UPCOMING EXPERIENCE STUDY

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

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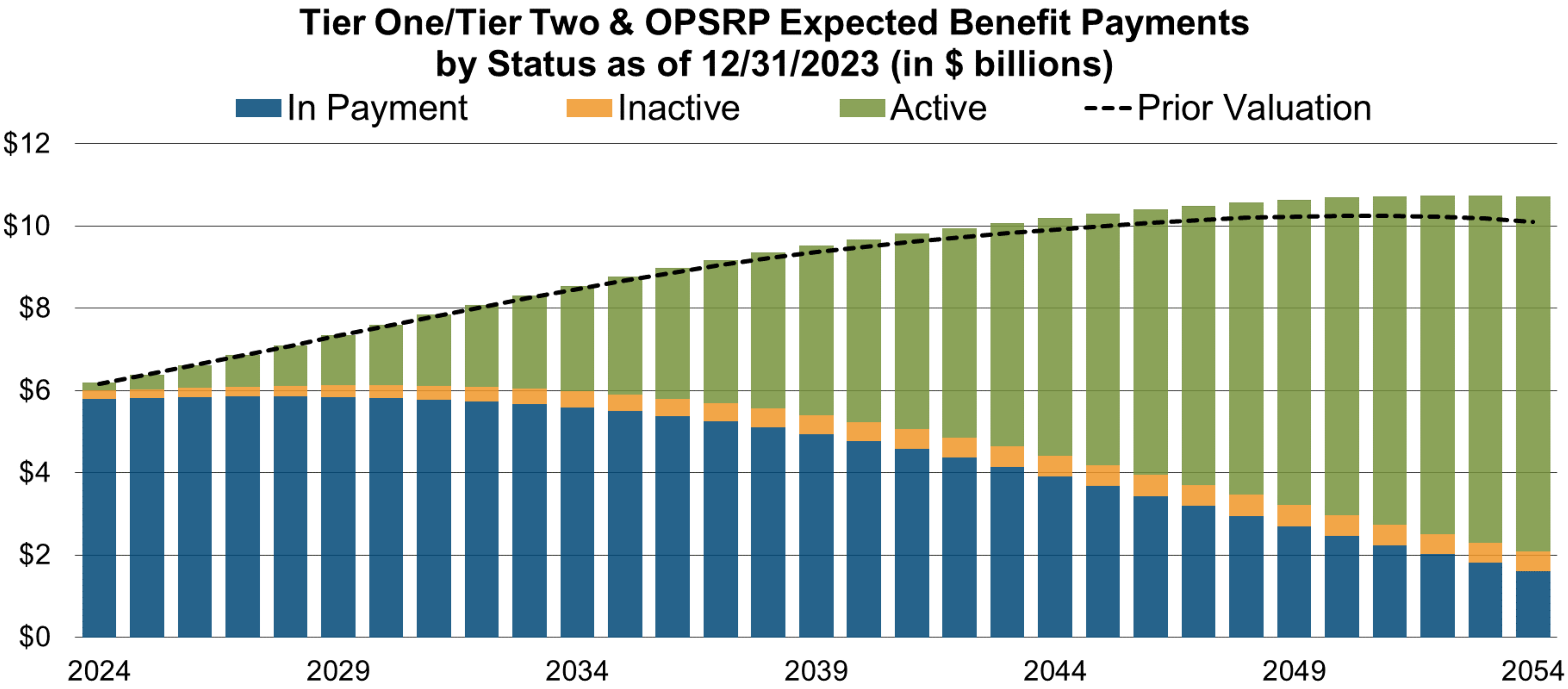
March 31, 2025

Foundation of All PERS Actuarial Valuation Work

Year-by-year Projected Benefit Payments (Excluding Members Joining OPSRP After 2023)



What Is an Actuarial Experience Study?

- Review and, if appropriate, update actuarial assumptions
  - Assumptions combine with benefit provisions and member data to project benefit payments

- Review and, if appropriate, modify actuarial methods
  - Methods help determine contribution rates to fund projected benefits in a sound manner

