Educational Intro and Actuarial Valuation as of July 1, 2024

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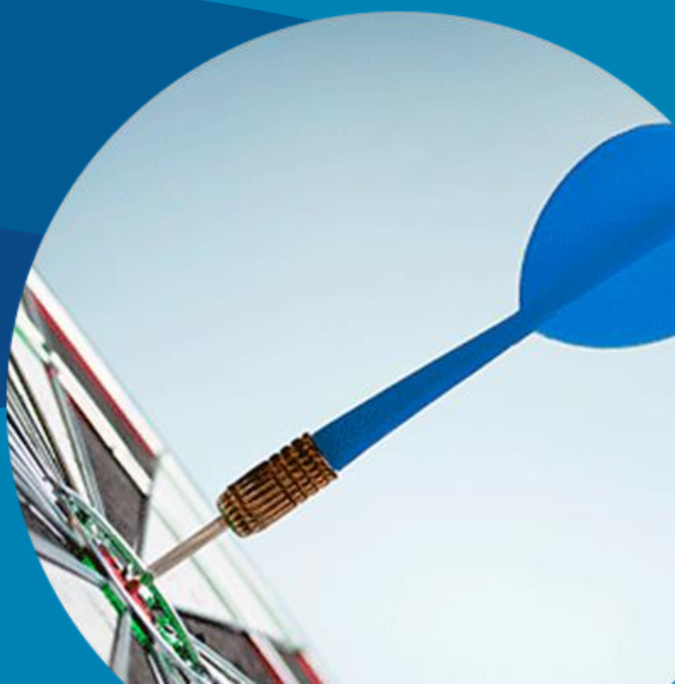

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Today

- Educational Intro: Experience Study Process and Key Actuarial Concepts and Terms
- FY 2024 Experience and Key July 1, 2024 Results
- Looking Forward – Plan Outlook

EDUCATIONAL INTRO: EXPERIENCE STUDY PROCESS

Purpose of Experience Study

- Assumptions should occasionally change to reflect
  - New information and changing knowledge
  - Changing patterns of retirements, terminations, mortality, etc.
- Experience study is a regularly scheduled review of the assumptions and methods
  - Generally recommend every 3-5 years
  - Five years since last study
- General process for setting assumptions and methods
  - Actuary makes recommendations
  - Board considers actuary's recommendation and makes the final decision for the system

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Inside the Actuarial Valuation: Projecting the Liability for Each Member

What is the probability the member reaches retirement? (Termination assumption)

When will the member retire? (Retirement assumption)

How much will the benefit be? (Salary increase assumption)

How long will the benefit be paid? (Mortality assumption)

Hired at age 30

Retire with annual benefit

Receive benefit for remaining lifetime

What investment earnings will be available to help pay the benefits?

What overall payroll will be available to provide contributions?

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How assumptions factor in…

- Over time, the true <u>cost</u> of benefits will be borne out in actual experience
  - Ultimate benefits paid are NOT affected by actuarial assumptions or methods
  - Determined by <u>actual</u> participant behavior (termination, retirement), plan provisions, and <u>actual</u> investment returns
- Assumptions help us develop a reasonable starting point for decision making today

Selection of Assumptions

What Are They?

Economic

- Investment Return
- Payroll Growth Rate
- Promotional/Step Pay Increases
- Population Growth Rate (Usually, a constant population size is assumed)

Demographic

- Retirement Rates
- Disability
- Turnover
- Mortality

Who Selects Them?

Economic

- Board
- Other Advisors

Demographic

- Board (usually based on experience study)

Experience Study Process

- Compare actual experience to current actuarial assumptions and recommend changes to assumptions if necessary to better align with future expectations
- Reviewed past experience over a given timeframe
  - Identified how many members retired, terminated, became disabled, or died, including their age/service
  - Identified salary increases received by active members
  - Greater emphasis on forward-looking expectations for economic assumptions

Experience Study Timing

- It's already begun!
  - Currently working on analyzing your plan experience over last five years
- GRS will present additional education and results at winter/spring meetings
- Could do in one long session or break into education and results
- Adopt assumptions in time for use in July 1, 2025 valuation

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EDUCATIONAL INTRO (CONT'D): KEY ACTUARIAL CONCEPTS AND TERMS

Who Invited the Actuary?

- SUCCESS is always having money on hand to pay every benefit promised
  - No assumptions, no projections…just the facts
- The LIMITATION is that there is heavy competition for limited resources and a goal of equity across generations of stakeholders
- The CHALLENGE is that we will not know if we were successful until the last benefit is paid, which actually will never happen
  - There are always new members being added, members aging through the career and retiring, etc.
  - So, you always find yourself in the middle of the race
  - How do we know we are on the right track?
- ACTUARIES:
  - Determine/access the appropriate amount and pattern of contribution
  - Help stakeholders monitor the fund’s progress towards success
  - Provide advice on how to improve sustainability

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What is a Secure Retirement?

- Secure:
  - *not subject to threat; certain to remain or continue safe and unharmed*
  - <u>*feeling safe, stable, and free from fear or anxiety*</u>

Who is the Audience?

