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OVERVIEW OF RATE COLLARING POLICY

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

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Introduction

- Today's presentation provides overview and historical background on the contribution rate collar method used to determine PERS employer rates
  - For informational purposes; no Board action required

- Rate collaring was among methods and assumptions Board adopted in October 2019 to be used in calculating 2021-2023 contribution rates

- The rate collar affects the timing of when OPERF asset gains and losses, along with the effect of assumption changes, are reflected in employer contribution rates
  - Given recent market turbulence, it is important to continue to assess how the current rate collar design will function in the event of a significant downturn

Valuation Process and Timeline

- Actuarial valuations are conducted annually
  - Alternate between “rate-setting” and “advisory” valuations
- Board adopts contribution rates developed in rate-setting valuations, and those rates go into effect 18 months subsequent to the valuation date

Valuation Date	Employer Contribution Rates
12/31/2017 →	July 2019 – June 2021
12/31/2019 →	July 2021 – June 2023
12/31/2021 →	July 2023 – June 2025

System-average weighted total* pension-only rates

2009-2011 rates set **prior to economic downturn**

2011-2013 rates first to reflect **-27%** return in 2008

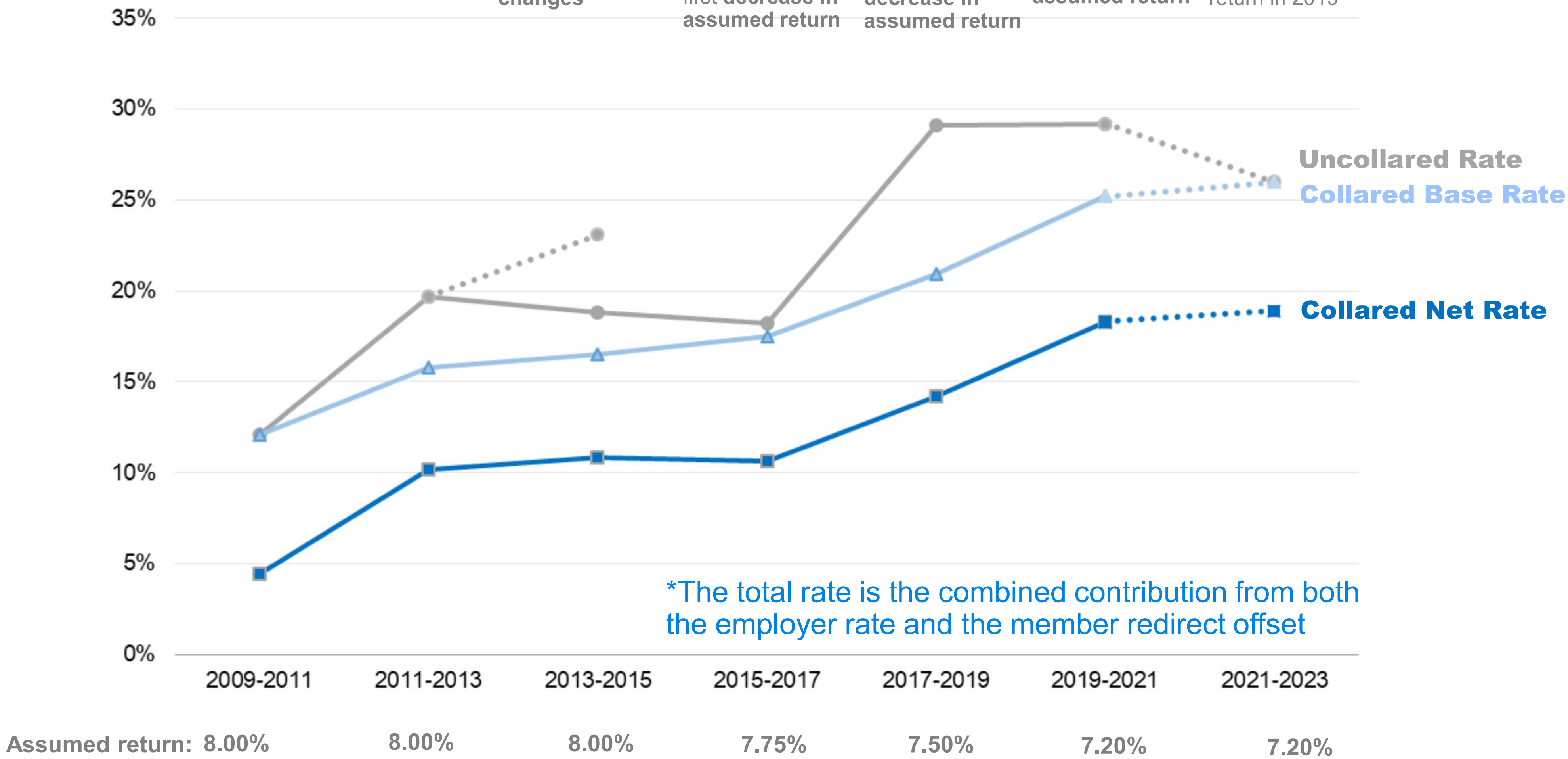
2013-2015 shown before (dotted line) and after (solid line) **legislated changes**

