



Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve

Montana Public Employees' Retirement Board

Valuation Results
June 30, 2023

Presented October 5, 2023





Why does my Plan need an Actuary?



Develop

- Develop a strategy to systematically fund the promised benefits of the system

Measure

- Measure assets and liabilities (future benefit payments)

Determine

- Determine actuarial contribution rates

Analyze

- Analyze experience (actual vs. expected)

Report

- Report on trends, risks, accounting, etc.

Basic Retirement Funding Formula

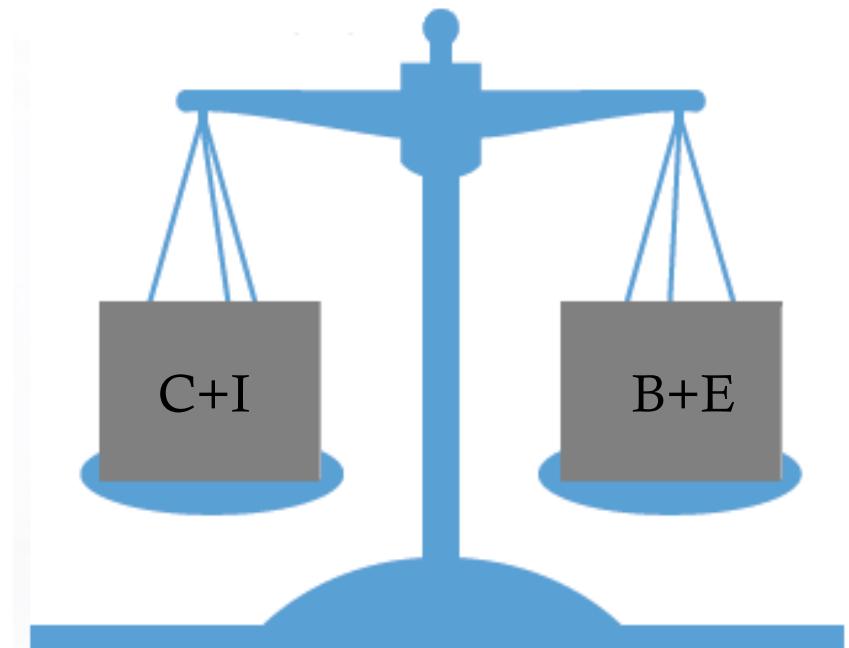
$$C + I = B + E$$

C = Contributions

I = Investment Income

B = Benefits Paid

E = Expenses



“Money In = Money Out”



Benefit Financing



$$C + I = B + E$$

B depends on

- Plan Provisions
- Experience

C depends on

- Short Term: Actuarial Assumptions
Actuarial Cost Method
- Long Term: I, B, E

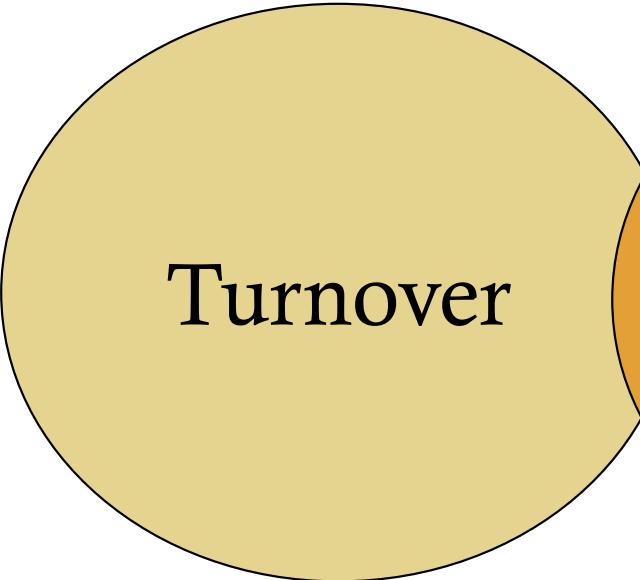


Actuarial Valuation



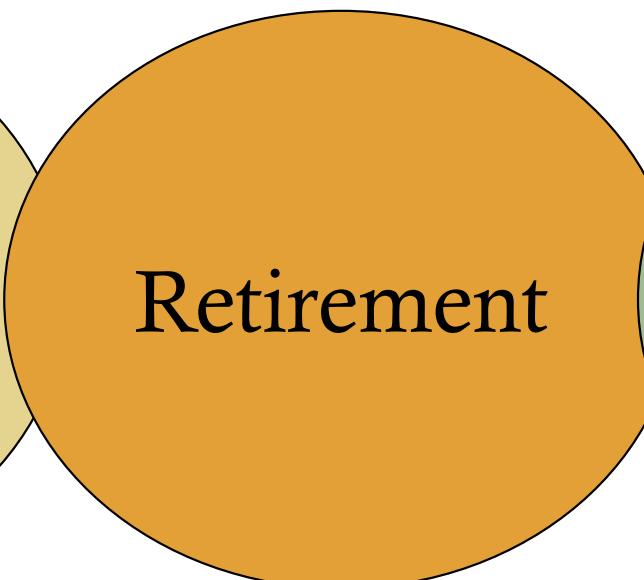
- For a defined benefit pension plan, the ultimate value of future cash flows cannot be predicted with certainty
 - To estimate the probability and the likely cost of a future event such as disability, retirement, or death, **actuaries need to make assumptions**