- Members
- Decision makers
  - Board, Legislature
- Outside advanced users
  - Other actuaries, bond raters, financial economists, etc.

Basic Retirement Funding Equation

C + I = B + E

Contributions	Investment Income	Benefits	Expenses
• Funding Policy	• Investment Strategy	• Plan Design	• Administrative Policy

"Money In = Money Out"

Defined Benefit Plan

- NDTFFR is a Defined Benefit Plan
  - The retirement benefit is based on a pre-determined formula: thus "defined"

- Based on C+I=B+E, if the B is "defined" and the I is uncertain, then the C has to also be uncertain
  - Future contributions will depend on whether assumptions are met

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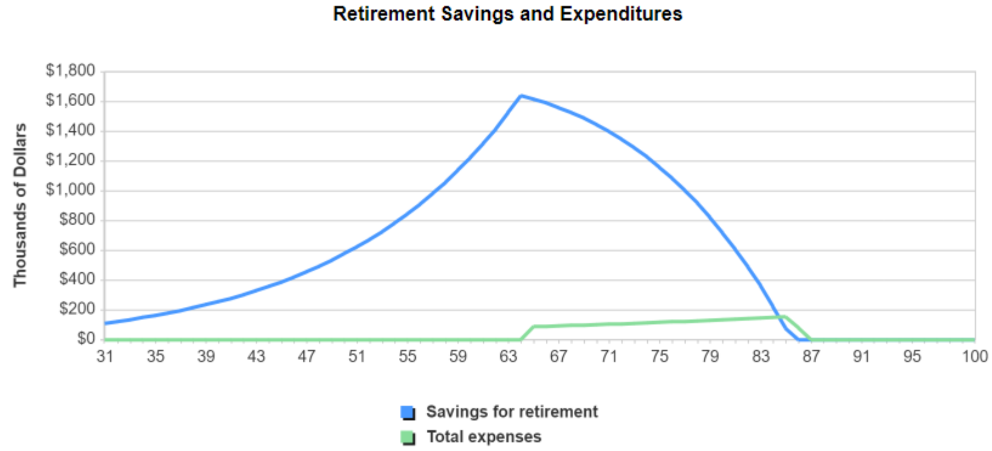
Accrued Liabilities

- Consider a simple retirement planning calculator for an individual
- The blue line represents the target asset level at each age

- For NDTFFR, the annual valuation determines what that optimal, target value of assets is for every member in the pension plan
- The Actuarial Accrued Liability is the total of all those individual target asset levels, and thus becomes the target level of assets for the Plan as a whole

Retirement savings runs out at age 86. This assumes annual retirement expenses of $88,230 which is 90% of your last year's income of $98,034.



Normal Cost

- An optimal funding strategy has the growth in the assets keep up with the growth in the liabilities
  - When a member retires, all of the monies needed to provide the benefits for that member have been accumulated
- The Normal Cost is the cost of the new benefit being earned
  - The cost of accruing that year's benefit associated with a year of service

Unfunded Accrued Liabilities

- If the actuarially accrued liability (AAL) is the target value of assets, then the Unfunded Actuarial Accrued Liability (UAAL) is the difference between the target value of assets and the actual value of assets
- The Funded Ratio is the actual value of assets as a percentage of the target value of assets

($ in millions)	June 30, 2023
AAL (Target Value)	$25,437
Assets (Actual Value)	$17,058
UAAL	$8,379
Funded Ratio	67.1%

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Actuarially Determined Contribution

- It is the sum of:
  1. The normal cost for the year and
  2. The amortization payment of the UAAL
  3. Sometimes expenses
- Another way to look at it:
  - The contribution for the current year

