



**OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM
BOARD MEETING AGENDA**

**Friday
July 26, 2019
10:00 A.M.**

**PERS
11410 SW 68th Parkway
Tigard, OR**

ITEM		PRESENTER
A. Administration		
1.	May 31, 2019 Board Meeting Minutes	SHENOY
2.	Director's Report	OLINECK
	a. Forward-Looking Calendar	
	b. OPERF Investment Report	
	c. Budget Execution Report	
3.	OSGP Advisory Committee Appointments	SMITH
B. Administrative Rulemaking		
1.	Adoption of Receipt Date Rule	VAUGHN
C. Action and Discussion Items		
1.	2019 Legislative Session Review and 2019-21 Budget Update	
	a. Session Overview and 2020 Preview	TAYLOR
	b. SB 1049 Implementation Update	ELLEDGE-RHODES
	c. 2019-21 Budget	GABRIEL
2.	Valuation Methods and Assumptions Including Assumed Rate of Return	MILLIMAN
3.	Preliminary Adoption of Assumed Rate Rule	VAUGHN

Public testimony will be taken on action items at the Chair's discretion.

Please submit written testimony to PERS.Board@state.or.us (three days in advance of the meeting is preferred.)

<http://www.oregon.gov/PERS/>

2019 Meetings: October 4, December 6*
2020 Meetings: January 31, March 30*, May 29, July 31*, October 2, December 4*
 *Audit Committee planned for post-Board meeting

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM BOARD MEETING MINUTES

May 31, 2019

Board members present:

Chair Sadhana Shenoy, Vice Chair Lawrence Furnstahl, Stephen Buckley, Christelle deAsis, and Steve Demarest were present.

Staff present:

Andy Kicza, Anne Marie Vu, Bryan Wynn, Colin Campi, Danielle Keyser, Dean Carson, Denise Helms, Elizabeth Rossman, Janice Richards, Jason Stanley, Jordan Masanga, Karen Chavez, Katie Brogan, Kevin Olineck, Marjorie Taylor, Matt Rickard, Neil Jones, Sam Paris, Stephanie Vaughn, Tami Dohrman, Yong Yang, Yvette Elledge-Rhodes

Others present:

Alex Bowers, Aruna Mash, Amy Crooks, Bob Burket, Carol Samuels, Cindy Moore, David Barenberg, Debra Grabler, Douglas Berg, GayLynn Bath, Gordon Hoberg, Lynn Groff, Hintry Getz, Jardon Jaramillo, Jan Petrilla, Jeff Gudman, Jennifer Cooperman, John Thomas, Josh Eggston, Karl Cheng, Kali Leinenbauch, Kevin McCart, Matt Larrabee, Michelle Kunec-North Michelle Taylor, Molly Buzkson, Nancy Brewer, Nate Carter, Nathan Klinkhammer, Robin Richardson, Scott Preppernau, Shauna Tobiasson, Shelly Taylor, Michelle Kunec-North, Ted Sickinger, Trudy Vidal

Chair Sadhana Shenoy called the meeting to order at 10:00 a.m.

ADMINISTRATION

A.1. MEETING MINUTES OF APRIL 1, 2019

Board member Buckley suggested that, going forward, any changes made to the PERS Board meeting minutes be specifically listed. Board member Buckley moved to approve the minutes submitted from the April 1, 2019 PERS Board meeting. Board member Demarest seconded the approval of the minutes. The motion passed unanimously.

A.2. DIRECTOR'S REPORT

Director Kevin Olineck presented the Director's Report. Olineck noted that PERS staff has been preparing for SB1049 implementation. He highlighted some of the contents of the report.

Olineck reviewed the forward looking calendar. The proposed 2020 meeting dates are listed and are scheduled to start at 10:00am. He noted that the joint meeting with the Oregon Investment Council (OIC) will be on Wednesday, June 5, 2019.

OPERF investment report for the periods ending April 2019 showed earnings of 6.09%.

The budget execution report showed a projected positive variance of 4.3% of the operating budget. PERS presented the Phase II Budget. The budget working sessions will be scheduled soon. A fiscal impact statement for SB1049 was put together. There would need to be an end of session bill to fund the project.

A.3. BOARD SCORECARD REPORT ON AGENCY MEASURES

Olineck noted that PERS is working through all agency measures to refine all processes and measures. These measures were developed about 6 years ago, so it is time for a refresh.

Matt Rickard and Bryan Wynn of the PERS Outcome-Based Management System (POBMS) Council presented the Board Scorecard Report on Agency Performance Measures, of which 54% of the reported measures are in the green range for the first quarter of 2019.

The call center technology is being reviewed, however it brings up more questions as to the benefit of implementing a call back feature. It was reported that 87% of the system downtime was due to long running batches.

The next Board Scorecard will be presented at the December meeting. No board action was required.

ADMINISTRATIVE RULEMAKING

Stephanie Vaughn, Policy Analysis and Compliance Section Manager, presented.

B.1. NOTICE OF RECEIPT DATE RULE

Vaughn presented notice of rulemaking for Receipt Date Rule, OAR 459-005-0220, Receipt Date for Reports, Documents, Remittances, Payments, Data, and Requests. This rule will add a receipt date for electronic submissions of data made through PERS Online Member Services. A rulemaking hearing will be held June 25, 2019, at 2:00 p.m. at PERS headquarters in Tigard. The public comment period ends July 2, 2019, at 5:00 p.m. No board action was required.

B.2. NOTICE OF ASSUMED RATE RULE

Vaughn presented notice of rulemaking for Assumed Rate Rule, OAR 459-007-0007, Assumed Rate. A rulemaking hearing will be held June 25, 2019, at 2:00 p.m. at PERS headquarters in Tigard. The public comment period ends July 2, 2019, at 5:00 p.m. No board action was required.

B.3. ADOPTION OF STUDENT EMPLOYEES RULE

Vaughn presented the adoption of modifications to the Student Employees rule. A rulemaking hearing was held April 22, 2019, at 2:00 p.m. at PERS headquarters in Tigard. No members of the public attended. The public comment period ended May 3, 2019, at 5:00 p.m. No public comment was received. Board member Demarest motioned to adopt modifications to the Student Employees rule, as presented. Vice Chair Furnstahl seconded the motion. The motion passed unanimously.

ACTION AND DISCUSSION ITEMS

C.1. LEGISLATIVE UPDATE

Marjorie Taylor, Senior Policy Director, presented.

Taylor provided an update on legislation impacting PERS statutes, referring to retirement or to PERS. There are 27 that directly impact PERS statutes, or refer to PERS, that have been approved by both chambers, or remain in committees that may take some sort of action on them. The Joint Ways and Means Subcommittee on Capital Construction remains the focus of conversations on

PERS reforms. The Governor, on April 12, and legislature, on May 10, each introduced proposals for discussion.

On May 21, the Joint Ways and Means Capital Construction subcommittee approved an amendment to Senate Bill 1049 that includes a variety of provisions impacting members and employers. SB1049 was approved by the House. The two major pieces are the IAP redirect and the re-amortization of the Tier One/Tier Two UAL over a 22-year period. The amortization of the OPSRP UAL would remain at 16-years. Other provisions are being evaluated by staff. There are a number of bills with provisions that have been incorporated into SB1049.

C.2. IAP TDF IMPLEMENTATION UPDATE

Yvette Elledge-Rhodes, Deputy Director, presented.

Elledge-Rhodes' update included IAP TDF Implementation background, project end date, budget, project activities, member communications, and staff recommendation of TDF modifications. Staff recommends the Board pass a motion to adopt the addition of a new 2065 TDF and the consolidation of the 2020 TDF into the Retirement Allocation Fund effective December 31, 2019.

It is not clear if this decision is within the board's jurisdiction; Nate Carter and Stephanie Vaughn will seek clarification. The board should at least be aware of, and agree with, the change.

Board member deAsis motioned to adopt the addition of a new 2065 TDF and consolidation of the 2020 TDF into the RAF effective December 31, 2019. Vice Chair Furnstahl seconded the motion. The motion passed unanimously.

C.3. 2020 RETIREE HEALTH INSURANCE PLAN RENEWALS AND RATES

Furnstahl recused himself from participating in this conversation, given his association with OHSU, and left the room.

Karen Chavez, PERS Health Insurance Program (PHIP) Manager, presented the 2020 PHIP Plans and Rates.

Buckley moved to approve the proposed PHIP RFP contract awards, benefits, surcharges and rates for the 2020 Plan Year, as presented in Item C.3.Attachment 1: PHIP 2020 Proposed Rates. Demarest seconded the motion. The motion passed unanimously.

Furnstahl rejoined the meeting at this time.

C.4. OVERVIEW OF ACTUARIAL METHODS & ECONOMIC ASSUMPTIONS

Public Testimony on item C.4. Overview of Actuarial Methods & Economic Assumptions was given by Douglas Berg from Eugene; John Thomas (former Board Chair) from Eugene; and Jeff Gudman from Lake Oswego. They were each given 5 minutes to speak. Jeff Gudman read from Exhibit 1.

Scott Preppernau and Matt Larrabee of Milliman presented economic assumptions and system funding methods.

The presentation reviewed inflation and system payroll growth, the assumed rate, and actuarial methods including amortization and collaring policy. At the July 2019 meeting, demographic assumptions will be discussed before asking for adoption of the assumptions and methods for the current and next year's advisory valuation. They will come back with the 2018 valuations results in October 2019. No board action was required.

Chair Shenoy adjourned the board meeting at 12:22 a.m.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Kevin Olineck".

Kevin Olineck, Director

PERS Testimony
April 1, 2019
Citizen Comment

Good morning,

My name is Jeff Gudman. I reside at 4088 Orchard Way in Lake Oswego. I am a 2018 2 term limited as of December 2018 member of the Lake Oswego City Council.

Thank you for the opportunity to offer some thoughts and to also thank you for your service to the residents of Oregon.

Except for schooling I have resided in Oregon my entire life. I have a B.A. in Economics from Pomona College, one of the Claremont Colleges, and an M.B.A. from the University of Pennsylvania, Wharton School of Business. I provide this background information, not to impress, but to let you know that I can speak “number.” Perhaps not “actuarial number”, but “number” none the less. It also means when I read Present Value of Future Normal Costs and Unfunded Actuarial Liability is used for determining the Long Term Contribution Effort, I have some understanding of what that means.

I also want to acknowledge and thank the PERS Board and the members of the PERS team for the excellent and informative website. PERS by the Numbers is very good and is just one example of the great information provided.

I believe that prior to 2003 and the creation of what I call Tier 3 employees and continuing today is a retirement goal for a person with 30 years of service is to achieve 50% of final average salary pension. Social security plus whatever a person has personally set aside either through an IRA or other savings will be in addition to the government service portion. In effect a three-legged retirement stool.

Part of the reason for the challenges PERS faces today is the 50% goal for 30 years of government service was exceeded in the past. In some cases, quite dramatically.

With the creation of Tier 3 we now have a combined defined benefit and defined contribution government service plan. One of the three legs of the retirement stool.

For an employee, not including police and fire, beginning work today and working 30 years, they will receive upon retirement a defined benefit of 1.5% per year of employment times 30 years or 45% of final average salary. The defined contribution portion comes from the 6% IAP dollars (whether or not the employee contributed the 6%).

Again, the long-standing goal being 50% of final average salary for a 30-year employee.

So, how are we doing? If you look at the 6% IAP dollars at actual rates of return since 2003 and at slightly less than the system's projected earnings rate going forward (7.2%) it

appears it will generate at least 16% or more of Final Average Salary for a person whose wages grow at 3.5% year, who retires after 30 years at age 65 and who gets the benefit on withdrawing the funds over their expected lifetime on an annuitized basis. A 45% defined benefit plus 16% defined contribution equals 61% which exceeds the 50% goal.

Unfortunately, PERS by the Numbers and other information on the website does not appear to provide that information. I understand the reluctance of the PERS team to present a specific retirement goal percentage for a new employee given the vagaries of investment returns going forward. It is significantly easier to provide the per cent goal for a defined benefit program. Presenting an explicit goal under the current program or to even state a target or goal might create legal challenges.

Nonetheless, the goal is in place and with a goal of 50% of Final Average Salary for 30 years of service, it will be helpful for this body and the public to know, subject to all the usual assumptions and qualifications whether or not the goal for a new employee will be met, not met or exceeded.

This brings me to my request. The information provided by the PERS staff on the web page and elsewhere is very good and necessary, but it is not sufficient.

The ask is...Is the goal still 50% for somebody beginning work today and working thirty years. What are the assumptions behind the goal? How soon can this information be generated, brought to this body, debated and subsequently posted to the website?

We need those numbers to better plan for our future. This also will give additional assurance to the public we are being good stewards of the public's money.

I am recommending you make it possible to better inform not only my past colleagues on council, but all governing bodies in the state. Most importantly our citizens will have a clearer understanding. They are our bosses and the ones to whom we are responsible.

If I am mistaken and that information (the total of the Defined Benefit and Defined Contribution produces a retirement percentage of Final Average Salary of X% for a person starting work today and working 30 years) is available on the web site, I apologize for taking up your time. If I am not mistaken, I hope the information will be provided.

Thank you.



OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM DIRECTOR'S REPORT

KEVIN OLINECK, DIRECTOR

NOTEWORTHY CHANGES HIGHLIGHTS OF THE LAST YEAR

This Director's Report tries to encapsulate, at a high level, noteworthy changes that have taken place since the last board meeting, while providing a retrospective of some significant accomplishments of the past year.

I noted, in the May Director's Report, that it was at that meeting a year ago, when I was confirmed as Director. I officially began on July 16, 2018 and am very grateful for the opportunity to serve as the PERS Director. In that time, PERS staff have not only made great progress with standard operational initiatives, but also made significant progress on strategic initiatives. The following are three strategic initiatives that deserve to be highlighted, with staff publicly acknowledged for their efforts. I will be highlighting other successes in subsequent Director's Reports.

PERS BRANDING

One of the most obvious changes within PERS over this past year is our branding initiative. I believe that the new PERS brand is the beginning of many positive communications initiatives. This first step helps to engage and support our members in making informed retirement decisions and engenders a broader role for PERS as a retirement education resource. I believe we have created an identity that will personalize PERS, instill a sense of ownership among our members, and promote the agency as an accessible, comprehensive, and easy-to-use resource.

CONTINUITY MANAGEMENT/DISASTER RECOVERY

PERS has been working diligently on establishing a Continuity Management Program which encompasses our Continuity of Operations Plan, Business Recovery, and Disaster Recovery Plans. With the assistance of consultants, agency staff have made significant strides in establishing this program. We were successful in having the consultant provide a letter verifying that PERS has established an industry standard program. That said, there is recognition

that, while we now have the basics in place, there is still significant effort required to ensure that we continue to build out our Continuity Management Program.

INFORMATION SECURITY

Similar to Continuity Management, Information Security is one of the foundational initiatives that PERS needs to have in place. This instills in our stakeholders a sense of trust and confidence, assuring them that the data that we maintain is secure. Working collaboratively with the State Enterprise Security Office, staff made significant strides in building out our Information Security Program, which included changes from both a system and process point of view. We also received an external assessment that culminated in a letter from the assessor stating we have an industry best practice Information Security Program.

ADDRESSING FINDINGS

As the board is well aware, there have been legislative directives, as well as a Secretary of State Audit, which identified deficiencies in our Continuity Management as well as Information Security Programs. There were many sub-projects that encompassed the work on these two programs and I am very proud of our efforts in addressing those deficiencies. PERS has leapfrogged many other state agencies in our capabilities in both of these program areas and we have plans in place to continue to augment these capabilities.

PERS Continuity Management Tabletop Exercise

OBJECTIVE: In a "risk-free" simulated environment, validate the PERS Crisis Decision Making and Crisis Communications process and demonstrate an understanding of roles to maintain essential functions during a crisis event.

SCENARIO DESCRIPTION	PARTICIPANTS	BENEFITS
<p>Scenario: PERS experienced an electrical fire in the data center. DAS staff estimates 4-6 weeks to work through risk management and contract repair. TOS Manager estimates another 2-3 weeks to mount racks, place equipment, complete connectivity, bring systems back up, test reliability and restore data. PERS needs to plan for 6-9 weeks without the data center and facility access.</p> <ul style="list-style-type: none"> Move 1: Crisis Decision Making Move 2: Crisis Communications Move 3: Critical Functions Business Continuity Plans <p>Background: PERS experienced an electrical fire in the data center. One of the electrical outlets failed and a fire occurred. The fire suppression system worked well. However the UPS are unusable, wiring is shorted, systems are down, and there is smoke damage and damage to the sheet rock and ceiling tiles caused by the fire department in their effort to extinguish the fire. The fire department has turned the building over to the ISRO with the caveat that the building be inspected for safety.</p>	<p>Executive Leadership Team and Essential Staff responsible for:</p> <ul style="list-style-type: none"> Monthly Pension Roll Approved Retirement Applications Approved Disability Payments Active Health Insurance Eligibility and Subsidies Active Health Insurance Payments to Carriers 	<ul style="list-style-type: none"> Increased awareness of how a single crisis episode can have broad, enterprise-wide impact and consequences Greater understanding of value of proactive and consistent identification, analysis, and prioritization of key internal and external stakeholder relationships Improved understanding of PERS plans and procedures
<p>Move 1: Crisis Decisions</p> <p>Crisis Decisions: ELT must meet to discuss staffing and next steps. Essential and Non-essential staff have not been working to this point. Only staff currently working are response and recovery personnel.</p>	<p>Move 2: Crisis Communications</p> <p>Communication Challenge: State-wide media amplifies public frustration with the incident as the first of the month quickly approaches. Public pressures toward incident recovery quickly mount, demanding answers and a response to address the evolving crisis. The Governor notifies PERS that they must prepare a briefing on the latest recovery assessment and provide to the public.</p>	<p>Move 3: Critical Functions</p> <p>Physical and IT Challenges: Facility Team deems building still unsafe for use and will require more time. Data center is up and running and essential staff are working from Salem. Non-essential staff are still not working. Systems: ORION in support of critical functions is up however telephones are not available. There is no VPN access</p>

Facilitated Discussion and Hotwash

SENATE BILL 1049 (SB1049)

IMPLEMENTATION

SB1049 was signed into law on June 11. As will be described within agenda item C.1.b., the agency is working diligently to put into place a plan to implement the different components of the bill, some within some very short time lines.

The challenge for PERS is to not only implement this bill, but also continue to provide our members and employers with uninterrupted service, while working through the ramifications of SB1049. In addition to providing quality service to our stakeholders, we must also continue to move forward on other important initiatives that can't be deferred. Our work towards implementing an enterprise portfolio management practice will be an important element in being able to balance these competing objectives.

BUDGET

SIGNIFICANT OPERATIONAL CHANGES

Our budget was finalized as House Bill 5032. On June 12, the Legislative Fiscal Office (LFO) presented their proposal to the Joint Ways & Means General Government subcommittee with those proposals being approved by the full Joint Ways & Means Committee on June 14. Our budget was passed on June 29, as recommended by LFO, and is awaiting the Governor's approval.

While we will be covering the budget in item C.1.c, I thought it important to note the following significant operational changes that were made to our 2019-21 biennium budget proposal.

CENTERS OF EXCELLENCE REORGANIZATION

The LFO recommended we return in the February 2020 short session to seek approval on the Centers of Excellence Reorganization. The positions we were going to use to finance the reorganization were abolished as part of the LFO recommendations, as were the extra funds requested to deal with long-standing Work out of Class staffing issues. Additionally, our request to permanently fund our Communications Officer position was not approved. I am in discussions with the LFO to understand what the agency needs to do in order to resolve all of these staffing issues.

RISK & SECURITY MANAGEMENT

At the December 2018 Emergency Board meeting, the agency was given approval to hire two FTEs to assist in our ongoing risk and security management program. One FTE was for the Information Security Program (ISS8), while another was for the Continuity Management Program (OPA3). The agency had, subsequently, put forth a revised budget proposal, based on the Deloitte assessment, to further enhance the staffing required to run these programs. These additional FTEs were not approved. Additionally, the LFO recommended the funding required for external support for the

programs was to be "unscheduled" until such time as the agency could submit third party assessments evaluating whether we had established industry standard Cyber Security, Disaster Recovery, and Business Continuity Programs. We provided these letters to the LFO prior to the end of June and are hoping to have these funds scheduled and released in our next quarterly allotment.

The agency was requesting funding to build out an Enterprise Risk Management program and that resource request was denied. This impacts our ability to have a process in place that will ensure the agency has appropriately identified and rated all our enterprise risks as well as our ability to make sound risk-based decisions.

DEFERRED MAINTENANCE

The agency had originally requested the recommended amount - 2% of the value of the building or \$625,000. Prior to the LFO recommendations being finalized, we were able to provide the LFO with a detailed engineering report that articulated a greater need than the \$625,000. The LFO subsequently recommended that we receive \$1.1 million to deal with these deferred maintenance items.

BUSINESS INNOVATION PROGRAM

Our request to begin work on our long-term Enterprise Architecture was denied, however, we will be incorporating elements of this work into our SB1049 efforts to ensure that, to the greatest extent possible, we can build towards a more modern system architecture that will serve us well beyond the implementation of this bill.

SCHOOL DISTRICT UNFUNDED LIABILITY PROGRAM

In the Governor's Recommended Budget, the Governor had put in a request for \$100 million to fund the School District Unfunded Liability Program. This request was not approved. However, as part of SB 1049, there was a recommendation to provide \$100 million to the Employer Incentive Fund (which applies to all employers and not just school districts). The funds were ultimately approved.

CHANGES

IN THE EXECUTIVE LEADERSHIP GROUP

I am pleased to announce Richard Horsford joined us as our new Chief Financial Officer, effective July 11. Richard comes to us with CFO experience from the Social Services Sector and will be a strong addition to our Executive Leadership Team. I am excited to have him on board as we move into the 2019-21 biennium. I'd like to thank Tami Dohrman, who was our interim CFO for the past three months, for her leadership during that time, and her assistance with Richard's onboarding.

SAFETY

ENSURING A SAFE WORK ENVIRONMENT

While we did not have any specific staff-supported events this past month, there were three staff training sessions that are worthy of noting. The first was active shooter training, conducted by the Tigard Police Department. Second, we held CPR and automated external defibrillator (AED) training for staff in June. Finally, we also conducted our annual Fire and Evacuations Drills. All these trainings are geared toward ensuring we have a safe work environment at PERS.

AWARD

RETIREMENT ADVISOR COUNCIL AWARD

On June 18, Member Engagement and Communications Director Dean Carson was invited to Denver for the annual meeting of the Retirement Advisor Council to accept an award: PERS' 2018 Expo was recognized as an "Award-Winning Financial Wellness Program" and received a "2019 Excellence Award: Financial Wellness Program." As part of this honor, Dean was interviewed about the Expo in front of over a hundred attendees—retirement and financial advisors, plan sponsors, and other financial experts—and discussed PERS' successes and challenges in organizing the Expo. Attendees were impressed by the scale of the Expo, and asked insightful questions about how PERS reaches younger members, partnering with our record keeper (Voya), and plans to grow the Expo in the future.

“

I was most proud to speak about the hard work our staff undertakes to truly honor our members' public service by helping them understand their retirement benefits."

-Dean Carson,
Member Engagement and
Communications Director



Clockwise from bottom: Dean Carson, answering questions about the Expo in front of an audience of over a hundred retirement and financial advisors, plan sponsors, and other financial experts; Carson, being interviewed about the PERS Expo; Carson, receiving the certificate from Robert Jennings, Moderator, on behalf of the Retirement Advisor Council.

PERS Board Meeting Forward-Looking Calendar

Friday, October 4, 2019

Member and Employer Satisfaction Survey Results
Agency Strategic Plan Overview
System Valuation Results – 2021-2023 Advisory Employer Rates
CEM Benchmarking Cost Effectiveness Presentation
Actuarial Contract Renewal

Friday, December 6, 2019*

Board Scorecard Report on Agency Performance Measures
Agency Strategic Plan Update
Valuation Update and Financial Modeling Results
Adoption of Actuarial Equivalency Factor Tables

Friday, January 31, 2020

Annual Report of Director's Financial Transactions
Legislative Preview/Update
Preliminary Earnings Crediting and Reserving

Monday, March 30, 2020*

Legislative Session Review
Final Earnings Crediting
Agency Budget Preview for Next Biennium

Friday, May 29, 2020

Board Scorecard Report on Agency Performance Measures
Retiree Health Insurance Plan Renewals and Rates
Agency Budget Development for Next Biennium

*Audit Committee planned for post-Board meeting

Returns for periods ending MAY-2019

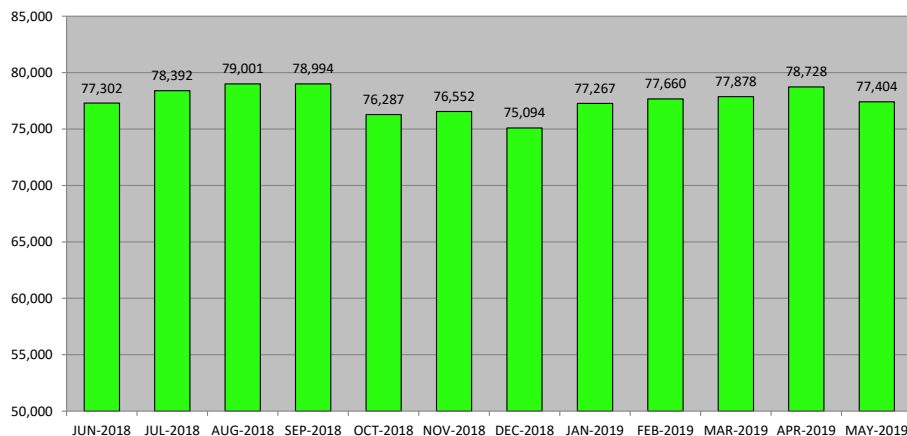
Oregon Public Employees Retirement Fund

OPERF	Regular Account				Historical Performance (Annual Percentage)							
	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
Public Equity	32.5-42.5%	37.5%	\$ 24,682,446	33.1%	8.41	(3.48)	4.70	9.15	5.26	5.44	10.23	10.16
Private Equity	13.5-21.5%	17.5%	\$ 16,595,793	22.2%	3.86	13.96	17.03	15.00	12.94	12.17	13.64	14.02
Total Equity	50.0-60.0%	55.0%	\$ 41,278,239	55.3%								
Opportunity Portfolio	0-3%	0%	\$ 1,702,553	2.3%	2.73	5.02	6.35	7.21	6.16	4.94	8.99	10.69
Total Fixed	15-25%	20.0%	\$ 16,207,479	21.7%	4.94	5.97	3.09	3.11	2.68	2.63	3.27	5.78
Real Estate	9.5-15.5%	12.5%	\$ 8,219,395	11.0%	2.88	6.95	7.40	8.29	8.59	9.43	10.82	9.83
Alternative Investments	0-12.5%	12.5%	\$ 7,210,439	9.7%	(0.98)	(3.91)	0.60	3.86	2.63	1.92	2.05	
Cash w/Overlay	0-3%	0%	\$ 10,445	0.0%	1.67	3.03	2.22	1.87	1.59	1.38	1.24	1.16
TOTAL OPERF Regular Account		100.0%	\$ 74,628,549	100.0%	5.15	3.50	6.95	8.58	6.50	6.51	9.06	9.84
OPERF Policy Benchmark					4.21	3.35	7.20	8.76	6.68	6.83	9.58	9.68
Value Added					0.94	0.15	(0.25)	(0.17)	(0.18)	(0.33)	(0.52)	0.16
Target Date Funds			2,309,043									
TOTAL OPERF Variable Account			\$ 466,721		9.21	(1.98)	5.18	9.28	5.56	5.56	10.01	9.94

Asset Class Benchmarks:

Russell 3000	10.92	2.50	8.60	11.55	8.60	9.25	13.32	13.93
OREGON MSCI ACWI EX US IMI NET	7.11	(7.14)	1.21	6.51	1.97	1.45	6.49	6.08
MSCI ACWI IMI NET	9.06	(2.35)	4.80	8.86	5.13	5.16	9.65	9.59
RUSSELL 3000+300 BPS QTR LAG	(5.28)	6.99	15.55	15.73	12.54	13.20	17.34	17.68
OREGON CUSTOM FI BENCHMARK	4.80	6.02	3.04	2.77	2.41	2.35	2.79	4.04
OREGON CUSTOM REAL ESTATE BENCHMARK	2.33	6.82	7.44	7.55	8.97	9.53	9.88	7.59
CPI +4%	3.61	5.86	6.38	6.23	5.94	5.54	5.62	5.85
91 Day Treasury Bill	1.02	2.26	1.77	1.32	1.03	0.83	0.62	0.47

Total OPERF NAV
(includes Variable Fund asset)
One year ending MAY-2019
(\$ in Millions)



¹OIC Policy revised June 2015.

²Includes impact of cash overlay management.

³For mandates beginning after January 1 (or with lagged performance), YTD numbers are "N/A". Performance is reflected in Total OPERF. YTD is not annualized.

Returns for periods ending JUN-2019

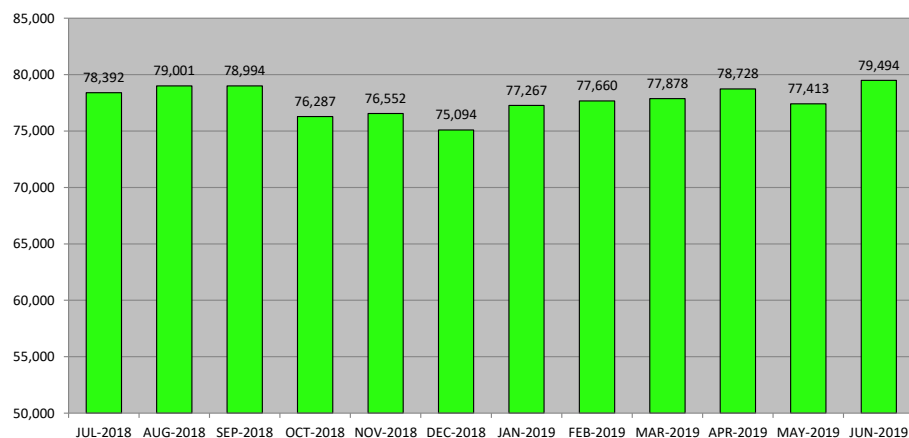
Oregon Public Employees Retirement Fund

OPERF	Regular Account				Historical Performance (Annual Percentage)							
	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
Public Equity	32.5-42.5%	37.5%	\$ 26,783,551	35.0%	15.38	3.63	7.60	11.68	7.42	6.27	10.46	10.87
Private Equity	13.5-21.5%	17.5%	\$ 16,516,650	21.6%	4.63	15.03	16.39	15.11	12.24	11.69	12.83	14.49
Total Equity	50.0-60.0%	55.0%	\$ 43,300,201	56.5%								
Opportunity Portfolio	0-3%	0%	\$ 1,705,836	2.2%	1.54	3.55	5.40	6.65	5.84	4.49	8.28	10.60
Total Fixed	15-25%	20.0%	\$ 15,962,777	20.8%	6.18	7.24	3.74	2.98	3.15	2.81	3.31	5.69
Real Estate	9.5-15.5%	12.5%	\$ 8,291,318	10.8%	2.92	5.85	7.24	7.59	8.40	9.12	10.36	10.03
Alternative Investments	0-12.5%	12.5%	\$ 7,329,823	9.6%	(0.50)	(2.65)	0.84	4.13	2.88	1.88	2.02	
Cash w/Overlay	0-3%	0%	\$ 22,270	0.0%	2.01	3.22	2.34	1.94	1.68	1.44	1.27	1.16
TOTAL OPERF Regular Account		100.0%	\$ 76,612,224	100.0%	7.88	6.52	7.96	9.34	7.24	6.65	8.87	10.17
OPERF Policy Benchmark					7.98	7.20	8.19	9.78	7.67	7.23	9.38	10.33
Value Added					(0.10)	(0.68)	(0.23)	(0.43)	(0.43)	(0.58)	(0.51)	(0.15)
Target Date Funds			2,391,833									
TOTAL OPERF Variable Account			\$ 489,763		16.22	4.91	8.17	11.83	7.80	6.44	10.26	10.66

Asset Class Benchmarks:

Russell 3000	18.71	8.98	11.84	14.02	10.93	10.19	13.79	14.67
OREGON MSCI ACWI EX US IMI NET	13.33	0.26	3.94	9.17	4.13	2.25	6.53	6.78
MSCI ACWI IMI NET	16.07	4.56	7.80	11.42	7.38	6.03	9.90	10.32
RUSSELL 3000+300 BPS QTR LAG	(0.80)	12.01	14.57	16.86	13.13	13.64	15.98	19.38
OREGON CUSTOM FI BENCHMARK	5.90	7.15	3.64	2.55	2.83	2.54	2.82	4.06
OREGON CUSTOM REAL ESTATE BENCHMARK	2.74	6.55	6.83	7.01	8.13	9.03	9.55	8.46
CPI +4%	3.97	5.71	6.34	6.12	5.85	5.50	5.64	5.77
91 Day Treasury Bill	1.24	2.31	1.84	1.38	1.08	0.87	0.65	0.49

Total OPERF NAV
(includes Variable Fund asset)
One year ending JUN-2019
(\$ in Millions)



¹OIC Policy revised June 2015.

²Includes impact of cash overlay management.

³For mandates beginning after January 1 (or with lagged performance), YTD numbers are "N/A". Performance is reflected in Total OPERF. YTD is not annualized.



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July 26, 2019

TO: Members of the PERS Board
FROM: Tamara Dohrman, Interim CFO
SUBJECT: July 2019 Board Report

2017-19 OPERATING BUDGET

Operating expenditures for May 2019 and preliminary expenditures for June 2019 were \$4,043,356 and \$7,051,665 respectively. Final expenditures for June closed in the Statewide Financial Management System (SFMS) on July 12, 2019, and will be included in the October 2019 report to the board.

- To date, the Agency has expended a total of \$88,619,275 or 87.2% of PERS' adjusted legislatively approved operations budget of \$101,657,012. PERS will continue to pay invoices for goods received and for services rendered as of June 30, 2019 in the following months up until December 31, 2019.
- At this time, the Agency's projected positive variance is \$4,536,753 or approximately 4.5% of the operating budget.

2017-19 NON-LIMITED BUDGET

The approved budget includes \$10,980,719,086 in total estimated non-limited budget expenditures. Non-limited budget expenditures include benefit payments, health insurance premiums, and third-party administration payments for both the PERS Health Insurance Program and the Individual Account Program (IAP).

2019-21 LEGISLATIVELY ADOPTED BUDGET

The agency's Legislatively Adopted Budget for 2019-21 (House Bill 5032) was approved by the Legislature on June 29. PERS' operating limitation totaling \$163,356,188 was approved, which includes \$39,059,714 related to the passage of SB 1049 and \$11,539,472 related to SB 1566. This limitation was specifically allocated among the agency's divisions in line with our organizational structure:

- \$9,088,250 for Central Administration;
- \$48,143,077 for Financial and Administrative Services Division;
- \$52,744,509 for Information Services Division;
- \$43,958,241 for Operations Division; and
- \$9,422,111 for Compliance, Audit and Risk Division.

Budget Execution Report

7/26/2019

Page 2 of 2

The adopted budget also consists of \$12,504,627,192 in Other Funds Non-Limited budget, which represents benefit payments, health insurance premiums, and third-party administration payments for both the PERS Health Insurance Program and the Individual Account Program.

Minor budget impacts were also included in House Bill 5050, requiring PERS to reimburse the Department of Administrative Services for two positions related to implementation work on SB 1049. More detailed information on the 2019-21 Legislatively Adopted Budget can be found in Item C.1.c.

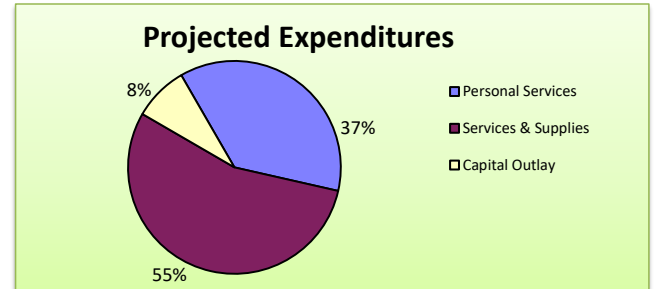
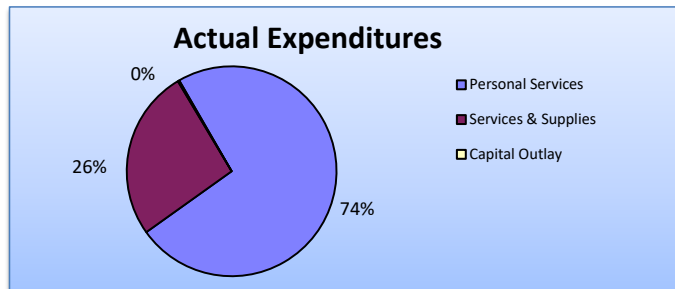
A.2.c. Attachment – *2017-19 Agency-wide Budget Execution Summary Analysis*

**2017-19 Agency-wide Budget Execution
Summary Budget Analysis
Summary For the Month of May 2019**

Limited - Operating Budget

2017-19 Biennial Summary

Category	Actual Exp. To Date	Projected Expenditures	Total Est. Expenditures	2017-19 LAB	Variance
Personal Services	65,110,067	3,135,549	68,245,616	73,511,089	5,265,473
Services & Supplies	23,300,483	4,659,425	27,959,908	26,851,571	(1,108,337)
Capital Outlay	208,725	706,010	914,735	1,294,352	379,617
Total	88,619,275	8,500,984	97,120,259	101,657,012	4,536,753



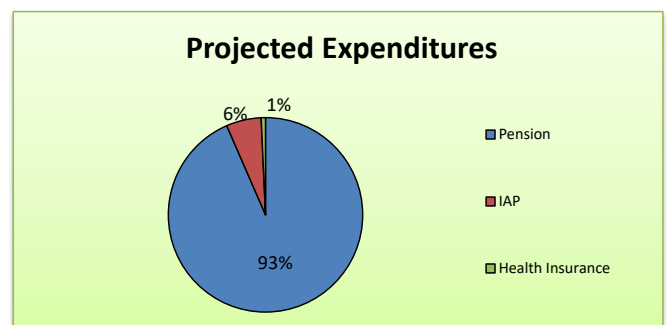
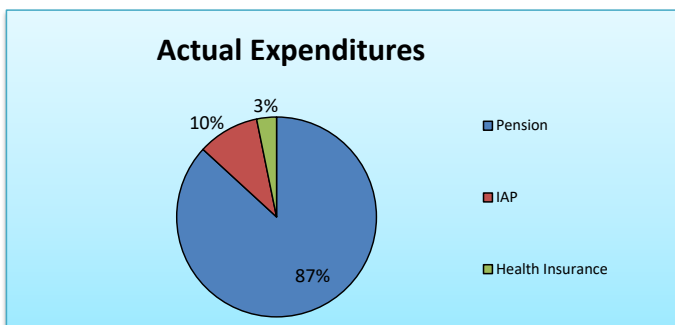
Monthly Summary

Category	Actual Exp.	Projections	Variance	Avg. Monthly Actual Exp.	Avg. Monthly Projected Exp.
Personal Services	3,030,987	3,137,290	106,303	2,830,872	3,135,549
Services & Supplies	1,004,269	1,008,049	3,780	1,013,064	4,659,425
Capital Outlay	8,100	8,100	0	9,075	706,010
Total	4,043,356	4,153,439	110,083	3,853,011	8,500,984

Non-Limited Budget

2017-19 Biennial Summary

Programs	Actual Exp To Date	Projected Expenditures	Total Est. Expenditures	Non-Limited LAB	Variance
Pension	8,779,899,404	811,401,392	9,591,300,796	9,222,000,000	(369,300,796)
IAP	1,008,361,301	50,481,600	1,058,842,901	1,056,900,000	(1,942,901)
Health Insurance	324,392,173	6,183,215	330,575,388	815,271,000	484,695,612
Total	10,112,652,878	868,066,207	10,980,719,085	11,094,171,000	113,451,915





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July 26, 2019

TO: Members of the PERS Board
FROM: Roger Smith, Deferred Compensation Program Manager
SUBJECT: Appoint Advisory Committee Member for the Oregon Savings Growth Plan

OVERVIEW

- Action: Appoint to the Oregon Savings Growth Plan (OSGP) Advisory Committee, one new member to fill an unexpired vacancy triggered by a resignation.
- Reason: The Advisory Committee consists of seven members appointed by the PERS Board.