2015-2017 set **pre-*Moro*** reflecting 2012 (**+14.3%**) & 2013 (**+15.6%**) returns, first **decrease in assumed return**

2017-2019 set **post-*Moro***, reflecting 2015 return (**+2.1%**) and second **decrease in assumed return**

2019-2021 reflects **+15.4%** return in 2017 and third **decrease in assumed return**

2021-2023 are **preliminary estimates** of **total rates** *before reduction for effect of* ***SB 1049 member redirect offset*** *contributions*; reflects **+13.6%** return in 2019



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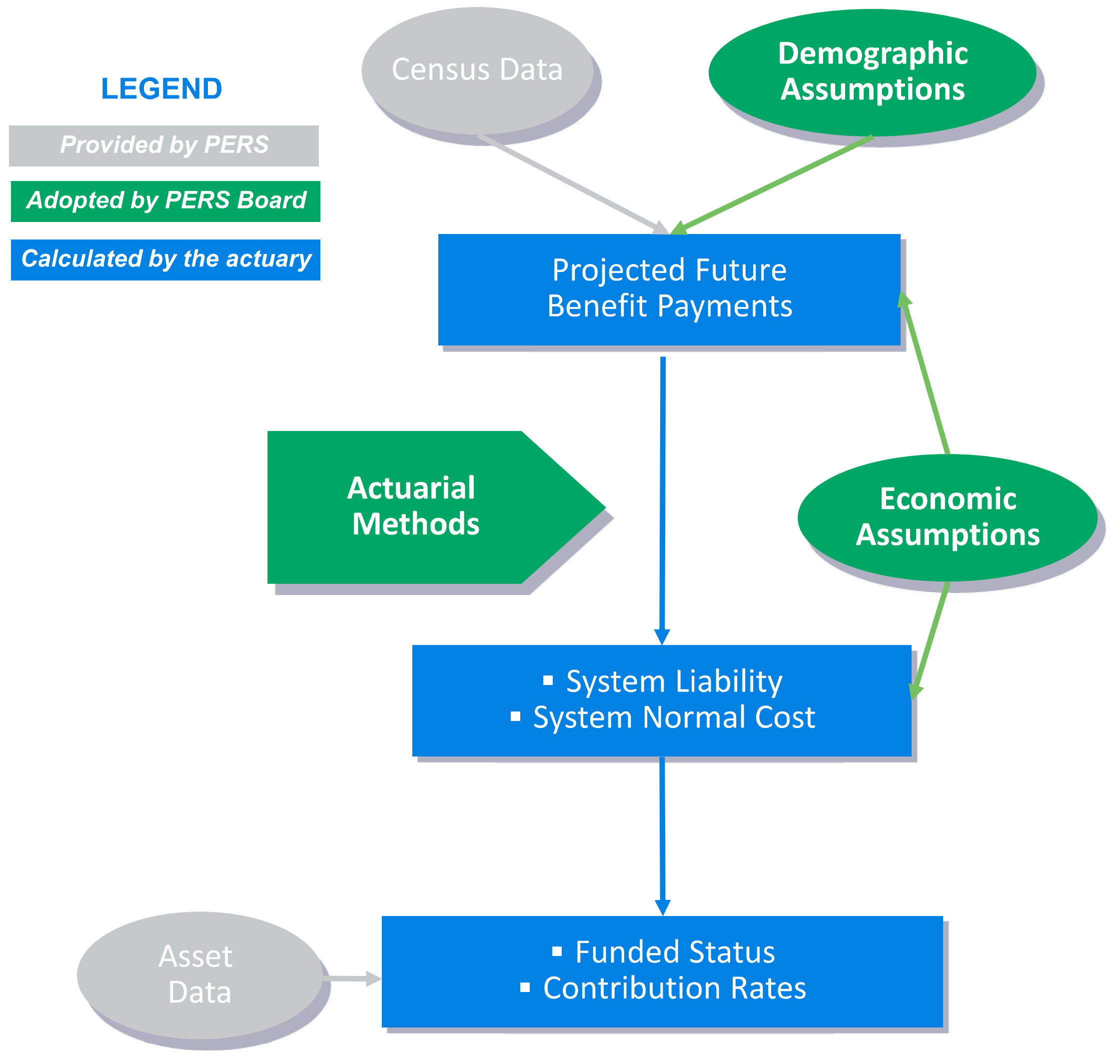
What is a rate collar?