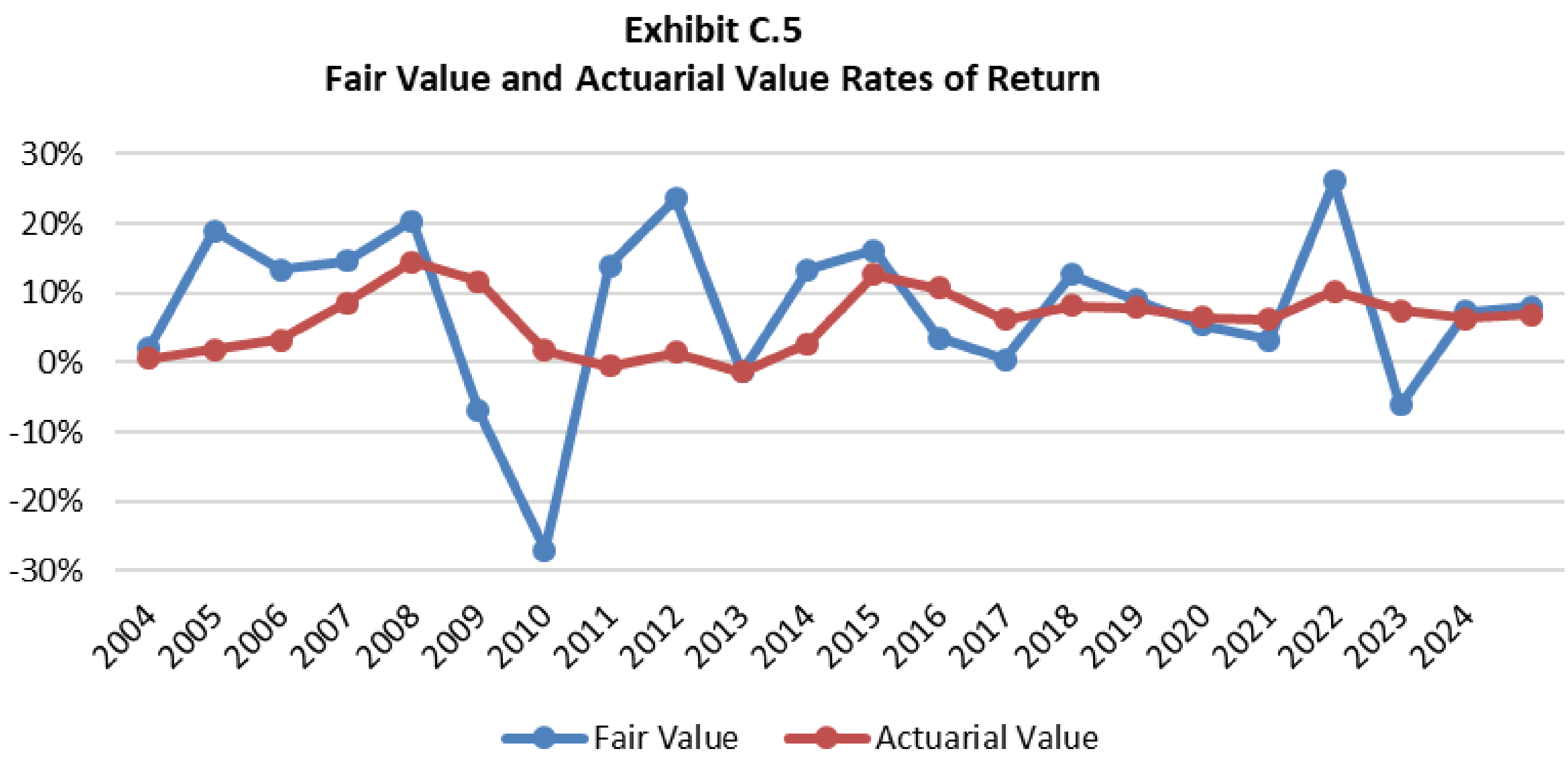
    plus
  - The contribution to make up any shortfall that may have occurred due to past experience or plan changes
- For NDTFFR, meant to serve as a metric to which we can compare the statutory contribution

FY 2024 EXPERIENCE AND KEY JULY 1, 2024 RESULTS

Key Factors in FY 2024 Experience

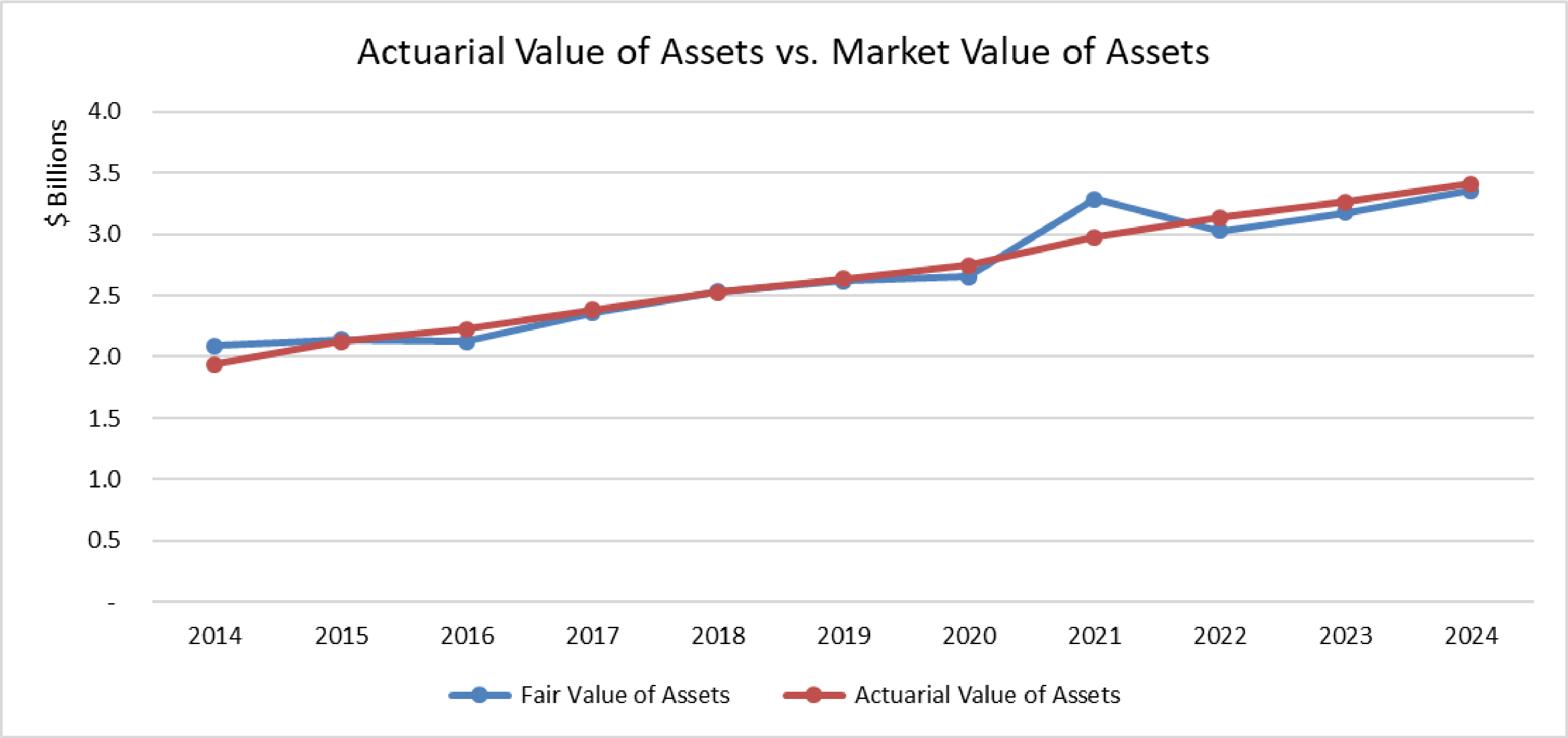
- Asset experience
  - Fair value return exceeded assumption
  - Overall slightly adverse experience
    - on smoothed results
    - from prior deferred losses
  - Biggest impact item
  - Negatively impacts funded ratio, UAAL, ADC, funding period
    - Basically everything
- Salary experience
  - increased more than expected
    - both individual salary and total payroll
  - Impacts different key metrics differently