BACKGROUND

ORS 243.505 provides an Advisory Committee for OSGP that consists of seven members with knowledge of deferred compensation plans. According to that statute (attached), the Committee shall study and advise the Public Employees Retirement Board on policies and procedures and such other matters as the board may request.

Advisory Committee members must be OSGP participants and have knowledge of the current program. One member shall be retired from state service. Two members shall be participants with separate local government plan sponsors who offer OSGP. Four members shall be employees of separate state agencies.

Appointment is for a three year term of office, but a member serves at the pleasure of the board. If there is a vacancy during an unexpired term, the board's appointment will become immediately effective for the unexpired term.

Currently, the Advisory Committee includes the following members:

Name	Position	Employer	Term	Term End Date
Richard Bailey	State	Oregon Institute of Technology	Second	June 2020
Michael Marostica	State	Department of Corrections	First	June 2022
Colin Benson	State	Department of Justice	First	June 2022
Vacant	State	Unexpired term (Thomas Poon resignation)		June 2022
Mary Jo Evers	Local Government	Ontario School District	First	June 2022
Celeste VanCleave	Local Government	Central Linn School District	Second	June 2020
Eugene Bentley	Retired	Retired	First	June 2022

The criteria used in selecting Advisory Committee members includes;

1. Current participation in OSGP;
2. Meeting the qualifications for the vacancy to be filled;
3. Possessing a mixture of expertise, knowledge, and experience useful to the Advisory Committee;
4. Sincere interest in promoting and improving the deferred compensation program; and
5. Willing and able to work in a group setting to review and recommend policies governing the program.

RECOMMENDED APPOINTMENTS

Staff recommends appointing Christine Valentine to fill an unexpired term vacated as a result of Thomas Poon's resignation.

BOARD ACTION

The board's option for appointments to the OSGP Advisory Committee are:

1. Accept the recommendation to appoint Christine Valentine to an unexpired vacancy.
2. Request staff to solicit further applications for review.

STAFF RECOMMENDATION

Staff recommends the board to adopt Option 1.

- Reason: Staff believes Christine Valentine meets the criteria and service needs of the Advisory Committee.

ORS 243.505 Deferred Compensation Advisory Committee

- (1) The Deferred Compensation Advisory Committee shall be appointed by the Public Employees Retirement Board, consisting of seven members with knowledge of deferred compensation plans.
- (2) At the direction of the board, the committee shall advise the Public Employees Retirement Board on policies and procedures and such other matters as the board may request.
- (3) The term of office of each member is three years, but a member serves at the pleasure of the board. Before the expiration of the term of a member, the board shall appoint a successor, whose term begins on July 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the board shall make an appointment to become immediately effective for the unexpired term.
- (4) A member of the Deferred Compensation Advisory Committee is entitled to compensation and expenses as provided in ORS 292.495.
- (5) The Deferred Compensation Advisory Committee shall select one of its members as chairperson and another as vice chairperson, for such terms and with duties and powers necessary for the performance of the functions of such offices as the committee determines.
- (6) A majority of the members of the committee constitutes a quorum for the transaction of business.
- (7) The Deferred Compensation Advisory Committee may meet at a place, day and hour determined by the committee. The committee also may meet at other times and places specified by the call of the chairperson or of a majority of the members of the committee. [1991 c.618 §10; 1997 c.179 §19; 1999 c.406 §1]

OAR 459-050-0025

Deferred Compensation Advisory Committee

- (1) The seven members of the Deferred Compensation Advisory Committee provided for under ORS 243.505, shall be subject to the following qualifications and limitations:
 - (a) Each member shall be a participant in a deferred compensation plan established under ORS 243.401 to 243.507, and shall have knowledge of the Program.
 - (b) Four members shall be participants in the state deferred compensation plan.
 - (c) Two members shall be participants in a local government deferred compensation plan.
 - (d) One member shall be a retired deferred compensation plan participant.
 - (e) No two members may be employed by the same state agency or local government except that a member who transfers employment to the employer of another member may continue to serve

on the Advisory Committee, but only for the balance of the term of appointment of the transferring member.

(f) No member may serve more than two consecutive full terms.

(g) No member may be an employee of PERS during the term of appointment.

(2) The Advisory Committee shall study and advise the Board on all aspects of the Program, including but not limited to:

(a) The Program fee structure and procedures;

(b) State and federal legislative issues relative to the administration of deferred compensation plans;

(c) The administration of the catch-up and the financial hardship provisions in Section 457 of the Internal Revenue Code;

(d) Ways and means to inform and educate eligible employees about the Program;

(e) The expressed desires of eligible employees as to the Program; and

(f) The actuarial characteristics of eligible employees.

(3) Upon the request of the OIC, the Advisory Committee shall study and advise the Board on the following:

(a) Investment programs, including options and providers; and

(b) Information furnished by the OIC or the State Treasurer concerning the types of available investments, the respective balance of risk and return of each investment, and the administrative costs associated with each investment.

(4) The Advisory Committee shall meet at least four times during a calendar year.

(5) A majority of the Advisory Committee shall constitute a quorum for transacting business. However, the Advisory Committee may establish such other procedures for conducting business that it deems necessary.

(6) Pursuant to the Public Meetings Law, ORS 192.610 to 192.690, the Deferred Compensation Manager shall distribute to the Advisory Committee, and other interested parties, an agenda for a regular meeting a reasonable time prior to the meeting.

(7) Nominations of candidates for the Advisory Committee shall be made as follows:

(a) Notice of a position on the Advisory Committee expected to become vacant upon the expiration of a term of appointment shall be published not later than April 15 of each calendar year.

(b) Persons interested in serving on the Advisory Committee must apply in writing to the Manager not later than May 15 following the publication of a vacancy.

(c) The Manager shall review the written applications of interested persons for completeness, accuracy, and satisfaction of the minimum requirements of the vacant position on the Advisory Committee.

(d) A committee consisting of the Manager and two members of PERS executive or managerial staff designated by the PERS Executive Director shall review the acceptable applications and recommend to the Board candidates for appointment to the Advisory Committee that:

(A) Reflect a cross section of state agencies, participating local governments, and classification levels;

(B) Reflect a mixture of expertise, knowledge, and experience useful to the Advisory Committee;

(C) Appear to have a sincere interest in the Program; and

(D) Appear to be willing and able to work in a group setting to review and recommend policies governing the Program.

(e) In the event of a vacancy for an unexpired term, the Manager may select applications from the most recent list of interested persons established under subsection (c) of this section and the applications of other persons as deemed appropriate for consideration. A committee consisting of the Manager and two members of PERS executive or managerial staff designated by the PERS Executive Director shall review the selected applications and recommend to the Board candidates for appointment to the Advisory Committee. The appointment shall be immediately effective for the remainder of the unexpired term. If no candidate is recommended or appointed, the vacancy must be filled under the provisions of subsections (a) through (d) of this section.

Stat. Auth: ORS 243.470

Stats. Implemented: ORS 243.505

Hist.: PERS 2-1993, f. & cert. ef. 9-23-93; PERS 2-1995, f. 10-13-95, cert. ef. 11-1-95; PERS 5-2000, f. & cert. ef. 8-11-00; PERS 3-2007, f. & cert. ef. 1-23-07; PERS 11-2014, f. & cert. ef. 7-25-14



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July 26, 2019

TO: Members of the PERS Board
FROM: Stephanie Vaughn, Manager, Policy Analysis & Compliance Section
SUBJECT: Adoption of Receipt Date Rule:
OAR 459-005-0220, *Receipt Date for Reports, Documents, Remittances, Payments, Data, and Requests*

OVERVIEW

- Action: Adopt modifications to the Receipt Date rule.
- Reason: Add category for electronic submissions of data made through PERS Online Member Services.
- Policy Issue: None identified.

BACKGROUND

Receipt dates assist staff in determining timeliness of requests, eligibility, and effective dates. OAR 459-005-0220 outlines when certain types of submissions are considered received by PERS. However, the rule does not currently provide direction on when electronic transmissions of data submitted through PERS Online Member Services (OMS) are deemed received by PERS.

PERS' OMS is a secure online portal, first launched in 2011, that provides members with convenient online access to pension-related information. OMS also allows PERS members to view and update their address/contact information and retiree residency status, as well as initiate certain processes, such as member account withdrawals or data verifications.

The proposed amendment clarifies that the receipt date for electronic submissions of data or requests is the date on which data or a request successfully submitted through OMS is saved to PERS' system. When a member transmits data or a request electronically by clicking a button on an online prompt, the data is immediately saved to PERS' system, and the member's screen will display a confirmation message that the data change or request was saved. The data change or request is immediately loaded into the system workflows and relevant PERS staff notified.

It should be noted that the receipt date is not necessarily the same date as an effective date, which may depend on other legal standards or factors. For example, under Oregon Revised Statutes 238.374, the effective date for a member's Residency Status Certification for tax remedy purposes is January 1 of the year after the receipt date.

PUBLIC COMMENT AND HEARING TESTIMONY

A rulemaking hearing was held June 25, 2019, at 2:00 p.m. at PERS headquarters in Tigard. No members of the public attended. The public comment period ended July 2, 2019, at 5:00 p.m. No public comment was received.

LEGAL REVIEW

The attached draft rule was submitted to the Department of Justice for legal review and any comments or changes are incorporated in the rule as presented for adoption.

IMPACT

Mandatory: No, the board need not adopt the rule modifications.

Benefit: Members and staff will benefit from the updated receipt date requirements.

Cost: There are no discrete costs attributable to the rule.

RULEMAKING TIMELINE

May 29, 2019	Staff began the rulemaking process by filing a Notice of Rulemaking with the Secretary of State.
May 31, 2019	Secretary of State published the Notice in the Oregon Administrative Rules Database. Notice was sent to employers, legislators, and interested parties. Public comment period began.
May 31, 2019	PERS Board notified that staff began the rulemaking process.
June 25, 2019	Rulemaking hearing held at 2:00 p.m. at PERS in Tigard.
July 2, 2019	Public comment period ended at 5:00 p.m.
July 26, 2019	Board may adopt the permanent rule modifications.

BOARD OPTIONS

The board may:

1. Pass a motion to “adopt modifications to the Receipt Date rule, as presented.”
2. Direct staff to make other changes to the rule or explore other options.

STAFF RECOMMENDATION

Staff recommends the board choose Option #1.

- Reason: Add category for electronic submissions of data made through PERS Online Member Services.

If the board does not adopt: Staff would return with rule modifications that more closely fit the board’s policy direction if the board determines that a change is warranted.

B.1. Attachment 1 - 459-005-0220, *Receipt Date for Reports, Documents, Remittances, Payments, Data, and Requests*

**OREGON ADMINISTRATIVE RULE
PUBLIC EMPLOYEES RETIREMENT BOARD
CHAPTER 459
DIVISION 005 – ADMINISTRATION**

1 **459-005-0220**

2 **Receipt Date for Reports, Documents, Remittances, *[and]* Payments, Data, and**
3 **Requests**

4 (1) As used in this rule:

5 (a) “Imaged date” means the date on which a report, document, remittance, or
6 payment is imaged and stored electronically to a dedicated network server.

7 **(b) “OMS” means PERS’ Online Member Services.**

8 **(c) “Online submission date” means the date on which data or a request**
9 **successfully submitted through OMS is saved to PERS’ system.**

10 **[(b)](d)** “Private express carrier” has the same meaning as in ORS 293.660(2).

11 **[(c)](e)** “Settlement date” means the date on which the participating Depository
12 Financial Institution (DFI) or its correspondent is scheduled to be debited or credited by
13 the Federal Reserve.

14 (2) If the due date of a report, document, remittance, or payment falls on a weekend or
15 legal holiday, the due date is deemed to be the next business day.

16 (3) **Except as otherwise provided in this rule, any** *[Any]* report, document, or
17 remittance required by PERS shall be deemed filed and received on the date of the receipt
18 stamp affixed to the report, document, or remittance when received by PERS. In the case
19 of a check or cash submission, the payment shall be deemed filed and received on the date
20 recorded in PERS’ daily cash receipts log or check log.

21 (4) **Except as otherwise provided in this rule, any** *[Any]* report, document,
22 remittance, or payment that does not display a PERS receipt stamp, or has not been

1 recorded in PERS' daily cash receipts log or check log, shall be deemed filed and received
2 on the imaged date. If the imaged date, cash receipts log date or check log date is later than
3 the due date, the report, document, remittance, or payment shall be deemed filed and
4 received one business day before the imaged date, cash receipts log date, or check log date.

5 (5) Any report, document, remittance, *[or]* payment, data, or request required by
6 PERS which is lost or delayed in transmission *[through USPS or by a private express*
7 *carrier]*, shall be deemed filed and received on the date it was mailed or deposited for
8 transmittal to USPS or a private express carrier, or the date it was transmitted by fax,
9 email, or OMS if the sender:

10 (a) Can establish by evidence satisfactory to PERS^[,] that the report, document,
11 remittance, payment, data, or request was deposited for delivery or transmission on
12 or before the date due for filing, and was correctly addressed to PERS.

13 (A) Evidence satisfactory to PERS for USPS or a private express carrier may
14 include, *[which includes]* but is not limited to, documentation provided by USPS or the
15 private express carrier, *[that the report, document, remittance, or payment was deposited*
16 *in the USPS or with a private express carrier]* such as a receipt or delivery
17 confirmation. *[before the date due for filing, and was correctly addressed to PERS;]*

18 (B) Evidence satisfactory to PERS for a fax communication or email
19 transmission that is lost in transmission may include, but is not limited to, an affidavit
20 by the sender verifying that the fax or email was correctly addressed and sent to
21 PERS, together with a copy of any activity report from the sender's fax or electronic
22 device, and a duplicate of the original report or document.

1 (C) Evidence satisfactory to PERS for an OMS submission that is lost in
2 transmission may include, but is not limited to, an affidavit by the member verifying
3 that the member submitted the data through OMS, together with a printout of the
4 confirmation message displayed on the member's screen that the online submission
5 was successful.

6 (b) Files with PERS a duplicate of the lost report, document, remittance, *[or]*
7 payment, data, or request in accordance with the transmittal requirements of OAR 459-
8 005-0210 or 459-005-0215; and

9 (c) Satisfies the requirements of subsections (a) and (b) of this section within 30 days
10 after PERS notifies the sender in writing of failure to receive the report, document,
11 remittance, or payment.

12 (6) An electronic funds transfer (EFT) shall be deemed received on the settlement date
13 of the transfer. A settlement date specified by an employer for an EFT shall be no later
14 than the due date specified by PERS for a remittance or a payment.

15 *[(7) Any report or document that PERS accepts by fax as provided in OAR 459-005-*
16 *0210 or 459-005-0215, which is:]*

17 *[(a) Transmitted by a fax device to any office of PERS shall be deemed filed and*
18 *received on the date of transmission as inscribed by the PERS fax device.]*

19 *[(b) Lost in transmission through a fax communication shall be deemed filed and*
20 *received when originally transmitted if the sender can establish by affidavit the proof of*
21 *sending and correct addressing, together with a copy of any activity report from the*
22 *sender's fax device, and a duplicate of the original report or document.]*

1 *[(8) A fax shall be accepted on weekends and holidays as long as the fax is otherwise*
2 *in compliance with due dates specified in administrative rule.]*

3 *[(9)](7)* Any report or document that PERS accepts by e-mail transmission as
4 specified in OAR 459-005-0210(5), which is[:]

5 *[(a) T]* transmitted by e-mail to any office of PERS shall be deemed received as of the
6 *[date PERS receives the transmission]* system-generated date and time stamp that is
7 displayed on the email header line of the email that is received by PERS.

8 *[(b) Lost in transmission by email shall be deemed filed and received when originally*
9 *transmitted if the sender can establish by affidavit the proof of sending and correct*
10 *addressing, together with a copy of any activity report from the sender’s electronic device,*
11 *and a duplicate of the original report or document.]*

12 (8) An electronic submission of data made through OMS shall be deemed
13 received on the online submission date.

14 *[(10)](9)* A report, *[or]* document, or data transmitted by fax, *[or]* e-mail, or OMS
15 must be transmitted in accordance with the provisions of this rule and OAR 459-005-0215,
16 and must be received by PERS before midnight on the due date.

17 *[(11)](10)* When transmitting a report, document, or *[report]* data by *[use of]* fax,
18 *[or]* e-mail, or OMS, the sender bears the risk of failure of the transmission.

19 Stat. Auth.: ORS 238.650

20 Stats. Implemented: ORS 238, 238A



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July 26, 2019

TO: Members of the PERS Board
FROM: Marjorie Taylor, Senior Policy Director
SUBJECT: Legislative Update

LEGISLATION IMPACTING PERS

As of July 1, 2019, the following bills that impact PERS statutes were approved by the legislature and Governor. The agency is in various stages of implementation of these changes to our statutes. Information will be provided to members and employers as we resolve details of these programs.

Additional information is available on the legislative website:

<https://www.oregonlegislature.gov/>

Bill Number	Brief Summary
Technical Changes	
HB 2118	<i>Relating to consumer price index</i> – Standardizes the use of Consumer Price Index for purposes in PERS and other statutes.
SB 213	<i>Relating to connection to federal tax law</i> – A perennial bill that conforms PERS statutes to the Internal Revenue Code and other provisions of federal tax law.
Changes in Terminology	
HB 3007	<i>Relating to estates</i> – Changes terminology in certain PERS statutes from “an affidavit” to “a small estate affidavit.”
HB 3146	<i>Relating to corrections</i> – Changes terminology in certain PERS statutes generally from “inmate” to “adult in custody.”
Program Changes	
HB 2196	<i>Relating to the military</i> – Defines certain past, current, and future employees of the Oregon Military Department as “firefighters” for the purpose of PERS benefits.
HB 2417	<i>Relating to death benefits under the Public Employees Retirement System</i> – Establishes an alternate death benefit for surviving spouses of Tier One and Tier Two members who die before retirement.
HB 2972	<i>Relating to retirement of employees of Harney County Health District</i> – Allows Harney County Health District to offer an alternative retirement program to PERS. Also allows Tier One and Tier Two PERS retirees employed by and licensed, registered, or certified to provide health services in the Harney County Health District to work unlimited hours.
SB 576	<i>Relating to campus security officers</i> - Also allows Tier One and Tier Two PERS retirees employed as “special campus security officers” at public universities or “security officers” at community colleges, to work unlimited hours.
SB 1049	<i>Relating to public employee retirement</i> – PERS Reform legislation including provisions that impact members and employers.

PERS BUDGET – HOUSE BILL 5032

House Bill 5032, the PERS agency budget, was sent to the Governor for consideration on June 29. PERS and other agencies, whose budgets were not approved by July 1, began operations in the 2019-2021 biennium under House Bill 5048 – the “continuing resolution.”

In addition to positions and budget authority included in HB 5032, several positions in the Department of Administrative Services (DAS) were acknowledged for their close work with PERS on the implementation of Senate Bill 1049. House Bill 5050 requires PERS to reimburse DAS for those positions in IT and procurement.

SENATE BILL 1049 - REPORTING

The PERS Board is required, by SB 1049, to report to the Joint Ways and Means Committee at least 30 days in advance of making changes to actuarial methods and assumptions. The report must outline any proposed changes and the associated, actuarially determined impact to the total and accrued liability of the system and employer rates.

Similar to board approval and reporting of earnings crediting each year, PERS is prepared to report preliminary board action taken today on actuarial methods and assumptions, which will be finalized at the October 4, 2019 board meeting when the December 31, 2018 system valuation will also be presented.

2019-2020 INTERIM and 2020 LEGISLATIVE SESSION

Interim legislative committees will meet in mid-September, November, and January before the 2020 Legislative Session is convened. We are not currently aware of presentations that must be made during these “legislative days” but will be prepared to do so if asked.

A budget note in HB 5032 requires PERS and DAS to report during the February 2020 legislative session on the implementation of SB 1049 to the Committees on Ways and Means and Information Management and Technology.

The reports from PERS and DAS are to include:

- Update on project scope, schedule, and budget, and total cost of ownership;
- Identification of costs associated with one-time solutions versus permanent solutions;
- Independent quality assurance reporting on the project;
- Impact of Senate Bill 1049 (2019) information technology project on routine agency operations;
- Any exceptions from administrative rules, policies or procedures, or statutes granted to PERS by the Department of Administrative Services; and
- Other information that helps inform the Legislature on the status of the project or issues that have arisen as the result of the project.



Oregon

Kate Brown, Governor

Public Employees Retirement System

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July 26, 2019

TO: Members of the PERS Board
FROM: Yvette Elledge-Rhodes, Deputy Director
SUBJECT: SB 1049 Implementation Update

Senate Bill 1049 was signed into law by the Governor on June 11. Prior to, and following that date, PERS staff have been focused on building out a budget and implementation plan that will allow us to successfully implement SB 1049 in an efficient and effective manner.

COMMUNICATIONS

We are building out a suite of communications materials to help members and employers understand the impacts of this legislation. These include the following tasks:

- Our website has been updated to have a [micro site](#) devoted to SB 1049 and a new GovDelivery notification set up for members and employers to keep up to date – it's a great information resource. ([Sign up for GovDelivery.](#))
- Member Services and Employer Services are gathering questions so we can ensure our communication materials answer the key needs of our stakeholders.
- The communication production team is working with the data to create visual examples.
- A generic presentation was developed and presented to both an All State Agency Director meeting, as well as an All State Agency Human Resources Director meeting.

PROJECT PLANNING

We are developing our overall implementation approach and governance committees. A steering committee, core team, and sub-teams have been set-up to tackle each element of SB 1049, as well as to integrate change management and internal communications. This will be managed as one, comprehensive, program with the following five individual projects under the SB 1049 Implementation Program:

<u>Project</u>	<u>Effective Date</u>
Employer Programs Project	Effective 7/1/2019
Salary Cap Project	Effective 1/1/2020
Work After Retirement Project	Effective 1/1/2020
Member Redirect Project	Effective 7/1/2020
Member Choice Project	Effective 1/1/2021

A budget of approximately \$39 million was approved to implement all the various aspects of SB 1049. One important item is that the budget provides the agency with six positions on a permanent

SB 1049 Implementation Update

July 26, 2019

Page 2 of 2

basis to enable us to administer the changes on a long-term basis, with an additional 37 limited duration positions to assist in the implementation efforts. These positions provide PERS with back-up resources for staff that will be dedicated to project implementation efforts as well as for additional workload resources.

The SB 1049 implementation budget is as follows:

External Project Management:	\$2,500,000
External Quality Assurance:	\$2,500,000
Information Technology Applications (Architecture/Development/Testing/Software/Consultants, etc.)	\$25,992,000
Staffing	\$7,567,714
Contingency	<u>\$500,000</u>
Total	\$ 39,059,714

In the last few weeks, PERS has been supported by other state agencies, in particular the Office of the State Chief Information Officer (OSCIO), Department of Administrative Services (DAS) Procurement and Facilities, as well as the Department of Justice (DOJ). We are already having regular meetings with these groups and they are actively engaged in assisting us. In fact, some of these staff will be working here at PERS on a part-time basis, to facilitate quicker decisions as we work towards some very near implementation deadlines.



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July 26, 2019

TO: Members of the PERS Board
FROM: Greg Gabriel, Senior Financial Analyst
SUBJECT: 2019-21 PERS Agency Budget Update (HB 5032)

House Bill 5032, the PERS agency budget, was approved by the House and Senate before the end of session on June 30, 2019. At the time of this memo being finalized, the budget had not been signed by the Governor. Therefore, as of July 1, PERS is funded by a continuing resolution (House Bill 5048) for the first portion of the 2019-2021 biennium.

- Operating Budget (Limited) \$163,356,188
- Benefit / Health Payments (Non-Limited) \$12,504,627,192
- Positions 419
- FTE 414.32

The operating budget is \$61.7 million or 60.7% above the 2017-19 Legislatively Approved Budget of \$101.7 million. This increase can be attributed to the passage of Senate Bill 1049, which approves a one-time expenditure of \$39.1 million for implementation costs. There is an additional \$11.5 million of approved limitation related to SB 1566(2018) and the School Districts Unfunded Liability Fund (SDULF). The Agency's core operating costs increased by \$11.1 million or 10.9% due to increased program staffing, associated payroll costs and State Government Service Charges.

The Non-Limited Budget for benefit payments increased by \$1.5 billion or 13.7% more than the 2017-19 Legislatively Approved Budget. This increase is due to growing retirements and benefit payments in all programs: Tier 1, Tier 2, Oregon Public Service Retirement Program (OPSRP), Individual Account Program (IAP) and the PERS Health Insurance Program (PHIP).

The Agency received approval for the following policy packages related to operations for the 2019-21 biennium:

Package 081/082 – 2018 E-Board Reconciliation September and December (\$640,257 / 3.0 FTE)

Package 082 – Oregon Savings Growth Plan (\$1,698,000 / 0.0 FTE)

Package 102 – PERS Production Data Center Migration (\$1,715,318 / 0.0 FTE)

Package 103 – Financial & Administrative Services Strategic Fulfillment (\$357,679 / 1.0 FTE)

Package 104 – Maintaining Current Service Levels (\$1,045,185 / 6.0 FTE)

Package 106 – Risk & Security Management (\$638,291 / 0.0 FTE)

Package 107 – Deferred Maintenance Requirement of SB 1067 (2017) (\$1,161,555 / 0.0 FTE)

The Agency received additional policy package recommendations approved by the Legislative Fiscal Office (LFO), most of which are related to the passage of SB 1049.

LFO Packages:

Package 090 – Removes \$644,528 in the Operations Division (OD) and the Financial and Administrative Division (FASD) for unneeded Temporary Services and Services and Supplies.

Package 801 – Establishes \$11.5 million in FASD (Limited) and \$11.5 million in Tier1/2 (Non Limited) appropriations for expenditure authority for SDULF (SB 1566 2018). Additionally there is a \$1 placeholder approved for Employer Incentive Fund (EIF) and SDULF to establish the funds.

Package 802 – Approves \$2.5 million or 10% of project funding as requested for Project Management and Administration related to SB 1049.

Package 803 – Approved \$2.5 million or 10% of project funding as requested for Quality Assurance and Testing related to SB 1049.

Package 804 – Approves \$25.9 million for information technology applications. This includes all third party contractors as requested for both temporary and permanent solutions related to SB 1049.

Package 805 – Approves \$984,598 and six positions (5.44 FTE) for the permanent positions requested related to SB 1049, which will be part of the regular operating limitation (500 series).

Package 805 Approves \$5.6 million and 37 positions (33.60 FTE) for all limited duration positions related to SB 1049. These funds will fall under a newly developed division called Core Retirement System Applications (900 series). This also approves \$1.9 million expenditure authority for Actuarial, Legal and Communications contracts related to the bill.

Package 806 – Approves \$500,000 for a Contingency Reserve for SB 1049 implementation.

Package 812 – Removes \$631,523 in Vacant Position Elimination. Removes two vacant PEMF positions from FASD and OD that have been vacant and one OS1 position in the Information Services Division (ISD).

Below is the Agency overview by separated by operating division of the Legislatively Adopted Budget for 2019-21:

	CENTRAL ADMIN	FINANCIAL & ADMIN SRVCS	INFORMATION SERVICES	OPERATIONS	COMPLIANCE AUDIT & RISK	TOTAL
BUDGET	5,549,108	44,640,486	26,144,003	39,438,343	8,524,534	124,296,474
POSITIONS	21	64	70	207	20	382
FTE	20.92	63.52	69.76	206.52	20.00	380.72
SB 1049	3,539,142	3,502,591	26,600,506	4,519,898	897,577	39,059,714
POSITIONS	4	4	3	22	4	37
FTE	3.84	3.64	2.76	19.68	3.68	33.60
AGENCY TOTAL	9,088,250	48,143,077	52,744,509	43,958,241	9,422,111	163,356,188
POSITIONS	25	68	73	229	24	419
FTE	24.76	67.16	72.52	226.20	23.68	414.32



Valuation Methods & Assumptions

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

Presented by:

Matt Larrabee, FSA, EA

Scott Preppernau, FSA, EA

July 26, 2019

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Three-Meeting Process – Assumptions & Methods

- April 1: Background on current key assumptions and methods
 - Long-term investment return assumption (assumed rate)
 - Amortization period for unfunded actuarial liability (UAL)
 - Contribution rate collaring policy
- May 31: Economic assumptions, system funding methods
 - Inflation and system payroll growth
 - Assumed rate – data from Treasury’s consultant, Milliman’s model
 - Actuarial methods, including amortization and collaring policy
- **July 26: Demographic assumptions, Board direction to actuary**
 - **Member-specific assumptions based on study of recent PERS experience**
 - **Review methods for reflecting new legislative provisions**
 - **Assumptions and methods adopted will be used for:**
 - **12/31/2018 actuarial valuation with advisory 2021-2023 contribution rates**
 - **12/31/2019 actuarial valuation with proposed final 2021-2023 contribution rates**

Today's Agenda

- Background
- Recently passed legislation Senate Bill 1049
- Recap of economic assumptions and actuarial methods
 - Includes long-term investment return assumption
 - Reviewed in detail at last Board meeting
- Projected effects of legislation and investment return
- Overview of demographic assumptions
- Estimated effect of assumptions

Executive Summary

- Since last meeting, we analyzed PERS member census and are recommending updates to certain demographic assumptions
 - Combined, those recommendations are estimated to have a:
 - “Change” of \$0.0 billion the UAL (rounded to the nearest \$100 million)
 - 0.3% of payroll increase in the system-average advisory 2021-2023 uncollared rate
- In our financial modeling, SB 1049’s most visible impact is reamortization
 - How SB 1049 is implemented in certain areas will affect actuarial calculations
 - Some of those areas have open issues from our perspective
- Callan’s and Milliman’s capital market outlooks for future investment return are slightly higher than at the last review two years ago
 - We recommend the Board not increase the assumed rate from the current 7.2%
 - The Board should give consideration to decreasing the rate to 7.1% or 7.0%
 - A decrease to 7.1%/7.0% is estimated to increase the:
 - UAL as of December 31, 2018 by \$0.9/\$1.8 billion
 - System-average advisory 2021-2023 uncollared rate by 0.7%/1.4% of payroll

Background

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Two-Year Rate-Setting Cycle

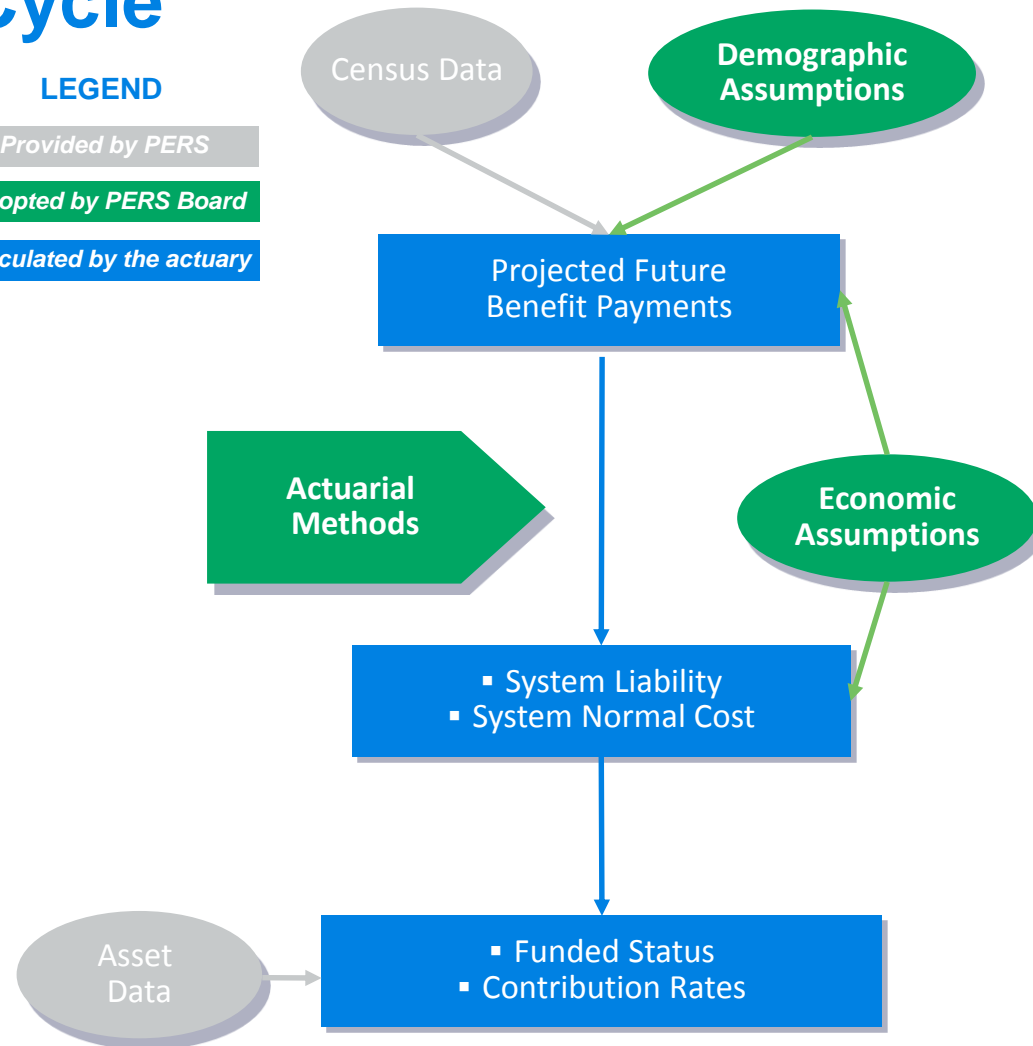
LEGEND

Provided by PERS

Adopted by PERS Board

Calculated by the actuary

- **July 2019: Assumptions & methods adopted by Board in consultation with the actuary**
- October 2019: System-wide 12/31/18 actuarial valuation results
- December 2019: Advisory 2021-2023 employer-specific contribution rates
- July 2020: System-wide 12/31/19 actuarial valuation results
- September 2020: Disclosure & adoption of employer-specific **2021-2023 contribution rates**



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Valuation Process and Timeline

- Actuarial valuations are conducted annually
 - Alternate between “rate-setting” and “advisory” valuations
 - The next valuation as of 12/31/2018 will be advisory
- 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
12/31/2015	—————→ July 2017 – June 2019
12/31/2017	—————→ July 2019 – June 2021
12/31/2019	—————→ July 2021 – June 2023

Board Objectives - Methods & Assumptions

- Transparent
- Predictable and stable rates
- Protect funded status
- Equitable across generations
- Actuarially sound
- GASB compliant

Some of the objectives can conflict, particularly in periods with significant volatility in investment return or projected benefit levels. Overall system funding policies should seek an appropriate balance between conflicting objectives.