Actuarial Assumptions



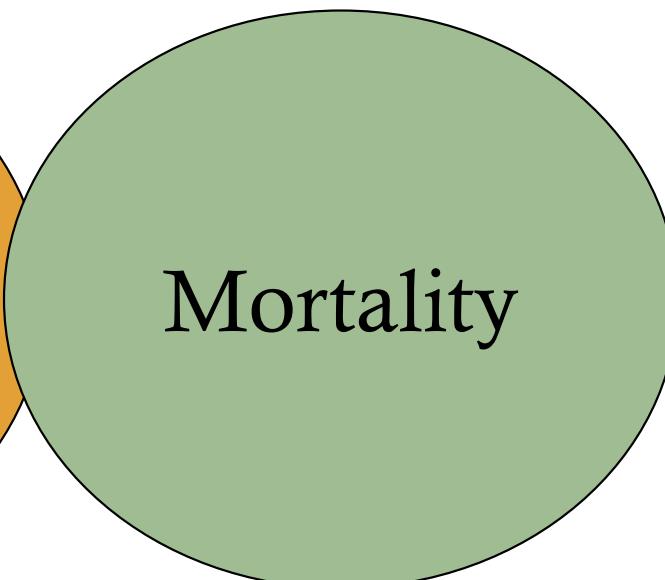
Turnover

Will an employee work long enough to vest and qualify for monthly benefits?



Retirement

When will the employee retire and start collecting benefits?



Mortality

How long will monthly benefits be paid?

Actuarial Assumptions



How will salaries grow in future years for each employee?



What is the present value of all of those future benefits in terms of today's dollars?

If we put money aside today, what rate of return can we expect to earn on it?



General Cost Impact of Assumption Changes



- General cost impact of each change in isolation

Assumption	Change in Assumption	Typical Effect On Liabilities/Costs
Turnover	Increase	Decrease
Retirement	Retire Later	Decrease
Mortality	Decrease (longer life expectancy)	Increase
Disability	Lower Disability	Decrease
Salary Increase	Increase (higher pay)	Increase
Discount Rate	Lower Return	Increase

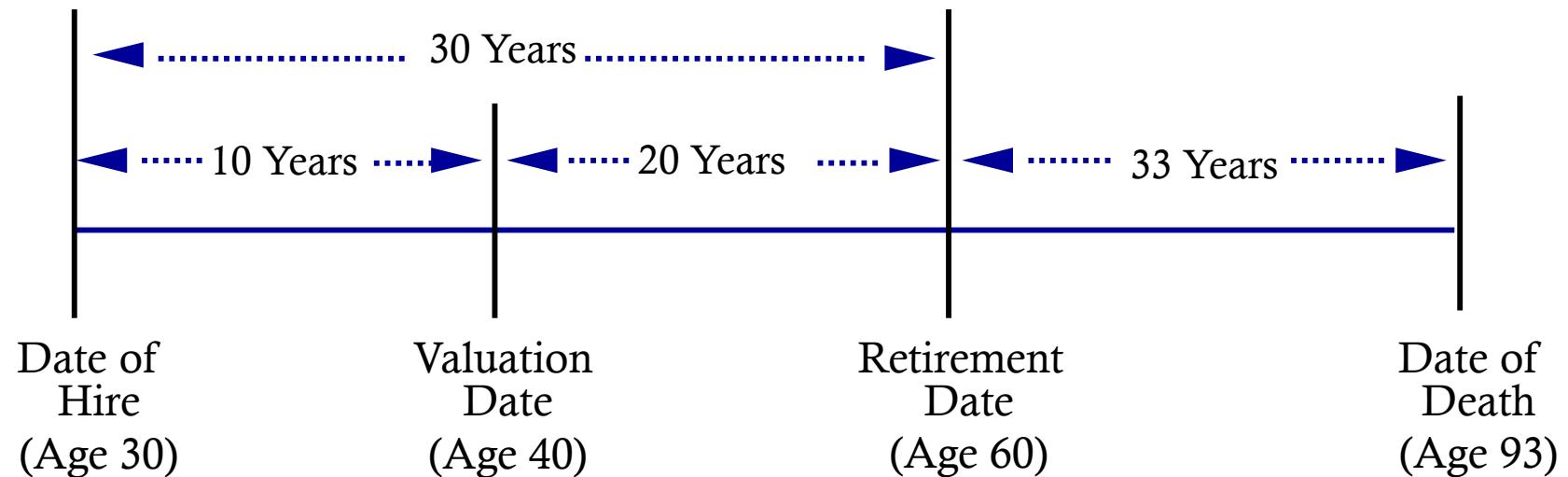
Actuarial Valuation

KNOWN at valuation date:

1. age
2. salary
3. gender
4. service to date
5. membership group

ASSUMED at valuation date:

1. future salary increases
2. retirement date(s)
3. death rates before and after
4. disability rates
5. other termination rates





Results



Changes Since Prior Valuations



- New ASOP 4 Disclosures have been added to the reports
 - Low-Default-Risk Obligation Measure (LDROM) Disclosure
 - Reasonable Actuarially Determined Contribution
 - Contribution Allocation Procedure
- No impact on the results of the valuation