Historical Returns and Impact of Smoothing



- Market value **7.9%** (on target)
- Actuarial value **6.9%** (actuarial loss, due to recognition of prior year outstanding losses)

Historical Asset Values and Impact of Smoothing



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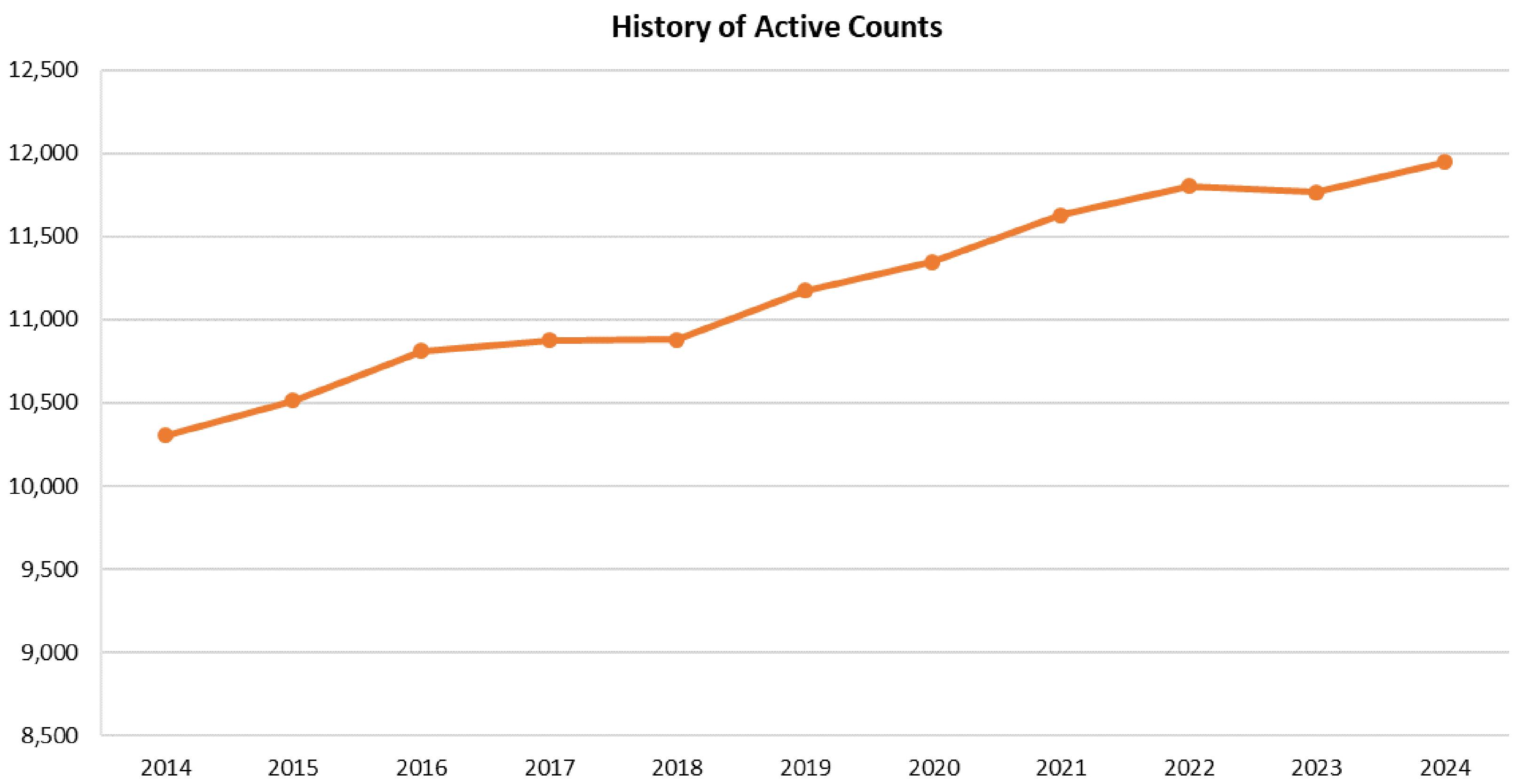
Slight Population Increase