The Fundamental Cost Equation

- Long-term program costs are the contributions, which are governed by the “fundamental cost equation”:

$$\mathbf{BENEFITS = CONTRIBUTIONS + EARNINGS}$$

Governance Structure

- Benefits:
 - Plan design set by Oregon Legislature
 - Subject to judicial review
- Earnings:
 - Asset allocation set by OIC
 - Actual returns determined by market
- Contributions:
 - Funding, including methods & assumptions, set by PERS Board
 - Since contributions are the balancing item in the fundamental cost equation, PERS Board policies primarily affect the **timing** of contributions
 - Different actuarial methods and assumptions produce different projected future contribution patterns



Recent Legislation

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Senate Bill 1049

- Senate Bill 1049 signed into law in June
- The legislation made a number of changes to PERS, many centered on funding/financing of the System's benefits:
 - Redirects portion of member contributions to fund DB benefits
 - Requires a one-time re-amortization of Tier 1/Tier 2 UAL
 - Work after retirement provisions
 - Limits future salary included in Final Average Salary
 - Requires 30 day advance reporting from PERS Board to Legislature on changes to actuarial methods and assumptions
 - Requires study prior to issuing new Pension Obligation Bonds
 - Provides for employee choice in IAP
 - Modifies some provisions for employers making side account deposits, Employer Incentive Fund, School District Fund

Additional Detail on Key Provisions

- Member redirected contribution
 - Tier 1/Tier 2: 2.5% of salary (3.5% goes to IAP)
 - OPSRP: 0.75% of salary (5.25% goes to IAP)
 - Members with less than \$2,500 monthly salary (indexed) exempt
- One-time re-amortization of Tier 1/Tier 2 UAL
 - Board directed to employ 22-year re-amortization for current cycle
 - Choice of future methods reverts to Board
- Work after retirement
 - Removes hours limits, charges contributions on payroll of rehired retirees
 - Applies for a 5-year period
- Limits on future salary
 - Salary for Final Average Salary limited to \$195,000 (indexed)

Considerations for Methods/Assumptions

- How will member redirect interact with employer contribution?
- How will work after retirement changes affect system?
 - Removing hours limits could increase work after retirement
 - Assessing employer contribution on rehired retirees could decrease it
 - Could be a knock-on effect on growth in (non-retired) system payroll
- Limits on future salary
 - Leads to lower future growth in accrued benefit for small portion of members
 - Tier 2 and OPSRP members were already subject to the (higher) federal limit; Tier 1 member previously were not subject to a limit
 - Our understanding is the limit also restricts payroll subject to contributions

Economic Assumptions and Actuarial Methods

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Economic Assumptions and Actuarial Methods

- At the May 31, 2019 meeting, the Board reviewed
 - Non-investment economic assumptions
 - Actuarial methods
 - Investment return assumption
- Our recommendations regarding economic assumptions and actuarial methods are unchanged since the May meeting

Economic Assumptions

Details of these recommendations are included in our May 2019 presentation

	12/31/2017 Valuation Assumptions	12/31/2018 Valuation Proposed Assumptions
Inflation	2.5%	2.5%
Real Wage Growth	<u>1.0%</u>	<u>1.0%</u>
System Payroll Growth	3.5%	3.5%
<u>Administrative Expenses:</u>		
- OPSRP	\$6.5 million	\$8.0 million
- Tier 1/Tier 2	\$37.5 million	\$32.5 million

No explicit assumption is made for investment-related expenses, which are accounted for implicitly in the analysis of the long-term investment return assumption.

Key Actuarial Methods

	12/31/2017 Valuation Methods	12/31/2018 Valuation Proposed Methods
Cost Allocation Method	Entry Age Normal	No change
Shortfall Amortization Method	<p>Level percent of pay, layered fixed periods:</p> <p>Tier 1/Tier 2: 20 years OPSRP: 16 years RHIA/RHIPA: 10 Years</p>	<p>No change to OPSRP and RHIA/RHIPA</p> <p>Current Tier 1/Tier 2 shortfall will be reamortized over 22 years per SB 1049</p>
Rate Collar	<p>Limits change in base contribution rate to larger of 20% of current rate or 3.00% of payroll;</p> <p>Collar widens incrementally when funded status below 70%</p>	No change

Long-Term Investment Return Assumption

- Uses of the investment return assumption
 - As a discount rate for establishing the:
 - Actuarial accrued liability, which is a net present value
 - Associated unfunded actuarial liability, also called the UAL or actuarial shortfall
 - Guaranteed crediting level for regular Tier 1 active member account balances
 - Annuitization rate for converting member account balances to lifetime money match monthly benefits



Reflecting expectations for investment earnings, the assumption helps set a reasonable and appropriate budgeting glide path for projected employer contribution rates

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:

$$\begin{array}{ccc} \mathbf{B} & = & \mathbf{C} & + & \mathbf{E} \\ \text{BENEFITS} & & \text{CONTRIBUTIONS} & & \text{EARNINGS} \\ \textit{Present value of} & & \textit{Employer funds to pay} & & \textit{Future returns on} \\ \textit{earned benefits} & & \textit{for pension benefits} & & \textit{investment funds} \\ \text{Set by: Oregon Legislature} & & \text{Set by: PERS Board} & & \text{Managed by: Oregon Investment Council} \end{array}$$

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 “E” does **not** affect actual future earnings

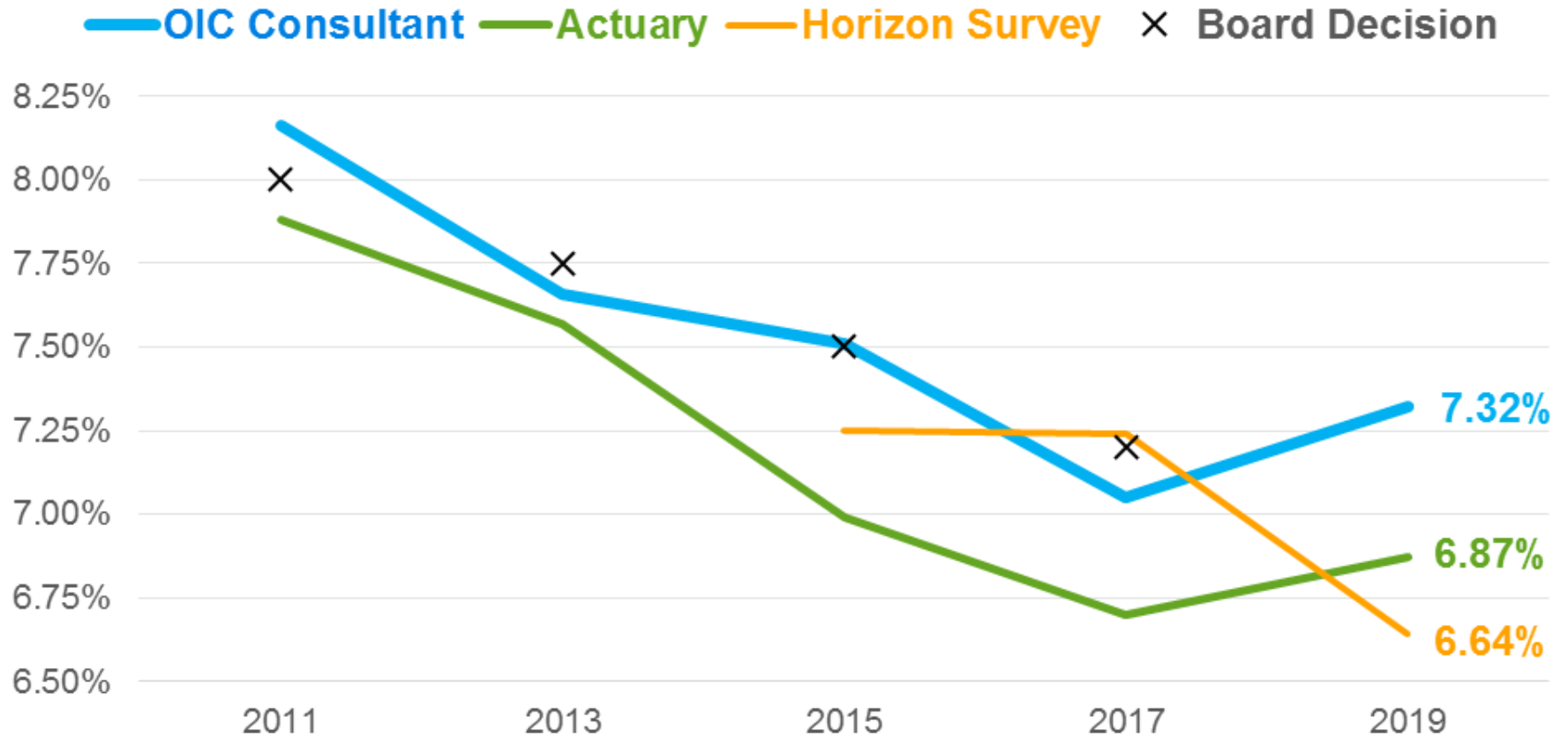
Investment Return 50th Percentile Outlooks

- We applied a standard mean/variance model to calculate 50th percentile return estimates based on capital market outlook assumptions from three sources
 - Milliman
 - Callan – Consultant to OIC
 - 2018 Horizon survey of capital market assumptions (survey of 34 advisors)
- Estimates do not reflect any possible “alpha” due to selected managers potentially outperforming market benchmarks over the long term, net of fees
- Today’s speakers are not credentialed investment advisors
 - We are presenting Milliman capital market outlook model results based on assumptions developed by Milliman’s credentialed investment professionals

Details on each set of capital market outlook assumptions are in the Appendix

Investment Return 50th Percentile Outlooks

Geometric Returns from Outlook Models



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Investment Return 50th Percentile Outlooks

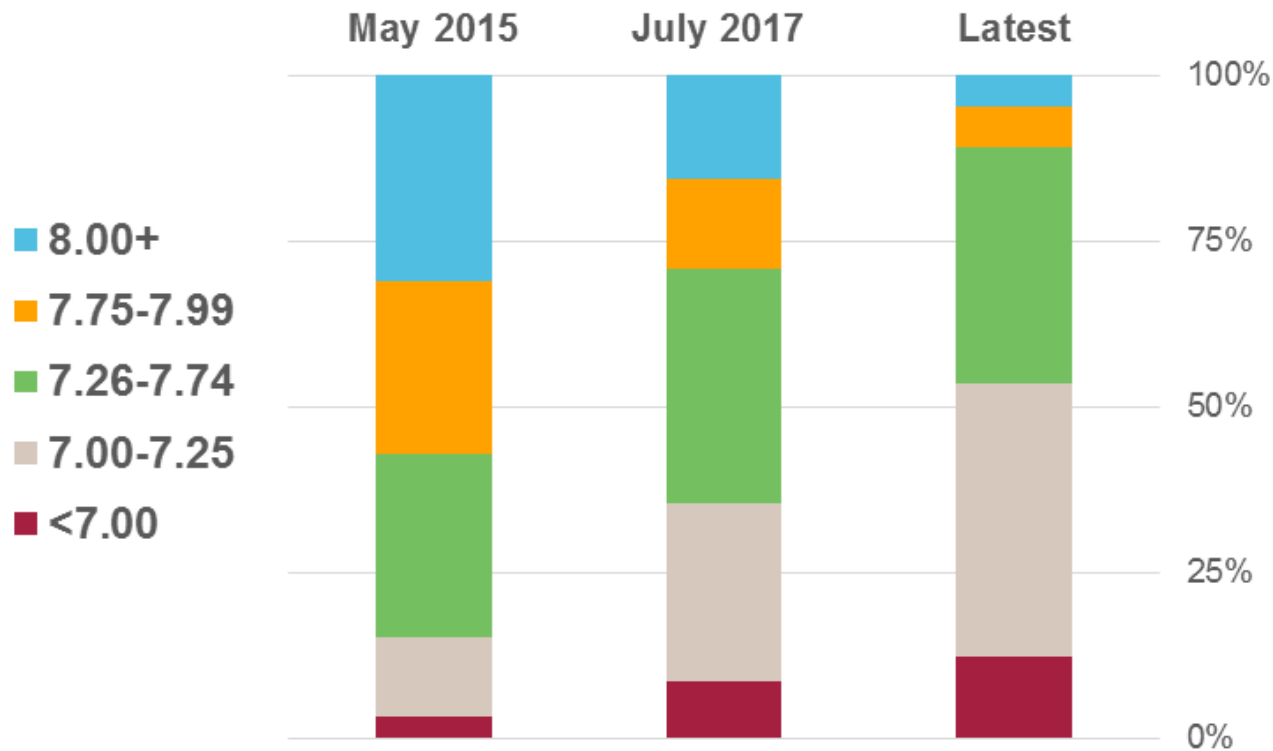
- Estimates are based on OIC's target long-term asset allocation
 - Current actual allocation differs somewhat from the target allocation
- Callan and Horizon estimates are calibrated over a shorter investment timeframe than Milliman's estimates
 - Also reflect lower level of assumed inflation

	Milliman	Callan	Horizon
Median Annualized Return	6.87%	7.32%	6.64%
Assumed Inflation	2.50%	2.25%	2.24%
Timeframe Modeled	20 years	10 years	10 years

The median returns shown above are geometric annualized average returns over the timeframes indicated above for each provided set of capital market assumptions

Comparison to Peer Systems

- There is a downward trend in public plan return assumptions, with a current median assumption for large public systems of **7.25%**
- Over 50% of the 129 systems tracked by the NASRA Public Fund Survey reduced their assumption over last 2-3 years



Source: NASRA (April, 2019)

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Effects of Lowering the Assumed Return

- A lower investment return assumption would produce higher calculated liabilities and contribution rates
- Liabilities are net present values, as of the valuation date, of a benefit payment projection that stretches far into the future
 - Changing the assumption modifies the projected balance of the fundamental cost equation between future investment earnings and future contributions
 - The actual balance will depend on actual investment earnings, not on the assumed return adopted by the PERS Board
 - The effect of lowering the assumed return to 7.00% is estimated as a 1.4% of payroll increase in the uncollared system average base employer contribution rate, while the effect of lowering the assumed return to 7.10% is estimated as a 0.7% of payroll increase
- For PERS, such an assumption change would also lower benefits for future retirements calculated under Money Match

Considerations in Setting the Return Assumption

- In our opinion, the current 7.20% long-term future investment return assumption is reasonable based on current data from the capital market outlook models, the guiding principles, and Actuarial Standards of Practice
- Callan, the primary investment consultant to the OIC, currently estimates a long-term return above the current assumption
 - The PERS Board could still elect to reduce the assumption for conservatism, if desired
 - We would not recommend increasing the return assumption at this time, given the uncertainty in future outlooks and the influence of the point-in-time measurement at year-end 2018

Projected Effects of Legislation and Investment Return Assumption

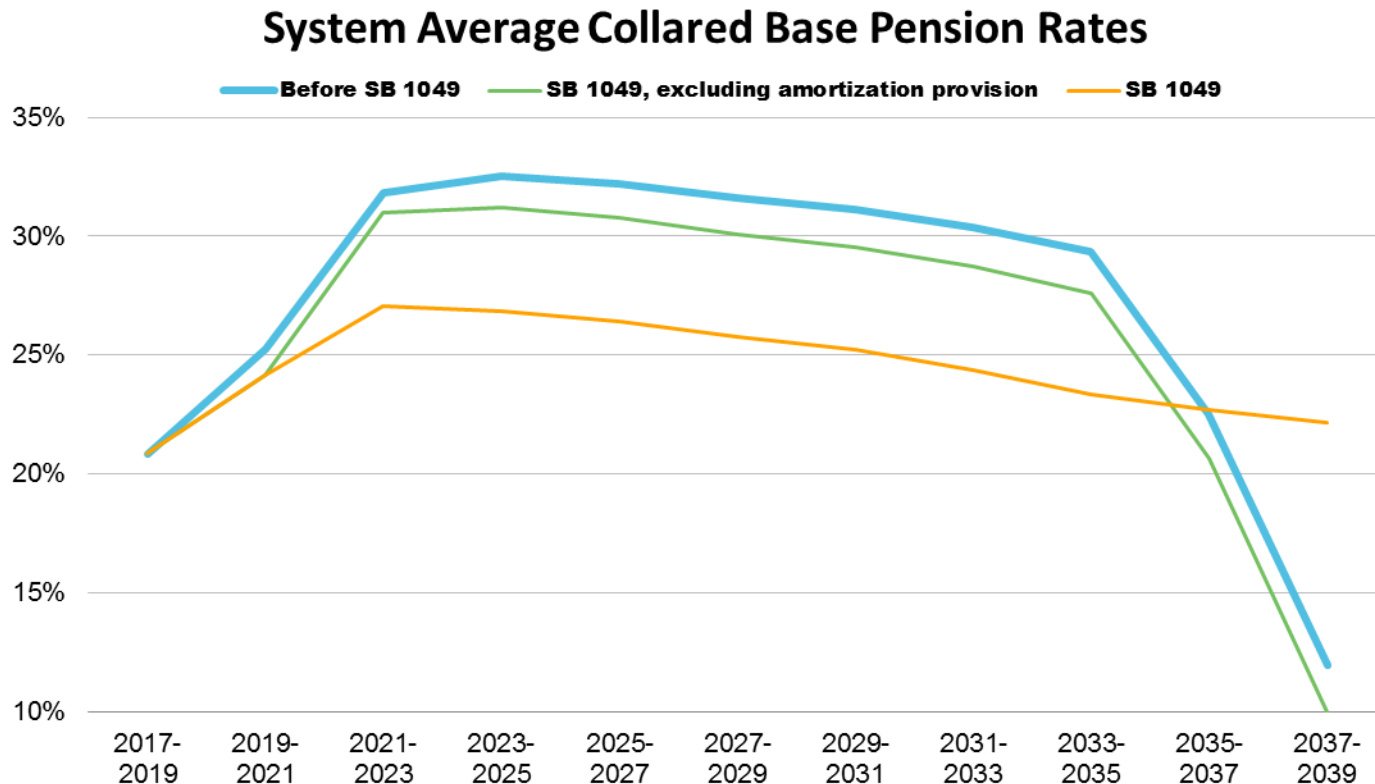
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Financial Modeling - Effect of SB 1049

- When legislation that became SB 1049 was in process, Milliman prepared financial modeling projections, building on work from the December 2018 Board meeting
- Illustrates effect of:
 - 22 year re-amortization of Tier 1 Tier 2 UAL with December 31, 2019 rate-setting valuation
 - Estimate of work after retirement and redirection provisions
 - Analysis assumes redirected member contributions would serve as an **offset** to employer contribution rates
- While not reflected in the financial modeling, the \$195,000 limit on salary would not materially affect depicted results
- See December 2018 Board materials and follow-up Milliman analyses for discussion of modeling basis and assumptions

Financial Modeling - Effect of SB 1049

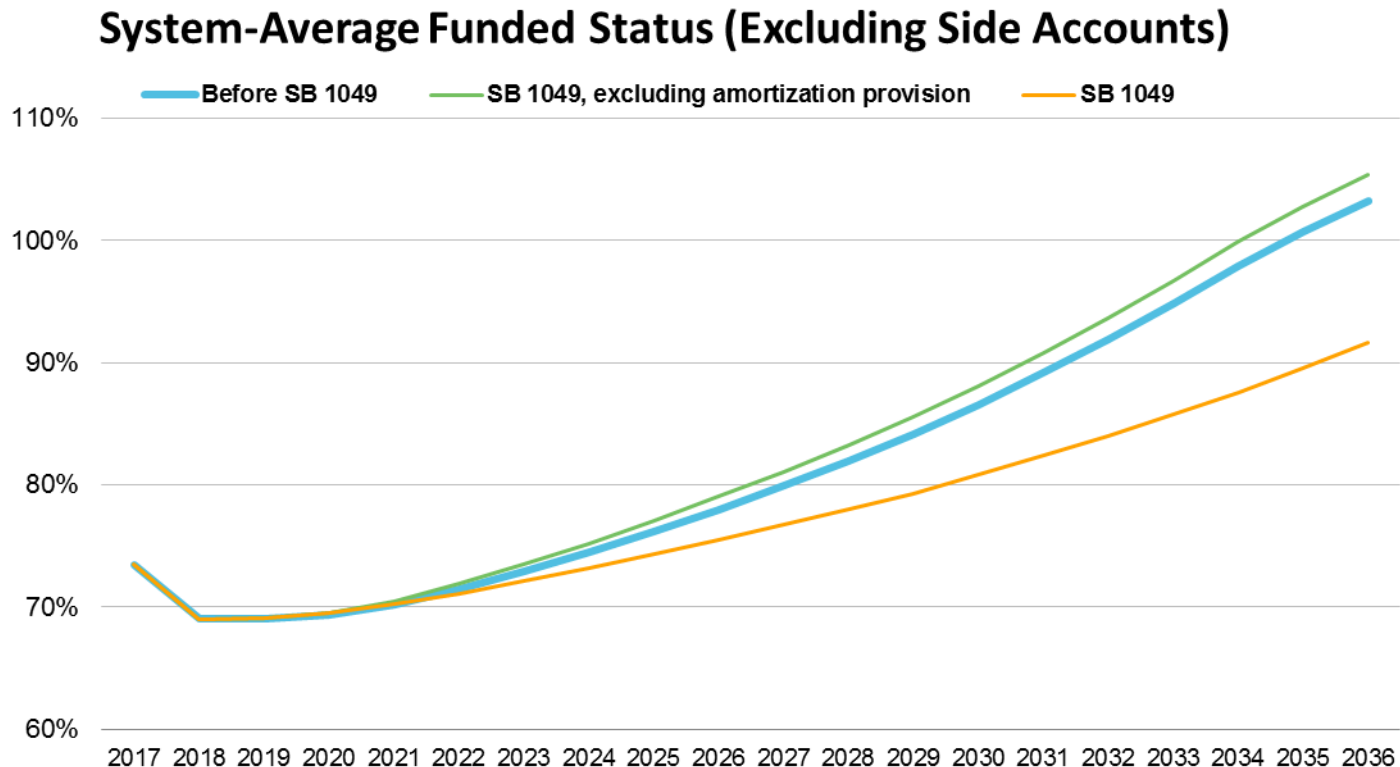
- Assumed rate of 7.2% and actual future returns of +7.20%



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Financial Modeling - Effect of SB 1049

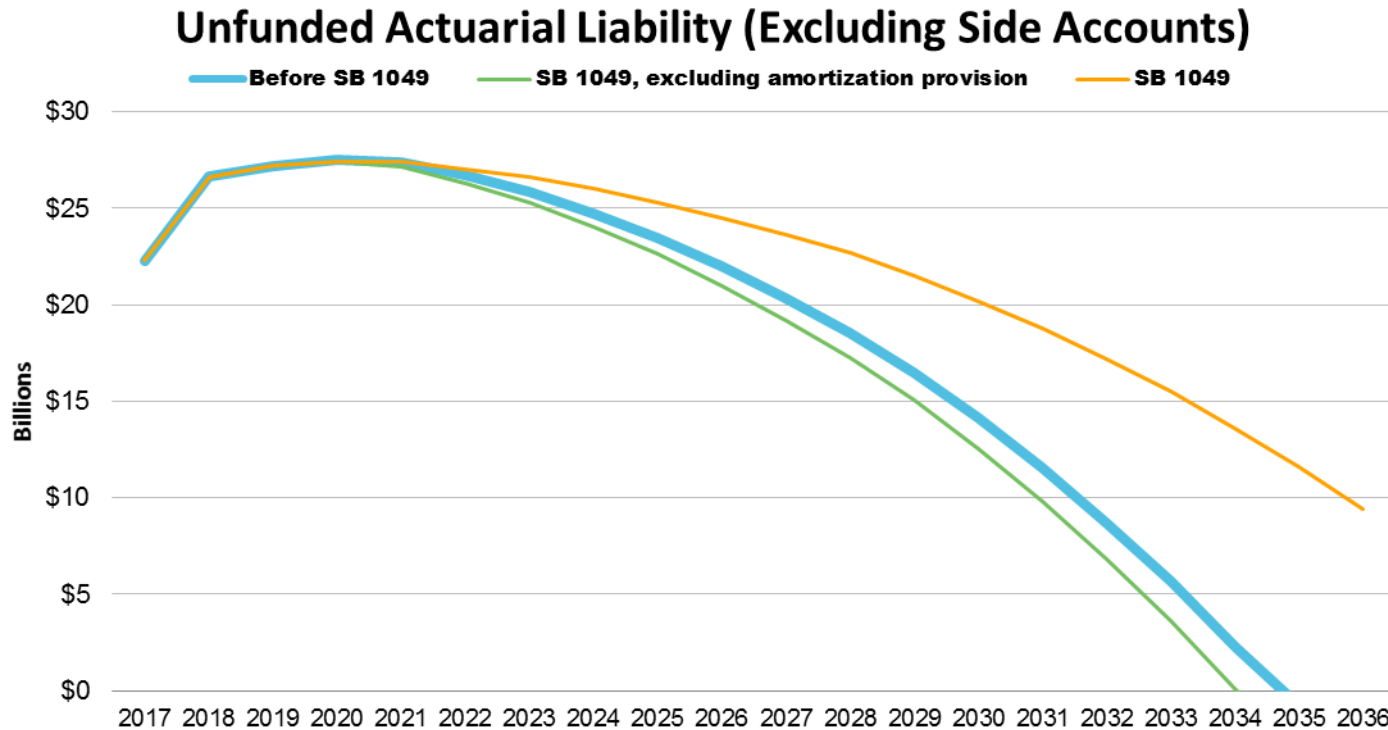
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Financial Modeling - Effect of SB 1049

- Assumed rate of 7.2% and actual future returns of +7.20%

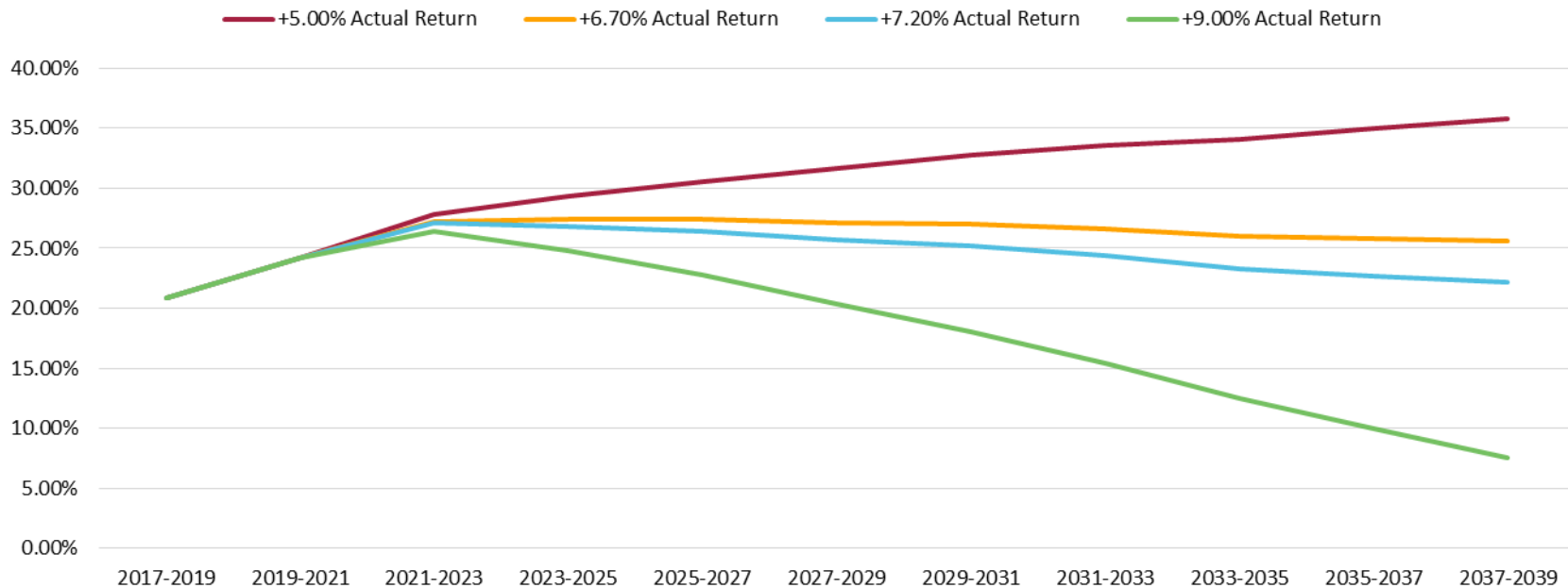


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Financial Modeling - Effect of SB 1049

- Assumed rate of 7.2% and varying actual steady future returns

System Average Collared Base Pension Rates
Reflecting SB 1049



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Overview of Demographic Assumptions

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Demographic Assumptions

- We have statistically analyzed member census data provided by PERS
 - Four years of data analyzed for most demographic assumptions
 - Eight years of data analyzed for individual member salary increase assumptions
- Recommended assumptions were developed based on the statistical analysis
- Full details of the analysis are in our formal experience study report

Summary of Demographic Assumptions

- Update mortality assumptions: use newly issued base tables specific to public plans
 - Also incorporate most recent data in assumption for projected future mortality improvement
- Adjust likelihood of retirement assumption at some ages where recent experience differed from current assumption
- Increase merit portion of individual member salary assumption for two of three groups
- Adjust pre-retirement termination assumptions for two groups
- Adjust disability incidence assumptions
- Updates to assumed final average salary adjustments for factors such as unused vacation and sick leave for most groups for members eligible under those provisions
- Updates to assumed lump sum and service purchase election rates
- Adjustments to post-retirement medical program assumptions
 - Participation levels (RHIA & RHIPA)
 - Healthcare inflation assumption for RHIPA program

Mortality Assumption

- For each group, the mortality assumption consists of two parts:
 - 1) A **base table** – for a given age, lists a probability of death at that age
 - 2) A **projection scale** – modifies base table entries to reflect anticipated continued mortality improvement over time
 - Reflects common-sense understanding that a new retiree today has a longer life expectancy than a new retiree 25 years ago...and that a new retiree 25 years from now is reasonably anticipated to have a longer life expectancy than a new retiree today
- We are recommending base table and projection scale updates:
 - Combined effect was decrease in liability of less than \$150 million
- New recommended “Pub-2010” base tables reflect the Society of Actuaries (SOA) Public Plans Mortality Study published in January 2019

Mortality Assumption

- ORS 238.607: adopted actuarial equivalency factors *must use the best actuarial information on mortality available at the time*
 - We separately reviewed police and fire mortality per ORS 238.608
- We matched PERS experience to the SOA's Public Plans ("Pub-2010") base tables
 - PERS was one of the systems that contributed data to the study; in general new tables fit experience well
 - Calibrated to PERS experience as needed with "set-backs" or other adjustments to standard table
- For mortality improvement projection scale, maintained approach adopted in prior experience study of using a projection scale based on 60-year average annual improvement from Social Security mortality experience
 - Updated to reflect most recent information available at the time (through 2015)
- Recommended assumptions produce results similar to prior assumptions

Technical details on our recommendation and more information on the mortality assumption are in our formal Experience Study report

Mortality Assumption

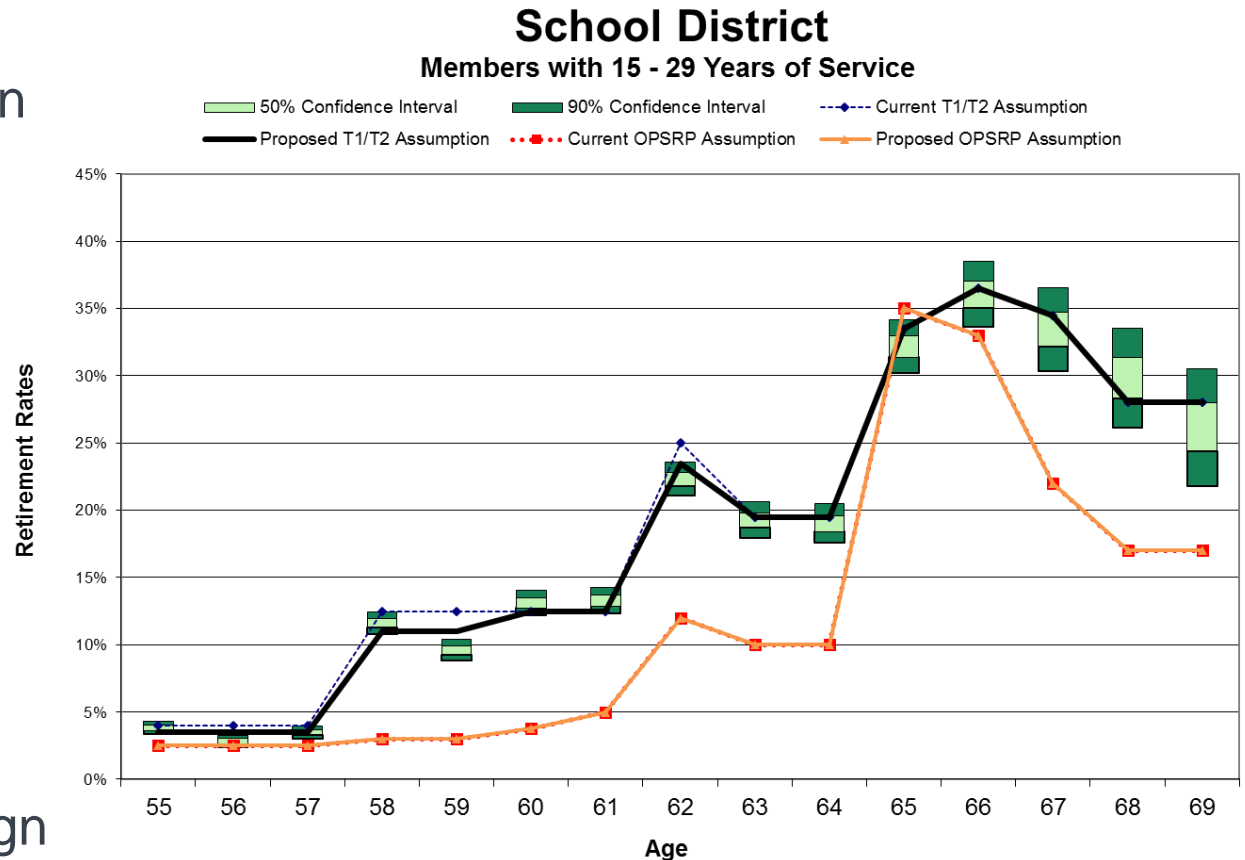
- Illustrative effect of assumption changes for non-disabled retiree:

Future Life Expectancy (in years)	Retires at Age 60 in 2019			Retires at Age 60 in 2039		
	Current	New	Change	Current	New	Change
School District Male	28.3	27.8	-0.5	29.6	29.0	-0.5
General Service Male	26.9	26.9	0.0	28.4	28.4	0.0
Police & Fire Male	26.9	25.7	-1.2	28.4	27.1	-1.3
School District Female	29.9	29.9	0.0	31.2	31.1	-0.1
General Service Female	28.1	28.6	0.5	29.5	29.9	0.4
Police & Fire Female	28.1	28.6	0.5	29.5	29.9	0.4

- The table above has three assumed preconditions, all of which serve to increase the life expectancy:
 - The individual is assumed to have already survived to age 60
 - The individual is assumed to have served in PERS-covered employment
 - The individual is assumed to not be disabled as of age 60

Rate of Retirement Assumption

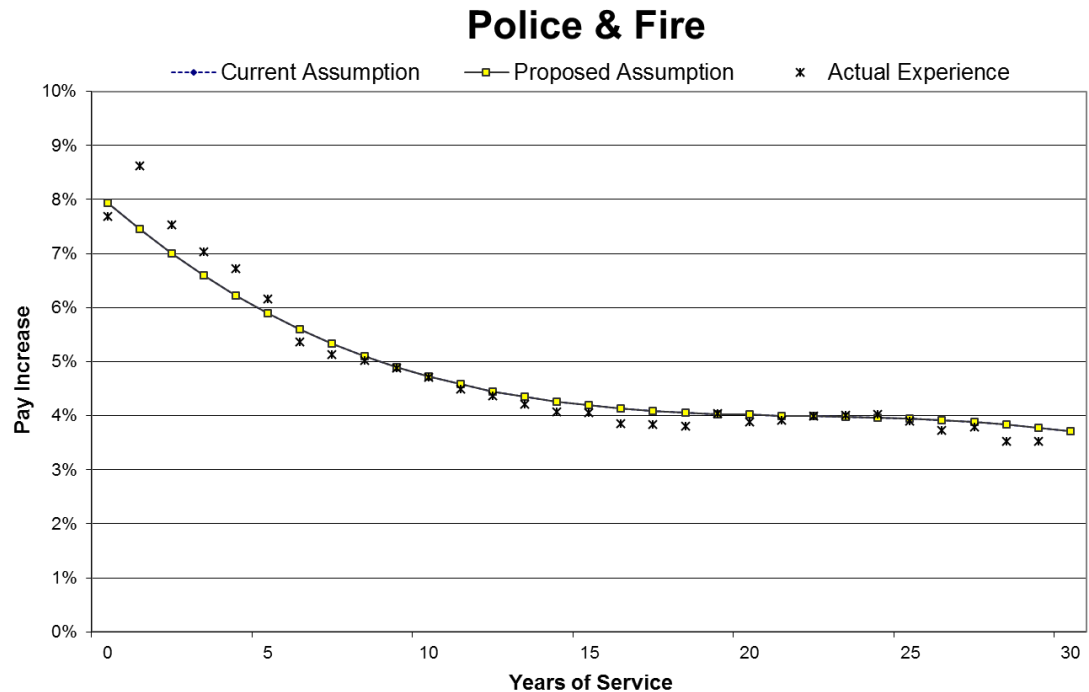
- The likelihood that an eligible member retires in a given year
- Structure:
 - School District
 - Other General Service
 - Police & Fire
 - Divided into 3 service bands
 - Tier 1/Tier 2 vs. OPSRP
- Modifications made to assumptions at certain ages to more closely align with recent experience
 - Typically, lowering assumptions at some earlier retirement ages



Example shown above. Recommendations for other groups shown in detailed Experience Study report.

