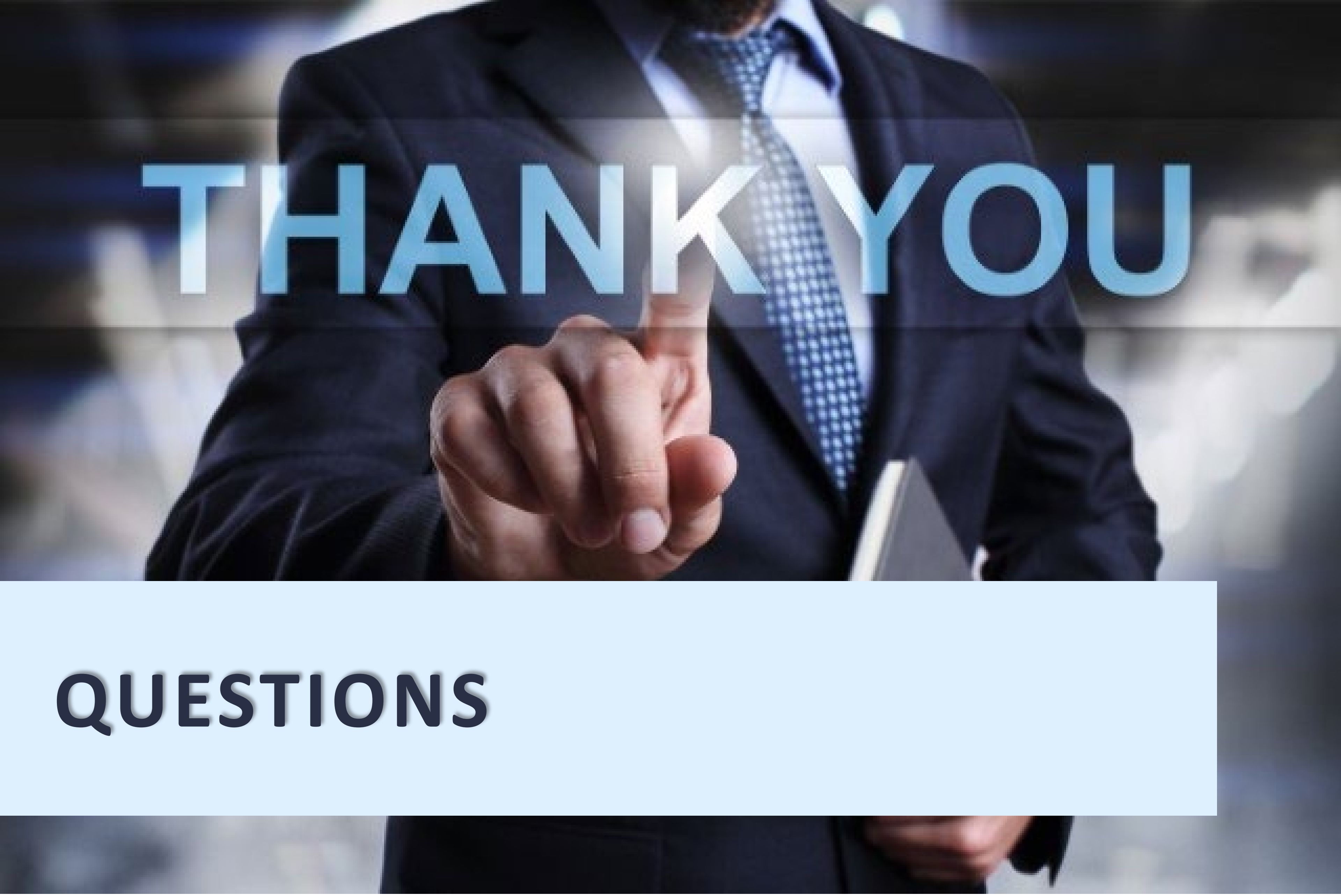
# WRS Has Been Disclosing Similar Risk Measures for Years (Total Future Benefits = PV @ 0%)




| $ Billions | With Expected Dividends | Without Expected Dividends |
|---|---|---|
| Total Future Benefit Payments | $153.0 | $121.7 |
| Present Assets | 75.6 | 75.6 |
| Future Investment Return Needed | 77.4 | 46.1 |

Based upon the assumptions used in the valuation, future dividends are expected to be approximately 1.7% per year. Of course actual dividends will be based upon actual future investment return and the operation of the Market Recognition Account.

**(Retired Lives Report-13)**




# QUESTIONS

# Disclaimers

- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- Jim Anderson, Mark Buis and Richard C. Koch Jr. are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.
- This is one of multiple documents comprising the actuarial report. Additional information regarding actuarial assumptions and methods, and important additional disclosures are provided in the full report entitled “Forty-Third Annual Actuarial Valuation and Gain/Loss Analysis.”
- If you need additional information to make an informed decision about the contents of this presentation or the contents of the full report, or if anything appears to be missing or incomplete, please contact us before making use of the information.