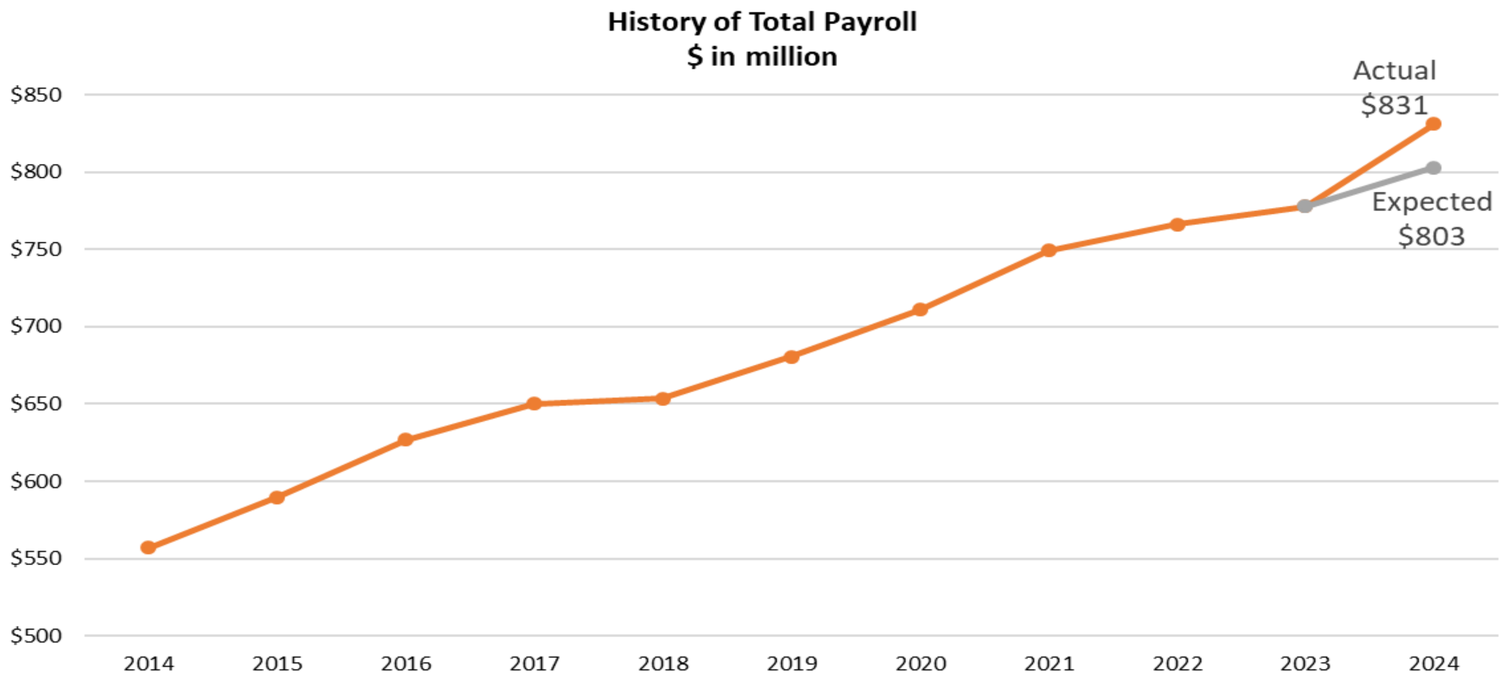


Total Payroll Growth More Than Expected

- Two sources
  - Pay increases more than expected for continuing actives
    - Primary source
    - Liability losses (projected benefits more) BUT
    - More Contributory Payroll to spread Unfunded Liability
  - Increased new hire replacement <u>decreases</u> ADC
    - Shared burden shared across more payroll
- Total combined impact
  - salary losses (*increase*) + more contributory payroll (*decrease*)
  - decrease ADC by 0.40%

Total Payroll Growth More Than Expected

- Total payroll expected to grow 3.25%
  - *As are calculated amortization payments*
- Actually grew 6.9%



Key Results – Static

$’s in Billions

- Slight improvement but less then expected

	7/1/2024		7/1/2023	
Actuarial Accrued Liability	$	4.76	$	4.58
Actuarial Value of Assets (AVA)		3.41		3.26
Unfunded Liability (AVA-basis)		1.35		1.32
Funded Ratio (AVA-basis)		71.6%		71.2%
Actuarial Accrued Liability	$	4.76	$	4.58
Fair Value of Assets (FVA)		3.35		3.17
Unfunded Liability (FVA-basis)		1.41		1.40
Funded Ratio (FVA-basis)		70.4%		69.3%