Changes Since Prior Valuations



- HPORS, SRS, GWPORS and JRS
 - House Bill 569
 - Actuarially determined contribution rate will be developed and contributed beginning fiscal year end 2025
 - Layered amortization approach with a 25-year closed amortization period for the Legacy UAL and 10-year closed amortization periods for Contemporary UAL
 - Legacy UAL: UAL as of June 30, 2023
 - Contemporary UAL: incremental change in the UAL in the subsequent actuarial valuations
 - UAL is projected forward one year to align with when contributions are made
 - HPORS, SRS and GWPORS received \$27.6 million, \$26.8 million and \$41.2 million, respectively, in July 2023
 - Employer contribution rate can only increase by 0.50% per year in the future (allowed to decrease by more)



Changes Since Prior Valuations



- HPORS & SRS Only
 - House Bill 569
 - New Benefit Tier: Members hired on or after July 1, 2023, retirement eligibility has been increased from any age with 20 years of service to age 50 with 20 years of service
 - This will reduce the normal cost rate of both SRS and HPORS as current actives terminate or retire from service and are replaced by a new hire

Comments on Valuations



- Asset returns
 - Market asset returns (net of investment and administrative expenses) averaged 8.25% vs. 7.30% expected (0.95% more than expected)
 - Actuarial asset returns (net of investment and administrative expenses) averaged 7.38% vs. 7.30% expected (0.08% more than expected)
 - Actuarial value of assets smooth investment gains and losses on a market value basis over a four-year period
 - The actuarial value of assets will recognize deferred investment gains/losses over the following three years
 - In general, If all assumptions met going forward, can expect:
 - 2024: Investment Gain
 - 2025: Investment Loss
 - 2026: Investment Gain



Comments on Valuations



- Funded Ratios
 - Funded ratios increased for all plans except SRS, GWPORS, and PERS
- Amortization Periods for Unfunded Liability
 - Amortization periods for PERS, VCFA, FURS and MPORS decreased
 - Generally due to substantial payroll growth from prior year
 - Amortization periods for HPORS, SRS, GWPORS and JRS is 25 years in accordance with HB 569
 - JRS has a funding credit since the funded ratio exceeds 100%



Comments on Valuations



- Actuarial Experience Across All Plans
 - Overall experience loss of \$144.3 million
 - Actuarial value of assets investment gain of \$17.5 million due to unrecognized investment gains and losses
 - Demographic and mortality experience loss of \$26.3 million (0.2% of AAL)
 - Experience loss of \$135.5 million due to salary increases that were greater than anticipated



Comments on Valuation



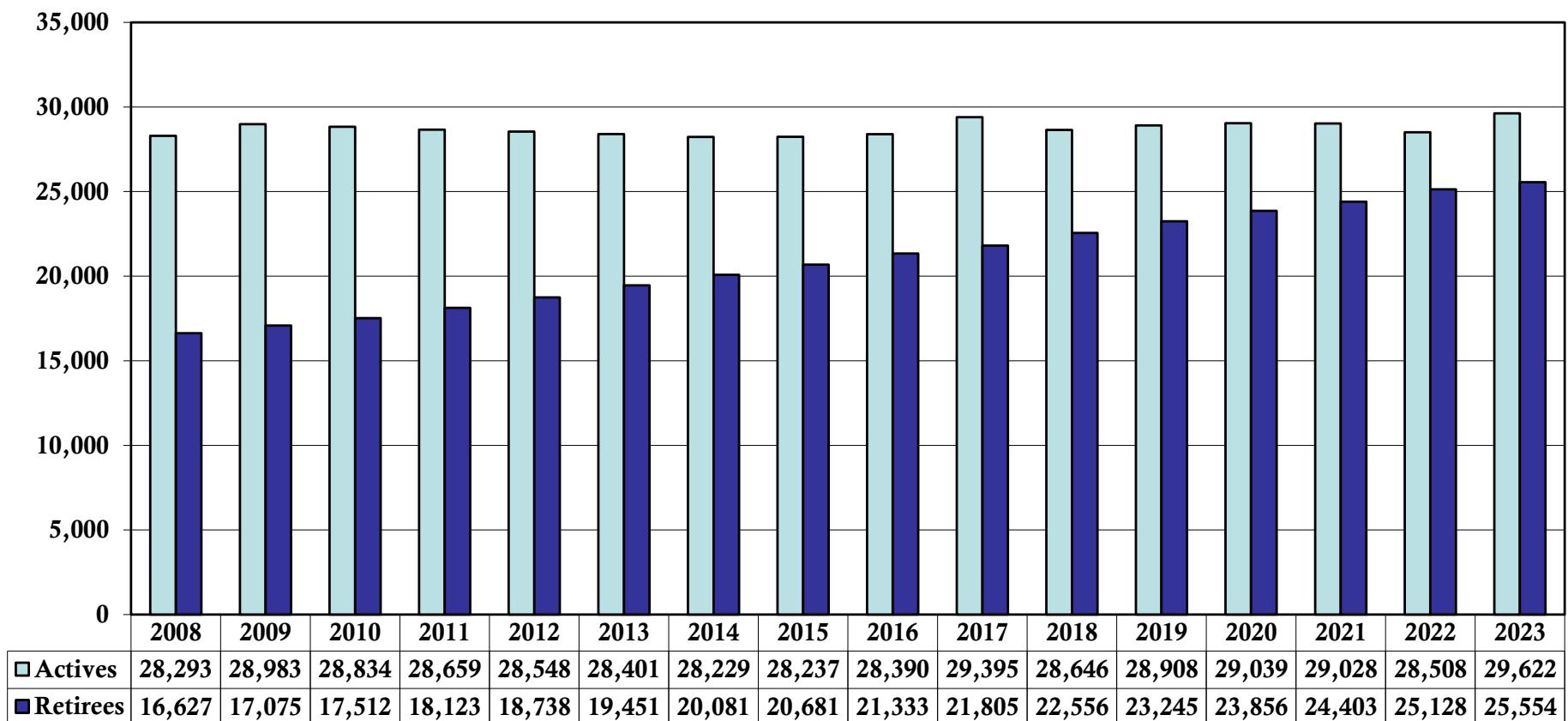
- PERS
 - In accordance with statute, the employer contribution rate was increased by 0.1%.
- HPORS
 - State special revenue fund to transfer \$4,000,000 by August 15, 2021, \$2,000,000 by August 15, 2022, and \$500,000 by August 15th for each fiscal year thereafter until the plan is 100% funded.