Individual Member Salary Increase Assumption

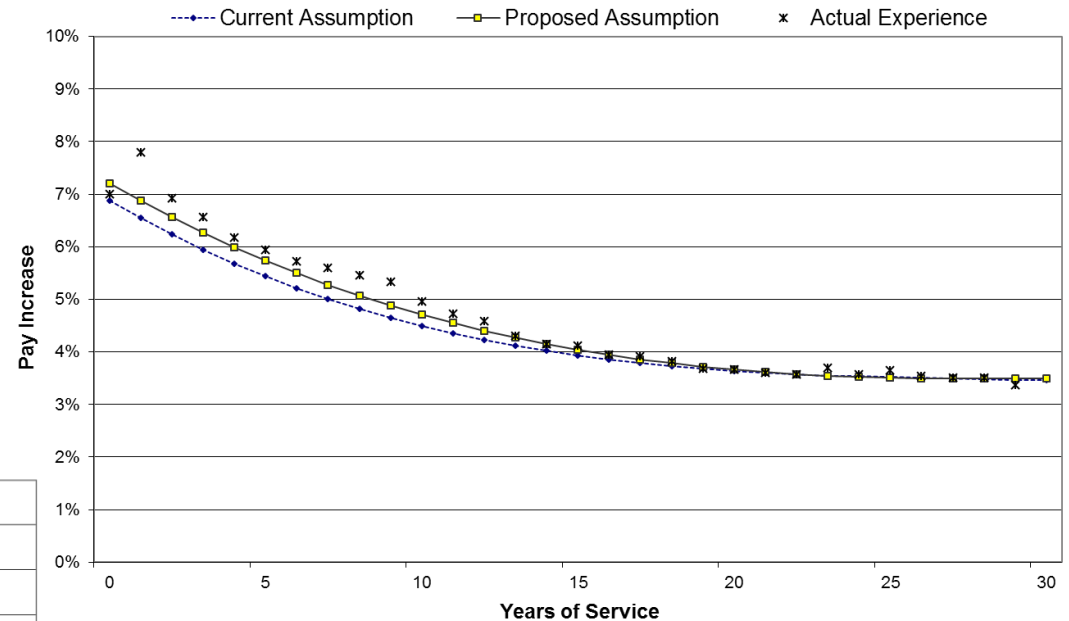
- Reflects combined effects of merit/longevity, general wage growth and inflation assumptions
 - Analyzed eight years of individual pay increases, then back out assumed inflation and general wage growth to isolate the merit/longevity component
- Structure:
 - School District
 - Other General Service
 - Police & Fire
- Police & Fire matched current assumption well



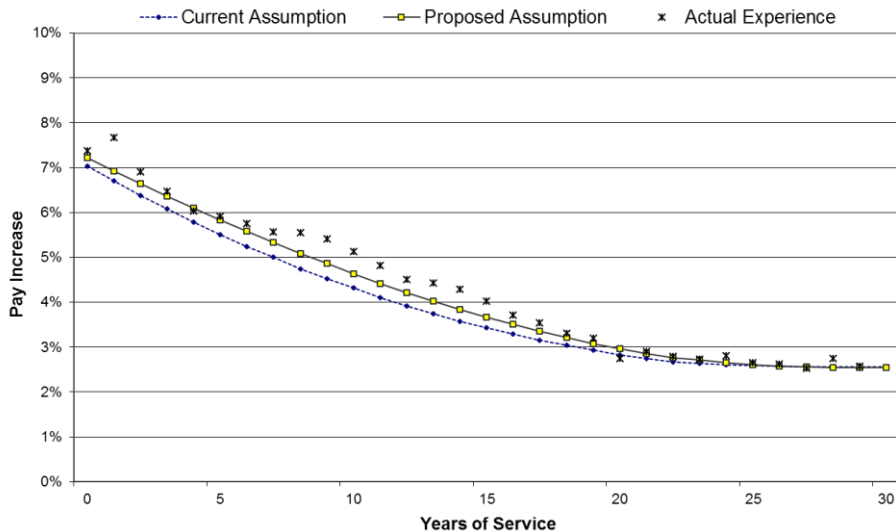
Individual Member Salary Increase Assumption

Other General Service

- School District and Other General Service had higher increases than assumed



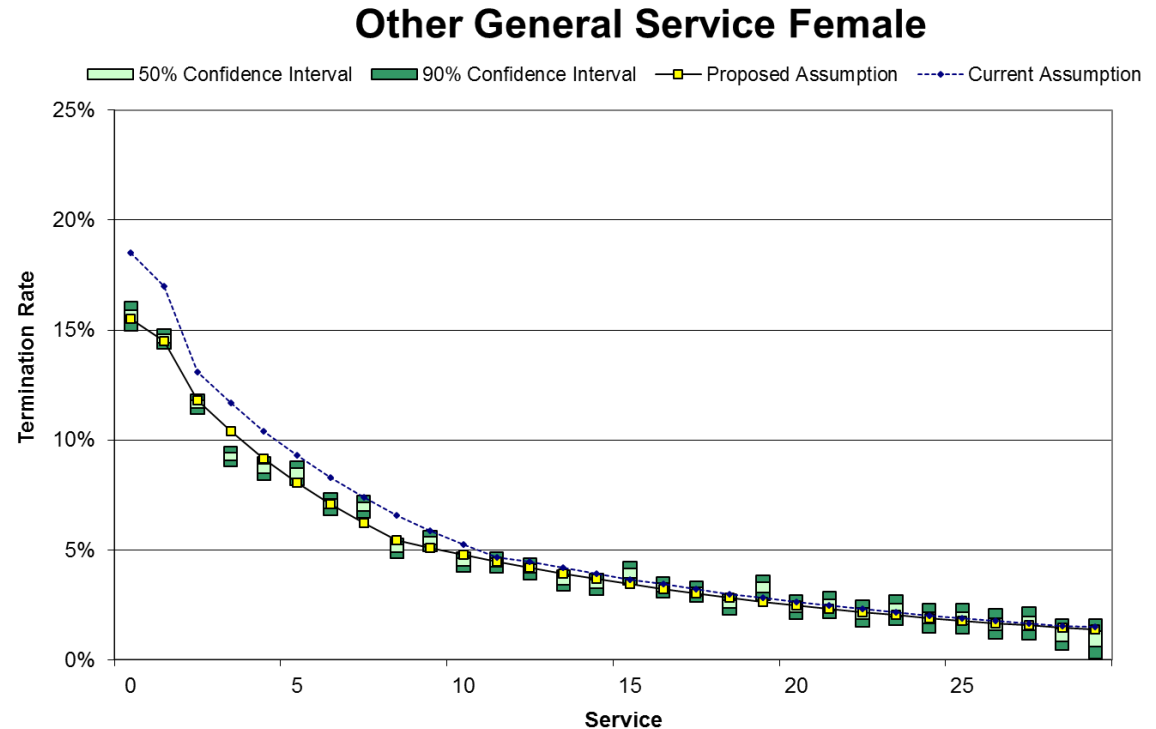
School Districts



- Assumptions updated reflecting a blend of current assumption and recent observed experience

Pre-Retirement Employment Termination Assumption

- The likelihood that a member leaves employment in a given year prior to retirement eligibility for reasons other than death or disability
- We recommend adjustments to the assumption for two of five groups for relatively minor, but statistically significant, differences between the current assumption and observed experience



Example shown above. Recommendations for other groups shown in detailed Experience Study report.

Final Average Salary Adjustments

- In the valuation, we apply assumptions regarding the increase in final average salary for Tier 1/Tier 2 members attributable to:
 - Unused sick leave
 - Lump sum distribution of vacation pay (only affects Tier 1)
- Only relevant when benefits are calculated using Full Formula or Formula Plus Annuity
- We recommend some adjustments to more closely track recent experience:

Unused Sick Leave	Current Assumption	Proposed Assumption	Tier 1 Vacation Cash Out	Current Assumption	Proposed Assumption
State GS Male	6.25%	7.00%	State GS	2.00%	2.25%
State GS Female	3.75%	3.75%	School District	0.25%	0.25%
School District Male	7.50%	7.75%	Local GS	2.75%	3.25%
School District Female	5.75%	5.75%	State Police & Fire	2.50%	2.75%
Local GS Male	4.75%	5.25%	Local Police & Fire	3.75%	4.25%
Local GS Female	3.25%	3.50%			
State Police & Fire	4.75%	4.00%			
Local Police & Fire	7.25%	7.25%			
Inactive Members	3.25%	3.25%			

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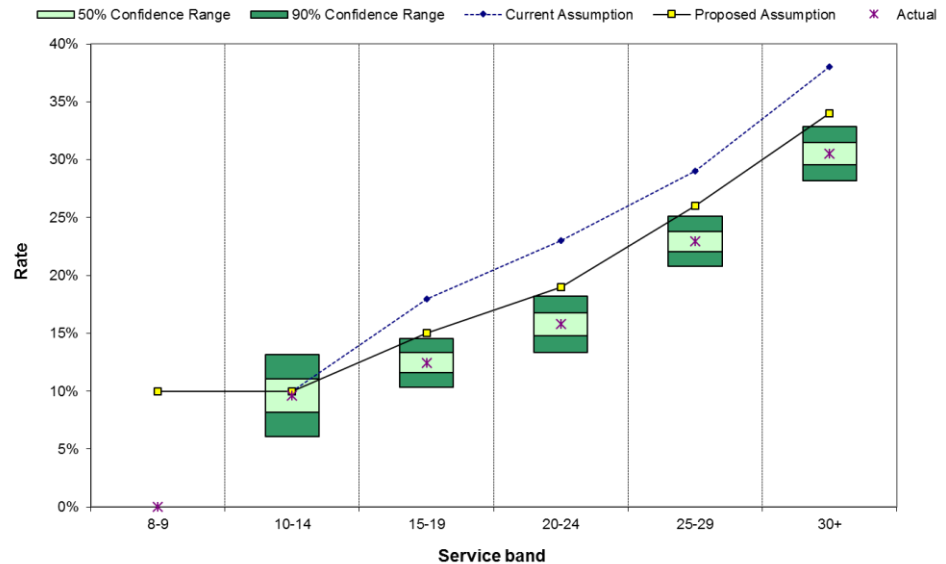
RHIA and RHIPA Assumptions

- Updates to retiree healthcare participation:
 - Healthy RHIA: Lower participation rates
 - Disabled RHIA: No change
 - RHIPA: Lower rates in most categories
- Health care cost trend assumption applied to RHIPA full subsidy amount was also updated
 - Based on analysis by Milliman health actuaries

**RHIA
Participation Rates**



**RHIPA
Participation Rates**



Estimated Effect of Assumption Changes

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Preliminary Effect of Changes – Liability

- Estimated effect on combined Tier 1, Tier 2, and OPSRP liabilities based on preliminary valuation work
 - Illustrated for three different investment return assumptions

12/31/2018 Accrued Liability	Assumed Return 7.2%	Assumed Return 7.1%	Assumed Return 7.0%
Current assumptions*	\$86.6 B		
Mortality	(\$0.1 B)		
Merit	\$0.0 B		
Other demographic assumptions	<u>\$0.1 B</u>		
Revised assumptions (before assumed return)	\$86.6 B	\$86.6 B	\$86.6 B
Assumed return	<u>\$0.0 B</u>	<u>\$0.9 B</u>	<u>\$1.8 B</u>
Revised assumptions	\$86.6 B	\$87.5 B	\$88.4 B

*Includes reduction of less than \$0.1 billion for SB 1049

Preliminary Effect of Changes – Uncollared Rates

- Estimated impact on uncollared system-average advisory pension rates for 2021-2023 based on preliminary valuation work

	Assumed Return 7.2%		Assumed Return 7.1%		Assumed Return 7.0%	
	UAL	Normal Cost	UAL	Normal Cost	UAL	Normal Cost
Mortality	(0.1%)	0.0%	(0.1%)	0.0%	(0.1%)	0.0%
Merit	0.0%	0.2%	0.0%	0.2%	0.0%	0.2%
Other demographic assumptions	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Assumed return	<u>0.0%</u>	<u>0.0%</u>	<u>0.4%</u>	<u>0.3%</u>	<u>0.8%</u>	<u>0.6%</u>
Total	0.0%	0.3%	0.4%	0.6%	0.8%	0.9%
Combined Total	0.3%		1.0%		1.7%	

Changes shown are stated as a percent of payroll and exclude changes for the RHIA & RHIPA retiree healthcare programs

Agenda Items – Remaining 2019 Meetings

- Needed action before completion of actuarial valuations:
 - Adoption of assumptions and methods for use in the following valuations:
 - December 31, 2018 “advisory” valuation that estimates 2021-2023 rates
 - December 31, 2019 valuation that calculates recommended 2021-2023 rates
- October meeting:
 - Presentation of system-level December 31, 2018 actuarial valuation results
 - Adoption of actuarial equivalency factors effective January 1, 2020
- December meeting:
 - Acceptance of the December 31, 2018 actuarial valuation report and employer-specific advisory 2021-2023 contribution rates
 - Financial modeling over the next twenty years under a variety of possible future scenarios for actual investment return



Appendix

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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, 2017 (“the Valuation Report”) published on September 28, 2018. 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, along with prior presentations to the PERS Board, including the April 2019 and May 2019 presentations to the PERS Board, and the full Experience Study report should be referenced for additional detail on the assumptions, methods, and plan provisions underlying this presentation.

This presentation also summarizes a limited number of high-level preliminary results based on information provided for the December 31, 2018 actuarial valuation. These results are preliminary in nature, are shown here only for illustrating the effect of assumption changes, and should not be relied upon for other purposes. Final results will be published in the December 31, 2018 Actuarial Valuation Report to be published later this year, which will also document the member census data underlying the results.

In preparing this presentation, we relied, without audit, on information (some oral and some in writing) supplied by the System’s staff as well as capital market expectations provided by Callan and information presented to the Oregon Investment Council. 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 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.

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. While we have illustrated scenarios with differing future investment future returns to illustrate the System’s sensitivity to investment risk, due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. Our annual financially modeling presentation to the PERS Board should be referenced for additional analysis of the potential variation in future measurements. Our forthcoming December 31, 2018 Actuarial Valuation Report will provide additional discussion of the System’s risks. The PERS Board has the final decision regarding the appropriateness of the assumptions.

Certification

Milliman's work product was prepared exclusively for Oregon PERS for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning PERS' operations, and uses PERS' data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its 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 plan sponsors. 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.

Appendix

Data

Except where noted, our analysis of demographic assumptions was based on data for the experience period from January 1, 2015 to December 31, 2018 as provided by the Oregon Public Employees Retirement System (PERS). PERS is solely responsible for the validity, accuracy and comprehensiveness of this information; the results of our analysis can be expected to differ and may need to be revised if the underlying data supplied is incomplete or inaccurate.

Member data was summarized according to the actual and potential member decrements during each year. Actual and potential decrements were grouped according to category of employment, sex, age, and/or service depending on the demographic assumption.

Where possible, we attempted to identify decrements that were spread across two calendar years (for example, if a member retired in one year, but didn't commence benefits until January 1 of the following year) so that we could reflect these decrements as individual events.

In order to capture experience across a broader range of budget, collective bargaining, and economic cycles, our analysis of salary increases covered observed salary experience from 2010 through 2018 as provided by PERS.

Our analysis focused on observed salary levels during consecutive calendar years for members who remained in active employment across both years, so that the observed change in salary would not be influenced by the reduced number of months worked during a year in which the member decrements. Similarly, we focused on experience above the 5th percentile and below the 95th percentile of observed salary increases in order to avoid the potential distorting effect of including extreme salary changes that likely resulted from unusual events.

Appendix

Actuarial Basis

Capital Market Assumptions - Milliman

For assessing the expected portfolio return under Milliman's capital market assumptions, we considered the Oregon PERS Fund to be allocated among the model's asset classes as shown below. This allocation is based on the Oregon Investment Council's Statement of Investment Objectives and Policy Framework for the Oregon PERS Fund, as revised April 2018, and changes adopted in April 2019.

	Annual Arithmetic Mean	20-Year Annualized Geometric Mean	Annual Standard Deviation	Policy Allocation
US Large/Mid-Cap Equity	7.35%	6.30%	15.50%	16.17%
US Small Cap Equity	8.35%	6.68%	19.75%	1.35%
US Micro-Cap Equity	8.86%	6.79%	22.10%	1.35%
Non-US Developed Equity	8.30%	6.91%	17.95%	13.47%
Emerging Markets Equity	10.35%	7.69%	25.35%	4.23%
Non-US Small Cap Equity	8.81%	7.25%	19.10%	1.92%
Private Equity	11.95%	8.33%	30.00%	17.50%
US Core Fixed Income	4.14%	4.07%	3.90%	9.60%
US Short-Term Bonds	3.70%	3.68%	2.10%	9.60%
US Bank/Leveraged Loans	5.40%	5.19%	6.85%	3.60%
High Yield Bonds	6.13%	5.74%	9.35%	1.20%
Real Estate	6.19%	5.55%	12.00%	10.00%
Global REITs	8.29%	6.69%	19.30%	2.50%
Timber	6.36%	5.61%	13.00%	1.13%
Farmland	6.87%	6.12%	13.00%	1.13%
Infrastructure	7.51%	6.67%	13.85%	2.25%
Commodities	5.34%	3.79%	18.70%	1.13%
Hedge Fund of Funds - Diversified	4.28%	4.06%	6.90%	1.50%
Hedge Fund Event-Driven	5.89%	5.59%	8.10%	0.37%
US Inflation (CPI-U)		2.50%	1.65%	N/A
Fund Total (reflecting asset class correlations)	7.55%	6.91%*	12.14%	100.00%

* Reflects 0.10% average reduction to model passive investment expenses. The model does not try to assess the actual investment expenses for active management. The model's 20-year annualized geometric median is **6.87%**.

Appendix

Actuarial Basis

Capital Market Assumptions - Callan

For assessing the expected portfolio return under Callan's capital market assumptions, we applied the assumptions shown below provided by Callan.

	10-Year Annualized Geometric Mean	Annual Standard Deviation	Policy Allocation
Broad US Equity	7.15%	17.97%	16.25%
Global ex-US Equity	7.25%	21.10%	16.25%
OIC Private Equity	9.18%	26.30%	17.50%
Private Real Estate	7.03%	12.21%	12.50%
US Fixed Income	3.75%	3.75%	20.00%
Diversifying Strategies	6.15%	10.97%	7.50%
Illiquid Alternatives	7.38%	12.56%	7.50%
Risk Parity	6.50%	11.00%	2.50%
Inflation	2.25%	1.50%	N/A
Fund Total (reflecting asset class correlations)	7.39%*	12.49%	100.00%

* 10-year annualized geometric median is 7.32%.

Appendix

Actuarial Basis

Capital Market Assumptions - Horizon

For assessing the expected portfolio return under an additional set of capital market assumptions, we applied the assumptions from the 2018 Survey of Capital Market Assumptions published by Horizon Actuarial Services, LLC. According to the survey report, the 10-year return assumptions shown below represent an average of the expectations for 34 investment advisors responding to the survey.

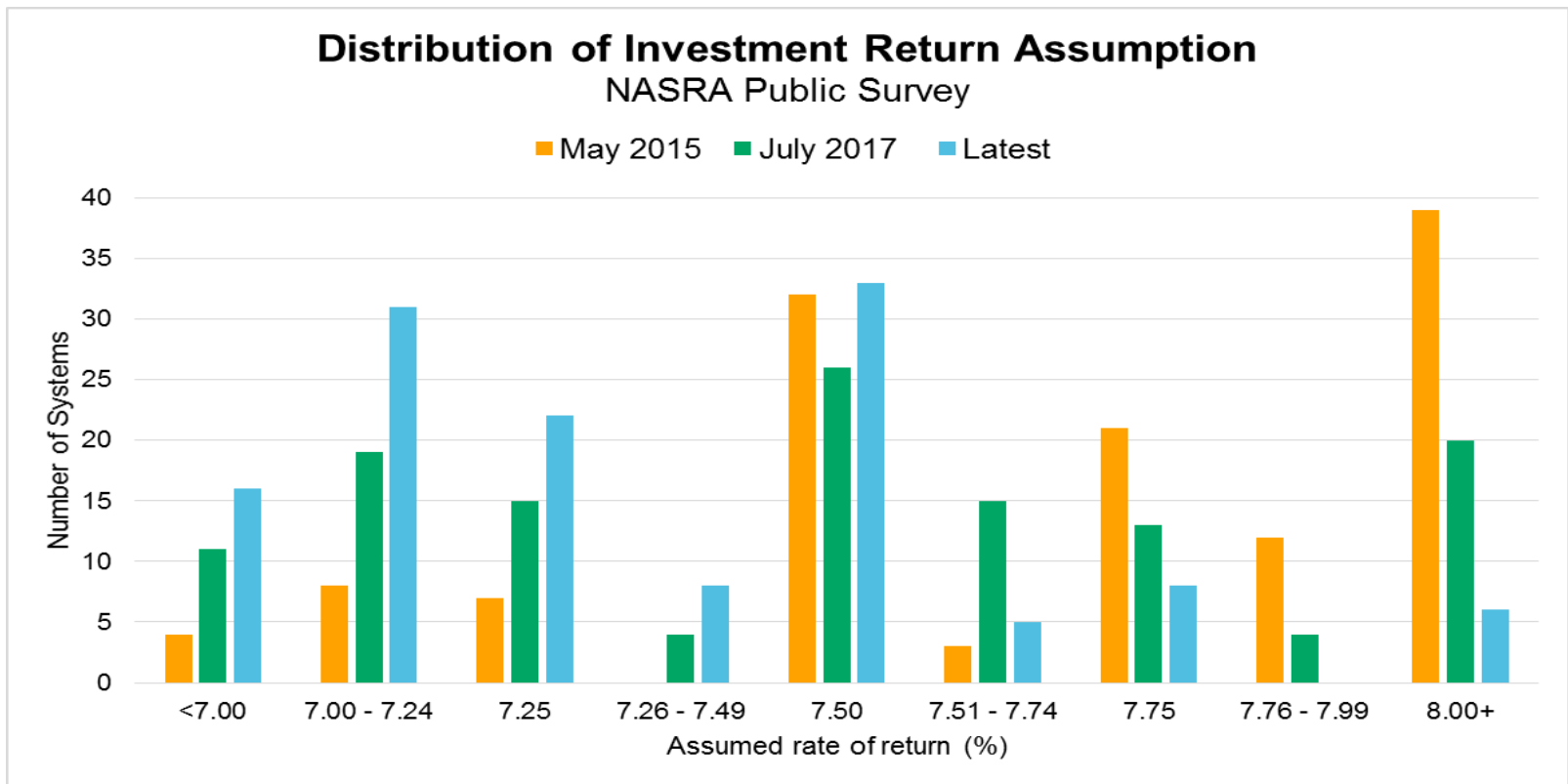
	10-Year Annualized Geometric Mean	Annual Standard Deviation	Policy Allocation
US Equity – Large Cap	6.07%	16.39%	16.17%
US Equity – Small/Mid Cap	6.57%	20.20%	5.20%
Non-US Equity – Developed	6.71%	18.67%	15.40%
Non-US Equity – Emerging	7.64%	24.89%	4.24%
US Corporate Bonds – Core	3.37%	5.71%	14.40%
US Corporate Bonds – High Yield	4.78%	10.24%	4.80%
US Treasuries (Cash Equivalents)	2.48%	2.74%	4.80%
Real Estate	5.90%	13.86%	12.25%
Hedge Funds	4.96%	7.87%	1.87%
Commodities	3.97%	17.60%	1.12%
Infrastructure	6.56%	14.74%	2.25%
Private Equity	8.33%	22.16%	17.50%
Inflation	2.24%		N/A
Fund Total (reflecting asset class correlations)	6.70%*		100.00%

* 10-year annualized geometric median is **6.64%**.

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Comparison to Peer Systems

- There is a downward trend in public plan return assumptions, with a current median assumption for large public systems of **7.25%**
- Over 50% of the 129 systems tracked by the NASRA Public Fund Survey reduced their assumption over last 2-3 years



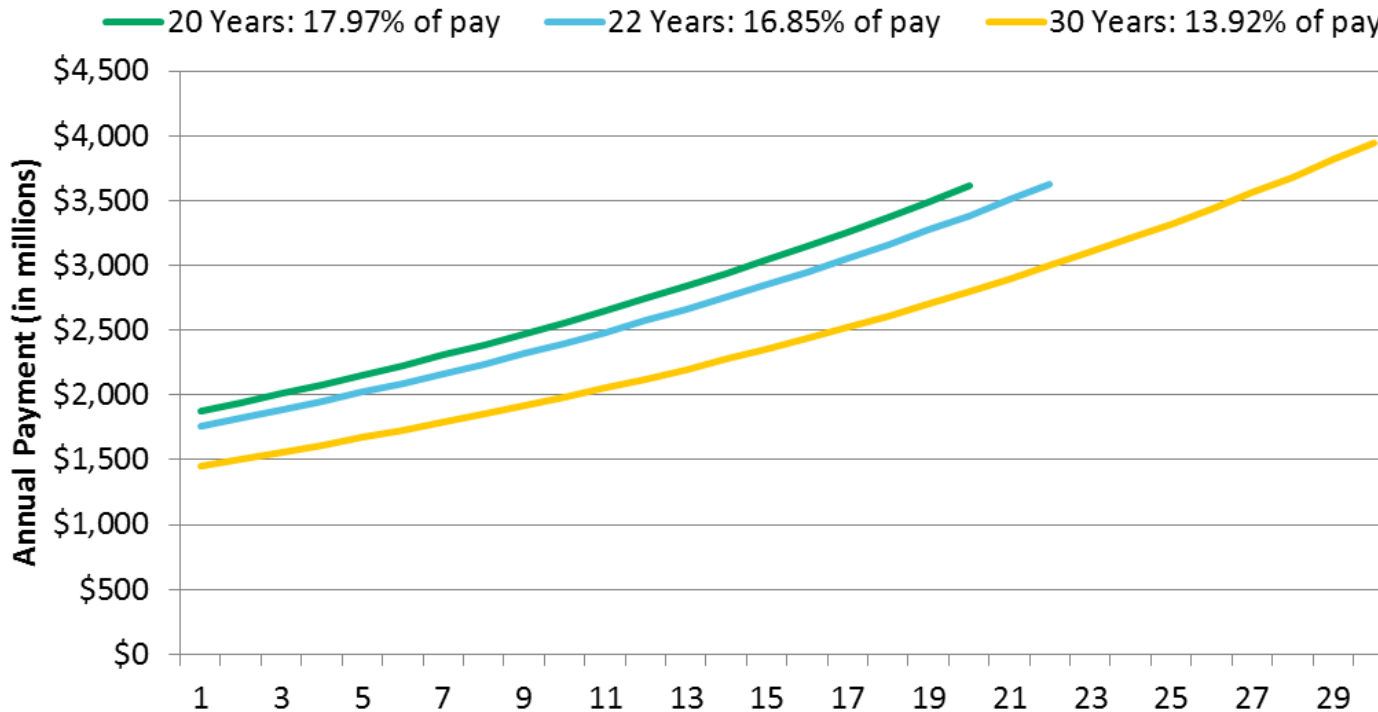
Source: **NASRA (April, 2019)**

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Illustration of UAL Amortization Periods

Annual UAL Payments by Selected Amortization Period

Level % of pay amortization, 7.20% interest, 3.50% payroll growth



Current policy

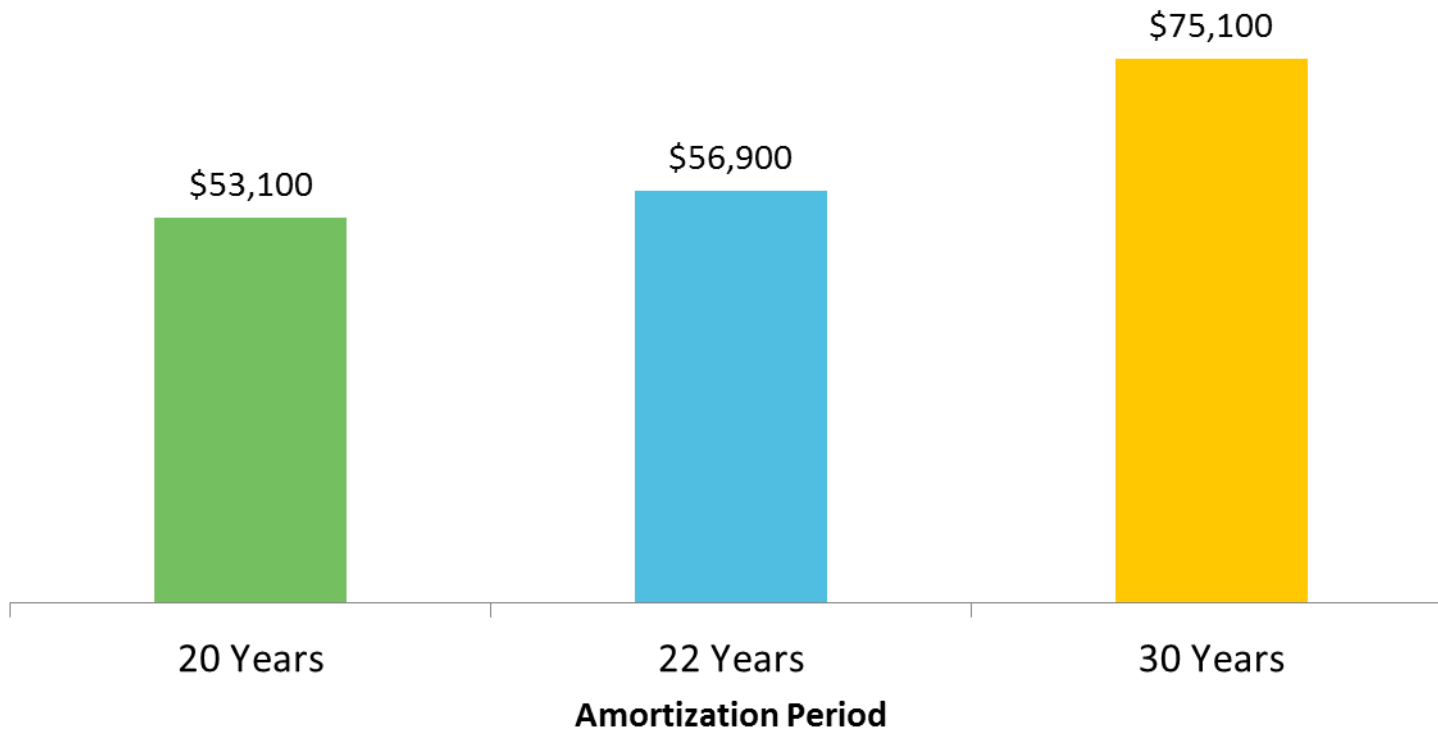
- Tier 1 / Tier 2:
20 years
- OPSRP:
16 years

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Illustration of UAL Amortization Periods

Total Repayment (\$M) by Selected Amortization Period

Level % of pay amortization, 7.20% assumed return, 3.50% payroll growth



Current policy

- Tier 1 / Tier 2:
20 years
- OPSRP:
16 years

Effects of Lowering the Assumed Return

- Lowering the assumption to 7.10% or 7.00% would affect the Money Match calculation for a member age 59½ with a \$135,000 member account balance as of 6/30/2019 as shown:

Benefit Commencement	Starting Benefit Under Assumed Rate*		
	7.20%	7.10%	7.00%
7/1/2019	\$1,909		
12/1/2019	\$1,973		
1/1/2020		\$1,971	\$1,951
2/1/2020		\$1,985	\$1,965
3/1/2020		\$1,999	\$1,979

* Illustration uses 2018 actuarial equivalency mortality in calculation of all benefits

- At a 7.00% assumption, it would take about three months without retirement for the December 2019 initial benefit level to be reached
 - At a 7.10% assumed return, it would take about one month
 - Illustration ignores Full Formula “floor”, which may mitigate any benefit decrease

Mortality Assumption

	Current Assumption	Proposed Changes
Healthy Retired	RP 2014 Generational, with unisex Social Security scale (1953-2013 experience) Healthy Annuitant, Sex distinct	Pub-2010 Generational, with unisex Social Security scale (1955-2015 experience) Healthy Retiree, Sex distinct
<ul style="list-style-type: none"> School district male Other GS male P&F male 	White collar, set back 1 year 50% blue/50% white collar, set back 1 year 50% blue/50% white collar, set back 1 year	Teachers, no set back General Employees, set back 1 year Public Safety, no set back
<ul style="list-style-type: none"> School district female Other GS female P&F female 	White collar, set back 1 year 50% blue/50% white collar, no set back 50% blue/50% white collar, no set back	Teachers, no set back General Employees, no set back Public Safety, set back 1 year
Disabled Retired	RP 2014 Disabled, Generational with unisex Social Security scale (1953-2013) Sex distinct	Pub-2010 Disabled, Generational with unisex Social Security scale (1955-2015) Sex distinct
<ul style="list-style-type: none"> P&F male Other male P&F female Other female 	Disabled Retiree, no set back Disabled Retiree, no set back Disabled Retiree, no set back Disabled Retiree, no set back	50% Public Safety/50% Non-Safety, no set back Non-Safety, set forward 2 years 50% Public Safety/50% Non-Safety, no set back Non-Safety, set forward 1 year
Non-Retired Mortality	RP 2014 Generational, with unisex Social Security scale (1953-2013) Employee (Non-Annuitant), Sex distinct	Pub-2010 Generational, with unisex Social Security scale (1955-2015) Employee (Non-Annuitant), Sex distinct
<ul style="list-style-type: none"> School district male Other GS male P&F male 	White collar, set back 1 year 50% blue/50% white collar, set back 1 year 50% blue/50% white collar, set back 1 year	Teachers, no set back, scaled 120% General Employees, set back 1 year, scaled 115% Public Safety, no set back, not scaled
<ul style="list-style-type: none"> School district female Other female 	White collar, set back 1 year 50% blue/50% white collar, no set back 50% blue/50% white collar, no set back	Teachers, no set back, not scaled General Employees, no set back, scaled 125% Public Safety, set back 1 year, not scaled



Oregon

Kate Brown, Governor

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July 26, 2019

TO: Members of the PERS Board
FROM: Kevin Olineck, Director
SUBJECT: Preliminary Adoption of Valuation Methods and Assumptions

At today's meeting, the Milliman actuaries are presenting their recommended changes to actuarial methods and assumptions so that they can complete the 2018 system valuation. These items are included in their presentation materials and the 2018 Experience Study, which was distributed to you prior to this meeting. The purpose of this memo is to compile these changes into one document and provide a recommended board motion.

Milliman recommends retaining or changing the following actuarial methods and assumptions:

ACTUARIAL METHODS

- Retain the Funding Policy based on the following objectives, while they might have competing interests: transparent; predictable and stable rates; protect funded status; equitable across generations; actuarially sound; and GASB compliant.
- Confirm continued use of the Entry Age Normal methodology.
- Continue use of the rate collaring policy which limits the change in base contribution rates to the larger of 20% of current rate or 3.00% of payroll. The collar widens incrementally when funded status is below 70%.
- As directed in Senate Bill 1049, on a one-time basis, set the amortization period for Tier One and Tier Two members to 22 years and reamortize the full liability of those two tiers. The amortization period for OPSRP liability remains at 16 years.

NON-ECONOMIC ASSUMPTIONS

- Retain the inflation rate of 2.5%, which affects all other assumptions including system payroll growth, investment return and health care inflation.
- Retain the real wage growth rate of 1.0%, which represents the increase in wages in excess of inflation for the whole population.
- Retain the system payroll growth of 3.5%, which is assumed to equal the sum of inflation and real wage growth.

ECONOMIC ASSUMPTIONS and ASSUMED RATE of RETURN

- Update the explicit assumptions regarding administrative expenses for Tier One/Tier Two and OPSRP.
- Update the assumed health cost trend (i.e., health cost inflation) rates for the RHIPA retiree healthcare program
- Milliman recommended the Board not increase the assumed rate from 7.20%, but that consideration be given to lowering the investment return assumption to 7.10% or 7.00%, based on an analysis of PERS's current target asset allocation using different sets of

capital market outlook assumptions. The averages of the 50th percentiles for those outlooks across 10-year (one outlook) and 20-year (two outlooks) time horizons fell in the range between 6.64% and 7.32%. The median assumption for large public sector plans currently sits at 7.25%.

DEMOGRAPHIC ASSUMPTIONS

- Adjust mortality assumptions to use Pub-2010 base tables and mortality improvement scale based on 60-year unisex average Social Security experience and updated to reflect most recent information available (January 2019).
- Adjust retirement rates for certain member categories and service bands to more closely align with recent and expected future experience; reduce percentage of future retirees assumed to elect a partial lump sum; increase percentage of members assumed to purchase credited service at retirement.
- Increase the merit component of the salary increase assumption for two member categories based on observations of the last eight years of experience.
- Update pre-retirement termination of employment assumptions for two member categories.
- Lower assumed rates of ordinary disability and general service duty disability to more closely match recent experience.
- Increase the Tier One unused vacation cash out assumption for most member categories
- Adjust the Tier One/Tier Two unused sick leave assumption for five member categories to reflect observed experience.
- Decrease the healthy participation assumption for the RHIA retiree healthcare program and decrease the RHIPA participation assumption for most service bands.

ALLOCATION PROCEDURES

- When allocating accrued liability for Tier One/Tier Two active members who have earned service with multiple PERS employers, base 90% of the allocation on service with each employer (100% for police & fire members) and base the rest on the member account balance associated with each employer. The assumption for general service has increased 5% since the prior experience study. This movement illustrates the continued migration of projected future Tier One/Tier Two retirement benefits away from the Money Match calculation, which is based on account balances, toward the ongoing Full Formula approach, which is based on final average salary.

BOARD OPTIONS

The Board may:

1. Pass a motion to “Adopt, on a preliminary basis, the recommended changes to the actuarial methods and assumptions as presented by Milliman in the 2018 Experience Study, including setting the assumed rate at ____%.”
2. Direct Milliman to review one or more of their recommended changes and return with recommendations that more closely align with the Board’s direction.

STAFF RECOMMENDATION

Staff recommends that the PERS Board choose Option #1 above, including setting the assumed rate.

The board will adopt, on a finalized basis, all recommended changes at their October board meeting. This is a change from previous years given the requirement, under SB1049, to provide the state legislature a report outlining the proposed changes at least 30 days prior to formal adoption.

If the Board does not adopt: If the PERS Board does not adopt actuarial methods and assumptions at today's meeting, production of the 2018 system valuation will be delayed.



OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

2018 Experience Study

Prepared by:

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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.



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July 24, 2019

Board of Trustees
Oregon Public Employees Retirement System

Re: 2018 Experience Study – Oregon Public Employees Retirement System

Dear Members of the Board:

The results of an actuarial valuation are based on the actuarial methods and assumptions used in the valuation. These methods and assumptions are used in developing employer contribution rates, disclosing employer liabilities pursuant to GASB requirements, and for analyzing the fiscal impact of proposed legislative amendments.

This experience study report has been prepared exclusively for the Oregon Public Employees Retirement System (PERS) and its governing PERS Board (Board). **The study recommends to the Board the actuarial methods and assumptions to be used in the December 31, 2018 and 2019 actuarial valuations of PERS.**

Except where otherwise noted, the analysis in this study was based on data for the experience period from January 1, 2015 to December 31, 2018 as provided by PERS. PERS is solely responsible for the validity, accuracy, and comprehensiveness of this information; the results of our analysis can be expected to differ and may need to be revised if the underlying data supplied is incomplete or inaccurate.