Four-Meeting Process – Assumptions & Methods

- March 31: Summary of process, background, and areas of focus

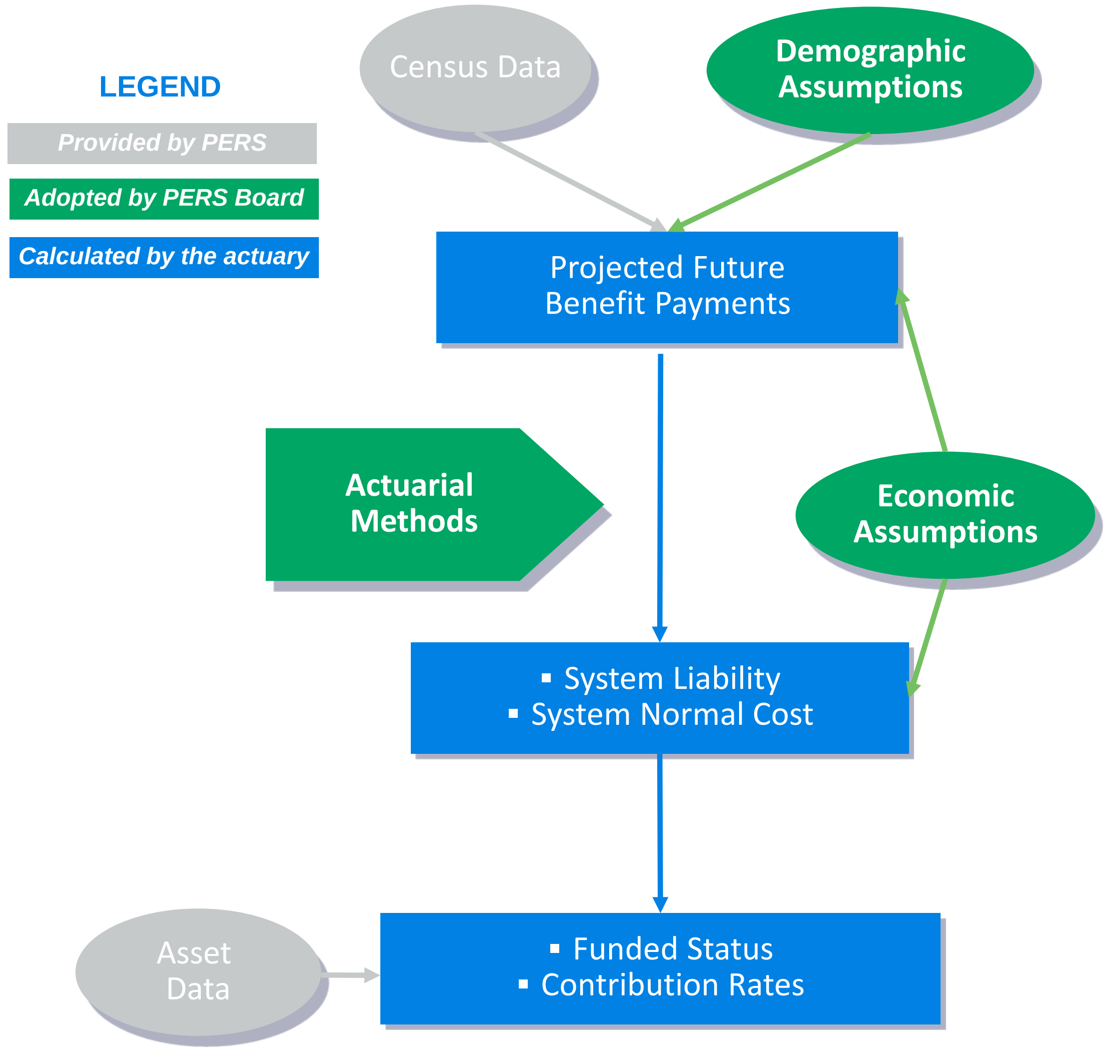
- May 28: Joint meeting with Oregon Investment Council (OIC)
  - Assumed rate – outlooks from OIC's consultants, Milliman

- May 30: Economic assumptions, system funding methods
  - Inflation and system payroll growth
  - Actuarial methods, including amortization and rate collaring policy

- July 25: Demographic assumptions, Board direction to actuary
  - Member-specific assumptions based on study of recent PERS experience
  - Assumptions and methods adopted for use in:
    - 12/31/2024 actuarial valuation with advisory 2027-2029 contribution rates
    - 12/31/2025 actuarial valuation with proposed final 2027-2029 contribution rates

Two-Year Rate-Setting Cycle

- **July 2025: Assumptions & methods adopted by Board in consultation with the actuary**
- September 2025: System-wide 12/31/24 actuarial valuation results
- December 2025: Advisory 2027-2029 employer-specific contribution rates
- July 2026: System-wide 12/31/25 actuarial valuation results
- September 2026: Disclosure & adoption of employer-specific **2027-2029 contribution rates**



Valuation Process and Timeline

- Actuarial valuations are conducted annually
  - Alternate between "rate-setting" and "advisory" valuations
  - This valuation as of 12/31/2024 is advisory
- Board adopts contribution rates developed in rate-setting valuations, and those rates go into effect 18 months after the valuation date

Valuation Date	Employer Contribution Rates
12/31/2021 →	July 2023 – June 2025
12/31/2023 →	July 2025 – June 2027
12/31/2025 →	July 2027 – June 2029