PERS Valuation Results



PERS Active and Retired Membership



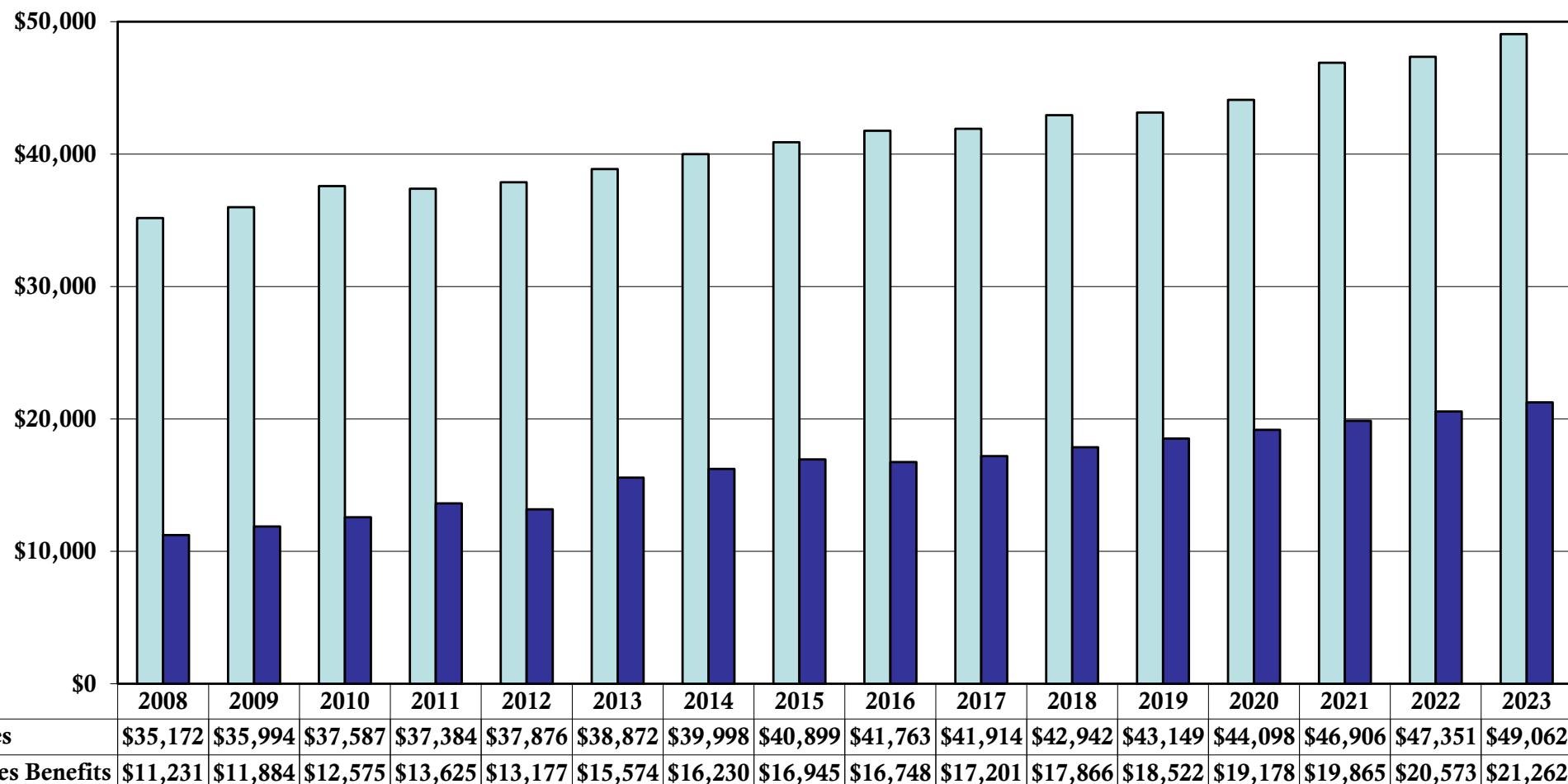
0.3% annual increase for active members since 2008; 3.9% increase for 2023.