- Rate collar: an **actuarial method** to set contribution rates

- 2007-2009 rates were the first to use a rate collar methodology
  - Collar development process during 2005 and 2006 included stochastic analysis to assess the collar's robustness in addressing a wide variety of possible future investment return scenarios

- The rate collar tries to balance competing articulated Board **objectives** for actuarial methods
  - Transparent
  - Predictable and stable rates
  - Protect funded status
  - Equitable across generations
  - Actuarially sound
  - GASB compliant

Rate-Setting Process



Step 1: Calculate an Uncollared Contribution Rate

- Calculate the **uncollared contribution rate** that:
  - Avoids UAL balance materially worsening in the near-term if actual future experience matches the assumptions used in calculating the UAL
  - Systematically returns PERS to 100% funded status if future experience matches assumptions

- The uncollared rate calculation uses best currently available market data
  - Fair market value of assets (instead of a smoothed asset measure)
  - Current capital market outlooks from actuary, investment consultant to Treasury

- Ideally, the uncollared rate is a contribution level based on model practices for assumptions and methods
  - The uncollared rate weights some of the articulated Board objectives listed on slide 4 more heavily than others

Step 2: Calculate a Collared Contribution Rate

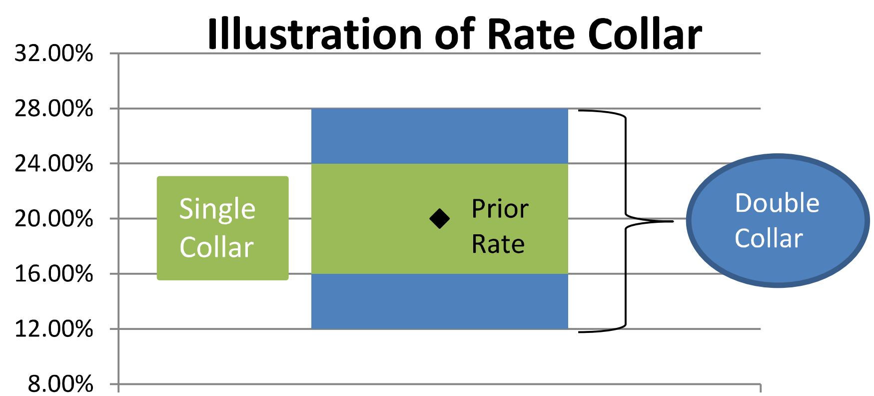
- If uncollared rate is well above the current rate charged, the initial increase in the rate actually charged is limited (or collared) by a formula
  - The rate charged to employers in the next biennium will be partway toward the uncollared rate