Summary of Assumptions and Methods to Review

Economic Assumptions

- Inflation
- Real wage growth
- System payroll growth
- **Long-term investment return**
- Healthcare cost trend

Actuarial Methods

- Actuarial cost method
- Amortization policy
  - UAL (shortfall) amortization
  - **Side account / PreSLGRP rate adjustments**
- Rate collar
- Contribution lag adjustment

Demographic Assumptions

- Mortality
- Retirement
- Pre-retirement termination
- Disability
- Individual salary increases
- Final average salary adjustments
- Member redirect offsets
- RHIA & RHIPA assumptions

*Background information for **bold** topics discussed on following slides*

Long-Term Investment Return ("The Assumed Rate")

The Assumed Rate: What Is It?

- Assumed rate: expected average annual **future** investment return

- PERS Board sets the assumed rate every two years
  - This year the rate will be selected at the July 25 meeting

- The assumed rate is used to determine:
  - The contribution cost rate for benefits earned in the future (normal cost rate)
  - The system’s current unfunded actuarial liability (UAL)
  - The contribution cost rate to systematically amortize UAL over time (UAL rate)
  - Actuarial equivalence factors (AEFs) for amounts of optional benefit forms
  - AEFs to convert account balances to “money match” annuities for Tiers One & Two
  - Account balance interest crediting level for Tier One actives

Use of the Assumed Rate

The PERS Funding Equation

At the end of each calendar year, the PERS actuaries calculate the system's funded status using the following basic equation:

B	=	C	+	E
BENEFITS *Present value of earned benefits* Set by: Oregon Legislature		CONTRIBUTIONS *Employer funds to pay for pension benefits* Set by: PERS Board		EARNINGS *Future returns on investment funds* Managed by: Oregon Investment Council

Every two years, the PERS Board adjusts contribution rates so that, over time, contributions will be sufficient to fund the benefits earned, if earnings follow assumptions.

- "B" is predictable with a relatively high degree of certainty
- "E" is the unpredictable **actual** future investment return on PERS assets
- "C" is the balancing item --- it must provide to "B" what "E" fails to cover

- The **assumed rate** is the Board's estimate of "E" to prudently set "C"
- The Board's decision on the estimated "E" does **not** affect actual future earnings

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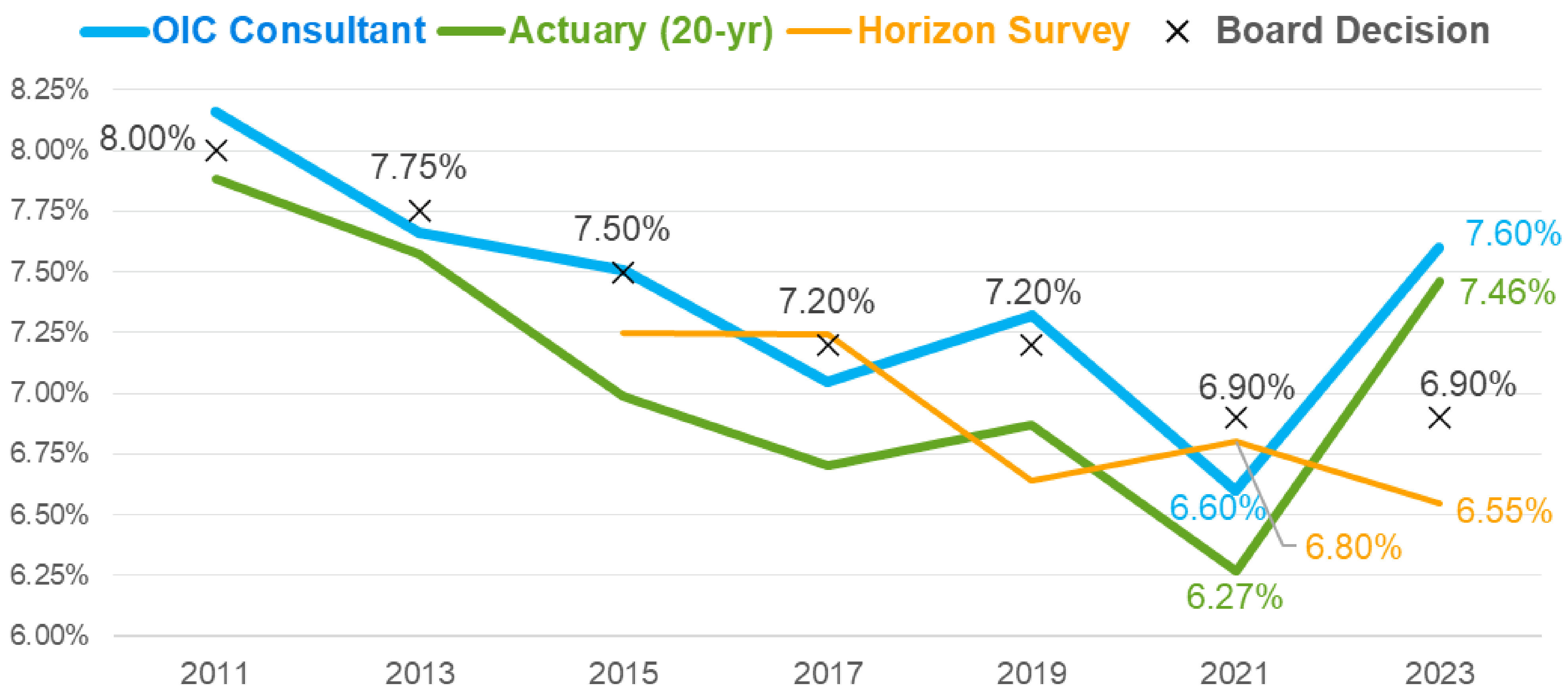
Investment Return 50th Percentile Outlooks