2.9% annual increase for retired members since 2008; 1.7% increase for 2023.

0.6 retirees per active 15 years ago; 0.9 retirees per active now.



PERS Average Salary and Benefits

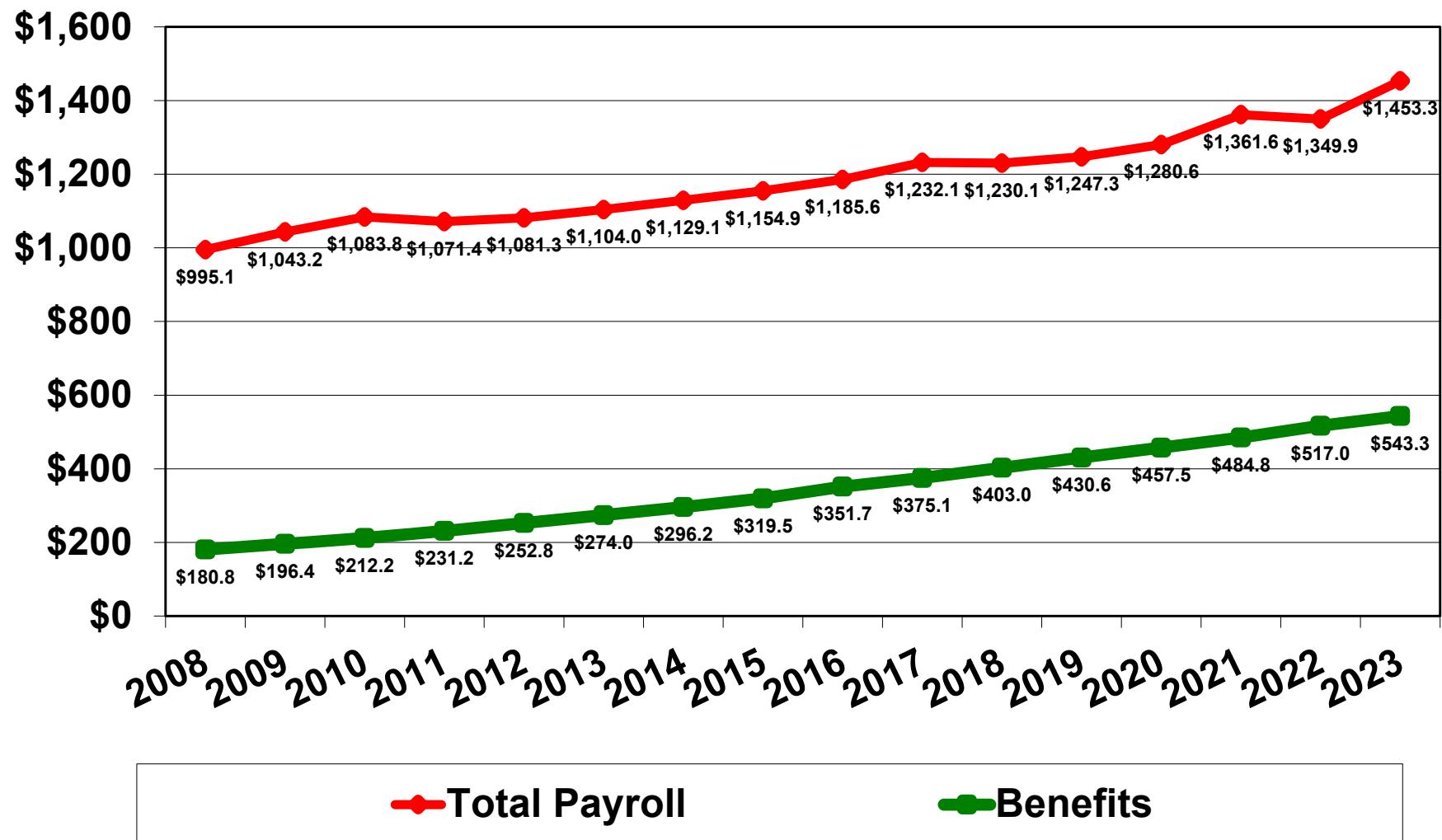


2.2% annual increase for average salary since 2008; 3.6% increase for 2023.

4.3% annual increase for average benefits since 2008; 3.3% increase for 2023.



PERS Payroll & Benefits (\$ Millions)