Key results – Forward Looking

% of Pay

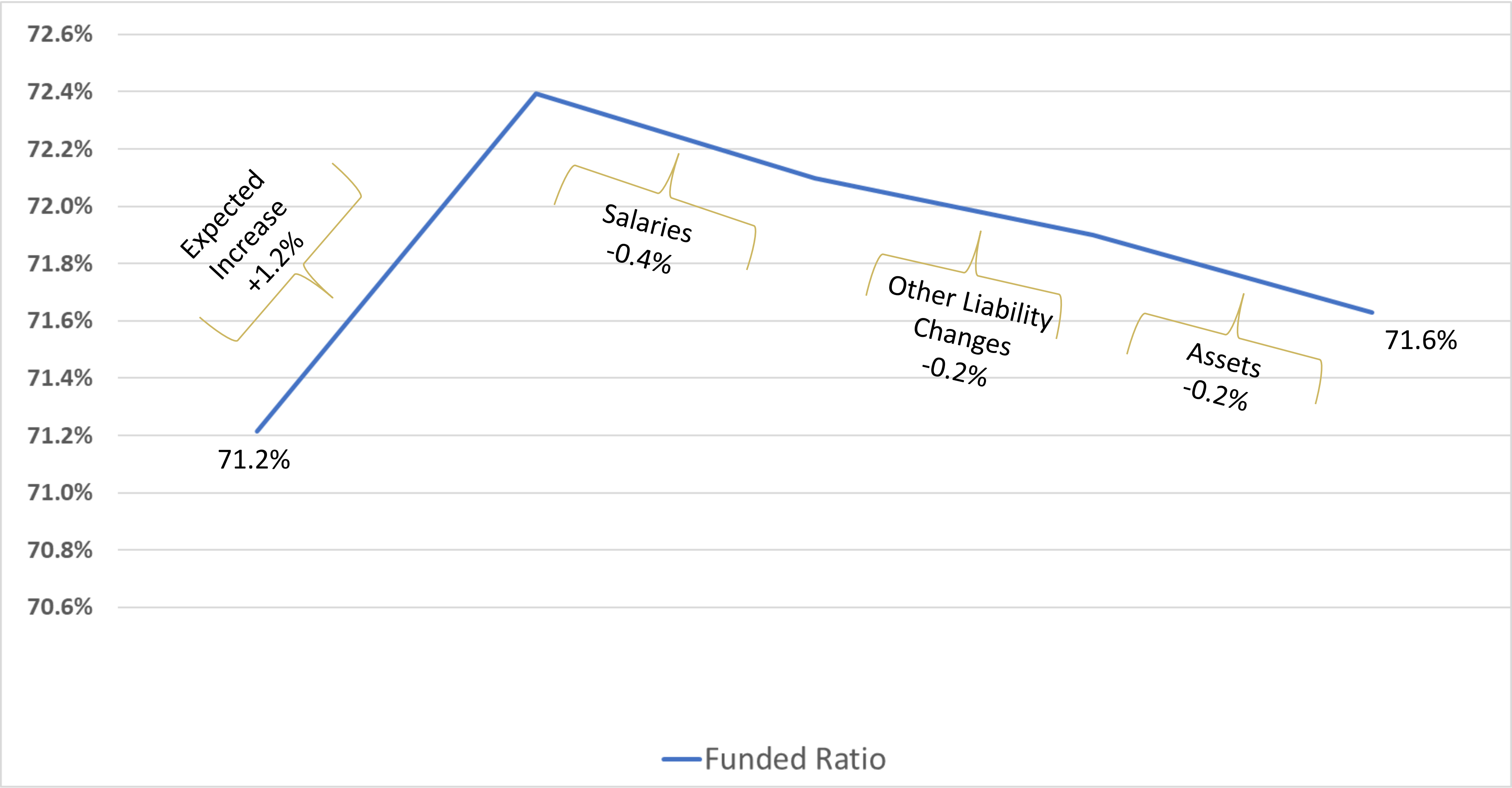
- Payroll/population growth means we're still on track for funding objectives

	7/1/2024	7/1/2023
Actuarially Determined Contribution (ADC)	24.21%	24.25%
Employee Contribution Rate	11.75%	11.75%
Net Employer ADC	12.46%	12.50%
Actual Employer Contribution Rate	12.75%	12.75%
Contribution Shortfall/(Surplus)	-0.29%	-0.25%
Funding Period	19 years	20 years