- The **collared rate** can temporarily be below the uncollared rate
  - Collaring systematically spreads large increases across multiple biennia
  - Additional market data after the first collared increase is used in later calculations

- The collar width should be calibrated to balance competing objectives
  - Too wide: same as having no collar, insufficiently stable or predictable
  - Too narrow: harms funded status, generationally inequitable, actuarially unsound in some scenarios for actual future experience

Width of the Rate Collar - Current Structure

- The maximum change typically permitted by the collar is:
  - 20% of the rate currently in effect (3% of payroll minimum collar width)
- If funded status excluding side accounts is 60% or lower, the width of the collar doubles
  - 40% of rate currently in effect (6% of payroll minimum collar width)
- If the funded status is between 60% and 70%, the collar size is pro-rated between the single collar width and the double collar width



- Collars are calculated at a rate pool level and limit the biennium to biennium increase in the UAL Rate for a given rate pool

What Has Changed Since the Collar Was Designed?

- The width of the single collar is the wider of the larger of:
  - 20% of the rate currently in effect, or
  - 3% of payroll

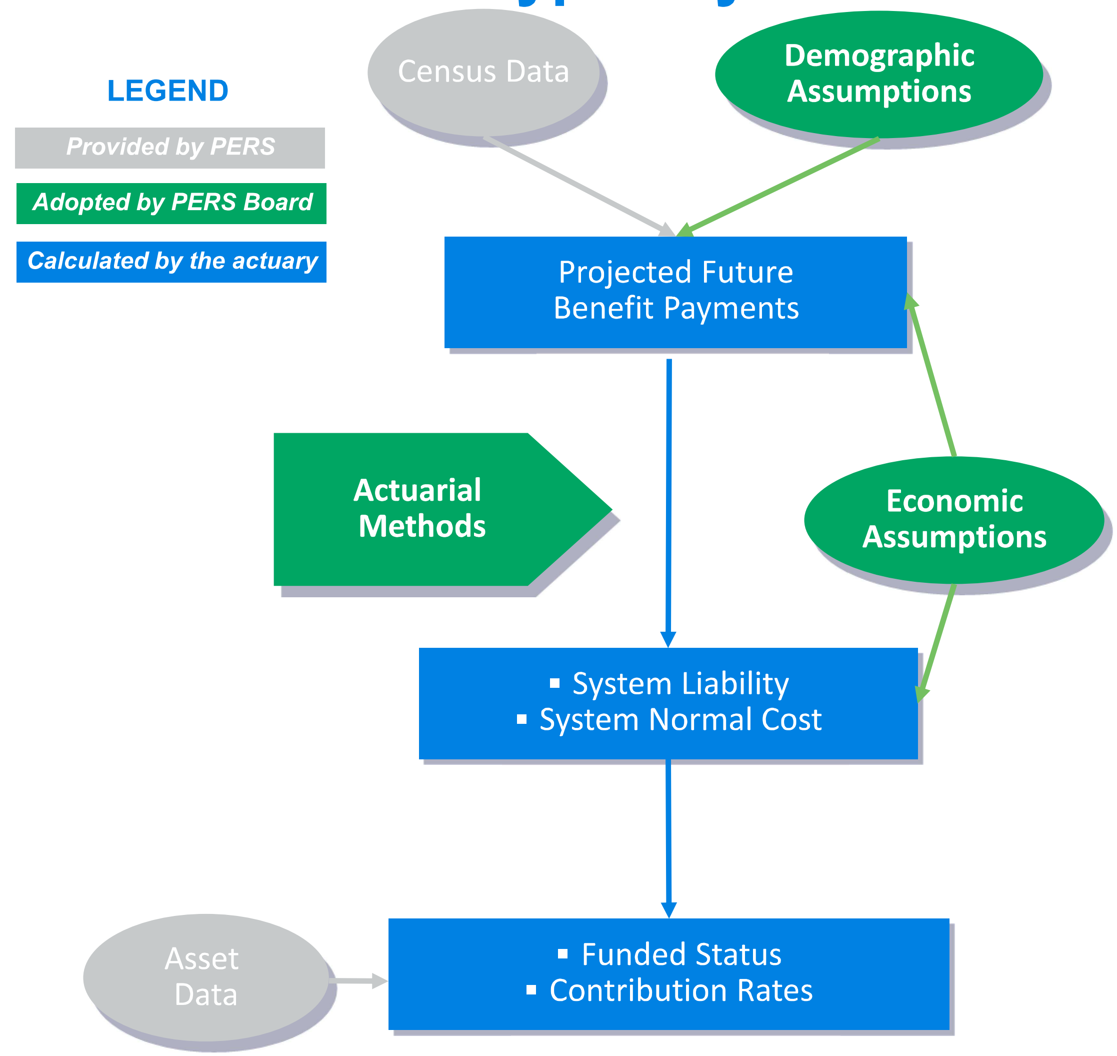
- When designed and adopted in 2005 – 2006 the "rate currently in effect" for most employers was below 15% of payroll, so:
  - The single collar's width was effectively 3% of payroll, and
  - The width of a double collar was effectively 6% of payroll