Geometric Returns from Outlook Models in Prior Seven Reviews



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Assumed Rate - Data Used in Prior Board Decision

- The table below is from the **July 2023** Board meeting
  - Median returns are geometric averages over the timeframe indicated

	OIC Consultant	Milliman 10-Year	Milliman 20-Year	Horizon Survey
Median Annualized Return	**7.60%**	**7.11%**	**7.46%**	**6.55%**
Assumed Inflation	2.50%	2.40%	2.35%	2.46%
Timeframe Modeled	20 years	10 years	20 years	10 years

- While most updated median returns were higher in the 2023 review, the Board left the assumption unchanged at 6.90%
  - After a decade-long process adjusting for lower forward-looking outlooks, it was unclear whether the rapid reversal after 2022 market losses would persist
  - Reflecting a "margin for adverse deviation" in assumptions is allowable under Actuarial Standards of Practice

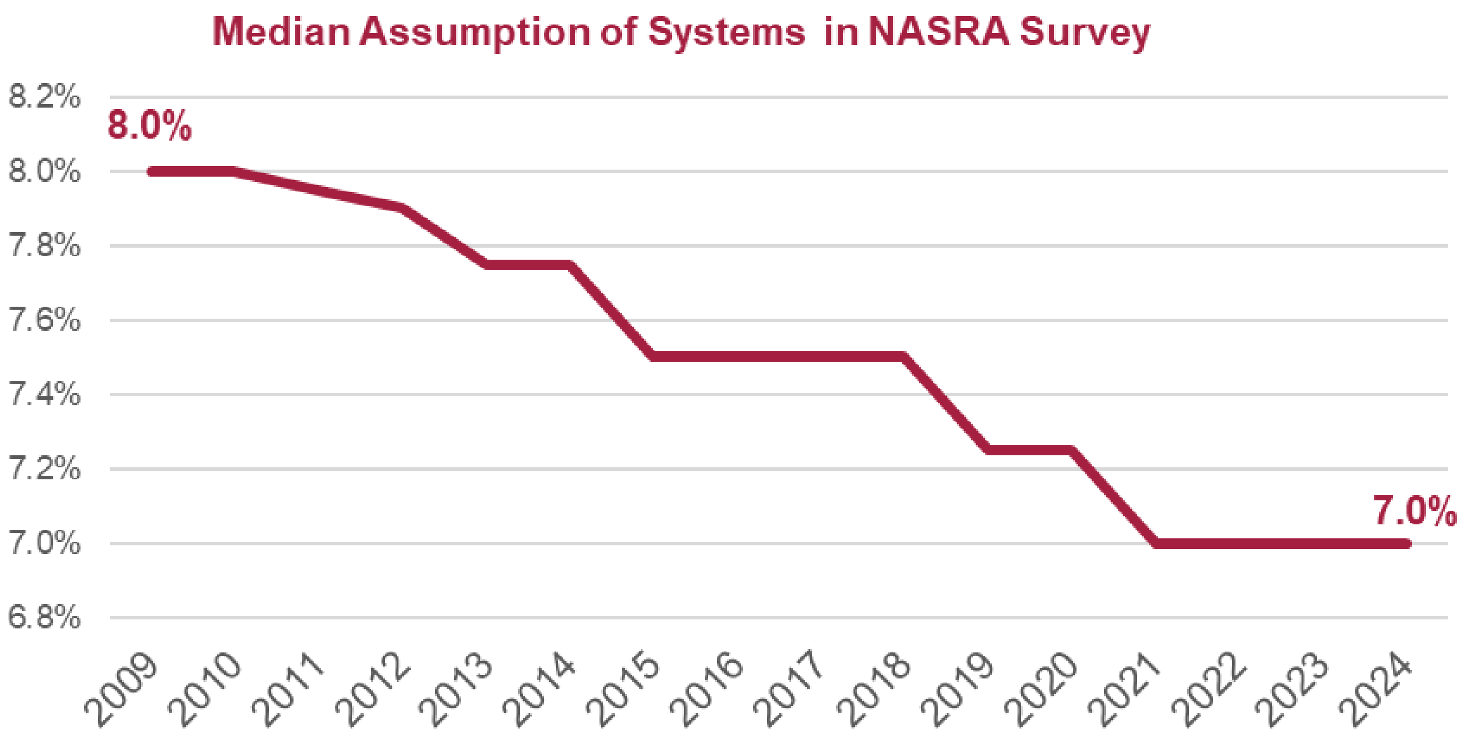
Preliminary Updates to Milliman Outlooks