Milliman's work is prepared solely for the use and benefit 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.

The consultants who worked on this assignment are pension actuaries and, for the analysis of the RHIPA program, healthcare actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.



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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. Assumptions related to the healthcare cost inflation rates for the RHIPA retiree healthcare program discussed in this report were determined by Milliman actuaries qualified in such matters.

Sincerely,



Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary



Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



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1. Executive Summary

This experience study report has been prepared exclusively for the Oregon Public Employees Retirement System (PERS) and the PERS Board (Board) in order to analyze the system's experience from January 1, 2015 through December 31, 2018 and to recommend actuarial methods and assumptions to be used in the December 31, 2018 and 2019 actuarial valuations of PERS.

A brief summary of the recommended method and assumption changes contained in this report as well as items reviewed at the May 2019 and/or July 2019 Board meetings follows:

Economic Assumptions

- In our professional opinion, the current investment return assumption of 7.20% per year is reasonable, based on an analysis of PERS's current target asset allocation with consideration of different sets of capital market outlook assumptions. However, the PERS Board should give consideration to reducing the assumption, with either 7.10% or 7.00% also being reasonable in our professional opinion. The median annualized return for the 10-year outlook from Callan (the outside investment advisor to the Oregon Investment Council) was 7.32%. The median annualized return for a 20-year time horizon based on Milliman's capital market outlook was 6.87%.
- Update the explicit assumptions regarding administrative expenses for Tier 1/Tier 2 and OPSRP.
- Update the assumed RHIPA cost subsidy trend rates.

Demographic Assumptions

- Adjust mortality assumptions to use the new "Pub-2010" base tables and a standard update to the mortality improvement scale, which is based on 60-year unisex average Social Security experience.
- Adjust retirement rates for certain member categories and service bands to more closely align with recent and expected future experience; reduce percentage of future retirees assumed to elect a partial lump sum; increase percentage of members assumed to purchase credited service at retirement.
- Increase the merit component of the salary increase assumption for two member categories based on observations of the last eight years of experience.
- Update pre-retirement termination of employment assumptions for two member categories.
- Lower assumed rates of ordinary (non-duty) disability and general service duty disability to more closely match recent experience.
- Increase the Tier 1 unused vacation cash out assumption for most member categories, reflecting recent experience.
- Adjust the Tier 1/Tier 2 unused sick leave assumption for five member categories to more closely reflect recently observed experience.
- Decrease the healthy participation assumption for the RHIA retiree healthcare program, reflecting recent experience.
- Decrease the RHIPA participation assumption for most service bands, reflecting recent experience.

Actuarial Methods

- Senate Bill 1049 was signed into law in June 2019 and requires a one-time re-amortization of Tier 1/Tier 2 UAL in the calculation of actuarially determined contribution rates for the 2021-2023 biennium. No additional changes are recommended for most actuarial methods, including the actuarial cost method, amortization method, and rate collar.

Allocation Procedures

- When allocating accrued liability for Tier 1/Tier 2 active members who have earned service with multiple PERS employers, base 90% of the allocation on length of service with each employer (100% for police & fire members) and base the rest on the member account balance associated with each employer. The percentage allocation for general service has increased 5% since the prior experience study. This movement illustrates the continued migration of projected future Tier 1/Tier 2 retirement benefits away from the Money Match calculation, which is based on account balances, toward the ongoing Full Formula approach, which is based on final average salary.

2. Actuarial Methods and Allocation Procedures

Overview

Actuarial methods and allocation procedures are used as part of the valuation to determine actuarial accrued liabilities, to determine normal costs, to allocate costs to individual employers and to amortize unfunded liabilities. The following Board objectives were considered in developing the actuarial methods and allocation procedures:

- Transparency of shortfall and funded status calculations
- Predictable and stable employer contribution rates
- Protection of the plan’s funded status to enhance benefit security for members
- Equity across generations of taxpayers funding the program
- Actuarial soundness - crafting policy that will fully fund the system if assumptions are met
- Compliance with GASB (Governmental Accounting Standards Board) requirements

The actuarial methods used for the December 31, 2017 actuarial valuation and the changes recommended for the December 31, 2018 and 2019 actuarial valuations are shown in the table below.

Method	December 31, 2017 Valuation	December 31, 2018 and 2019 Valuations
Cost method	Entry Age Normal (EAN)	No change
UAL Amortization method	UAL amortized as a level percent of combined Tier 1/Tier 2 and OPSRP payroll	No change
UAL Amortization period	<ul style="list-style-type: none"> ▪ UAL bases – Closed amortization from the first rate-setting valuation in which experience is recognized <ul style="list-style-type: none"> – Tier 1/Tier 2 – re-amortized over 20 years effective December 31, 2013 – OPSRP – 16 Years – RHIA/RHIPA – 10 years ▪ Newly established side accounts – Aligned with the new Tier 1/Tier 2 base from the most recent rate-setting valuation ▪ Newly established transition liabilities or surpluses – 18 years from the date joining the SLGRP (State & Local Government Rate Pool) 	<p>No change to OSRP and RHIA/RHIPA UAL, side accounts, and transition liabilities or surpluses.</p> <p>Current Tier 1/Tier 2 UAL will be re-amortized over 22 years per Senate Bill 1049.</p>
Asset valuation method	Market value	No change
Exclusion of reserves from valuation assets	Contingency Reserve, Capital Preservation Reserve, and Tier 1 Rate Guarantee Reserve (RGR) excluded from valuation assets. RGR is not excluded from valuation assets when RGR is negative (i.e., when the RGR is a deficit reserve).	No change

Method	December 31, 2017 Valuation	December 31, 2018 and 2019 Valuations
Allocation of Benefits in Force (BIF) Reserve	The BIF is allocated to each rate pool in proportion to the retiree liability attributable to the rate pool.	No change
Rate collar	Change in base contribution rate limited (i.e., collared) to greater of 20% of current base rate or 3% of payroll. Size of collar doubles if funded percentage excluding side accounts falls below 60% or increases above 140%. If the funded percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale. Exclude RHIA and RHIPA (retiree medical) rates from the rate collar calculation.	No change
Liability allocation for actives with multiple employers	<ul style="list-style-type: none"> ▪ Allocate Actuarial Accrued Liability 15% (0% for police & fire) based on account balance with each employer and 85% (100% for police & fire) based on service with each employer 	Change allocation to 10% (0% for police & fire) based on account balance and 90% (100% for police & fire) based on service with each employer.
	<ul style="list-style-type: none"> ▪ Allocate Normal Cost to current employer 	No change

The methods or procedures are described in greater detail on the following pages.

Actuarial Cost Method

The total cost of the program, over time, will be equal to the benefits paid less investment earnings and is not affected directly by the actuarial cost method. The actuarial cost method is simply a tool to allocate costs to past, current or future years and thus primarily affects the timing of cost recognition.

The December 31, 2017 valuation used the Entry Age Normal (EAN) method, which allocates costs as a level percentage of payroll across the full projected working career. EAN is the required method under the recently implemented GASB 67 and 68 financial reporting standards, though the Board could choose to use a different method for employer contribution rate calculations. Oregon PERS adopted EAN for all purposes with the December 31, 2012 valuation. Employing a consistent method for both financial reporting and contributions is more understandable to interested parties as only one set of liability and normal cost calculations will be made for each member, employer, and rate pool. The EAN approach is widely used in the actuarial and public plan sponsor community because it provides an actuarially sound estimate of the long-term employer contribution costs of a retirement program as a level percentage of payroll if all assumptions are met. The benefits of this method are unchanged from when the Board previously adopted it, and we recommend continuing to use the EAN cost method.

Amortization Method

Unfunded Actuarial Liability

The unfunded actuarial liability (UAL) is amortized as a level percentage of projected combined payroll (Tier 1/Tier 2 plus OPSRP) in order to maintain more level contribution rates as payroll for the closed group of Tier 1/Tier 2 members declines and payroll of OPSRP members increases. We recommend this methodology continue.

The UAL is currently amortized over the following closed periods as a level percent of projected payroll from the first rate-setting valuation in which the experience is recognized:

- Tier 1/Tier 2 – 20 years
- OPSRP – 16 years
- RHIA/RHIPA – 10 years

As part of a collection of method changes made with the 2012 Experience Study, the Board made a policy decision to re-amortize all existing Tier 1/Tier 2 unfunded actuarial liability (UAL) at the December 31, 2013 rate-setting actuarial valuation. Since then, gains and losses between subsequent rate-setting valuations have been amortized as a level percentage of payroll over a closed 20 year period from the rate-setting valuation in which they were first recognized.

Senate Bill 1049 was signed into law in June 2019 and requires a one-time re-amortization of Tier 1/Tier 2 UAL over a closed 22 year period at the December 31, 2019 rate-setting actuarial valuation which will set actuarially determined contribution rates for the 2021-2023 biennium.

Side Accounts and Transition Liabilities/Surpluses

Prior to the 2010 Experience Study, side accounts and transition liabilities/surpluses were amortized over the period ending December 31, 2027. To better match the amortization periods for new side accounts and new transition liabilities with the amortization of the Tier 1/Tier 2 UAL and to avoid issues related to a shortening amortization period, as part of the 2010 Experience Study the PERS Board adopted the following amortization procedures which are not tied to a fixed date:

- In general, newly established side accounts have been amortized over a 20-year period aligned with the new Tier 1/Tier 2 UAL base from the most recent rate-setting valuation. For example, a side account created in July 2019 would have been amortized to December 31, 2037, aligned with the 20-year Tier 1 /Tier 2 UAL base created in the most recent rate-setting valuation as of December 31, 2017 valuation. Employers who make lump sum payments in accordance with the rules under OAR 459-009-0086(9) may select a shorter amortization period of either 6, 10, or 16 years since the most recent rate-setting valuation.
- New transition liabilities/surpluses are amortized over the 18 year period beginning when the employer joins the SLGRP. This amortization period aligns with the last Tier 1/Tier 2 amortization base established as an independent employer.

We recommend no additional changes to the amortization method or periods of side accounts and new transition liabilities/surpluses. Despite the 22-year re-amortization of Tier 1/Tier 2 UAL as of December 31, 2019 required by SB 1049, we recommend continuing to use a 20-year period as the default schedule for new side account amortizations, to align with both past practice and anticipated future amortization periods for Tier 1/Tier 2.

Asset Valuation Method

Effective December 31, 2004, the Board adopted market value as the actuarial value of assets, replacing the four-year smoothing method previously used to determine the actuarial asset value, which is used for shortfall (UAL) calculations. Although asset smoothing is a common method for smoothing contribution rates in public sector plans, the smoothed asset value does not provide a transparent measure of the plan's funded status and UAL. Market value provides more transparency to members and other interested parties regarding the funded status of the plan. Instead of smoothing assets, a rate collar method (described below) is used to smooth contribution rates and systematically spread large rate increases across several biennia.

We recommend no change to the asset valuation method.

Excluded Reserves

Statute provides that the Board may establish Contingency and Capital Preservation reserve accounts to mitigate gains and losses of invested capital and other contingencies, including certain legal expenses or judgments. In addition, statute requires the establishment and maintenance of a Rate Guarantee or Deficit reserve to fund earnings crediting to Tier 1 member regular accounts when actual earnings are below the investment return assumption selected by the Board.

The Contingency and Capital Preservation reserves are excluded from the valuation assets used for employer rate-setting calculations. We recommend no change to the treatment of the Contingency and Capital Preservation reserves.

The Rate Guarantee Reserve (RGR) was positive as of December 31, 2017, but can become negative (in deficit status) if, over time, the required crediting on Tier 1 member accounts exceeds the investment earnings on those accounts. The RGR was negative from the December 31, 2008 valuation to the December 31, 2012 valuation. All else being equal, excluding a negative reserve increases the level of valuation assets used in employer rate-setting calculations. This occurs because subtracting a negative amount is mathematically equivalent to adding a positive amount of the same magnitude. If the negative reserve was larger in absolute value than the sum of the other reserves, this approach would lead to the actuarial value of assets used in shortfall (UAL) calculations being larger than the market value of assets.

As part of the 2010 Experience Study, the Board decided to only exclude the RGR from assets when it is in positive surplus position, and not to subtract a negative RGR (which would increase the actuarial value of assets) when it is in deficit status. We recommend this treatment of the RGR continue.

Rate Collar Method

Effective December 31, 2004, a rate collar method was adopted that limits biennium to biennium changes in contribution rates to be within a specified “collar” range. The existing rate collar method restricts the change in an employer’s “base” Tier 1/Tier 2 contribution rate (i.e., the rate before contemplation of side account rate offsets or rate adjustments for any pre-pooled obligations) to the greater of 20 percent of the current rate or 3% of payroll. If the funded status excluding side accounts is less than 60% or greater than 140%, the size of the rate collar is doubled. If the funded percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.

The rate collar is applied for each employer (or rate pool) prior to any adjustments to the employer contribution rate for side accounts, transition liabilities, or pre-SLGRP pooled liabilities. The rate collar only applies to employer contribution rates for pension benefits. Rates attributable to RHIA and RHIPA (retiree medical) programs are not subject to the collar.

Liability Allocation for Actives with Multiple Employers

Over the course of a member’s working career, a member may work for more than one employer covered under the Tier 1/Tier 2 program. Since employer contribution rates are developed on an individual employer basis, the member’s liability should be allocated between such a member’s various Tier 1/Tier 2 employers. If all of the member’s employers participate in the same rate pool, the allocation has no effect on rates, but if the employers participate in different pools or are independent, the allocation can have an impact on the different employers’ rates.

When a member retires, PERS allocates the cost of the retirement benefit between the employers the member worked for based on the formula that produces the member’s retirement benefit. If the member’s benefit is calculated under the Money Match approach, the cost is allocated in proportion to the member’s account balance attributable to each employer. If the member’s benefit is calculated under the percent of final average pay Full Formula approach, the cost is allocated in proportion to the service attributable to each employer.

In the period prior to the 2003 system reforms and shortly thereafter, the vast majority of retirement benefits were calculated under the Money Match approach, so the member liability in valuations prior to December 31, 2006 had been allocated in proportion to the member’s account balance attributable to each employer. With no new member contributions to Tier 1/Tier 2, however, this procedure meant no liability was allocated to employers for service after December 31, 2003 in the valuation. As Money Match benefits became less dominant and retirements under the Full Formula approach become more prevalent, a change in the procedure to allocate liability among employers was warranted.

Effective with the December 31, 2006 valuation, a change was made to allocate a member’s actuarial accrued liability among employers based on a weighted average of the Money Match methodology, which utilizes account balance, and the Full Formula methodology, which utilizes service. The methodologies were weighted according to the percentage of the system-wide actuarial accrued liability for new retirements projected to be attributable to the Money Match and Full Formula approaches, respectively, as of the next rate-setting valuation. For the December 31, 2016 and December 31, 2017 valuations, the Money Match method was weighted 15 percent for general service members and 0 percent for police & fire members.

The total actuarial liability for Tier 1/Tier 2 active members estimated to be attributable to the Money Match approach as of December 31, 2018 is 11 percent for General Service members and one percent for Police & Fire members. This continues the decreasing trend of Money Match benefits seen in prior Experience Studies.

We recommend the Money Match approach be weighted 10 percent for general service members. This weighting will continue to be reviewed with each experience study and updated as necessary. For police & fire members we recommend the allocation continue to be based entirely on the Full Formula approach, an assumption first adopted in the 2014 Experience Study, once the Money Match portion of future police & fire retirements fell below 5%.

As in prior valuations, the member's normal cost will continue to be assigned to their current employer.

3. Economic Assumptions

Overview

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance on selecting economic assumptions used in measuring obligations under defined benefit pension plans. ASOP No. 27 suggests that economic assumptions be developed using the actuary's professional judgment, taking into consideration past experience and the actuary's expectations regarding the future. The process for selecting economic assumptions involves:

- Identifying components of each assumption and evaluating relevant data
- Considering factors specific to the measurement along with other general factors
- Selecting a reasonable assumption

Under ASOP No. 27, an assumption is considered reasonable if:

- It is appropriate for the purpose of the measurement,
- It reflects the actuary's professional judgment,
- It takes into account relevant historical and current economic data,
- It reflects the actuary's estimate of future experience, the actuary's observation of estimates inherent in market data, or a combination thereof, and
- It has no significant bias, except when provisions for adverse deviation are included and disclosed.

A summary of the economic assumptions used for the December 31, 2017 actuarial valuation and those recommended for the December 31, 2018 and 2019 actuarial valuations is shown below:

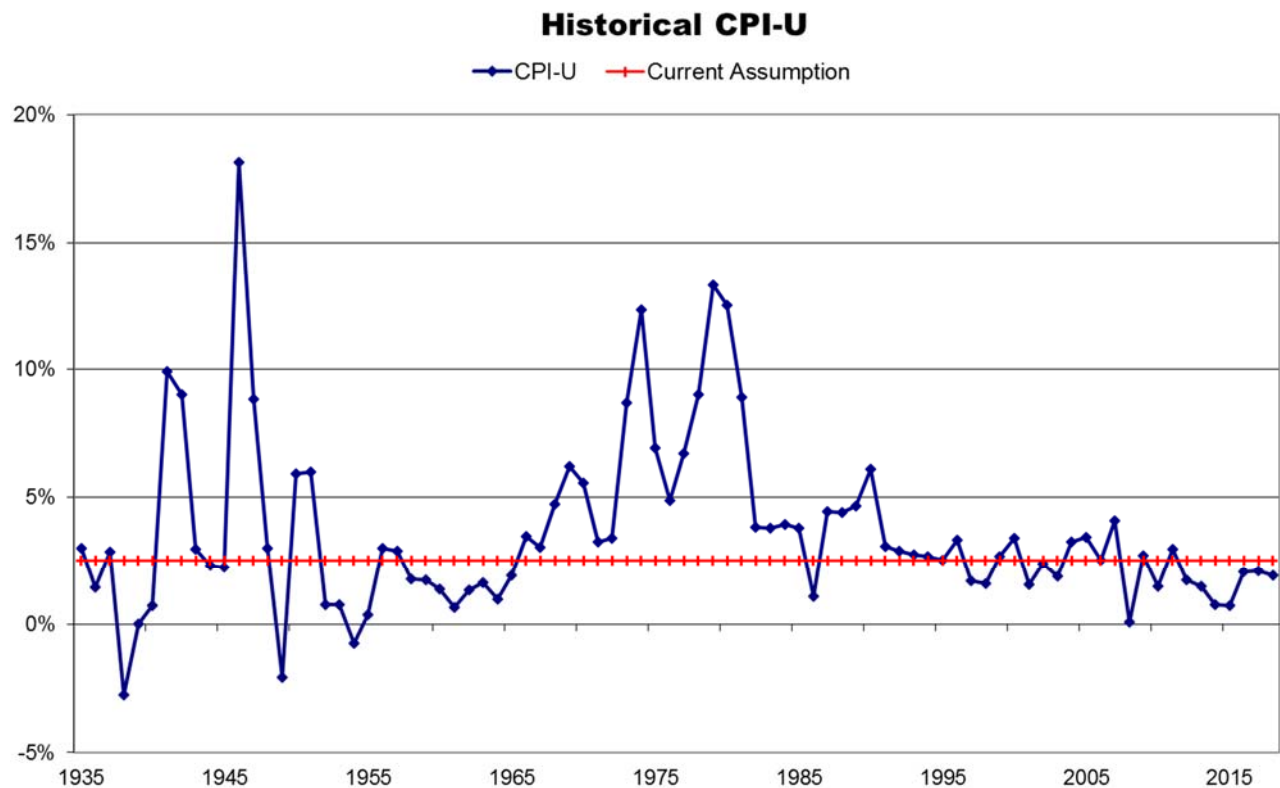
Assumption	December 31, 2017 Valuation	December 31, 2018 and 2019 Valuations
Inflation (other than healthcare)	2.50%	No Change
Real wage growth	1.00%	No Change
Payroll growth	3.50%	No Change
Regular investment return	7.20%	Current assumption is reasonable based on current data from capital market outlook models, but Board should give consideration to a lower rate, which would also be reasonable. Board will select the assumption at its July 26, 2019 meeting
Variable account investment return	Same as regular investment return	Same as regular investment return
Tier 1/Tier 2 administrative expenses	\$37.5 million/year	\$32.5 million/year
OPSRP administrative expenses	\$6.5 million/year	\$8.0 million/year

Assumption	December 31, 2017 Valuation	December 31, 2018 and 2019 Valuations
RHIPA subsidy cost trend rates		
▪ 2019 rate	5.90%	7.10%
▪ Ultimate inflation rate	4.20%	4.10%
▪ Year reaching ultimate rate	2093	2094

The recommended assumptions shown above, in our opinion, were selected in a manner consistent with the requirements of ASOP No. 27. Each of the above assumptions is described in detail below and on the following pages.

Inflation

The assumed inflation rate is the basis for all of the other economic assumptions. It affects other assumptions including payroll growth, investment return, and healthcare inflation.



In selecting an appropriate inflation assumption, we consider both historical data and the breakeven inflation rates inherent in current long-term Treasury Inflation Protection Securities (TIPS). The chart above shows the annual inflation rate for the years ending December 31 from 1935 through 2018 as reported by the Bureau of Labor Statistics. The mean and median annual rates over this period are **3.60** percent and **2.90** percent respectively.

Historical inflation rates vary significantly from period to period and may not be an indication of future inflation rates. With the development of a TIPS market, we can calculate an estimated breakeven inflation rate by comparing yields on regular Treasury securities to the yields on TIPS. The table below shows yields as of December 31, 2018, for 10-year and 30-year Treasury bonds and TIPS.

As of 12/31/2018	10-Year	30-Year
Treasury Yield	2.69%	3.02%
TIPS Yield	0.98%	1.21%
Breakeven Inflation	1.71%	1.81%

We also considered three other inflation measures in our analysis: Social Security’s intermediate inflation projection average of 2.53 percent over the period 2019-2029 (with an ultimate rate of **2.60** percent), the Medicare Trustees’ intermediate assumption of 3.20 percent inflation for ten years and **2.60** percent thereafter, and the Congressional Budget Office’s projection of CPI of an average of 2.37 percent inflation over the period 2019-2029. These measures were taken from, respectively, the 2018 OASDI Trustees Report, the 2018 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds, and *The Budget and Economic Outlook: 2019 to 2029* published by the CBO in January 2019.

Based on the information shown above, we consider the current assumption of 2.50 percent to continue to be reasonable and appropriate. We recommend no change to the assumption at this time.

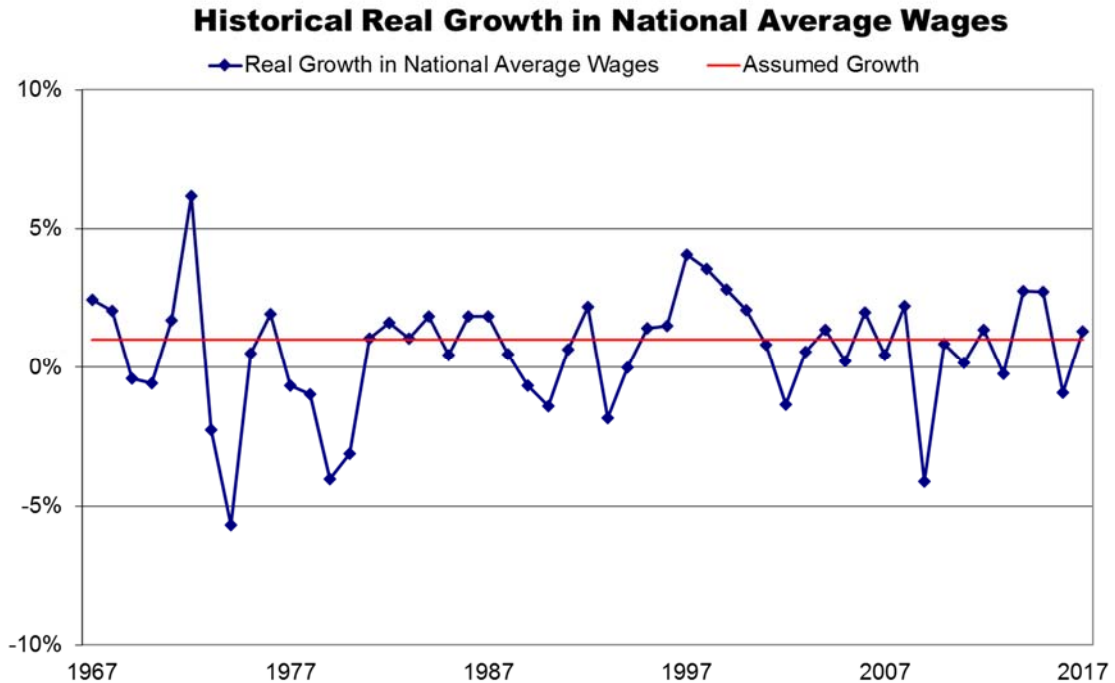
Real Wage Growth

The expected salary growth assumption is the sum of three factors:

- Inflation,
- Real wage growth, and
- Merit and longevity wage growth.

Real wage growth represents the increase in wages above inflation for an entire population due to improvements in productivity and competitive pressures. Merit and longevity wage growth, in contrast, represent the increases in wages for an individual due to factors such as performance, promotion, or seniority.

The chart below shows the real growth in national average wages over the past fifty years based on data compiled by the Social Security Administration.



While the change in any one year has been volatile, the change over longer periods of time is more stable as shown in the table below. However, the significant outlier result of a 4.1 percent productivity decrease in 2009 (measuring change in national average wages from 2008 to 2009) has a strong downward impact on the trailing averages shown in the table below. For example, the 10 year trailing average ending on December 31, 2008, is 1.11 percent.

Length of Period Ending December 31, 2017	Average Real Growth in National Average Wages
10 years	0.59%
20 years	0.92%
30 years	0.82%
40 years	0.65%
50 years	0.57%

We also considered the Social Security Administration’s current long-term intermediate wage growth assumption of 1.21 percent in our analysis.

Based on the combination of historical data and forecasted future experience, we consider the current assumption of 1.00 percent to continue to be reasonable and appropriate. We recommend no change to the assumption at this time.

Payroll Growth

Real wage growth combined with inflation represents the expected growth in total payroll for a stable population. Changes in payroll due to an increase or decline in the covered population are not captured by

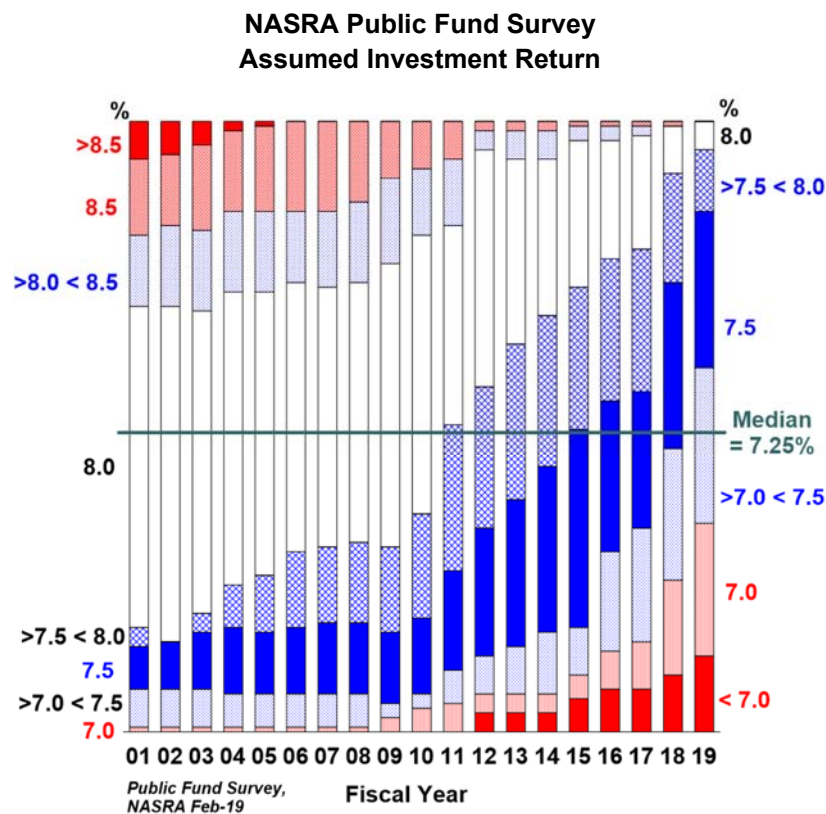
this assumption. The payroll growth assumption is used to develop the annual amount necessary to amortize the unfunded actuarial liability as a level percentage of projected future payroll.

Since we are recommending no changes to the inflation assumption or real wage growth assumption, we recommend that the payroll growth assumption should remain at 3.50 percent.

Investment Return

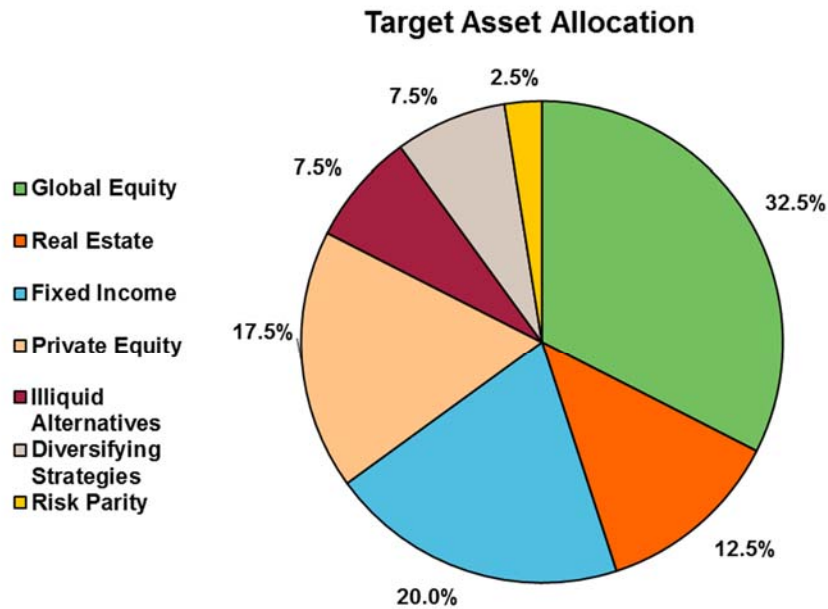
The assumed rate of investment return is used to calculate the present value as of the actuarial valuation date of future projected benefit payments from the retirement plan, to project interest credits applied to member accounts until retirement, to convert member accounts to a monthly retirement allowance under the Money Match formula, and to convert the retirement allowance to optional joint & survivor benefits. As such, it is one of the most important assumptions used in valuing the plan’s liabilities and developing contribution rates. The assumption is intended to reflect the long-term expected future return on the portfolio of assets that fund the benefits.

To provide some perspective on this assumption, the chart below shows the assumptions used by the 129 largest US public sector systems in a regularly updated survey published by the National Association of State Retirement Administrators (NASRA). As can be seen from the chart (updated in NASRA’s February 2019 Issue Brief), the Oregon PERS assumption of 7.20% used in the prior valuation is currently slightly lower than the median assumption for large US public sector systems. The arithmetic average (mean) of the return assumptions in the chart is 7.27%. Given the consensus view among investment professionals regarding low long-term expected returns for fixed income investments (relative to historical averages) and average future inflation , we believe that this downward trend in the survey will continue in the future as systems periodically revisit their investment return assumptions.



Regular Accounts

Based on the Oregon Investment Council’s (OIC) Statement of Investment Objectives and Policy Framework for the Oregon Public Employees Retirement Fund as most recently revised on April 24, 2019, we understand the target asset allocation adopted by the OIC is as follows:



To develop an analytical basis for the Board’s selection of the investment return assumption, we use long-term assumptions developed by Milliman’s capital market assumptions team for each of the asset classes in which the plan is invested based on the OIC’s long-term target asset allocation. Since the OIC uses broader asset classes than those for which Milliman’s investment professionals develop long-term return assumptions, we used OIC’s description of each asset class to map it to the classes shown below. For example, the OIC’s allocation to “illiquid alternatives” was distributed among hedge funds, infrastructure, and commodities based on the detail available. Each asset class assumption is based on a consistent set of underlying assumptions, including the inflation assumption. These assumptions are not based on average historical returns, but instead are based on a forward-looking capital market economic model. Based on the target allocation and investment return assumptions for each of the asset classes, our model’s 50th percentile output is developed as follows:

Asset Class	Target Allocation	Annual Arithmetic Mean	20-Year Annualized Geometric Mean	Annual Standard Deviation
Core Fixed Income	9.60%	4.14%	4.07%	3.90%
Short-Term Bonds	9.60%	3.70%	3.68%	2.10%
Bank/Leveraged Loans	3.60%	5.40%	5.19%	6.85%
High Yield Bonds	1.20%	6.13%	5.74%	9.35%

Asset Class	Target Allocation	Annual Arithmetic Mean	20-Year Annualized Geometric Mean	Annual Standard Deviation
Large/Mid Cap US Equities	16.17%	7.35%	6.30%	15.50%
Small Cap US Equities	1.35%	8.35%	6.68%	19.75%
Micro Cap US Equities	1.35%	8.86%	6.79%	22.10%
Developed Foreign Equities	13.48%	8.30%	6.91%	17.95%
Emerging Market Equities	4.24%	10.35%	7.69%	25.35%
Non-US Small Cap Equities	1.93%	8.81%	7.25%	19.10%
Real Estate (REITS)	2.50%	8.29%	6.69%	19.30%
Real Estate (Property)	10.00%	6.19%	5.55%	12.00%
Timber	1.13%	6.36%	5.61%	13.00%
Farmland	1.13%	6.87%	6.12%	13.00%
Infrastructure	2.25%	7.51%	6.67%	13.85%
Private Equity	17.50%	11.95%	8.33%	30.00%
Commodities	1.13%	5.34%	3.79%	18.70%
Hedge Fund of Funds – Diversified	1.50%	4.28%	4.06%	6.90%
Hedge Fund – Event-driven	0.38%	5.89%	5.59%	8.10%
Portfolio – Net of Investment Expenses	100.00%	7.55%	6.91%*	12.14%

*The Milliman model's 20-year annualized geometric median is 6.87%.

Based on capital market expectations developed by credentialed investment professionals at Milliman.

We compared the expected return to the range of returns developed using a mean-variance model and the capital market assumptions of both Milliman and Callan, the OIC's investment consultant. These capital market assumptions were developed based on year-end 2018 market conditions. In addition, we modeled the returns projected for the OIC's asset allocation using the 10-year capital market assumptions from the 2018 Survey of Capital Market Assumptions published by Horizon Actuarial Services, LLC in August 2018. Returns shown below are net of passive investment expenses. In our modeling, we assumed that expenses incurred for active management are offset by additional returns gained from active management.

The table below compares the median of expected annualized returns calculated on a geometric basis for the Regular Account based on Milliman's and Callan's capital market assumptions, and based on the average assumptions from the Horizon survey.

	Callan	Horizon	Milliman
Median annualized geometric return	7.32%	6.64%	6.87%
Assumed inflation	2.25%	2.24%	2.50%
Timeframe modeled	10 years	10 years	20 years

It is common practice among public pension systems for the investment return assumption to be a multiple of either a tenth- or quarter-point (i.e., 0.10% or 0.25%). The lack of additional precision in selected assumptions can reasonably be attributed to the inability to have precise knowledge in advance regarding future investment returns. The median annualized return for the 10-year outlook from Callan (the investment advisor to the Oregon Investment Council) was 7.32%. The median annualized return for a 20-year time horizon based on Milliman's capital market outlook was 6.87%. Those model outputs are based on the forward-looking return expectations of the investment professionals from those firms, and before any potential active management adjustments. Actual future investment returns are not determined by the assumed rate of return. Selecting an assumed return materially above the 50th percentile implies a materially greater than 50% chance of actual long-term future experience falling short of the selected assumption.

Both the Callan and Milliman models use capital market assumptions developed shortly after the end of 2018 and reflect the significant market downturn in the fourth quarter of that year in the underlying starting point. Our understanding is the relatively lower asset prices and P/E ratios as of December 31, 2018 would work to increase the forward-looking expected returns in many asset classes, based upon the analytical framework of both models. Since equity markets subsequently increased significantly in the first half of 2019, an updated version of these models may produce lower expected future returns, all else equal.

Based on the capital market outlooks modeled, we believe the current investment return assumption is reasonable. However, the PERS Board should give consideration to reducing the assumption out of acknowledgement of the uncertainty of future outlooks and the variance of single point-in-time measurement models such as those discussed above.

Variable Account

The variable account is invested entirely in Global Equities. As a result, the annual expected arithmetic return is significantly higher than for the regular account, but so is the standard deviation. The result is a long-term compounded geometric annual return similar to the regular account, based on Milliman's capital market assumptions. Prior to the December 31, 2012 valuation, the compound geometric variable account return was assumed to be higher than the regular account return. Beginning with that valuation, the variable account return assumption was set equal to the regular account return assumption, as the relationship between the various asset classes no longer warranted such a distinction in our opinion. We recommend continuing to set the variable account return assumption equal to the regular account return assumption.

Administrative Expenses

In accordance with GASB Statements No. 67 and No. 68, the long-term investment return assumption is considered to be gross of administrative expenses. In order to account for expected administrative expenses, we develop explicit assumptions for both Tier 1/Tier 2 and OPSRP based on recent and expected future experience. The assumed expenses for each program are added to the normal cost in the calculation of contribution rates in order to fund expenses each year as they occur.

The Tier 1/Tier 2 assumed administrative expenses in the December 31, 2017 valuation were \$37.5 million per year and the OPSRP assumed administrative expenses were \$6.5 million. A summary of recent actual administrative expenses for both Tier 1/Tier 2 and OPSRP is shown below.