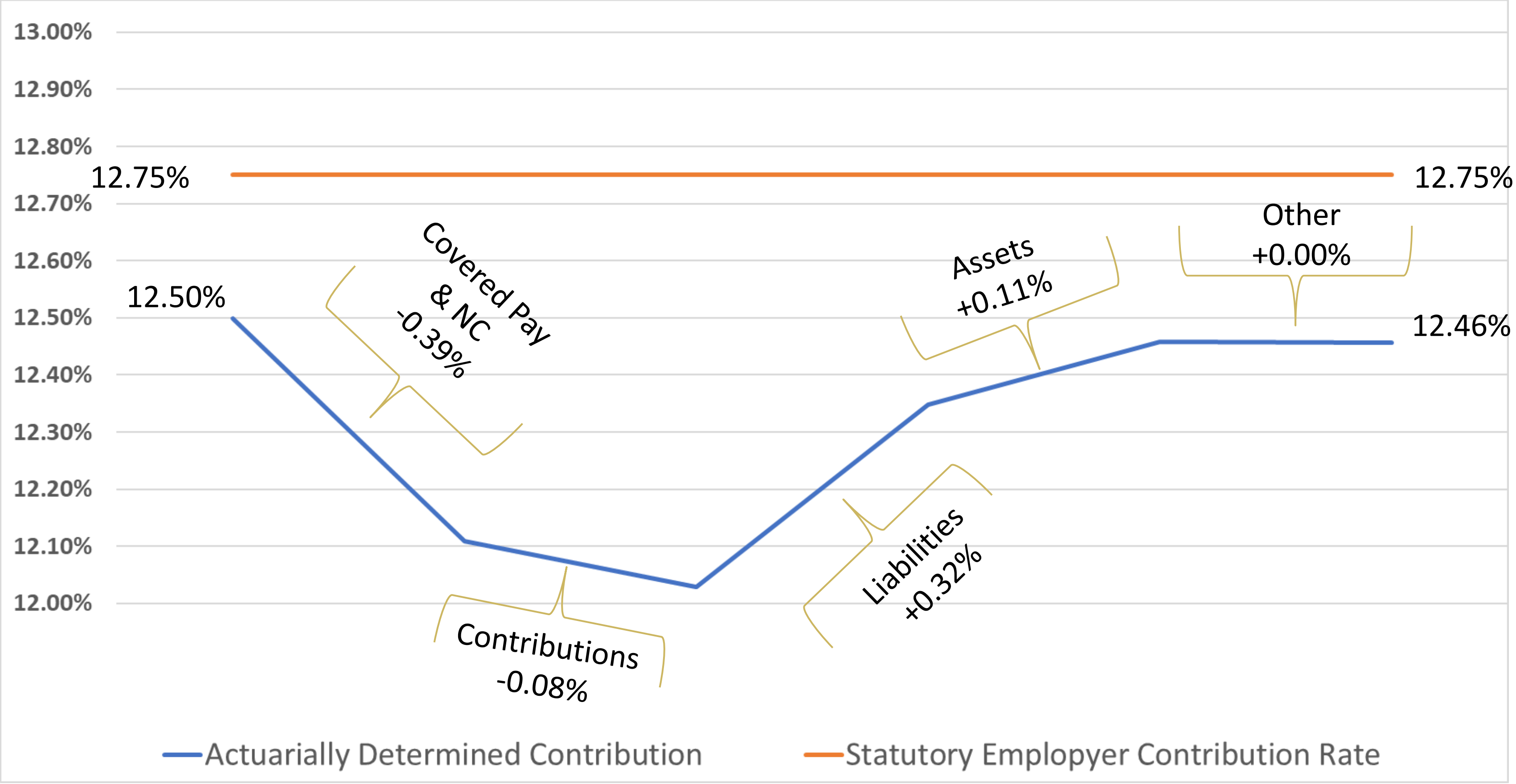
Change in UAAL Since Prior Valuation

Liability Change Detail:
- Salary Increases: +$19 million
- New Members and Rehire: +$9 million
- Other: +$9 million

Change in Funded Ratio Since Prior Valuation



Change in ADC Since Prior Valuation



LOOKING FORWARD

If All Goes As Planned
Long-term unchanged from last year

Deterministic Projection of the Unfunded Liability
$ in Millions

As of July 1, (a)	Payroll For Next FY (b)	Contribution as % of Payroll (c)	Normal Cost and Admin as % of Payroll (d)	Net Amortization [c - d] * b (e)	UAAL BOY (f)	Interest (g)	Net Principal Contribution e - g (h)	Funding Period (i)
2024	$879	24.50%	12.68%	$104	$1,350	$94	$10	19
2025	908	24.50%	12.67%	107	1,340	93	14	18
2026	937	24.50%	12.66%	111	1,326	92	19	17
2027	968	24.50%	12.66%	115	1,307	91	24	16
2028	999	24.50%	12.65%	118	1,283	89	30	15
2029	1,032	24.50%	12.64%	122	1,254	87	36	14
2030	1,065	24.50%	12.64%	126	1,218	84	43	13
2031	1,100	24.50%	12.63%	131	1,175	81	50	12
2032	1,136	24.50%	12.63%	135	1,126	77	58	11
2033	1,173	24.50%	12.63%	139	1,068	72	67	10
2034	1,211	24.50%	12.62%	144	1,001	67	76	9
2035	1,250	24.50%	12.62%	149	924	62	87	8
2036	1,291	24.50%	12.61%	153	838	55	98	7
2037	1,333	24.50%	12.61%	158	739	48	110	6
2038	1,376	24.50%	12.61%	164	629	40	124	5
2039	1,421	24.50%	12.60%	169	505	31	138	4
2040	1,467	24.50%	12.60%	175	367	20	154	3
2041	1,514	24.50%	12.59%	180	212	9	171	2
2042	1,564	24.50%	12.59%	186	41	(4)	190	1
2043	1,614	15.50%	12.59%	47	(149)	(12)	59	-

Assumes Actuarial Value of Assets earns 7.25% and all assumptions are met.