	2023 Outlook Milliman Final	2023 Outlook Milliman Final	2025 Outlook Milliman Preliminary	2025 Outlook Milliman Preliminary
Median Annualized Geometric Return	**7.11%**	**7.46%**	**7.07%**	**7.39%**
Assumed Inflation	2.40%	2.35%	2.37%	2.31%
Time Horizon Modeled	10 years	20 years	10 years	20 years

- **OIC consultant outlooks will be shared on May 28**
- Milliman's preliminary long-term forward-looking assumptions are slightly lower than in the previous review
  - Important: these are based on assumptions developed based on market conditions at the very start of 2025, and do not reflect recent market experience or any potential changes to long-term outlooks from recent developments in trade policy and economic management

What About the Assumptions of Other Systems?

- This line shows the median return assumption over time for about 130 large and/or statewide public systems



Source: NASRA Public Fund Survey (November 2024)

- The median decreased to **7.0%** by the end of 2021
  - The mid-point of public systems' return assumptions decreased by a full 1.0% in just over a decade, and has remained at that level in recent years

Historical Actual Returns vs. Assumed Returns

- Comparison of trailing average historical returns through end of 2024:
  - Actual – from *PERS By the Numbers*
  - Assumed – based on PERS' actuarial assumption for each year

Period Ending December 2024	Actual Return	Assumed Return
Trailing 30 years	9.0%	7.7%
Trailing 25 years	6.7%	7.6%
Trailing 20 years	7.4%	7.5%
Trailing 15 years	8.4%	7.4%
Trailing 10 years	7.4%	7.1%

Returns are geometric annualized average returns over the periods indicated
The specific starting and ending points matter (example: the difference in 30 v. 25-year returns)

PERS Year End 2024 Investment Returns (from PERS Website)

Private Equity – Highest 10-Year Returns; Explains Lag Versus Policy Benchmark

Returns for periods ending DEC-2024 **Oregon Public Employees Retirement Fund**

	Regular Account				Historical Performance (Annual Percentage)							
OPERF	**Policy[1]**	**Target[1]**	**$ Thousands[2]**	**Actual**	**Year-To-Date[3]**	**1 YEAR**	**2 YEARS**	**3 YEARS**	**4 YEARS**	**5 YEARS**	**7 YEARS**	**10 YEARS**
TOTAL OPERF Regular Account			$ 95,073,570		5.71	5.71	5.85	3.32	7.27	7.35	7.20	7.45
OPERF Policy Benchmark					*11.73*	*11.73*	*11.55*	*4.40*	*7.09*	*8.13*	*7.92*	*8.12*
Value Added					(6.01)	(6.01)	(5.71)	(1.08)	0.18	(0.78)	(0.73)	(0.67)
Oregon Reference Portfolio					*11.29*	*11.29*	*13.79*	*2.59*	*4.88*	*6.70*	*6.54*	*6.80*
Public Equity	22.5-32.5%	27.5%	$ 16,443,608	17.3%	17.34	17.34	18.55	6.40	9.65	10.25	8.99	9.38
MSCI ACWI IMI Net					*16.37*	*16.37*	*18.95*	*4.90*	*8.09*	*9.67*	*8.78*	*9.00*
Private Equity	17.5-27.5%	20.0%	$ 25,185,382	26.5%	4.11	4.11	5.24	3.86	12.26	12.36	12.99	12.14
Russell 3000+300 Bps Qtr Lag					*38.41*	*38.41*	*31.02*	*13.37*	*18.59*	*18.56*	*17.03*	*16.12*
Total Equity	45.0-55.0%	47.5%	$ 41,628,990	43.8%								
Fixed Income	20-30%	25.0%	$ 22,104,623	23.3%	2.62	2.62	4.80	(0.86)	(0.87)	0.78	1.81	2.00
Oregon Custom Fixed Income Benchmark					*1.25*	*1.25*	*3.37*	*(2.41)*	*(2.03)*	*(0.24)*	*1.01*	*1.31*
Real Estate	9.0-16.5%	12.5%	$ 13,453,345	14.2%	(3.99)	(3.99)	(7.15)	1.15	5.36	4.81	5.61	6.70
Oregon Custom Real Estate Benchmark					*(8.04)*	*(8.04)*	*(10.49)*	*(1.04)*	*2.44*	*2.05*	*3.21*	*5.10*
Real Assets	2.5-10.0%	7.5%	$ 10,024,111	10.5%	10.06	10.06	8.92	11.93	13.66	10.35	7.77	6.28
CPI +4%					*6.99*	*6.99*	*7.23*	*8.37*	*9.10*	*8.35*	*7.72*	*7.11*
Diversifying Strategies	2.5-10.0%	7.5%	$ 4,904,513	5.2%	7.65	7.65	4.15	9.60	9.37	4.69	1.40	2.44
HFRI FOF: Conservative Index					*6.52*	*6.52*	*6.00*	*3.99*	*4.88*	*5.20*	*4.47*	*3.75*
Opportunity Portfolio	0-5%	0%	$ 2,919,042	3.1%	11.15	11.15	12.50	8.63	12.04	11.66	10.01	8.85
Opportunity Custom Benchmark					*11.73*	*11.73*	*10.93*	*11.20*	*11.49*	*10.46*	*9.51*	*8.67*
Cash w/Overlay	0-3%	0%	$ 38,946	0.0%	5.62	5.62	5.54	3.83	2.88	2.62	2.63	2.14
91 Day Treasury Bill					*5.25*	*5.25*	*5.13*	*3.89*	*2.92*	*2.46*	*2.35*	*1.77*