Year	Tier 1/Tier 2		OPSRP	
	Dollar Amount (\$ millions)	Percentage of Beginning of Year Assets	Dollar Amount (\$ millions)	Percentage of Beginning of Year Assets
2014	\$30.1	0.06%	\$5.0	0.30%
2015	\$31.5	0.06%	\$5.7	0.28%
2016	\$35.8	0.07%	\$5.9	0.25%
2017	\$35.1	0.07%	\$5.9	0.20%
2018	\$29.1	0.05%	\$7.6	0.18%

Based on PERS financial reporting information reviewed as part of this study, we recommend setting the assumed actual administrative expenses for 2018 and 2019 at \$32.5 million for Tier 1/Tier 2 and \$8.0 million for OPSRP. These amounts reflect recent historical experience with an expectation of inflation-related growth for the next two years.

RHIPA Subsidy Cost Trend Rates

Trend rates are used to estimate increases in the employer cost of the RHIPA subsidy. Based on analysis performed by Milliman’s healthcare actuaries, we recommend the following change to the healthcare cost trend assumption. These rates include consideration of the excise tax scheduled to be introduced in 2022 by the Affordable Care Act.

Note that the following chart shows sample rates. A full chart can be found in the appendices.

Year	December 31, 2016 and 2017 Valuations	December 31, 2018 and 2019 Valuations
2017	7.5%	N/A
2018	6.5%	N/A
2019	5.9%	7.1%
2020	5.4%	5.8%
2021	5.3%	5.2%
2022	5.3%	5.0%
2023	5.3%	5.0%
2024	5.2%	5.0%
2025	5.2%	5.1%
2026	5.3%	5.0%
2027	5.3%	5.0%
2028	5.4%	5.0%
2029	6.2%	5.0%
2030	6.2%	5.4%

Year	December 31, 2016 and 2017 Valuations	December 31, 2018 and 2019 Valuations
2035	6.1%	5.9%
2040	6.0%	5.7%
2045	5.6%	5.6%
2050	5.4%	5.4%
2060	5.2%	5.1%
2070	4.6%	4.5%
2080	4.3%	4.2%
2090	4.3%	4.2%
2094+	4.2%	4.1%

4. Demographic Assumptions

Overview

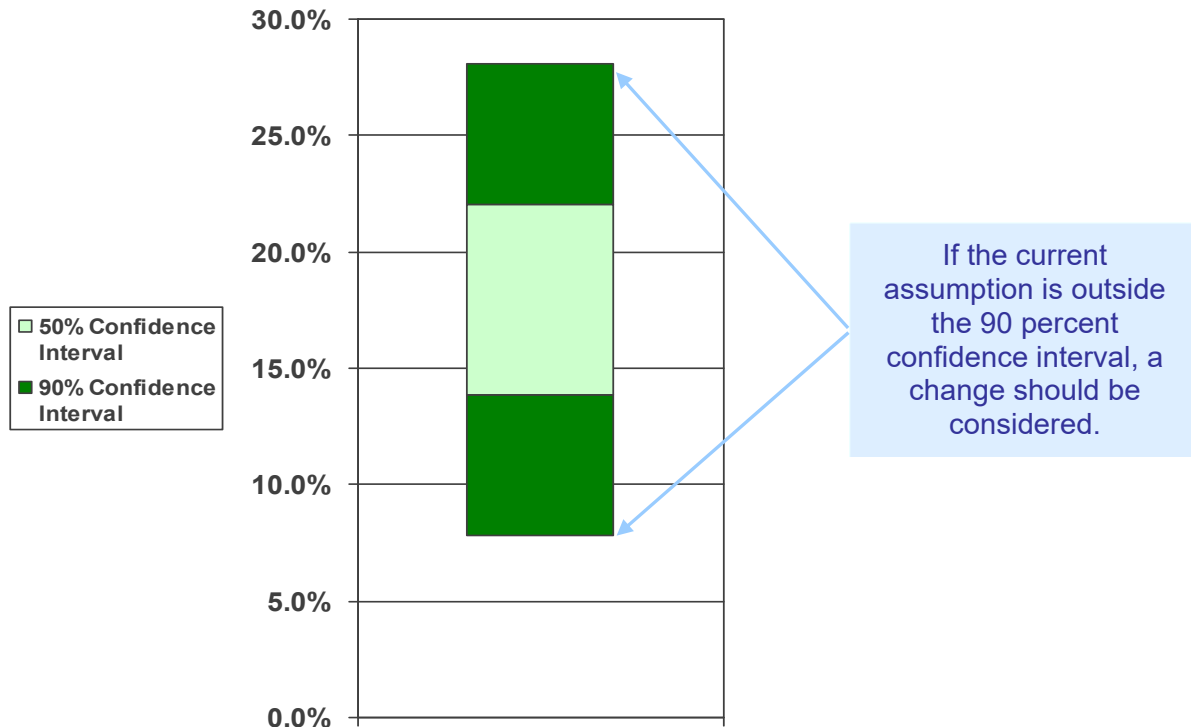
Actuarial Standard of Practice (ASOP) No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, provides guidance on selecting demographic assumptions used in measuring obligations under defined benefit pension plans. The general process for recommending demographic assumptions as defined in ASOP No. 35 is as follows:

- Identify the types of assumptions;
- Consider the relevant assumption universe;
- Consider the assumption format;
- Select the specific assumptions; and
- Evaluate the reasonableness of the selected assumption.

The purpose of the demographic experience study is to compare actual experience against expected experience based on the assumptions used in the most recent actuarial valuation. The observation period used in this study is January 1, 2015 through December 31, 2018, and the current assumptions are those adopted by the Board for the December 31, 2017 actuarial valuation. If the actual experience differs significantly from the overall expected experience, or if the pattern of actual experience by age, sex, or duration does not follow the expected pattern, new assumptions are considered.

Confidence intervals have been used to measure observed experience against current assumptions to determine the reasonableness of the assumption. The floating bars represent the 50 percent and 90 percent confidence intervals around the observed experience. The 90 percent confidence interval represents the range around the observed rate that could be expected to contain the true rate during the period of study with 90 percent probability. The size of the confidence interval depends on the number of observations and the likelihood of occurrence. If an assumption is outside the 90 percent confidence interval and there is no other information to explain the observed experience, a change in assumption should be considered. A sample graph with confidence intervals is shown below:

Overview (continued)



The demographic assumptions used for the December 31, 2017 actuarial valuation and the recommended assumptions for the December 31, 2018 and December 31, 2019 actuarial valuations are shown in detail in the following sections.

A summary of the changes recommended to the Board are as follows:

- Adjust mortality assumptions to use the new “Pub-2010” base tables and a standard update to the mortality improvement scale, which is based on 60-year unisex average Social Security experience.
- Adjust retirement rates for certain member categories and service bands to more closely align with recent and expected future experience; reduce percentage of future retirees assumed to elect a partial lump sum; increase percentage of members assumed to purchase credited service at retirement.
- Increase the merit component of the salary increase assumption for two member categories based on observations of the last eight years of experience.
- Update pre-retirement termination of employment assumptions for two member categories.
- Lower assumed rates of ordinary (non-duty) disability and general service duty disability to more closely match recent experience.
- Increase the Tier 1 unused vacation cash out assumption for most member categories.
- Adjust the Tier 1/Tier 2 unused sick leave assumption for five member categories to more closely reflect recently observed experience.
- Decrease the healthy participation assumption for the RHIA retiree healthcare program.
- Decrease the RHIPA participation assumption for most service bands.

The recommended assumptions, in our opinion, were selected in a manner consistent with the requirements of ASOP No. 35.

Mortality

Mortality rates are used to project the length of time benefits will be paid to current and future retirees and beneficiaries. The selection of a mortality assumption affects plan liabilities because the estimated present value of retiree benefits depends on how long the benefit payments are expected to continue. There are clear differences in the mortality rates among healthy retired members, disabled retired members, and non-retired members. As a result, each of these groups is reviewed independently.

A summary of the current assumed mortality rates and recommended changes is shown below:

Assumption	Recommended December 31, 2016 and 2017 Valuations	Recommended December 31, 2018 and 2019 Valuations
Healthy Annuitant Mortality	RP-2014 Healthy Annuitant, Sex Distinct, Generational Projection with Unisex Social Security Data Scale	Pub-2010 Healthy Retiree, Sex Distinct, Generational Projection with Unisex Social Security Data Scale
<ul style="list-style-type: none"> ▪ School District male 	White collar, set back 12 months	Teachers, no set back
<ul style="list-style-type: none"> ▪ Other General Service male (and male beneficiary) 	Blended 50% blue collar/50% white collar, set back 12 months	General Employees, set back 12 months
<ul style="list-style-type: none"> ▪ Police & Fire male 	Blended 50% blue collar/50% white collar, set back 12 months	Public Safety, no set back
<ul style="list-style-type: none"> ▪ School District female 	White collar, set back 12 months	Teachers, no set back
<ul style="list-style-type: none"> ▪ Other General Service female (and female beneficiary) 	Blended 50% blue collar/50% white collar, no set back	General Employees, no set back
<ul style="list-style-type: none"> ▪ Police & Fire female 	Blended 50% blue collar/50% white collar, no set back	Public Safety, set back 12 months
Disabled Retiree Mortality	RP-2014 Disabled Retiree, Sex Distinct, Generational Projection with Unisex Social Security Data Scale	Pub-2010 Disabled Retiree, Sex Distinct, Generational Projection with Unisex Social Security Data Scale
<ul style="list-style-type: none"> ▪ Police & Fire male 	No collar adjustment, no set back	Blended 50% Public Safety, 50% Non-Safety, no set back
<ul style="list-style-type: none"> ▪ Other General Service male 	No collar adjustment, no set back	Non-Safety, set forward 24 months
<ul style="list-style-type: none"> ▪ Police & Fire female 	No collar adjustment, no set back	Blended 50% Public Safety, 50% Non-Safety, no set back
<ul style="list-style-type: none"> ▪ Other General Service female 	No collar adjustment, no set back	Non-Safety, set forward 12 months
Non-Annuitant Mortality	RP-2014 Employee, Sex Distinct, Generational Projection with Unisex Social Security Data Scale	Pub-2010 Employee, Sex Distinct, Generational Projection with Unisex Social Security Data Scale
<ul style="list-style-type: none"> ▪ School District male 	Same collar and set back as Healthy Annuitant assumption	120% of same table and set back as Healthy Annuitant assumption
<ul style="list-style-type: none"> ▪ Other General Service male 	Same collar and set back as Healthy Annuitant assumption	115% of same table and set back as Healthy Annuitant assumption

Mortality (*continued*)

Assumption	Recommended December 31, 2016 and 2017 Valuations	Recommended December 31, 2018 and 2019 Valuations
▪ Police & Fire male	Same collar and set back as Healthy Annuitant assumption	100% of same table and set back as Healthy Annuitant assumption
▪ School District female	Same collar and set back as Healthy Annuitant assumption	100% of same table and set back as Healthy Annuitant assumption
▪ Other General Service female	Same collar and set back as Healthy Annuitant assumption	125% of same table and set back as Healthy Annuitant assumption
▪ Police & Fire female	Same collar and set back as Healthy Annuitant assumption	100% of same table and set back as Healthy Annuitant assumption

Mortality Improvement Scale

Mortality rates are expected to continue to decrease in the future, and the resulting increased longevity should be anticipated in the actuarial valuation. For Oregon PERS, this is done through the use of a generational mortality assumption, which incorporates a base table and a projection scale. The base table defines the mortality rates assumed at each age in a single specific calendar year, while the projection scale defines how quickly the mortality rates at each individual age are assumed to improve in future calendar years.

The current assumed mortality improvement scale is based on 60-year unisex average mortality improvement rates by age, calculated using Social Security data through 2013. Our recommendation is to update the mortality improvement scale based on Social Security data through 2015 (the most recent publically released data at the time we updated the improvement scale). We believe this meets the “*best actuarial information on mortality at the time*” standard mandated by ORS 238.607. A full listing of the recommended projection scale rates is included in the appendix.

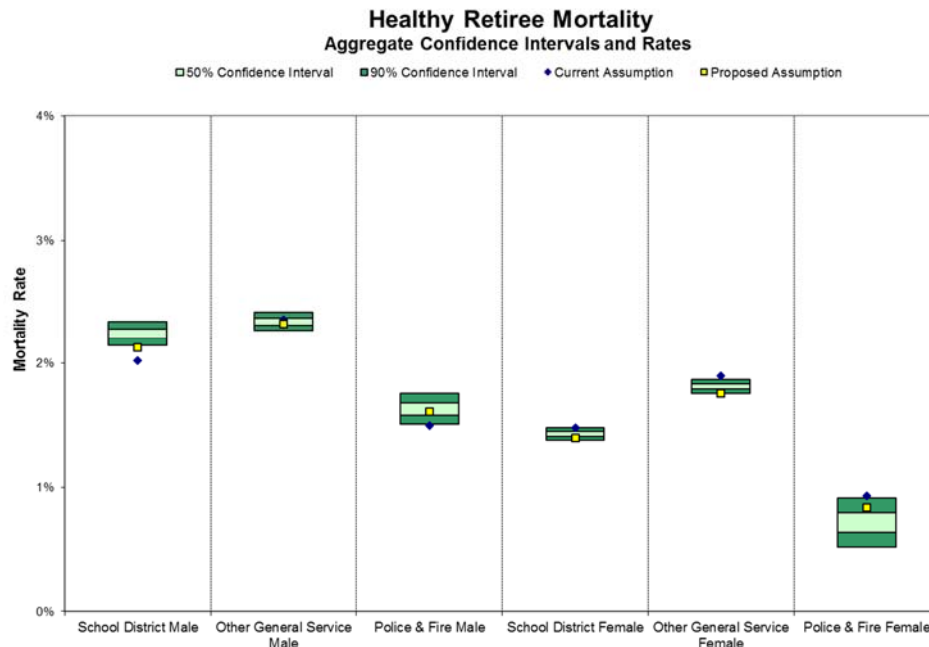
Healthy Annuitant Mortality

Mortality assumptions for healthy retired members are separated into six groups based on employment category and gender (school district males, school district females, police & fire males, police & fire females, other general service males, other general service females). Beneficiaries were combined with non-school district general service members of the same gender. In prior experience studies, female police & fire members were not rated separately due to the relatively small size of the data set. However, the release of the Pub-2010 tables allowed us to make use of a larger, statistically credible data source specific to female police & fire retirees, so we now recommend a distinct assumption for this group.

To assist in review of the current mortality assumptions’ reasonability, we calculated the ratio of actual deaths to expected deaths (A/E ratio) during the experience study period for each of the six groups described above. In the prior study, mortality assumptions were targeted to achieve an A/E ratio of approximately 100 percent (from 98 to 103 percent) on a benefits-weighted basis. In the current study, A/E ratios for most groups remained near 100 percent, though both school district males and police & fire males showed an increase in the A/E ratio. Though the prior assumption basis continues to match experience reasonably well, we recommend updating the assumption to use the recently-published Pub-2010 mortality tables, as discussed below.

Mortality (continued)

	Benefits-Weighted (\$1,000s of monthly benefits)		Current Assumption		Recommended Assumption	
	Exposures	Actual Deaths	Expected Deaths	A/E Ratio	Expected Deaths	A/E Ratio
School District male	209,554	4,699	4,229	111%	4,462	105%
Other General Service male (and male beneficiary)	348,098	8,149	8,208	99%	8,078	101%
Police & Fire male	108,651	1,771	1,628	109%	1,744	102%
School District female	320,325	4,576	4,740	97%	4,475	102%
Other General Service female (and female beneficiary)	314,936	5,702	5,967	96%	5,537	103%
Police & Fire female	12,871	92	120	76%	108	85%



We recommend moving from the RP-2014 mortality tables to the Pub-2010 mortality tables (released by the Society of Actuaries in January 2019) as the underlying base tables for generational mortality assumptions in the current study. The Pub-2010 mortality tables reflect experience that is both more recent and more relevant to the Oregon PERS member population. Despite the name, the RP-2014 family of mortality tables reflects experience from 2004 to 2008, while the Pub-2010 tables reflect observed experience from calendar years 2008-2013, with 2010 as the middle of the observation period. At least as importantly, the Pub-2010 tables are based exclusively upon data gathered from large public sector pension systems (including Oregon PERS) for the first modern study specific to the mortality experience of public pension plans, while the RP-2014 tables are based solely on private sector plan experience. As a result, the recommended assumptions are expected to better reflect the composition of Oregon PERS membership and the System’s anticipated future mortality experience.

Mortality (*continued*)

In the Pub-2010 study, different gender-distinct mortality tables were published for three separate job categories: teachers, public safety, and general employees. When selecting a table to match the mortality rates of Oregon PERS, we started from the category table most applicable to the portion of the population under consideration, and then adjusted, if needed, to more closely align with recent Oregon PERS experience. At times we use a “set back” to adjust the mortality rates. A “set back” of 12 months, for example, treats all members as if they were 12 months younger than they really are when applying the mortality table, which results in lower assumed mortality rates for members.

A summary of the current and recommended healthy retiree mortality assumptions is shown below:

	Recommended December 31, 2016 and 2017 Valuations	Recommended December 31, 2018 and 2019 Valuations
Basic Table	RP-2014 Healthy Annuitant, Sex Distinct, Generational Projection with Unisex Social Security Data Scale	Pub-2010 Healthy Retiree, Sex Distinct, Generational Projection with Unisex Social Security Data Scale
School District male	White collar, set back 12 months	Teachers, no set back
Other General Service male (and male beneficiary)	Blended 50% blue collar/50% white collar, set back 12 months	General Employees, set back 12 months
Police & Fire male	Blended 50% blue collar/50% white collar, set back 12 months	Public Safety, no set back
School District female	White collar, set back 12 months	Teachers, no set back
Other General Service female (and female beneficiary)	Blended 50% blue collar/50% white collar, no set back	General Employees, no set back
Police & Fire female	Blended 50% blue collar/50% white collar, no set back	Public Safety, set back 12 months

Disabled Retiree Mortality

Disabled members are expected to experience higher mortality rates at a given age than non-disabled retired members. As a result, disabled member mortality experience is analyzed separately from that of non-disabled annuitants and beneficiaries. We recommend using the Pub-2010 Disabled Retiree mortality tables and the 60-year average unisex Social Security projection scale as the starting point for setting disabled mortality assumptions in the current study. This will maintain a consistent basis for disabled and non-disabled retiree assumptions, as has been the case in prior studies.

In prior studies, we have recommended applying adjustments to the underlying disabled mortality tables published by the SOA where needed in order to more closely match assumptions to recent Oregon PERS experience. For this study, we compared recent Oregon PERS experience to the Pub-2010 Disabled Retiree mortality tables on a benefits-weighted approach to see whether similar adjustments would be advisable.

Mortality (continued)

	Benefits-Weighted (\$1,000s of monthly benefits)		Current Assumption		Recommended Assumption	
	Exposures	Actual Deaths	Expected Deaths	A/E Ratio	Expected Deaths	A/E Ratio
Disabled Police & Fire male	7,930	177	256	69%	166	107%
Disabled General Service male	10,593	470	432	109%	445	106%
Disabled Police & Fire female	1,586	24	30	80%	23	106%
Disabled General Service female	14,781	439	396	111%	423	104%

In prior studies, disabled police & fire members were not rated separately due to the relatively small amount of experience for such members. However, the Pub-2010 report includes tables developed specifically for disabled police & fire members based on statistically credible data sets for these populations, so we were able to refine this assumption. Using a benefits-weighted approach, the selected variations of the Pub-2010 Disabled Retiree mortality tables fell within a 90 percent confidence interval around observed experience for all groups.



Mortality (*continued*)

A summary of current and recommended disabled retiree mortality assumptions is shown below:

	Recommended December 31, 2016 and 2017 Valuations	Recommended December 31, 2018 and 2018 Valuations
Basic Table	RP-2014 Disabled Retiree, Sex Distinct, Generational Projection with Unisex Social Security Data Scale	Pub-2010 Disabled Retiree, Sex Distinct, Generational Projection with Unisex Social Security Data Scale
Disabled Police & Fire male	No collar adjustment, no set back	Blended 50% Public Safety, 50% Non-Safety, no set back
Disabled General Service male	No collar adjustment, no set back	Non-Safety, set forward 24 months
Disabled Police & Fire female	No collar adjustment, no set back	Blended 50% Public Safety, 50% Non-Safety, no set back
Disabled General Service female	No collar adjustment, no set back	Non-Safety, set forward 12 months

Non-Annuitant Mortality

The non-annuitant mortality assumption applies to active members and dormant members (those members who have terminated employment but have a vested right to a future benefit). As with the other mortality assumptions, we recommend using the Pub-2010 mortality tables and the 60-year average unisex Social Security projection scale as the starting point for setting mortality assumptions for this group. This will maintain a consistent basis for mortality assumptions, as has been the case in prior studies.

For a given age and gender, an employed person is on average less likely to die in a given year than a retired person of the same age and gender. For the current study we recommend using separate Pub-2010 Healthy Retiree and Pub-2010 Employee mortality tables for healthy annuitants and non-annuitants, respectively. Each Healthy Retiree table published by the SOA has a corresponding Employee table, which reflects differences in the anticipated mortality rates for the retiree and employee populations.

For each population subgroup, we recommend using the Pub-2010 Employee table (including adjustments) that corresponds to the Healthy Retiree table selected for that subgroup, and then adjusting the mortality rates with a scaling factor if needed to better match recent Oregon PERS experience. For example, mortality for non-annuitant School District males will be assumed to follow the Pub-2010 Employee table for the teacher job category, with no set back, and will be projected generationally using the Social Security Unisex Scale (all of which parallels treatment for the corresponding retiree group), and will be scaled by a factor of 120% to better match the aggregate Oregon PERS-specific experience of the relevant employee group.

The relative values of corresponding Pub-2010 Employee and Healthy Retiree mortality tables were developed by the SOA based on a much larger population than that of Oregon PERS. As a result, we believe it is preferable to reflect that relationship as the starting point when developing non-annuitant versions of the recommended healthy annuitant mortality tables for Oregon PERS. The analysis below compares recent experience in aggregate for the non-annuitant population under this approach. This comparison was done on a headcount-weighted basis only, since the final level of retirement benefits cannot be predicted with certainty for current active members.

Mortality (continued)

	Headcount-Weighted		Current Assumption		Recommended Assumption	
	Exposures	Actual Deaths	Expected Deaths	A/E Ratio	Expected Deaths	A/E Ratio
Total Non-Annuitant Experience	826,764	1,091	1,102	99%	968	113%

In aggregate, using the Pub-2010 Employee mortality tables corresponding to the relevant recommended Healthy Retiree mortality tables for each subgroup and adjusted as noted below produces an A/E ratio of 113 percent. For a headcount-weighted analysis, we would prefer an A/E ratio between 110 percent and 120 percent to approximate an outcome similar to targeting 100 percent on a benefits-weighted basis. The actual A/E ratio of 113 percent shown above fits well within this range.

A summary of the current and recommended non-annuitant mortality assumptions is shown below:

	Recommended December 31, 2016 and 2017 Valuations	Recommended December 31, 2018 and 2019 Valuations
Basic Assumption	RP-2014 Employee, Sex Distinct, Generational Projection with Unisex Social Security Data Scale	Pub-2010 Employee, Sex Distinct, Generational Projection with Unisex Social Security Data Scale
School District male	White collar, set back 12 months	120% of Teachers, no set back
Other General Service male	Blended 50% blue collar/50% white collar, set back 12 months	115% of General Employees, set back 12 months
Police & Fire male	Blended 50% blue collar/50% white collar, set back 12 months	100% of Public Safety, no set back
School District female	White collar, set back 12 months	100% of Teachers, no set back
Other General Service female	Blended 50% blue collar/50% white collar, no set back	125% of General Employees, no set back
Police & Fire female	Blended 50% blue collar/50% white collar, no set back	Public Safety, set back 12 months

Retirement Assumptions

The retirement assumptions used in the actuarial valuation include the following assumptions:

- Retirement from active status
- Probability a member will elect a lump sum option at retirement
- Percentage of members who elect to purchase credited service at retirement.
- Probability a member will remain an Oregon resident during retirement.

Retirement from Active Status

Members are eligible to retire as early as age 55 (50 for police & fire members), or earlier if the member has 30 years of service. In our analysis, we have found significant differences in the retirement patterns based on length of service, employment category (general service or police & fire), and eligibility for unreduced benefits.

A summary of the early, normal, and unreduced retirement dates under the plan are as follows:

Employment Category	Tier	Normal Retirement Age	Early Retirement Age	Unreduced Retirement
General Service	1	58	55	30 years of service
General Service	2	60	55	30 years of service
General Service	OPSRP	65	55	Age 58 with 30 years
Police & Fire	1 and 2	55	50	30 years of service, or age 50 with 25 years of service
Police & Fire	OPSRP	60	50	Age 53 with 25 years
State Judiciary	N/A	65	60	60 if Plan B; N/A if Plan A

Structure for Retirement Rates

The structure of the PERS retirement rate assumption separates rates by job classification and by service level. General service rates differ across three service bands: less than 15 years, 15 to 29 years, and 30 or more years of service. Each service band has different assumptions for school districts versus all other general service members. Police & fire rates employ the following three service bands: less than 13 years, 13 to 24 years, and 25 or more years of service.

The service band structure anticipates that member retirement decisions will contemplate the amount of the retirement benefit and the affordability of retirement.

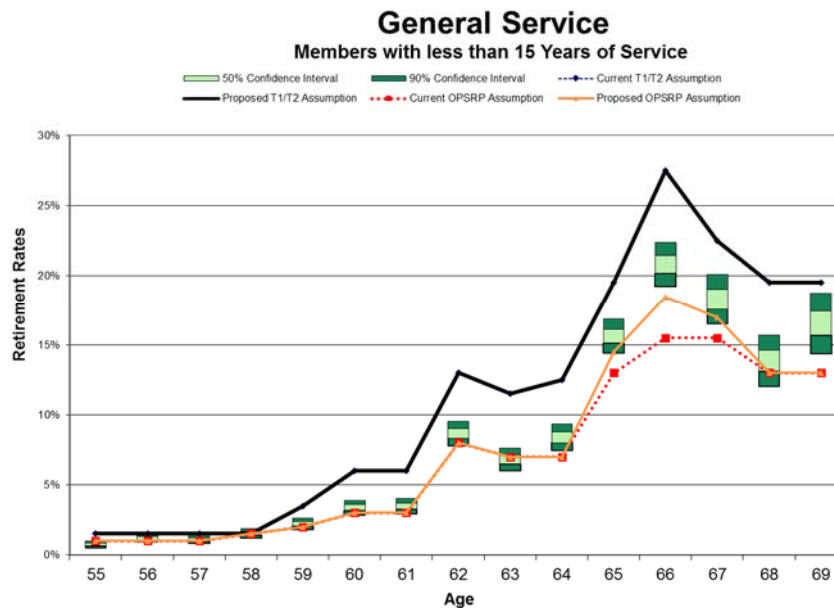
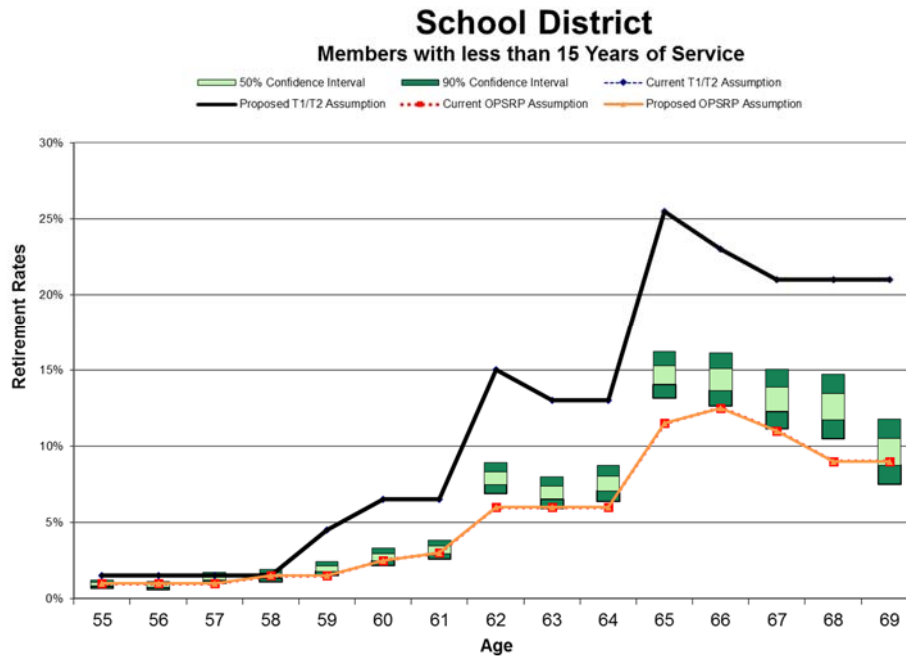
School District and General Service Retirement Rates

Members with Less Than 15 Years of Service

Retirement decisions by members with less than 15 years of service are likely to be heavily influenced by the availability of resources other than PERS benefits, including Social Security, prior employment, spousal benefits, and savings.

Retirement Assumptions (continued)

The following charts show the current assumed rates of retirement, the confidence interval around observed experience, and the recommended retirement rate assumption for school district and general service members retiring with less than 15 years of service.

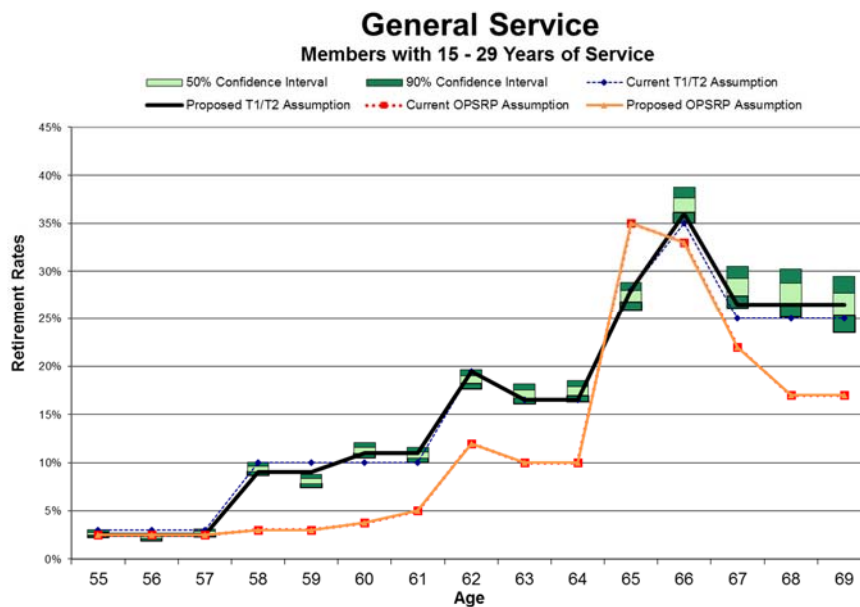
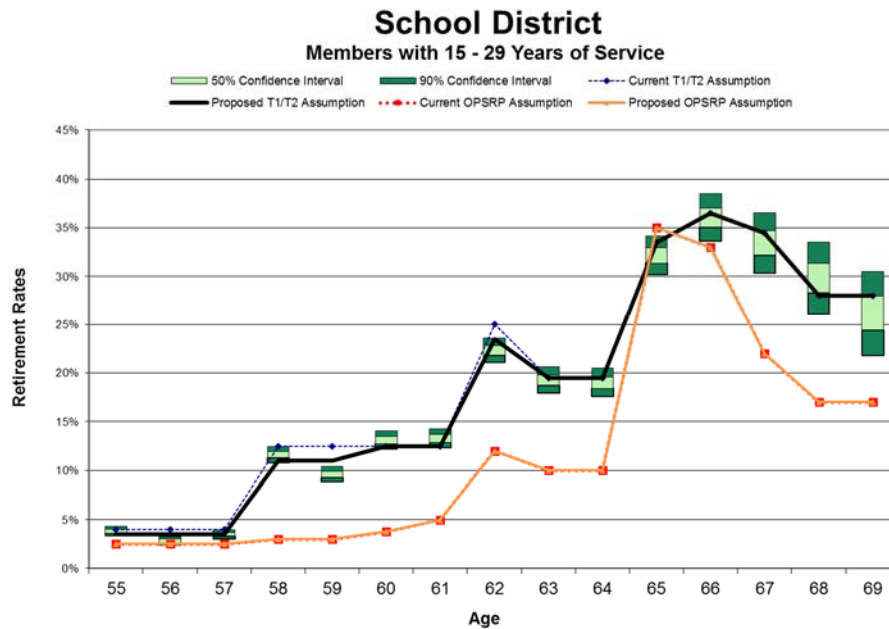


Retirement Assumptions (continued)

Members with 15 to 30 Years of Service

Retirement decisions by members with 15 to 29 years of service are likely to be influenced by the structure of PERS benefits as well as the availability of other resources, including Social Security, prior employment, spousal benefits, and savings.

The following charts show the current assumed rates of retirement, the confidence interval around observed experience, and the recommended retirement rate assumption for school district and general service members retiring with more than 15 years of service and less than 30 years of service.

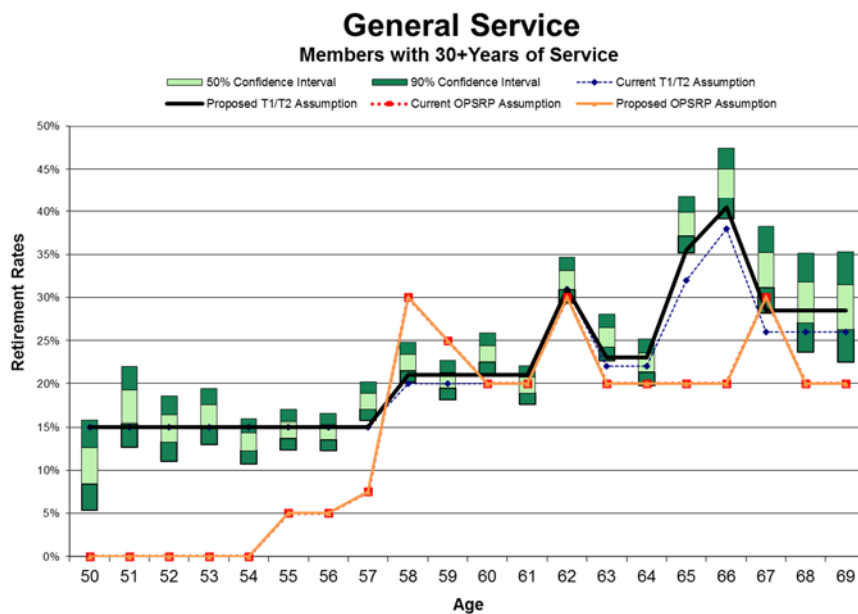
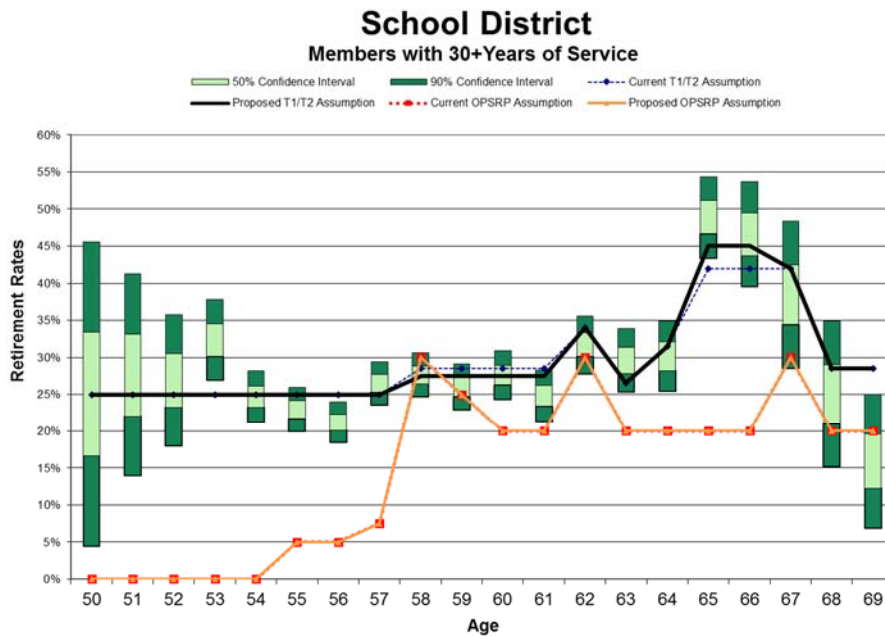


Retirement Assumptions (continued)

Members with 30 or More Years of Service

Members with 30 or more years of service are eligible for unreduced PERS benefits at any age (age 58 for OPSRP). As a result, retirement rates at all ages are relatively high, with a spike when Social Security benefits become available.

The following charts show the current assumed rates of retirement, the confidence interval around observed experience and the recommended retirement rate assumption for school district and other general service members retiring with more than 30 years of service.



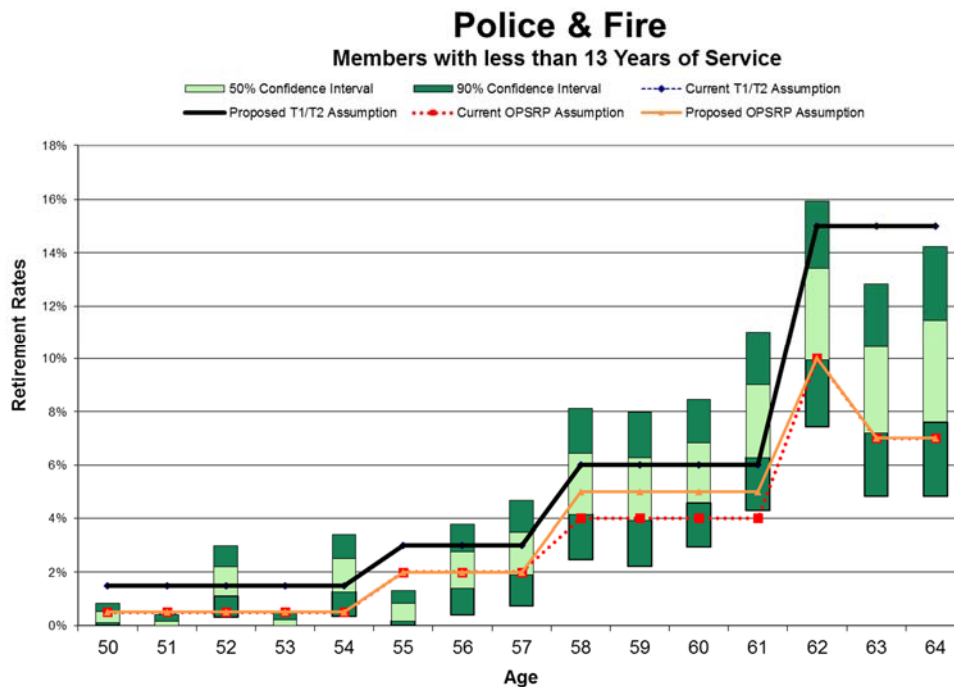
Retirement Assumptions (continued)

Police & Fire

Members with Less Than 13 Years of Service

The retirement assumption for police & fire members differs for members retiring with less than 13 years of service, those retiring with between 13 and 24 years of service, and those retiring with more than 25 years of service. Retirement decisions by members with less than 13 years of service are likely to be heavily influenced by the availability of resources other than PERS benefits, including Social Security, prior employment, spousal benefits, and savings.