—●— Total Payroll

—●— Benefits



PERS Actuarial Experience

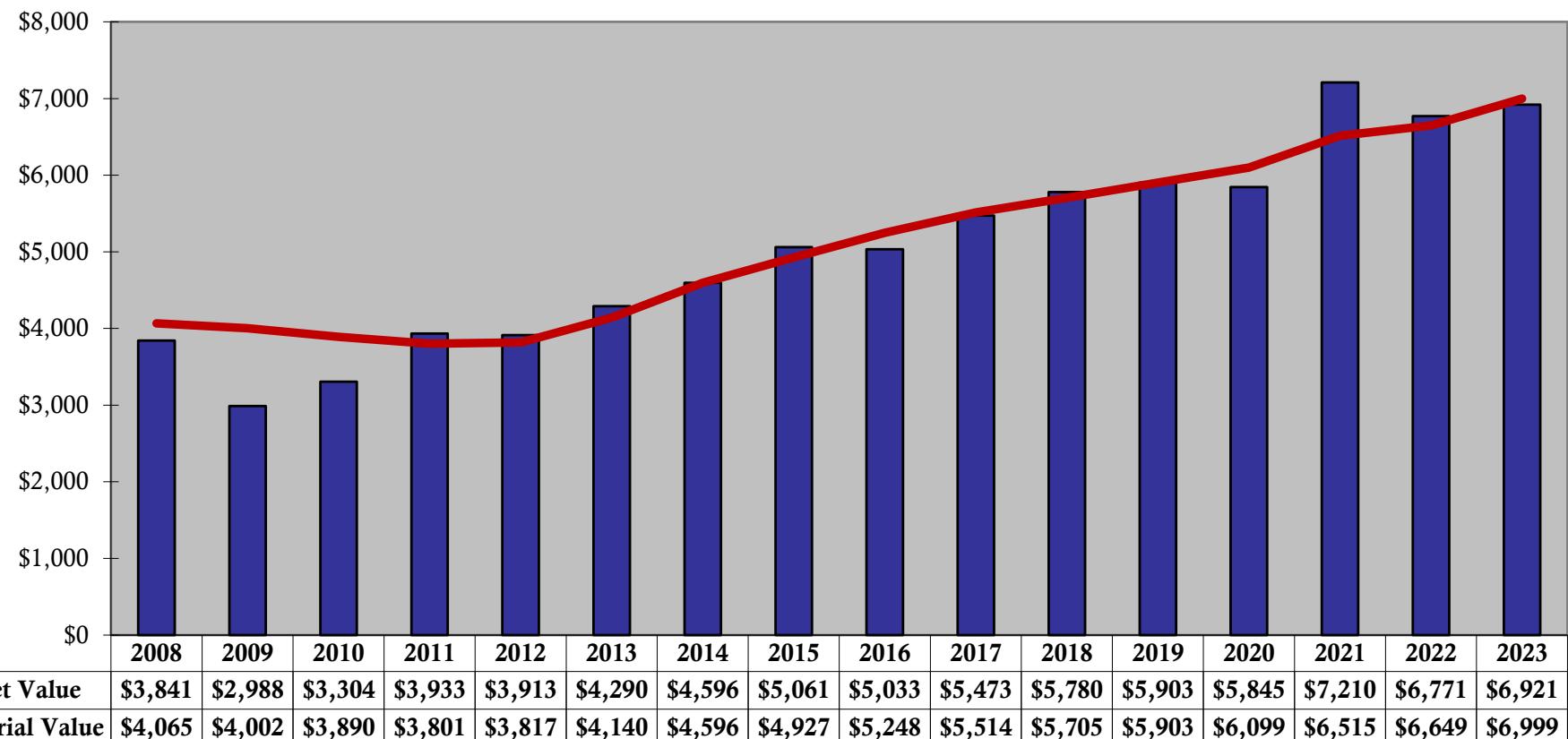


- Overall experience loss of \$114.0 million
- Asset returns
 - Market asset returns (net of investment and administrative expenses) averaged 8.35% vs. 7.30% expected (1.05% more than expected)
 - Actuarial asset returns (net of investment and administrative expenses) averaged 7.55% vs. 7.30% expected (0.25% more than expected)
 - Actuarial value of assets investment gain of \$16.3 million due to unrecognized investment gains and losses
 - If all assumptions met going forward, can expect:
 - 2024: Recognize Gain – \$96.5 million
 - 2025: Recognize Loss – \$192.2 million
 - 2026: Recognize Gain – \$17.2 million
- Experience loss of \$97.0 million due to salary increases that were greater than anticipated
- \$33.3 million experience loss due to all other demographic experience (mortality, retirement, termination, disability, misc.)
 - 0.4% of AAL



PERS Assets

(\$ Millions)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Market Return	(4.9)%	(20.9)%	12.9%	21.7%	2.3%	13.0%	17.1%	4.6%	2.0%	11.9%	8.9%	5.7%	2.7%	27.8%	(4.2)%	8.4%
Actuarial Return	7.6%	(0.2)%	(1.2)%	(0.1)%	3.3%	11.9%	13.2%	9.6%	9.3%	8.1%	6.7%	7.1%	7.1%	10.8%	8.2%	7.6%



PERS Funding Results



	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	9.72%	9.45%
Member Contribution Rate	7.90%	7.90%
Employer Normal Cost Rate	1.82%	1.55%
Total Employer Contribution Rate	FY 2023	FY 2024
Employer Normal Cost Rate	1.82%	1.55%
Rate to Amortize UAAL	7.21%	7.58%
Transfer to DB Education Fund	<u>0.04%</u>	<u>0.04%</u>
Statutory Funding Rate*	9.07%	9.17%
Actuarial Accrued Liability	\$9,026.8 million	\$9,361.2 million
Actuarial Value of Assets	\$6,770.8 million	\$6,999.3 million
Unfunded Actuarial Accrued Liability	\$2,256.0 million	\$2,361.9 million
Funded Ratio	75.01%	74.77%
Amortization Period*	32 Years	28 Years

* Reflects projected State revenue. Payable in fiscal year immediately following the valuation date.