- Many employers' Tier 1/Tier 2 "rate currently in effect", which is higher than the system average rate shown on slide 3, is now near 30% of payroll, so:
  - The single collar's width is effectively 6% of payroll, and
  - The width of a double collar is effectively 12% of payroll

- One-time re-amortization of Tier 1/Tier 2 UAL over 22 years per SB 1049
  - Lowers the uncollared rate; delays achievement 100% funded status

What do systems that do not use a collar typically do?

- Most systems smooth **inputs**, rather than use a rate collar which smooth **outputs**
  - This typically includes deferred systematic recognition of investment gains and losses over time
- Manage rates via selection of assumptions and methods, which can lead to:
  - Optimistic rather than prudent actuarial assumptions, particularly the investment return assumption
  - Methods, especially amortization periods, that are far from best practice
- Often, there is no calculation of a rate based on prudent assumptions, best practice methods, and current asset levels



Wrap-up

- Rates in effect for 2021-2023 will be based on asset and liability levels as of December 31, 2019
  - System-average estimates of those rates are shown on slide 3
  - Employer rates proposed for adoption will be presented on October 2nd

- Under the standard rate-setting calendar, the effects of the current investment downturn would first be reflected in 2023-2025 rates

- Milliman can provide detailed analysis of any potential changes to the rate collar in subsequent meetings, if alternatives are identified for consideration
  - Would inform Board's next review of methods and assumptions in 2021
  - The annual financial modeling, currently slated for the December 4th meeting, would be a natural time to analyze alternatives using our variable return model that analyzes 10,000 possible scenarios for future investment returns

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Appendix

Certification

This presentation summarizes information provided in valuations for the Oregon Public Employees Retirement System ("PERS" or "the System") and prior presentations to the PERS Board, including the December 2019 and January 2020 presentations to the PERS Board. Those presentations, along with the December 31, 2018 System-Wide Actuarial Valuation Report, should be referenced for additional detail on the assumptions, methods, and plan provisions underlying these results.

In preparing this report, 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, employee 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.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the System.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as 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 additional cost or contribution requirements 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. The PERS Board has the final decision regarding the appropriateness of the assumptions.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. The computations prepared for other purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals.

Certification

The calculations in this report have been made on a basis consistent with our understanding of the plan provisions described in the appendix of this report. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

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 its work product.

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 pension 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. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.