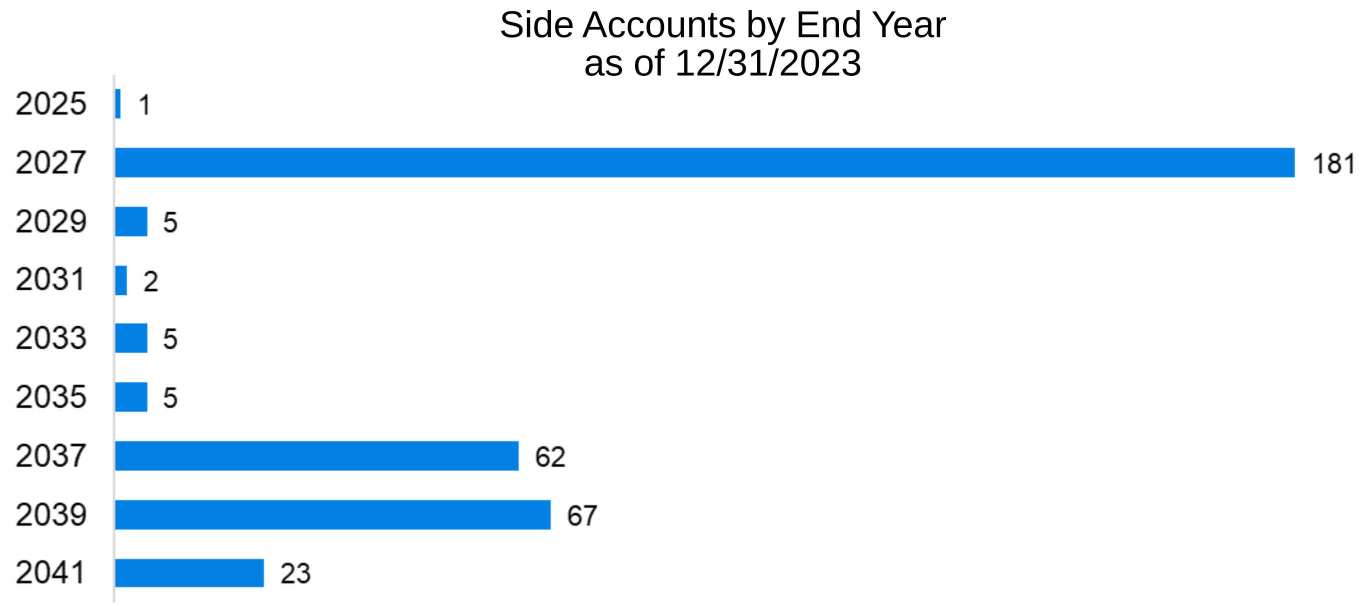
Considerations in Setting the Return Assumption

- Preliminary indications are that capital market outlooks in early 2025 produce slightly lower expected returns than at the last assumption review
  - May still be at or above the current 6.90% assumption
- Current year-to-date market losses and heightened trade policy uncertainty are not reflected in the beginning-of-year outlooks
- Even if median forward-looking expectations are above the current 6.90% investment return assumption, the Board may consider leaving unchanged again