The following graph shows the current assumed rates of retirement, the confidence interval around observed experience and the recommended retirement rate assumption for police & fire members retiring with less than 13 years of service.

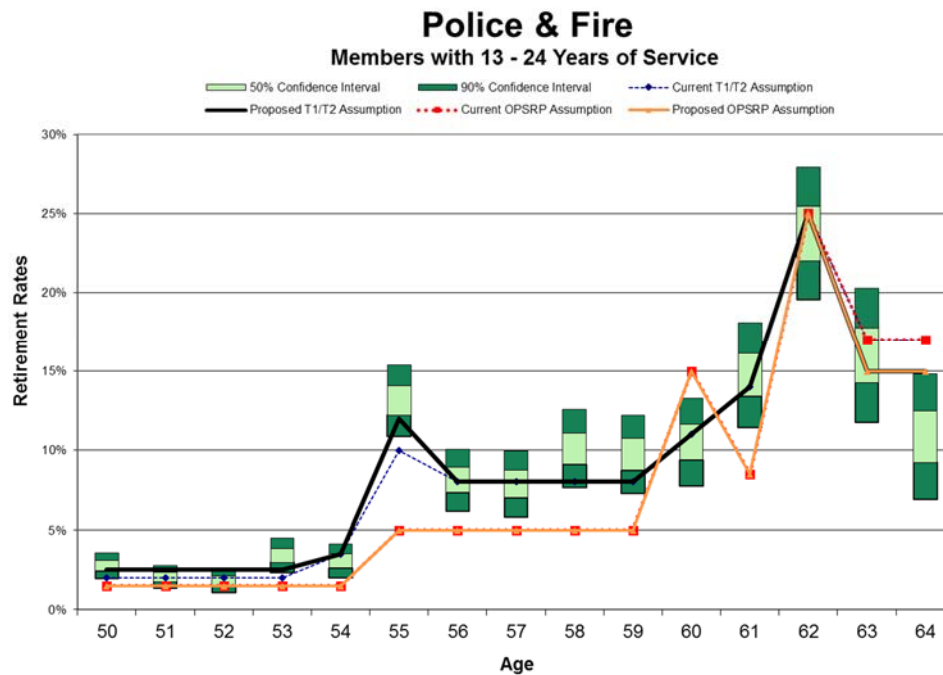


Retirement Assumptions (continued)

Members with 13 to 24 Years of Service

Retirement rates for members with 13 to 24 years of service are likely to be influenced by the structure of PERS benefits as well as the availability of other resources, including Social Security, prior employment, spousal benefits, and savings.

The following chart shows the current assumed rates of retirement, the confidence interval around observed experience, and the recommended retirement rate assumption for police & fire members retiring with between 13 and 24 years of service.

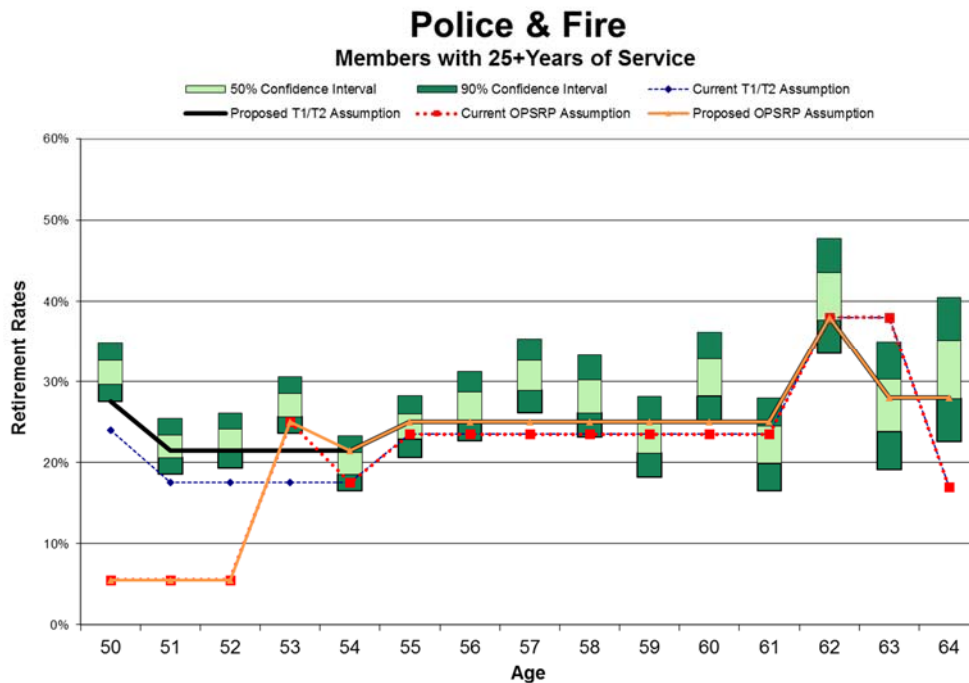


Retirement Assumptions (continued)

Members with 25 or More Years of Service

Police & fire members with 25 or more years of service can retire immediately at age 50 (53 for OPSRP) with unreduced retirement benefits. As a result, retirement rates at all ages are relatively high, with a spike at first eligibility for unreduced benefits, and another increase when Social Security benefits become available.

The following chart shows the current assumed rates of retirement, the confidence interval around observed experience, and the recommended retirement rate assumption for police & fire members retiring with more than 25 years of service.

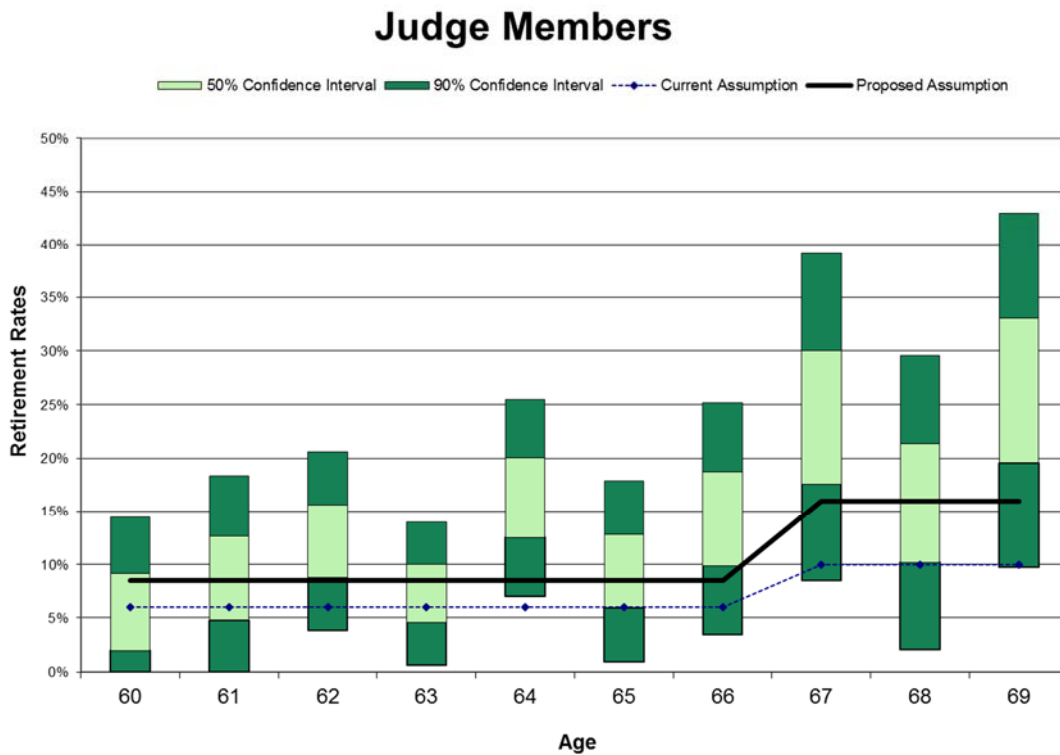


Retirement Assumptions (continued)

Judges

The vast majority of members of the State Judiciary elect to receive PERS benefits under Plan B. These benefits are available on an unreduced basis immediately upon retirement eligibility at age 60. As a result, there is relatively little variation in retirement rates by age for these members.

The following chart shows the current assumed rates of retirement, the confidence interval around observed experience, and the recommended retirement rate assumption for members of the State Judiciary.



Retirement Assumptions (continued)

Summary of Recommended Retirement Rates

The following table summarizes our recommended Tier 1/Tier 2 retirement rates:

Tier 1/Tier 2 Recommended December 31, 2018 and 2019 Valuations										
	Police & Fire			General Service			School Districts			Judges
Age	< 13 yrs	13-24 yrs	25+ yrs	<15 yrs	15-29 yrs	30+ yrs	<15 yrs	15-29 yrs	30+ yrs	
Less than 50						15.00%			25.00%	
50	1.50%	2.50%	27.50%			15.00%			25.00%	
51	1.50%	2.50%	21.50%			15.00%			25.00%	
52	1.50%	2.50%	21.50%			15.00%			25.00%	
53	1.50%	2.50%	21.50%			15.00%			25.00%	
54	1.50%	3.50%	21.50%			15.00%			25.00%	
55	3.00%	12.00%	25.00%	1.50%	2.50%	15.00%	1.50%	3.50%	25.00%	
56	3.00%	8.00%	25.00%	1.50%	2.50%	15.00%	1.50%	3.50%	25.00%	
57	3.00%	8.00%	25.00%	1.50%	2.50%	15.00%	1.50%	3.50%	25.00%	
58	6.00%	8.00%	25.00%	1.50%	9.00%	21.00%	1.50%	11.00%	27.50%	
59	6.00%	8.00%	25.00%	3.50%	9.00%	21.00%	4.50%	11.00%	27.50%	
60	6.00%	11.00%	25.00%	6.00%	11.00%	21.00%	6.50%	12.50%	27.50%	8.50%
61	6.00%	14.00%	25.00%	6.00%	11.00%	21.00%	6.50%	12.50%	27.50%	8.50%
62	15.00%	25.00%	38.00%	13.00%	19.50%	31.00%	15.00%	23.50%	34.00%	8.50%
63	15.00%	15.00%	28.00%	11.50%	16.50%	23.00%	13.00%	19.50%	26.50%	8.50%
64	15.00%	15.00%	28.00%	12.50%	16.50%	23.00%	13.00%	19.50%	31.50%	8.50%
65	100.00%	100.00%	100.00%	19.50%	28.00%	35.50%	25.50%	33.50%	45.00%	8.50%
66				27.50%	36.00%	40.50%	23.00%	36.50%	45.00%	8.50%
67				22.50%	26.50%	28.50%	21.00%	34.50%	42.00%	16.00%
68				19.50%	26.50%	28.50%	21.00%	28.00%	28.50%	16.00%
69				19.50%	26.50%	28.50%	21.00%	28.00%	28.50%	16.00%
70				100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Retirement Assumptions (continued)

The following table summarizes our recommended OPSRP retirement rates:

OPSRP Recommended December 31, 2018 and 2019 Valuations									
	Police & Fire			General Service			School Districts		
Age	< 13 yrs	13-24 yrs	25+ yrs	<15 yrs	15-29 yrs	30+ yrs	<15 yrs	15-29 yrs	30+ yrs
50	0.50%	1.50%	5.50%						
51	0.50%	1.50%	5.50%						
52	0.50%	1.50%	5.50%						
53	0.50%	1.50%	25.00%						
54	0.50%	1.50%	21.50%						
55	2.00%	5.00%	25.00%	1.00%	2.50%	5.00%	1.00%	2.50%	5.00%
56	2.00%	5.00%	25.00%	1.00%	2.50%	5.00%	1.00%	2.50%	5.00%
57	2.00%	5.00%	25.00%	1.00%	2.50%	7.50%	1.00%	2.50%	7.50%
58	5.00%	5.00%	25.00%	1.50%	3.00%	30.00%	1.50%	3.00%	30.00%
59	5.00%	5.00%	25.00%	2.00%	3.00%	25.00%	1.50%	3.00%	25.00%
60	5.00%	15.00%	25.00%	3.00%	3.75%	20.00%	2.50%	3.75%	20.00%
61	5.00%	8.50%	25.00%	3.00%	5.00%	20.00%	3.00%	5.00%	20.00%
62	10.00%	25.00%	38.00%	8.00%	12.00%	30.00%	6.00%	12.00%	30.00%
63	7.00%	15.00%	28.00%	7.00%	10.00%	20.00%	6.00%	10.00%	20.00%
64	7.00%	15.00%	28.00%	7.00%	10.00%	20.00%	6.00%	10.00%	20.00%
65	100.00%	100.00%	100.00%	14.50%	35.00%	20.00%	11.50%	35.00%	20.00%
66				18.50%	33.00%	20.00%	12.50%	33.00%	20.00%
67				17.00%	22.00%	30.00%	11.00%	22.00%	30.00%
68				13.00%	17.00%	20.00%	9.00%	17.00%	20.00%
69				13.00%	17.00%	20.00%	9.00%	17.00%	20.00%
70				100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Retirement Assumptions (*continued*)

Lump Sum Option at Retirement

At retirement, a member has the option of electing a total lump sum distribution equal to two times the member's account balance, a partial lump sum distribution equal to the member's account balance with a reduced monthly allowance, or a monthly allowance with no lump sum distribution. The percentage of active members electing a lump sum distribution at retirement has declined slightly from the prior experience study. The results of our analysis are as follows:

Election at Retirement	Number of Retired Members	Percentage of Retirements	December 31, 2017 Valuation Assumption	Recommended December 31, 2018 and 2019 Valuations
Partial Lump Sum	561	2.6%	3.5%	3.0%
Total Lump Sum				
• 2015	110	2.0%	3.0%	N/A
• 2016	98	1.9%	2.5%	N/A
• 2017	103	1.6%	2.0%	N/A
• 2018	69	1.4%	1.5%	N/A
• 2019	TBD	TBD	1.0%	No change
• 2020	TBD	TBD	0.5%	No change

When a member elects a total or partial lump sum under Money Match or a partial lump sum under Full Formula, they give up the value of future COLAs (cost of living allowances) on the lump sum amount. A total lump sum election under Full Formula may cause the member to give up significantly more. Because there are no new contributions to member accounts and the system is projected to become dominated by Full Formula over time, we expect the total lump sum rate to decline over time.

Based on the data shown above, we recommend lowering the partial lump sum assumption of 3.5 percent to 3.0 percent. We recommend no change to the total lump sum assumption of 1.0 percent in 2019 decreasing by 0.5 percent per year until reaching 0.0 percent.

Retirement Assumptions (*continued*)

Purchase of Credited Service

A member has the option of purchasing service at retirement to enhance their retirement benefits. Service may be purchased under one or more of the following categories:

- Purchase of forfeited service
- Credit for waiting time
- Credit for educational service
- Credit for military service
- Credit for seasonal positions
- Credit for police officers and firefighters
- Purchase of retirement credit for disability time

Most purchases are full cost purchases, meaning the member pays both the member and employer cost to obtain the service. Since the member pays the full cost of the service purchased, the purchase produces no impact or only a small impact on projected Tier 1/Tier 2 employer costs. The most common, and predictable, non-full cost service purchase made by members is purchasing credit for the six-month waiting period. Thus, for valuation purposes, we have included an adjustment to account for those members who are expected to make the waiting period service purchase.

For Money Match retirements, the purchase of credited service is generally cost-neutral to the system, because the member is depositing both the member and employer contributions. Therefore, in reviewing actual experience, we examined non-Money Match retirements. The following table shows the number of members who retired in the experience period and elected to purchase credit for the six-month waiting period:

	Count	Number Electing to Purchase Waiting Time Service	Percentage of Retirements	December 31, 2017 Valuation Assumption	Recommended December 31, 2018 and 2019 Valuations
Non-Money Match Retirements	12,620	8,928	71%	65%	70%

We recommend increasing the assumption of non-Money Match retirements purchasing credited service for the six month waiting period from 65 percent to 70 percent.

Retirement Assumptions (*continued*)

Oregon Residency Status

Members who are eligible for a tax remedy benefit adjustment under Senate Bill 656 or House Bill 3349 may only receive the adjustment as long as they remain residents of Oregon for tax purposes following retirement. Since a member's residency status may change multiple times during retirement, the residency status of a newly retired member may not be representative of that member's probability of remaining resident later in retirement. As such, we analyzed the entire current population of retired members and beneficiaries who are eligible for a tax remedy and compared to the number who are currently receiving a tax remedy. The results of that analysis are as follows:

Number Eligible for Tax Remedy	Number Receiving Tax Remedy	Percentage Receiving Tax Remedy	December 31, 2017 Valuation Assumption	Recommended December 31, 2018 and 2019 Valuations
117,492	99,792	85%	85%	85%

Disability Incidence Assumptions

The Plan provides duty and non-duty disability benefits to members. Members are eligible to receive duty disability benefits if they become disabled as a direct result of a job-related injury or illness, regardless of length of service. Members are eligible for non-duty disability benefits (also referred to as ordinary disability) if they become disabled after ten years of service (six years if a judge), but prior to normal retirement eligibility.

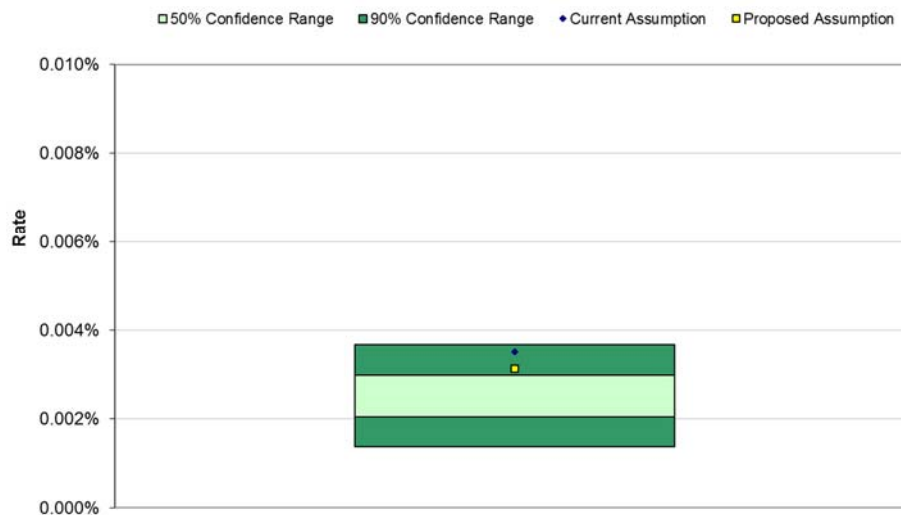
Duty disability incidence rates are developed separately for police & fire and general service members. Ordinary (non-duty) disability rates are developed for the system as a whole.

Duty Disability

Due to the limited amount of experience data available at some ages, this assumption employs a standard table adjusted to fit within the aggregate confidence interval.

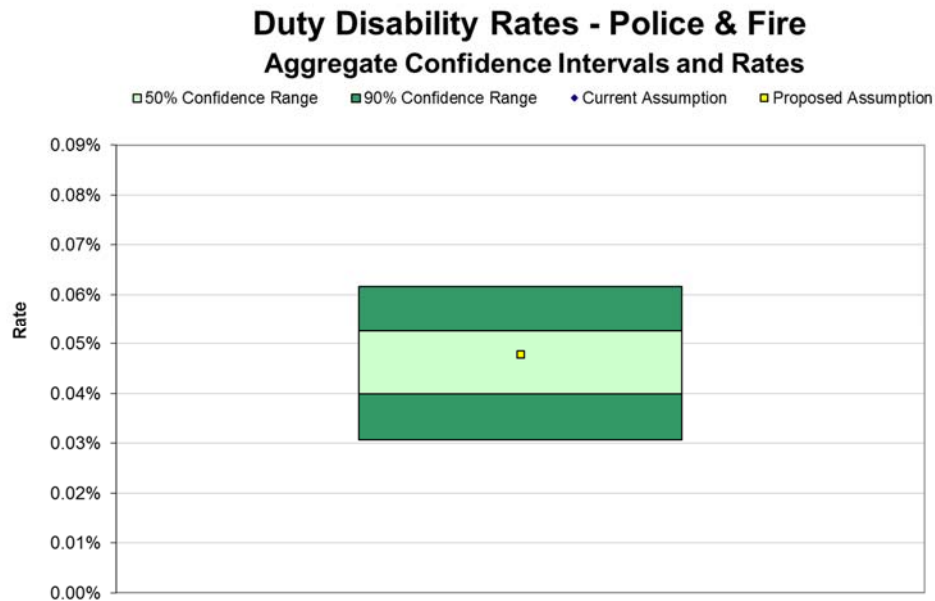
While the current assumed aggregate rate for the general service assumption is within the 90 percent confidence interval of the disability rates experienced, it sits near the top of the confidence interval for the second consecutive study. As such, we recommend updating the assumption.

Duty Disability Rates - General Service
Aggregate Confidence Intervals and Rates



The current assumed aggregate rate for police & fire members is within the 50 percent confidence interval. As such, we recommend maintaining the current assumption and continuing to monitor experience in the next study.

Disability Incidence Assumptions (*continued*)

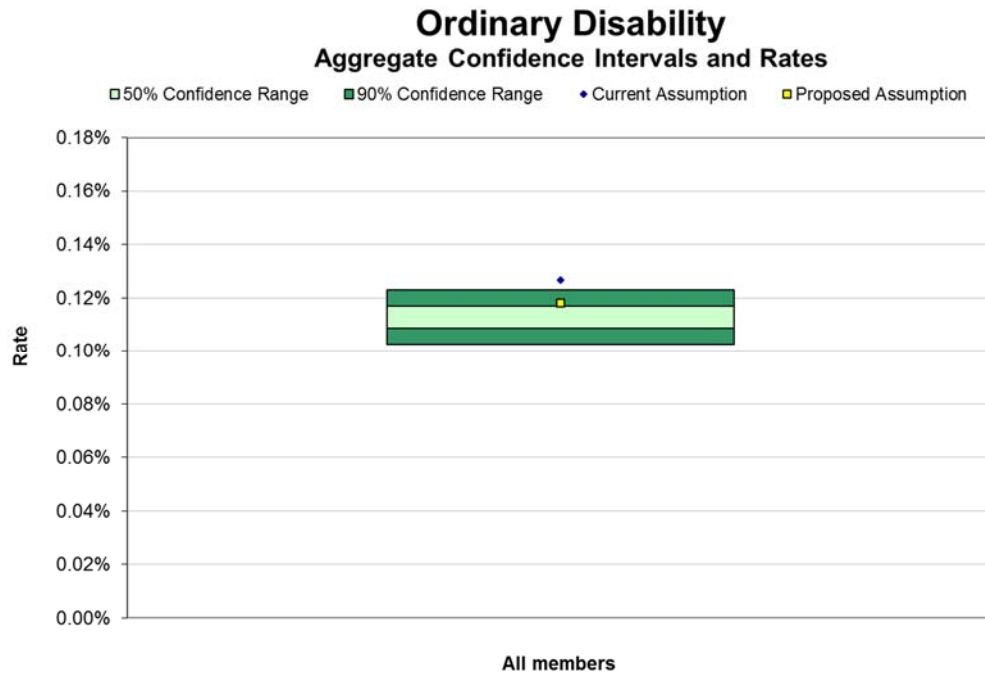


Ordinary (Non-Duty) Disability

As with duty disability, the experience data for ordinary disability was very limited at specific ages. Therefore, this assumption also uses a standard table adjusted to fit within the aggregate confidence interval. Based on the disability rates experienced in the observation period, we recommend lowering the ordinary disability incidence assumption at this time.

The data underlying the ordinary disability study showed a pattern wherein a member’s record would only be recognized as a disability retirement (rather than a service retirement or other separation from service) after a lag period that could span over a year. Because such lagged experience is not yet available for 2018, the final year of our study, we included in our analysis an assumption as to additional disabilities occurring in 2018 that will not be apparent until the subsequent reporting period. This assumption was based on an average of such records observed in the first three years of the study.

Disability Incidence Assumptions (continued)



The following table summarizes our recommended disability incidence rate assumptions:

	Percentage of the 1985 Disability Class 1 Rates (sample rates shown for ages 20–55)	
	December 31, 2017 Valuation	Recommended December 31, 2018 and 2019 Valuations
Duty Disability		
• Police & Fire	20% (0.0060%–0.1690%)	No change
• General Service	0.9% (0.0003%–0.0076%)	0.8% (0.0002%–0.0068%)
Ordinary Disability	35% with 0.18% cap (0.0150%–0.1800%)	30% with 0.18% cap (0.0090%–0.1800%)

Termination Assumptions

Not all active members are expected to continue working for covered employers until retirement. Termination rates represent the probabilities that a member will leave covered employment for causes other than retirement, disability or death at any given point during their working career.

Termination rates have been developed as service-based assumptions. The service-based assumptions reflect the experience of Tier 1, Tier 2, and OPSRP members, with each group affecting the period of the table relating to the relevant service amount.

Assumptions are developed for the following groups:

- School District males
- School District females
- Other General Service males
- Other General Service females
- Police & Fire (single table for both males and females)

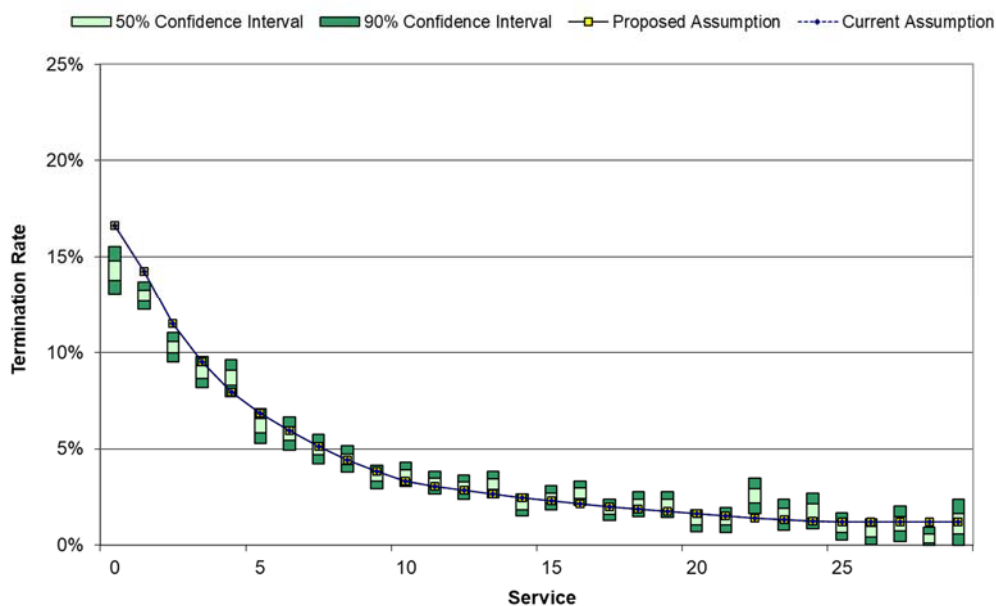
Termination Rates

The following charts show the confidence interval around observed experience and the recommended rates of termination by year of service. These charts are based on the observed experience of members in the relevant group during the study period. We recommend changes to the assumptions for school district males, school district females, and non-school district general service males. For the other two groups, we recommend maintaining the current assumption and evaluating again with the next study.

Full listings of recommended termination assumptions are included in the appendix.

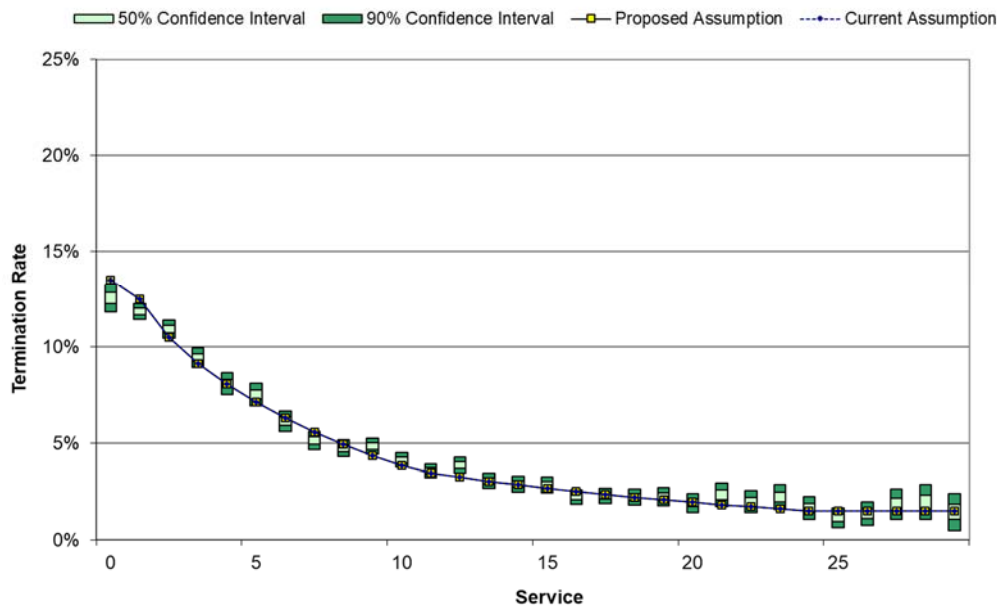
School Districts

School District Male



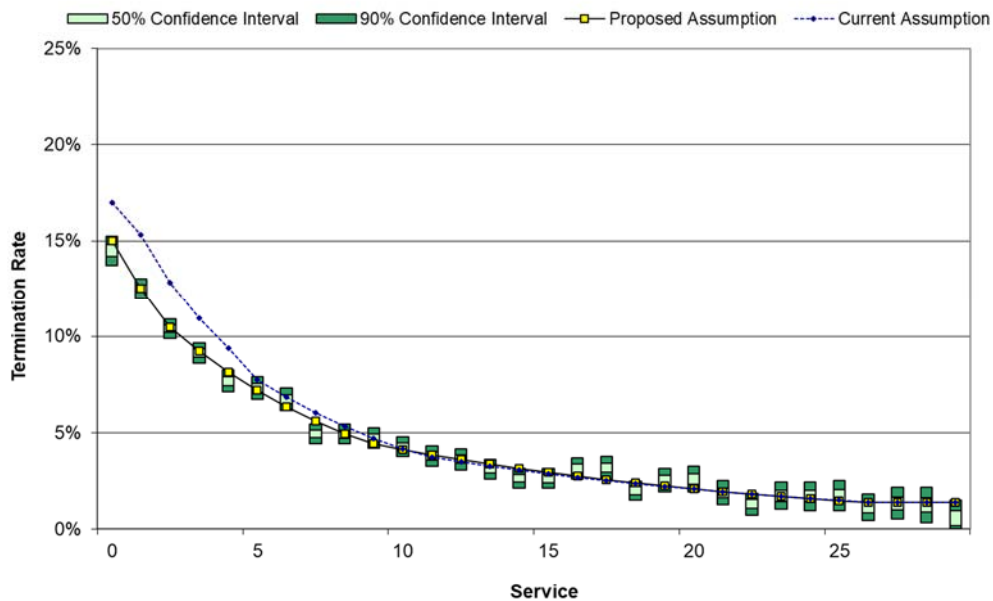
Termination Assumptions (continued)

School District Female



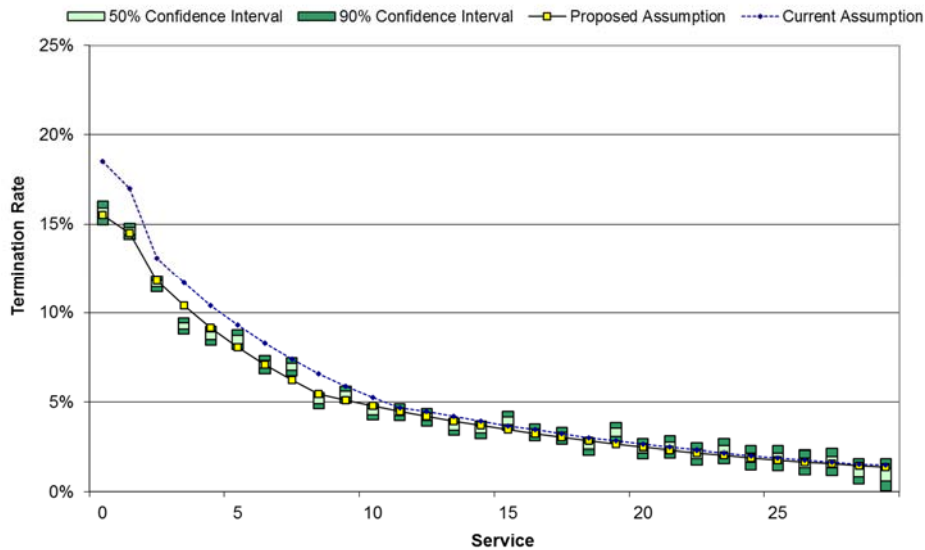
General Service

Other General Service Male



Termination Assumptions (continued)

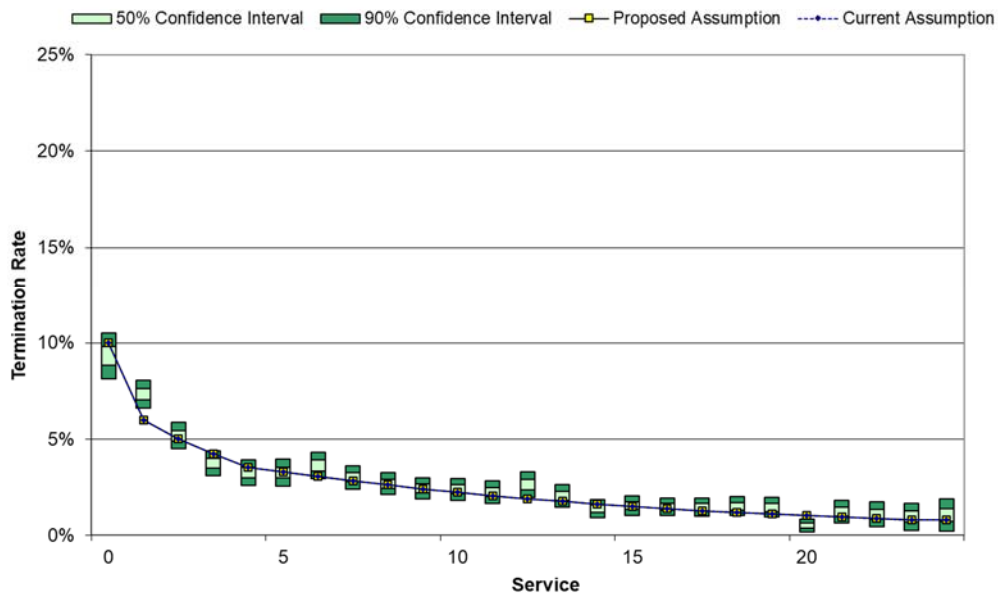
Other General Service Female



Police & Fire

All police & fire members were rated together, with no variation by group or gender.

Police & Fire



Salary Increase Assumptions

The salary increase assumptions analyzed with demographic experience were:

- Merit scale increases
- Unused sick leave adjustments
- Unused vacation cash out adjustments

Merit Scale

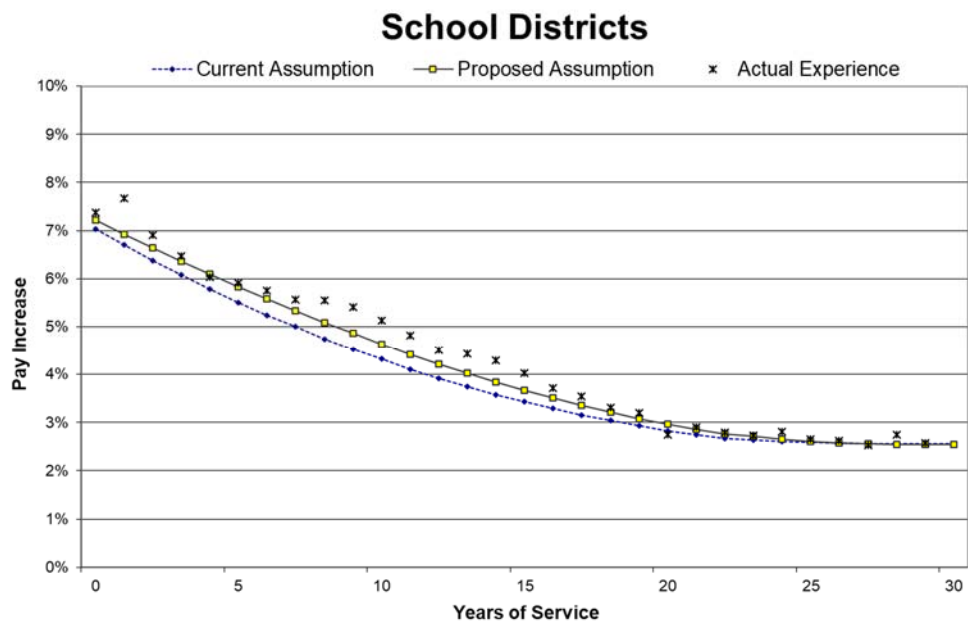
The merit scale assumption is used in conjunction with the inflation and real wage growth assumptions to project individual member salaries to retirement. In developing this assumption, our analysis first focused on the gross salary increases received by members during the observation period. The assumed merit (or longevity) component was then determined by backing out assumed inflation and real wage growth.