Valuation Results (Other Fixed Rate Plans)



System	Funded Ratio		Amortization Period		Rate			30-Year Funding Rate	
	2022	2023	2022	2023	Member	Employer	Total	2022	2023
MPORS	71%	73%	24	21	9.00%	43.78%	52.78%	50.67%	48.50%
FURS	81%	82%	12	10	10.70%	46.97%	57.67%	45.83%	43.72%
VFCA*	91%	98%	3	1	5% of premium taxes				\$1,060,482 \$796,125

* The actual contributions for the fiscal year ending 2022 and 2023 were \$2,851,975 and \$3,156,488, respectively.



Funding Results for HPORS



	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	28.78%	26.89%
Member Contribution Rate	13.05%	13.05%
Employer Normal Cost Rate	15.73%	13.84%
Total Employer Contribution Rate	FY 2023	FY 2025
Employer Normal Cost Rate	15.73%	13.84%
Rate to Amortize UAAL	<u>22.60%</u>	<u>20.56%</u>
Statutory Funding Rate*	38.33%	34.40%
Actuarial Accrued Liability	\$273.2 million	\$283.4 million
Actuarial Value of Assets	\$179.4 million	\$188.7 million
Unfunded Actuarial Accrued Liability	\$93.8 million	\$94.7 million
Funded Ratio	65.64%	66.58%
Amortization Period*	47 Years	25 Years

* Reflects projected State revenue of \$500,000 payable by August 15th each year, Employer Contribution for Fiscal Year Ended 2024 is 38.33% of payroll.



Development of HPORS UAAL Rate



A.	Unfunded Actuarial Accrued Liability @ of June 30, 2023	\$94,718,948
B.	Expected Employer Contribution Rate for Year Ending June 30, 2024	38.33%
C.	Employer Normal Cost Rate for Year Ending June 30, 2024	13.84%
D.	Contribution Rate Applied to UAAL [B. – C.]	24.49%
E.	Projected Payroll for the Year After the Valuation Date	\$17,565,022
F.	Expected UAAL Contribution [D. x E.]	\$4,301,674
G.	State Appropriation	\$28,100,000
H.	Interest on A., F. and G. to June 30, 2024 @ 7.30%	\$4,713,642
I.	Projected UAAL @ June 30, 2024 [A. – F. – G. + H.]	\$67,030,916



Development of HPORS UAAL Rate



Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2024 Balance	Annual Payment
2023 Legacy UAAL	\$67,030,916	25	\$67,030,916	\$4,241,920
Total			\$67,030,916	\$4,241,920

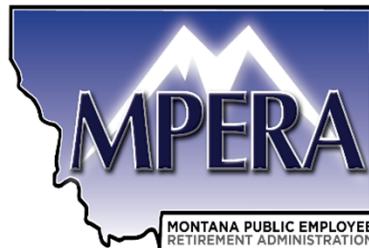
1. Total UAAL Amortization Payments \$ 4,241,920
2. Special State Revenue Transfer Adjusted for Timing \$ 513,387
3. Expected Payroll for FYE 2025 \$ 18,135,885
4. UAAL Amortization Payment Rate 20.56%
[(1. - 2.) / 3.]



Development of HPORS UAAL Rate



A. Employer Normal Cost Rate	13.84%
B. UAAL Contribution Rate for FY 2025	20.56%
C. Actuarial Determined Employer Contribution Rate for FY 2025 [(A) + (B)]	34.40%
D. Statutory Employer Contribution Rate for FY 2024	38.33%
E. Statutory Employer Contribution Rate for FY 2025	34.40%



Funding Results for SRS



	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	16.180%	15.810%
Member Contribution Rate	10.495%	10.495%
Employer Normal Cost Rate	5.685%	5.315%
Total Employer Contribution Rate	FY 2023	FY 2025
Employer Normal Cost Rate	5.685%	5.315%
Rate to Amortize UAAL	<u>7.430%</u>	<u>6.759%</u>
Statutory Funding Rate*	13.115%	12.074%
Actuarial Accrued Liability	\$597.1 million	\$641.7 million
Actuarial Value of Assets	\$469.5 million	\$499.9 million
Unfunded Actuarial Accrued Liability	\$127.6 million	\$141.8 million
Funded Ratio	78.64%	77.91%
Amortization Period	33 Years	25 Years

* Employer Contribution for Fiscal Year Ended 2024 is 13.115% of payroll.



Development of SRS UAAL Rate



A.	Unfunded Actuarial Accrued Liability @ of June 30, 2023	\$141,756,205
B.	Expected Employer Contribution Rate for Year Ending June 30, 2024	13.115%
C.	Employer Normal Cost Rate for Year Ending June 30, 2024	5.315%
D.	Contribution Rate Applied to UAAL [B. – C.]	7.800%
E.	Projected Payroll for the Year After the Valuation Date	\$104,211,156
F.	Expected UAAL Contribution [D. x E.]	\$8,128,470
G.	State Appropriation	\$26,800,000
H.	Interest on A., F. and G. to June 30, 2024 @ 7.30%	\$8,100,339
I.	Projected UAAL @ June 30, 2024 [A. – F. – G. + H.]	\$114,928,074



Development of SRS UAAL Rate



Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2024 Balance	Annual Payment
2023 Legacy UAAL	\$114,928,074	25	\$114,928,074	\$7,272,998
Total			\$114,928,074	\$7,272,998