Side Account & Pre-Pooling Adjustments

Side Accounts

- As of December 31, 2023, 231 employers had at least one side account, with a combined total of 352 separate side accounts
- Of these, 181 (51%) have an amortization end period of December 31, 2027
  - No rate offset will be included for these side accounts in the 2027-2029 employer rates
  - PERS will work with employers to use the remaining account balance after July 1, 2027



Pre-SLGRP & Transition Liability Rate Charges / (Offsets)

- Pre-SLGRP calculated at time SLGRP was formed
  - Easier to grasp with only two different rates
    - Local government employers – uniform offset – 0.57% of pay for 2025-2027
    - State and community colleges – uniform charge – 0.53% of pay for 2025-2027
  - **Offsets and charges scheduled to expire at end of 2027-2029 biennium**

- Transition liability / (surplus) – employer-specific rate charge / (offset)
  - Each liability / (surplus) established with goal of equitable pooling
    - Calculation based on time of joining a pool
  - Much more significant variation in magnitude from employer to employer
  - Greater potential for biennium-to-biennium change
  - **Most offsets and charges scheduled to expire at end of 2027-2029 biennium**
    - Employers joining SLGRP 12/31/2009 or later are on an 18-year charge / (offset) schedule

Pooling-Related Rate Charges / (Offsets)

- From the detailed report PERS provides to each employer (Multnomah County example)

Employer Contribution Rates Effective July 1, 2025

	Payroll				
	Tier One/Tier Two			OPSRP	
	Default All Tier One/Tier Two Payroll	Optional Separate Rates General Service	Optional Separate Rates Police & Fire	General Service	Police & Fire
Pension					
Normal cost rate	16.79%	15.07%	22.19%	10.47%	15.74%
Tier One/Tier Two UAL rate [1]	12.46%	12.46%	12.46%	12.46%	12.46%
Multnomah Fire District #10 UAL rate	0.06%	0.06%	0.06%	0.06%	0.06%
OPSRP UAL rate	2.69%	2.69%	2.69%	2.69%	2.69%
Pre-SLGRP pooled liability rate [2]	(0.57%)	(0.57%)	(0.57%)	(0.57%)	(0.57%)
Transition liability/(surplus) rate [3]	(0.86%)	(0.86%)	(0.86%)	(0.86%)	(0.86%)
Side account rate relief [3]	(3.20%)	(3.20%)	(3.20%)	(3.20%)	(3.20%)
Member redirect offset [4]	(2.40%)	(2.40%)	(2.40%)	(0.65%)	(0.65%)
Net employer pension contribution rate	**24.97%**	**23.25%**	**30.37%**	**20.40%**	**25.67%**
Retiree Healthcare					
Normal cost rate	0.04%	0.04%	0.04%	0.00%	0.00%
UAL rate	(0.04%)	(0.04%)	(0.04%)	0.00%	0.00%
Net retiree healthcare rate	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Total net employer contribution rate	**24.97%**	**23.25%**	**30.37%**	**20.40%**	**25.67%**

1 *Includes any impact of rate collar developed in the system-wide actuarial valuation report.*

2 *The side account rate relief shown may be reduced such that the net pension contribution rate does not go below 0.00%.*

3 *Redirected member contributions under Senate Bill 1049 (2.50% of payroll for Tier One/Tier Two and 0.75% of payroll for OPSRP) will offset employer contribution rates. Redirect does not apply to members with monthly pay below a threshold. The values shown in the table incorporate an estimate of the effect of this limitation.*

Side Accounts and Pooling-Related Charges/Offsets

- With the previous experience study, the PERS Board adjusted amortization policies to better coordinate upcoming expirations in:
  - Side accounts
  - Pre-SLGRP & Transition liability/surplus

- Rate adjustments from both sources become more volatile as they approach their conclusion
  - Short period to reflect differences between actual experience and assumptions built into the rate adjustment
  - Sources of differences include investment returns (affects side accounts) and employer payroll (affects both)

- Employers with significant adjustments approaching expiration should prepare accordingly
  - Most transition liability/surplus charges or offsets will expire July 1, 2029; these can be significant elements of the total contribution rate for some employers
  - In addition, if an employer has experienced significant payroll growth, the balance of a Transition liability/surplus may draw down and expire ahead of schedule

Agenda for Upcoming Experience Study Presentations

- May 28: Assumed rate
  - Joint board meeting with Oregon Investment Council (OIC)
  - Outlooks from OIC's consultants, updates to Milliman's model

- May 30: Economic assumptions, rate-setting methods
  - Inflation and system payroll growth
  - Amortization and contribution rate collaring