Short Term Sensitivity Analysis

FY 2024 Return	24%	16%	7.25%	0%	-7.25%	-16%	-24%
Employer ADC	11.37%	11.83%	12.32%	12.74%	13.15%	13.65%	14.10%

- There is an expectation that with a 0% return in FY 2025, the ADC would continue to be less than the current statutory contribution rate of 12.75%
  - Any less and expected to breech threshold

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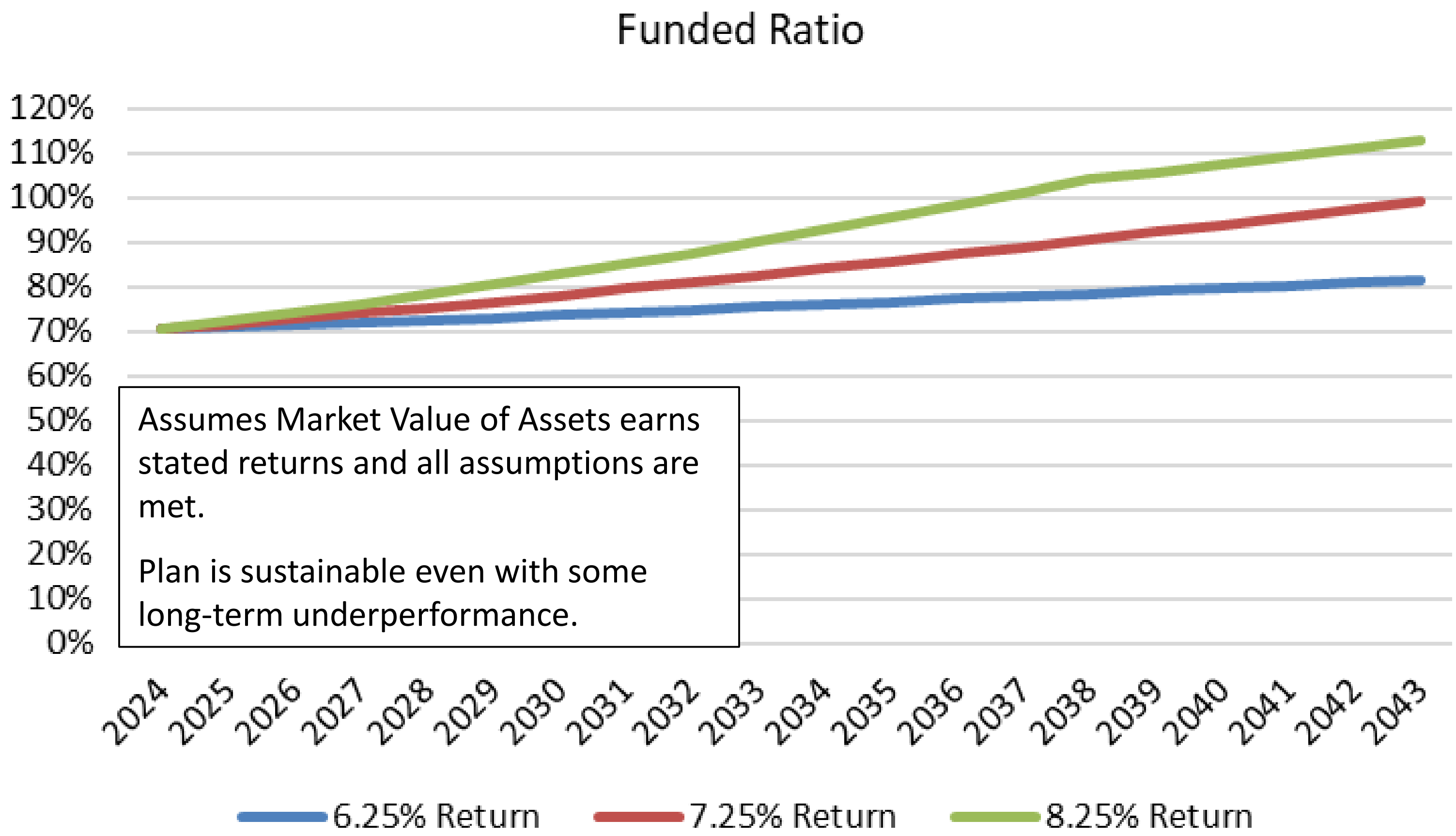
Long Term Projections



Assumes Market Value of Assets earns stated returns and all assumptions are met.

Plan is sustainable even with some long-term underperformance.

Summary

- TFFR statutory contributions still meeting Board funding policy objectives
  - Full funding expected in 19 years
- Slim margins
- In addition to the usual (investment return), will be keeping close eye on active population (counts and payroll growth) to make sure reliance on future payroll remains reasonable

Disclaimers

- This presentation is intended to be used in conjunction with the actuarial valuation report issued on October . This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.

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