1. Total UAAL Amortization Payments \$ 7,272,988
2. Expected Payroll for FYE 2025 \$ 107,598,019
3. UAAL Amortization Payment Rate
(1) / (2) 6.759%



Development of SRS UAAL Rate



A. Employer Normal Cost Rate	5.315%
B. UAAL Contribution Rate for FY 2025	6.759%
C. Actuarial Determined Employer Contribution Rate for FY 2025 [(A) + (B)]	12.074%
D. Statutory Employer Contribution Rate for FY 2024	13.115%
E. Statutory Employer Contribution Rate for FY 2025	12.074%



Funding Results for GWPORS



	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	18.50%	17.92%
Member Contribution Rate	10.56%	10.56%
Employer Normal Cost Rate	7.94%	7.36%
Total Employer Contribution Rate	FY 2023	FY 2025
Employer Normal Cost Rate	7.94%	7.36%
Rate to Amortize UAAL	<u>1.06%</u>	<u>2.26%</u>
Statutory Funding Rate*	9.00%	9.62%
Actuarial Accrued Liability	\$320.5 million	\$348.3 million
Actuarial Value of Assets	\$266.1 million	\$284.5 million
Unfunded Actuarial Accrued Liability	\$54.4 million	\$63.8 million
Funded Ratio	83.02%	81.69%
Amortization Period	Does Not Amortize	25 Years

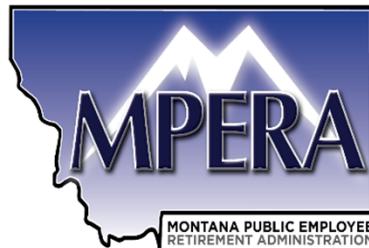
* Employer Contribution for Fiscal Year Ended 2024 is 10.56% of payroll.



Development of GWPORS UAAL Rate



A.	Unfunded Actuarial Accrued Liability @ of June 30, 2023	\$63,761,540
B.	Expected Employer Contribution Rate for Year Ending June 30, 2024	10.56%
C.	Employer Normal Cost Rate for Year Ending June 30, 2024	7.36%
D.	Contribution Rate Applied to UAAL [B. – C.]	3.20%
E.	Projected Payroll for the Year After the Valuation Date	\$60,253,979
F.	Expected UAAL Contribution [D. x E.]	\$1,928,127
G.	State Appropriation	\$41,200,000
H.	Interest on A., F. and G. to June 30, 2024 @ 7.30%	\$1,577,855
I.	Projected UAAL @ June 30, 2024 [A. – F. – G. + H.]	\$22,211,268



Development of GWPORS UAAL Rate



Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2024 Balance	Annual Payment
2023 Legacy UAAL	\$22,211,268	25	\$22,211,268	\$1,405,597
Total			\$22,211,268	\$1,405,597

1. Total UAAL Amortization Payments	\$ 1,405,597
2. Expected Payroll for FYE 2025	\$ 62,212,233
3. UAAL Amortization Payment Rate (1) / (2)	2.26%



Development of GWPORS UAAL Rate



A. Employer Normal Cost Rate	7.36%
B. UAAL Contribution Rate for FY 2025	2.26%
C. Actuarial Determined Employer Contribution Rate for FY 2025 [(A) + (B)]	9.62%
D. Statutory Employer Contribution Rate for FY 2024	10.56%
E. Statutory Employer Contribution Rate for FY 2025	9.62%



Funding Results for JRS



	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	27.24%	26.76%
Member Contribution Rate	7.00%	7.00%
Employer Normal Cost Rate	20.24%	19.76%
Total Employer Contribution Rate	FY 2023	FY 2025
Employer Normal Cost Rate	20.24%	19.76%
Rate to Amortize UAAL	<u>(20.24)%</u>	<u>(42.91)%</u>
Statutory Funding Rate*	0.00%	0.00%
Actuarial Accrued Liability	\$72.9 million	\$73.1 million
Actuarial Value of Assets	\$126.8 million	\$132.4 million
Unfunded Actuarial Accrued Liability	(\$53.9) million	(\$59.3) million
Funded Ratio	173.90%	181.03%
Amortization Period	0 Years	0 Years

* Employer Contribution for Fiscal Year Ended 2024 is 0.00% of payroll. Statutory Funding Rate cannot be below 0.00%.



PERS DCRP

Long Term Disability Plan



	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	0.05%	0.05%
Rate to Amortize UAL	<u>0.25%</u>	<u>0.25%</u>
Statutory Funding Rate	0.30%	0.30%
Actuarial Accrued Liability	\$1,610,180	\$1,501,873
Actuarial Value of Assets (Market Value)	\$7,180,523	\$8,604,097
Unfunded Actuarial Accrued Liability	(\$5,570,343)	(\$7,102,224)
Funded Ratio	445.95%	572.89%
Amortization Period	0 Years	0 Years
30-Year Funding Rate	(0.12)%	(0.14)%



Actuarial Certifications & Disclosures



- Additional information regarding the assumptions and methods can be found in the June 30, 2023 actuarial valuation reports.
- The actuaries who prepared these results, Todd B. Green, ASA, EA, FCA, MAAA, and Bryan Hoge, FSA, EA, FCA, MAAA, 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.