- July 25: Demographic assumptions, Board decisions
  - Member-specific assumptions based on study of recent PERS experience
  - Assumptions and methods adopted will be used for:
    - 12/31/2024 actuarial valuation with advisory 2027-2029 contribution rates
    - 12/31/2025 actuarial valuation with 2027-2029 contribution rates proposed for adoption

Appendix

Certification

This presentation discusses actuarial methods and assumptions for use in the valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”). For the most recent complete actuarial valuation results, including cautions regarding the limitations of use of valuation calculations, please refer to our formal Actuarial Valuation Report as of December 31, 2023 (“the Valuation Report”) published on September 19, 2024. The Valuation Report, including all supporting information regarding data, assumptions, methods, and provisions, is incorporated by reference into this presentation. The statements of reliance and limitations on the use of this material is reflected in the actuarial report and still apply to this presentation. The Valuation Report should be referenced for additional detail on the assumptions, methods, and plan provisions underlying this presentation.

In preparing this presentation, we relied, without audit, on information (some oral and some in writing) supplied by the System’s staff. This information includes, but is not limited to, statutory provisions, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different, and our calculations may need to be revised.

Actuarial assumptions, including discount rates, mortality tables, and others identified in this report, and actuarial cost methods are adopted by the PERS Board, which is responsible for selecting the plan’s funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods, and assumptions used in this valuation are those that have been so adopted and are described in this report. The System is solely responsible for communicating to Milliman any changes required thereto. All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which, in our professional opinion, are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System and are expected to have no significant bias . The valuation results were developed using models intended for valuations that use standard actuarial techniques. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice.

This valuation report is only an estimate of the System’s financial condition as of a single date. It can neither predict the System’s future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Certification

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or modifications to contribution calculations based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. Our annual financial modeling presentation to the PERS Board should be referenced for additional analysis of the potential variation in future measurements. Our December 31, 2023 Actuarial Valuation Report provides additional discussion of the System's risks. The PERS Board has the final decision regarding the selection of the assumptions and actuarial cost methods.

Milliman's work is prepared solely for the internal business use of the Oregon Public Employees Retirement System. Milliman does not intend to benefit or create a legal duty to any third-party recipient of this report. No third-party recipient of Milliman's work product should rely upon this report. Such recipients should engage qualified professionals for advice appropriate to their own specific needs. No third-party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are retirement actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel. The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board and the *Code of Professional Conduct* and *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States* published by the American Academy of Actuaries. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Appendix

Actuarial Basis

Capital Market Assumptions - Milliman

For this purpose, we considered the Oregon PERS Fund to be allocated among the model's asset classes as shown below. This allocation is based on input provided by Meketa (OIC's primary consultant) and reflects changes to the OIC's target allocation for the Oregon PERS fund adopted at the January 25, 2023 OIC meeting.

Reflects Milliman's capital market assumptions as of December 31, 2024.

	Annual Arithmetic Mean	20-Year Annualized Geometric Mean	Annual Standard Deviation	Policy Allocation
Global Equity	8.18%	6.63%	18.30%	27.500%
Private Equity	12.46%	8.38%	30.00%	25.500%
Real Estate	8.00%	6.69%	16.79%	12.250%
US Core Fixed Income	4.70%	4.61%	4.44%	25.000%
Hedge Fund – Macro	5.78%	5.52%	6.11%	5.625%
Hedge Fund – Equity Hedge	6.87%	6.01%	11.81%	0.625%
Hedge Fund – Multistrategy	6.36%	5.90%	8.74%	1.250%
Infrastructure	8.13%	6.75%	17.18%	1.500%
Master Limited Partnerships	8.89%	5.62%	26.46%	0.750%
US Inflation (CPI-U)	2.32%	2.31%	1.46%	**N/A**
Fund Total (reflecting asset class correlations)	**8.22%**	**7.43%***	**13.48%**	**100.00%**

* The model's 20-year annualized geometric median is **7.39%**.

Retirement System Risks

- Oregon PERS, like all defined benefit systems, is subject to various risks that will affect future system liabilities and contribution requirements, including:
  - **Investment risk**: the potential that investment returns will be different than assumed
  - **Demographic risks**: the potential that mortality experience, retirement behavior, or other demographic experience for the system membership will be different than assumed
  - **Contribution risk**: the potential that actual future contributions will be materially different than expected, for example if there are material changes in the system's covered payroll
- The results of an actuarial valuation are based on one set of reasonable assumptions, but it is almost certain that future experience will not exactly match the assumptions.
- Further discussion of system risks and historical information regarding system experience are shown in our annual actuarial valuations. In addition, our annual financial modeling presentation to the PERS Board illustrates future outcomes under a wide range of future scenarios reflecting variation in key risk factors.