In order to capture experience across a broader range of budget, collective bargaining, and economic cycles, the analysis covered observed salary experience from 2010 through 2018.

Assumptions are developed for the following groups:

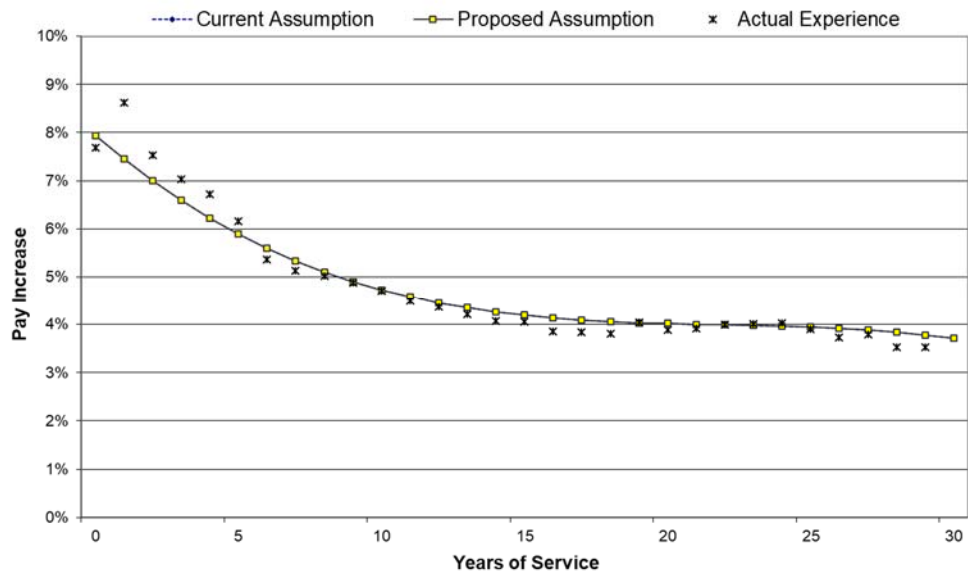
- School Districts
- Other General Service
- Police & Fire

The following charts show the current assumed rates of gross salary increases, the eight-year average of salary increases based on observed experience, and the recommended rates of gross salary increases. We recommend maintaining the current salary increase assumption for police & fire members, and increasing the assumptions for the other two groups. Where we have proposed new assumptions, the proposed rates strike a balance between the previous assumptions and the experience observed in the study period.

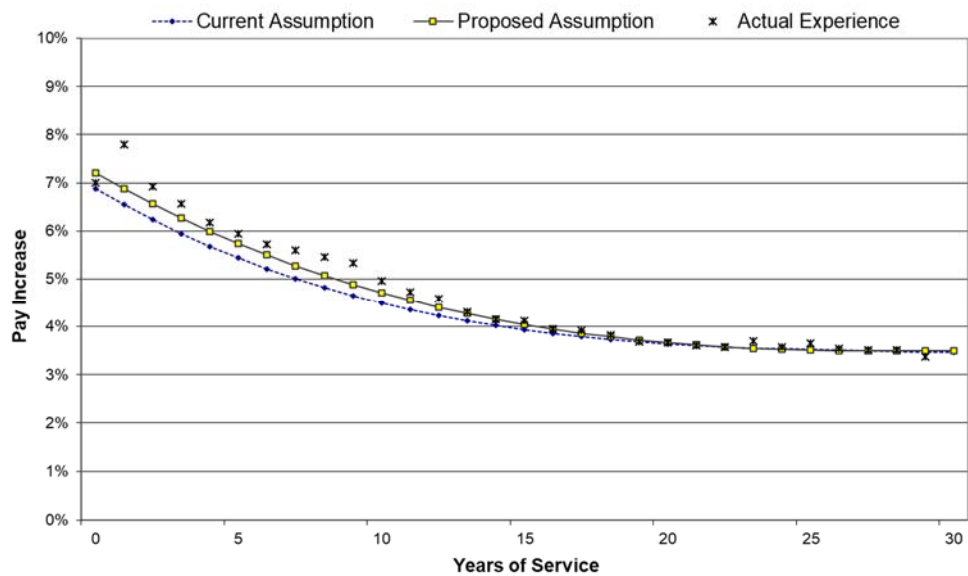


Salary Increase Assumptions (*continued*)

Police & Fire



Other General Service

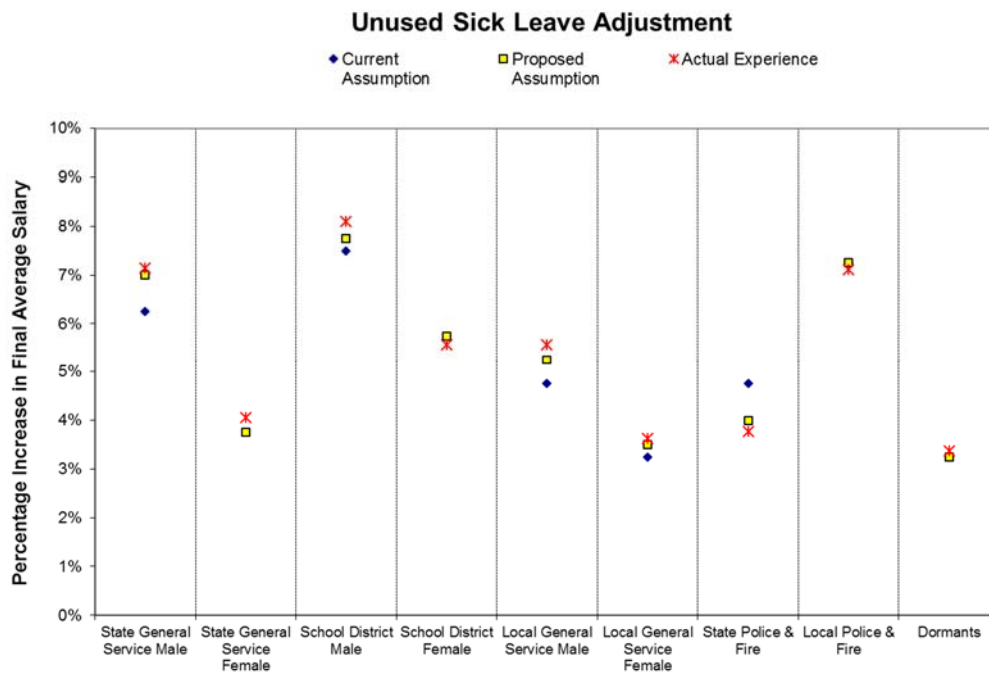


Salary Increase Assumptions (*continued*)

Unused Sick Leave Adjustment

Employers may elect to participate in the Unused Sick Leave Program. This program allows Tier 1/Tier 2 members to convert the value of one-half of their accumulated sick leave into additional retirement benefits. The assumption represents the percentage increase in a member’s final average pay due to the inclusion of the value of 50 percent of the member’s accumulated sick leave, and is only applied to employers who participate in the program.

For active members, there are currently eight sets of rates developed by employer group, employment category (general service or police & fire), and gender. In addition, a single rate is developed for eligible dormant members. The chart below shows the current assumption, the four-year average of the observed experience, and the recommended assumption for each of the groups studied. If the current assumption is not visible on the chart, it is the same as the proposed assumption.

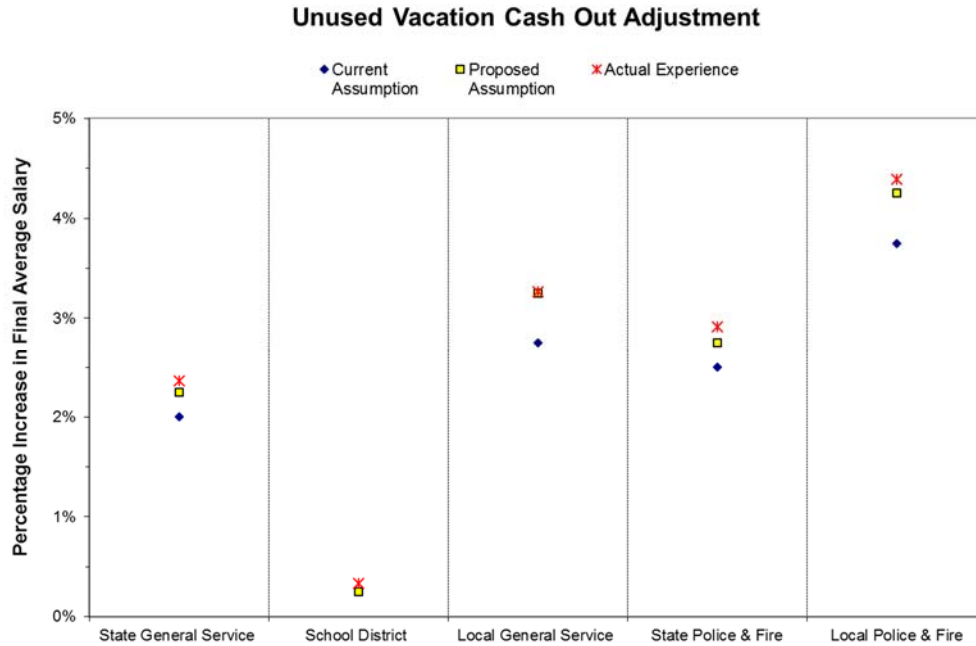


Due to the volatility in experience from one study to the next, for the groups where we recommended changes the recommended change is between the prior assumption and the actual observed experience. How closely the recommended assumption is set to the recently observed experience is influenced by the sample size of the particular group.

Salary Increase Assumptions (*continued*)

Unused Vacation Cash Out Adjustment

Tier 1 members are eligible to include the value of any lump sum payment of unused vacation pay in the calculation of their final average salary. The assumption shown below represents the percentage increase in a member's final average salary expected to result from this provision.



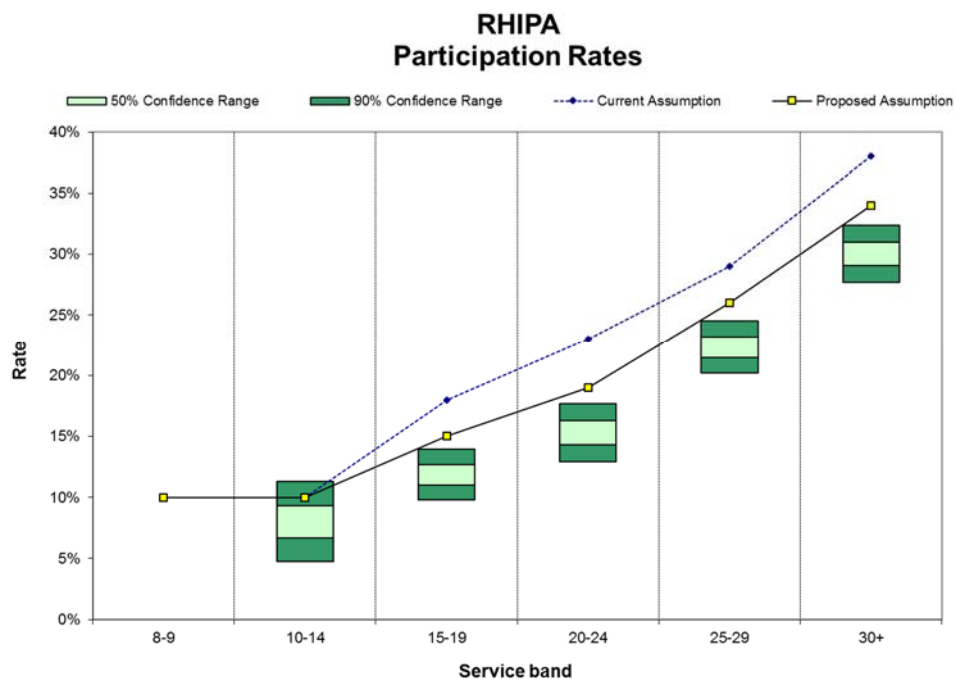
Retiree Healthcare Assumptions

There are two retiree healthcare programs offered to eligible members, the Retiree Health Insurance Premium Account (RHIPA) and the Retiree Health Insurance Account (RHIA).

RHIPA

RHIPA is a program for eligible retirees from State of Oregon employment that provides a subsidized pre-Medicare insurance plan. In the previous valuation, the participation rate assumption for future eligible retirees varied based on service at the time of retirement, as the level of employer-paid benefits in the RHIPA program varies by service level. We recommend continuing this structure for the assumption.

The current assumptions are consistently higher than recent observed experience. We recommend decreasing the assumed participation level at most age ranges, as shown below. The level of participation in RHIPA may be affected, at least in part, by economic conditions, cost of coverage, competition from alternative programs available to retirees, and the impact of healthcare reform legislation becoming effective. Since changes in these factors could change participation rates in RHIPA quickly and because the program's funded status is below 50% at the most recent valuation, we recommend that PERS closely monitor participation on a regular basis.



Retiree Healthcare Assumptions (*continued*)

RHIA

RHIA is a subsidized Medicare supplemental insurance program offered to all eligible retirees. Participation rates during the period of study decreased to approximately 31 percent for healthy retirees compared to the current assumption of 35 percent. For disabled retirees, the participation followed the current assumption of 20 percent fairly closely. As shown in the table below, we recommend decreasing the healthy assumption to 32 percent and maintaining the disabled assumption of 20 percent.

The data underlying this study showed a pattern wherein members would sometimes not appear until one or two years following retirement (or reaching age 65 if already retired). This may be due to a combination of participant behavior and administrative delay. Because such lagged experience is not yet available for the final two years of our study, we included in our analysis an assumption as to the number of additional enrollments not yet reported for members who retired (or reached age 65 if already retired) during 2017 or 2018. This assumption was based on the number of such records observed in the first two years of the study



5. Appendix

Data

Except where noted, the analysis in this study was based on data for the experience period from January 1, 2015 to December 31, 2018 as provided by the Oregon Public Employees Retirement System (PERS). PERS is solely responsible for the validity, accuracy and comprehensiveness of this information; the results of our analysis can be expected to differ and may need to be revised if the underlying data supplied is incomplete or inaccurate.

The member data was summarized according to the actual and potential member decrements for each year in the study. Actual and potential decrements were grouped according to age or service depending on the demographic assumption.

Assumption Tables

A complete listing of all the assumptions, methods and procedures presented to the Board for review on July 26, 2019 that are to be used in the December 31, 2018 and December 31, 2019 actuarial valuations are summarized on the following pages.

Methods and Procedures

Actuarial cost method: Entry Age Normal

UAL amortization method: Level percent of combined Tier 1, Tier 2, and OPSRP payroll

UAL amortization period:

- Closed amortization from the first rate setting valuation in which the experience is recognized
 - Tier 1/Tier 2 – 20 years
 - OPSRP – 16 years
 - RHIA/RHIPA – 10 years
 - Senate Bill 1049 was signed into law in June 2019 and requires a one-time re-amortization of Tier 1 /Tier 2 UAL over a closed 22 year period at the December 31, 2019 rate-setting actuarial valuation.
- In general side accounts are aligned with a 20-year period from the most recent rate-setting valuation. Employers who make lump sum payments in accordance with the rules under OAR 459-009-0086(9) may select a shorter amortization period of either 6, 10, or 16 years since the most recent rate-setting valuation.
- New transition liabilities are amortized over the 18-year period beginning when the employer joins the SLGRP.

Asset valuation method: Market value

Excluded reserves: Contingency Reserve, Capital Preservation Reserve. Rate Guarantee Reserve is excluded only when it is positive.

Contribution Rate Stabilization Method: Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) are confined to a collar based on the prior contribution rate (prior to application of side accounts, pre-SLGRP liabilities, and 6 percent Independent Employer minimum). The new contribution rate will generally not increase or decrease from the prior contribution rate by more than the greater of 3 percentage points or 20 percent of the prior contribution rate. If the funded percentage excluding

side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funded percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.

Liability Allocation for Actives with Several Employers: Allocate Actuarial Accrued Liability 10% (0% for police & fire) based on account balance with each employer and 90% (100% for police & fire) based on service with each employer.

Allocate Normal Cost to current employer.

Allocation of Benefits-In-Force (BIF) Reserve: The BIF is allocated to each rate pool in proportion to the retiree liability attributable to the rate pool.

Recommended Economic Assumptions

Inflation	2.50%
Real wage growth	1.00%
Payroll growth	3.50%
Investment return	Current assumption is reasonable based on current data from capital market outlook models, but the Board should give consideration to a lower assumption, which would also be reasonable. Board will select the assumption at its July 26, 2019 meeting
Interest crediting	
▪ Regular account	Equal to investment return assumption
▪ Variable account	Equal to investment return assumption
RHIPA subsidy cost trend rates	
▪ 2019 trend rate	7.10%
▪ Ultimate trend rate	4.10%
▪ Year reaching ultimate trend	2094

Demographic Assumptions

Mortality

Healthy Annuitant Mortality - Sample Values												
Age	Other General Service Male				Police & Fire Male		School District Female		Other General Service Female		Police & Fire Female	
	School District Male	Pub2010 Retiree, Teachers, Generational w/Social Security Data Scale, 0 year setback	Pub2010 Retiree, General Employees, Generational w/Social Security Data Scale, 1 year setback	Male	Pub2010 Retiree, Public Safety, Generational w/Social Security Data Scale, 0 year setback	Pub2010 Retiree, Teachers, Generational w/Social Security Data Scale, 0 year setback	Pub2010 Retiree, General Employees, Generational w/Social Security Data Scale, 0 year setback	Pub2010 Retiree, Public Safety, Generational w/Social Security Data Scale, 1 year setback	Female	Female	Female	Female
Year of Birth	1950	1960	1950	1960	1950	1960	1950	1960	1950	1960	1950	1960
50	0.001235	0.001110	0.001535	0.001380	0.002136	0.001920	0.000812	0.000730	0.002470	0.002220	0.001491	0.001340
51	0.001343	0.001207	0.003280	0.002948	0.002322	0.002088	0.000870	0.000782	0.002565	0.002305	0.001640	0.001474
52	0.001448	0.001302	0.003496	0.003142	0.002516	0.002261	0.000937	0.000842	0.002679	0.002408	0.001819	0.001635
53	0.001572	0.001414	0.003728	0.003351	0.002724	0.002451	0.000991	0.000891	0.002789	0.002509	0.002004	0.001801
54	0.001693	0.001525	0.003963	0.003566	0.002960	0.002666	0.001054	0.000949	0.002896	0.002609	0.002205	0.001984
55	0.002348	0.002117	0.004225	0.003806	0.003223	0.002906	0.001203	0.001183	0.003012	0.002716	0.002434	0.002192
56	0.002554	0.002302	0.004492	0.004050	0.003512	0.003167	0.001278	0.001194	0.003137	0.002829	0.002689	0.002425
57	0.002775	0.002502	0.004776	0.004306	0.003837	0.003460	0.001331	0.001210	0.003280	0.002958	0.002971	0.002679
58	0.003023	0.002720	0.005074	0.004575	0.004208	0.003786	0.001419	0.001252	0.003432	0.003088	0.003277	0.002955
59	0.003285	0.002950	0.005387	0.004847	0.004419	0.004148	0.001519	0.001305	0.003591	0.003250	0.003618	0.003256
60	0.003570	0.003203	0.005730	0.005146	0.004575	0.004287	0.001630	0.001405	0.003740	0.003445	0.003990	0.003583
61	0.003887	0.003480	0.006084	0.005458	0.004976	0.004685	0.001751	0.001526	0.003890	0.003636	0.004412	0.003958
62	0.004243	0.003791	0.006465	0.005788	0.005266	0.004976	0.001871	0.001656	0.004040	0.003832	0.004861	0.004352
63	0.004627	0.004121	0.006893	0.006159	0.005680	0.005395	0.001991	0.001776	0.004190	0.004029	0.005356	0.004785
64	0.005073	0.004505	0.007352	0.006549	0.006075	0.005786	0.002111	0.001891	0.004340	0.004264	0.005901	0.005256
65	0.005573	0.004939	0.007878	0.006969	0.006500	0.006211	0.002231	0.002021	0.004490	0.004415	0.006502	0.005775
66	0.006150	0.005440	0.008492	0.007526	0.007051	0.006760	0.002351	0.002141	0.004640	0.004565	0.007162	0.006347
67	0.006813	0.006020	0.009204	0.008141	0.010151	0.009870	0.002471	0.002280	0.004790	0.004715	0.007874	0.006964
68	0.007593	0.006723	0.010036	0.008867	0.011267	0.009976	0.002591	0.002480	0.004940	0.004865	0.008668	0.007659
69	0.008485	0.007527	0.011015	0.009752	0.012525	0.011112	0.002711	0.002600	0.005100	0.005025	0.009572	0.008475
70	0.009522	0.008473	0.012137	0.010767	0.013953	0.012417	0.002831	0.002740	0.005250	0.005175	0.010566	0.009374
71	0.010702	0.009542	0.013422	0.011944	0.015550	0.013865	0.002951	0.002860	0.005400	0.005325	0.011689	0.010402
72	0.012032	0.010739	0.014841	0.013233	0.017311	0.015451	0.003071	0.002970	0.005550	0.005475	0.012915	0.011516
73	0.013535	0.012081	0.016425	0.014661	0.019255	0.017186	0.003191	0.003080	0.005700	0.005625	0.014260	0.012728
74	0.015203	0.013556	0.018158	0.016208	0.021395	0.019077	0.003311	0.003200	0.005850	0.005775	0.015728	0.014038
75	0.017127	0.015287	0.020073	0.017899	0.023831	0.021271	0.003431	0.003340	0.006000	0.005925	0.017320	0.015444
76	0.019307	0.017251	0.022269	0.019877	0.026556	0.023727	0.003551	0.003480	0.006150	0.006075	0.019134	0.017079
77	0.021783	0.019503	0.024731	0.022097	0.029647	0.026542	0.003671	0.003620	0.006300	0.006225	0.021139	0.018887
78	0.024514	0.021969	0.027542	0.024658	0.033060	0.029628	0.003791	0.003740	0.006450	0.006375	0.023396	0.020946
79	0.027633	0.024815	0.030654	0.027472	0.036950	0.033182	0.003911	0.003860	0.006600	0.006525	0.025188	0.023178
80	0.031140	0.028021	0.034216	0.030727	0.041318	0.037179	0.004031	0.004080	0.006750	0.006675	0.028644	0.025723
81	0.035254	0.031851	0.038248	0.034417	0.046404	0.041925	0.004151	0.004200	0.006900	0.006825	0.031743	0.028563
82	0.040043	0.036361	0.042984	0.038835	0.052248	0.047443	0.004271	0.004320	0.007050	0.006975	0.035353	0.031941
83	0.045543	0.041564	0.048478	0.044020	0.058825	0.053686	0.004391	0.004440	0.007200	0.007125	0.039490	0.035859
84	0.052099	0.047884	0.054692	0.049914	0.066555	0.061171	0.004511	0.004560	0.007350	0.007275	0.044109	0.040299
85	0.059645	0.055208	0.062003	0.056988	0.075298	0.069697	0.004631	0.004680	0.007500	0.007425	0.049677	0.045659
86	0.068116	0.063432	0.070269	0.065042	0.084975	0.079131	0.004751	0.004800	0.007650	0.007575	0.055479	0.051800
87	0.077759	0.072850	0.079323	0.073867	0.095881	0.089828	0.004871	0.004920	0.007800	0.007725	0.062963	0.058633
88	0.088705	0.083608	0.089417	0.083772	0.108176	0.101960	0.004991	0.005040	0.007950	0.007875	0.070922	0.066445
89	0.100810	0.095497	0.100631	0.094849	0.121690	0.115276	0.005111	0.005160	0.008100	0.008025	0.079986	0.075390
90	0.114087	0.108509	0.112719	0.106778	0.136457	0.129786	0.005231	0.005280	0.008250	0.008175	0.090030	0.085294
91	0.129202	0.123504	0.125604	0.119464	0.152348	0.145630	0.005351	0.005400	0.008400	0.008325	0.101146	0.096201
92	0.145374	0.139523	0.139969	0.133796	0.167987	0.161225	0.005471	0.005520	0.008550	0.008475	0.112848	0.108584
93	0.162894	0.156966	0.154951	0.148714	0.183626	0.176944	0.005591	0.005640	0.008700	0.008625	0.123885	0.121469
94	0.181662	0.175756	0.170957	0.164736	0.199349	0.192867	0.005711	0.005760	0.008850	0.008775	0.140340	0.135233
95	0.200867	0.194921	0.188011	0.181898	0.214676	0.208321	0.005831	0.005880	0.009000	0.008925	0.155017	0.149977
96	0.220917	0.215024	0.205416	0.199336	0.230597	0.224446	0.005951	0.006000	0.009150	0.009075	0.170136	0.165100
97	0.239884	0.233719	0.223767	0.217799	0.245687	0.239373	0.006071	0.006120	0.009300	0.009225	0.186345	0.181374
98	0.260020	0.253846	0.241253	0.235053	0.262786	0.256546	0.006191	0.006240	0.009450	0.009375	0.202276	0.197078
99	0.278235	0.271629	0.260316	0.254135	0.279036	0.272411	0.006311	0.006360	0.009600	0.009525	0.220097	0.214871
100	0.297397	0.290627	0.277831	0.271234	0.297397	0.290627	0.006431	0.006480	0.009750	0.009675	0.237263	0.231630
101	0.316454	0.309651	0.296713	0.289959	0.316454	0.309651	0.006551	0.006600	0.009900	0.009825	0.256231	0.250398
102	0.335437	0.328459	0.315758	0.308880	0.335437	0.328459	0.006671	0.006720	0.010050	0.010075	0.275910	0.269900
103	0.354198	0.347177	0.334732	0.327769	0.354198	0.347177	0.006791	0.006840	0.010200	0.010125	0.295832	0.289678
104	0.370960	0.363608	0.353489	0.346483	0.370960	0.363608	0.006911	0.006960	0.010350	0.010275	0.315855	0.309594
105	0.388782	0.381458	0.370218	0.362880	0.388782	0.381458	0.007031	0.007080	0.010500	0.010425	0.334295	0.327669
106	0.406045	0.398796	0.388044	0.380733	0.406045	0.398796	0.007151	0.007200	0.010650	0.010575	0.353896	0.347229
107	0.422672	0.415541	0.405315	0.398078	0.422672	0.415541	0.007271	0.007320	0.010800	0.010725	0.373119	0.366457
108	0.436496	0.429132	0.421953	0.414834	0.436496	0.429132	0.007391	0.007440	0.010950	0.010875	0.391845	0.385234
109	0.451571	0.444398	0.435753	0.428402	0.451571	0.444398	0.007511	0.007560	0.011100	0.011025	0.407942	0.401059
110	0.463846	0.456935	0.450849	0.443687	0.463846	0.456935	0.007631	0.007680	0.011250	0.011175	0.425225	0.418470
111	0.465521	0.459045	0.463150	0.456249	0.465521	0.459045	0.007751	0.007800	0.011400	0.011325	0.441752	0.435171
112	0.467297	0.461257	0.464870	0.458402	0.467297	0.461257	0.007871	0.007920	0.011550	0.011475	0.457478	0.451114
113	0.466689	0.460658	0.466689	0.460658	0.466689	0.460658	0.007991	0.008040	0.011700	0.011625	0.466689	0.460658
114	0.468609	0.463016	0.468609	0.463016	0.468609	0.463016	0.008111	0.008160	0.011850	0.011775	0.468609	0.463016
115	0.470631	0.465480	0.468047	0.462461	0.470631	0.465480	0.008231	0.008280	0.012000	0.011925	0.468047	0.462461
116	0.470114	0.464968	0.470114	0.464968	0.470114	0.464968	0.008351	0.008400	0.012150	0.012075	0.464968	0.464968
117	0.469596	0.464456	0.469596	0.464456	0.469596	0.464456	0.008471	0.008520	0.012300	0.012225	0.469596	0.464456
118	0.469080	0.463945	0.469080	0.463945	0.469080	0.463945	0.008591	0.008640	0.012450	0.012375	0.469080	0.463945
119	0.468564	0.463435	0.468564	0.463435	0.468564							

Demographic Assumptions (continued)

Age	Beneficiary Mortality - Sample Values				Disabled Retired Mortality			
	Male		Female		Police & Fire Male	Police & Fire Female	Other General Service Male	Other General Service Female
	Pub2010 Retiree, General Employees, Generational w/Social Security Data Scale, 1 year setback	Pub2010 Retiree, General Employees, Generational w/Social Security Data Scale, 0 year setback	Blended 50% Pub2010 Retiree, 50% Non-Safety Disabled Retiree, Generational w/Social Security Data Scale, 0 year setback	Blended 50% Pub2010 Public Safety Disabled Retiree, 50% Non-Safety Disabled Retiree, Generational w/Social Security Data Scale, 0 year setback	Pub2010 Non-Safety Disabled Retiree, Generational w/Social Security Data Scale, 2 year setforw ard	Pub2010 Non-Safety Disabled Retiree, Generational w/Social Security Data Scale, 1 year setforw ard		
Year of Birth	1950	1960	1950	1960	1950	1950	1950	1950
50	0.001535	0.001380	0.002470	0.002220	0.010891	0.009940	0.020224	0.017076
51	0.003280	0.002948	0.002565	0.002305	0.011474	0.010264	0.021124	0.017467
52	0.003496	0.003142	0.002679	0.002408	0.012050	0.010596	0.021962	0.017845
53	0.003728	0.003351	0.002789	0.002509	0.012603	0.010928	0.022729	0.018205
54	0.003963	0.003566	0.002896	0.002609	0.013139	0.011265	0.023421	0.018536
55	0.004225	0.003806	0.003012	0.002716	0.013659	0.011600	0.024011	0.018841
56	0.004492	0.004050	0.003137	0.002829	0.014165	0.011934	0.024566	0.019105
57	0.004776	0.004306	0.003280	0.002958	0.014653	0.012260	0.025076	0.019343
58	0.005074	0.004575	0.003432	0.003088	0.015152	0.012593	0.025580	0.019556
59	0.005387	0.004847	0.003619	0.003250	0.015658	0.012923	0.026127	0.019774
60	0.005730	0.005146	0.003840	0.003445	0.016190	0.013275	0.026770	0.020000
61	0.006084	0.005458	0.004114	0.003683	0.016778	0.013648	0.027530	0.020280
62	0.006465	0.005788	0.004439	0.003966	0.017438	0.014065	0.028398	0.020617
63	0.006893	0.006159	0.004829	0.004302	0.018183	0.014527	0.029357	0.021018
64	0.007352	0.006549	0.005264	0.004675	0.019006	0.015039	0.030400	0.021496
65	0.007878	0.006996	0.005771	0.005115	0.019911	0.015613	0.031518	0.022063
66	0.008492	0.007526	0.006336	0.005604	0.020888	0.016253	0.032758	0.022747
67	0.009204	0.008141	0.006969	0.006158	0.021949	0.016983	0.034081	0.023591
68	0.010036	0.008867	0.007702	0.006819	0.023134	0.017836	0.035533	0.024589
69	0.011015	0.009752	0.008530	0.007567	0.024413	0.018797	0.037097	0.025767
70	0.012137	0.010767	0.009459	0.008418	0.025842	0.019898	0.038774	0.027098
71	0.013422	0.011944	0.010499	0.009361	0.027397	0.021108	0.040586	0.028584
72	0.014841	0.013233	0.011648	0.010397	0.029112	0.022428	0.042527	0.030224
73	0.016425	0.014661	0.012914	0.011527	0.031008	0.023861	0.044789	0.032031
74	0.018158	0.016208	0.014300	0.012751	0.033101	0.025406	0.047293	0.034142
75	0.020073	0.017899	0.015879	0.014173	0.035557	0.027179	0.050158	0.036502
76	0.022269	0.019877	0.017629	0.015751	0.038293	0.029145	0.053261	0.039192
77	0.024731	0.022097	0.019621	0.017566	0.041400	0.031379	0.056818	0.042123
78	0.027542	0.024658	0.021821	0.019556	0.044722	0.033906	0.060765	0.045458
79	0.030654	0.027472	0.024340	0.021858	0.048415	0.036963	0.065381	0.049154
80	0.034216	0.030727	0.027205	0.024480	0.052411	0.040359	0.070622	0.053465
81	0.038248	0.034417	0.030599	0.027646	0.056997	0.044319	0.076417	0.058389
82	0.042984	0.038835	0.034584	0.031403	0.062188	0.048851	0.083145	0.063880
83	0.048478	0.044020	0.039174	0.035751	0.067970	0.053930	0.090535	0.070306
84	0.054692	0.049914	0.044708	0.041091	0.074804	0.059907	0.098424	0.077510
85	0.062003	0.056988	0.051147	0.047342	0.082543	0.066655	0.107088	0.085047
86	0.070269	0.065054	0.058503	0.054479	0.091003	0.073928	0.116632	0.092963
87	0.079323	0.073867	0.066976	0.062747	0.100790	0.081873	0.128397	0.101241
88	0.089417	0.083772	0.076648	0.072244	0.111718	0.090552	0.141247	0.109624
89	0.100631	0.094849	0.087314	0.082712	0.124352	0.099780	0.155133	0.118162
90	0.112719	0.106778	0.098832	0.094000	0.138148	0.109613	0.169082	0.127672
91	0.125604	0.119464	0.111585	0.106665	0.153044	0.120602	0.183530	0.137653
92	0.139969	0.133796	0.124848	0.119823	0.167987	0.132086	0.198620	0.148676
93	0.154951	0.148714	0.138941	0.133885	0.183626	0.144493	0.213877	0.160995
94	0.170957	0.164736	0.153967	0.148960	0.199349	0.157997	0.230105	0.174240
95	0.188011	0.181898	0.169459	0.164444	0.214676	0.172182	0.245792	0.189074
96	0.205416	0.199336	0.186033	0.181070	0.230597	0.187707	0.263428	0.204361
97	0.223767	0.217799	0.202322	0.197123	0.245687	0.203316	0.280188	0.221651
98	0.241253	0.235053	0.220398	0.215165	0.262786	0.220873	0.298770	0.238543
99	0.260316	0.254135	0.237770	0.232125	0.279036	0.237903	0.317851	0.257414
100	0.277831	0.271234	0.256822	0.250975	0.297397	0.256822	0.336850	0.277128
101	0.296713	0.289959	0.276518	0.270495	0.316454	0.276518	0.355619	0.297079
102	0.315758	0.308880	0.296455	0.290288	0.335437	0.296455	0.372449	0.317122
103	0.334732	0.327769	0.316488	0.310215	0.354198	0.316488	0.390264	0.335636
104	0.353489	0.346483	0.334965	0.328326	0.370960	0.334965	0.407511	0.355244
105	0.370218	0.362880	0.354569	0.347890	0.388782	0.354569	0.424112	0.374466
106	0.388044	0.380733	0.373792	0.367118	0.406045	0.373792	0.437983	0.393181
107	0.405315	0.398078	0.392512	0.385891	0.422672	0.392512	0.453020	0.409332
108	0.421953	0.414834	0.408636	0.401742	0.436496	0.408636	0.465240	0.426589
109	0.435753	0.428402	0.425906	0.419141	0.451571	0.425906	0.466828	0.443081
110	0.450849	0.443687	0.442416	0.435824	0.463846	0.442416	0.468514	0.458762
111	0.463150	0.456249	0.458120	0.451746	0.465521	0.458120	0.467905	0.467905
112	0.464870	0.458402	0.467297	0.461257	0.467297	0.467297	0.469736	0.467297
113	0.466689	0.460658	0.466689	0.460658	0.466689	0.466689	0.471668	0.469172
114	0.466082	0.460059	0.468609	0.463016	0.468609	0.468609	0.471149	0.471149
115	0.468047	0.462461	0.470631	0.465480	0.470631	0.470631	0.470631	0.470631
116	0.470114	0.464968	0.470114	0.464968	0.470114	0.470114	0.470114	0.470114
117	0.469596	0.464456	0.469596	0.464456	0.469596	0.469596	0.469596	0.469596
118	0.469080	0.463945	0.469080	0.463945	0.469080	0.469080	1.000000	0.469080
119	0.468564	0.463435	0.468564	0.463435	0.468564	0.468564	1.000000	1.000000
120	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.



Demographic Assumptions (continued)

Non-Annuitant Mortality												
Age	School District Male		Other General Service Male		Police & Fire Male		School District Female		Female		Police & Fire Female	
	120% of Pub2010 Employee, Teachers, Generational w/Social Security Data Scale, 0 year setback		115% of Pub2010 Employee, General Employees, Generational w/Social Security Data Scale, 1 year setback		100% of Pub2010 Employee, Public Safety, Generational w/Social Security Data Scale, 0 year setback		100% Pub2010 Employee, Teachers, Generational w/Social Security Data Scale, 0 year setback		125% of Pub2010 Employee, General Employees, Generational w/Social Security Data Scale, 0 year setback		100% of Pub2010 Employee, Public Safety, Generational w/Social Security Data Scale, 1 year setback	
Year of Birth	1950	1960	1950	1960	1950	1960	1950	1960	1950	1960	1950	1960
30	0.000300	0.000287	0.000445	0.000426	0.000465	0.000446	0.000159	0.000152	0.000213	0.000204	0.000285	0.000273
31	0.000326	0.000313	0.000468	0.000448	0.000476	0.000456	0.000170	0.000163	0.000227	0.000217	0.000305	0.000292
32	0.000340	0.000325	0.000493	0.000472	0.000488	0.000466	0.000182	0.000174	0.000255	0.000244	0.000316	0.000303
33	0.000371	0.000353	0.000520	0.000497	0.000504	0.000479	0.000195	0.000185	0.000272	0.000259	0.000339	0.000324
34	0.000389	0.000368	0.000550	0.000523	0.000521	0.000492	0.000220	0.000208	0.000304	0.000287	0.000365	0.000347
35	0.000421	0.000395	0.000582	0.000550	0.000549	0.000516	0.000234	0.000220	0.000336	0.000316	0.000391	0.000370
36	0.000452	0.000422	0.000628	0.000590	0.000577	0.000539	0.000259	0.000242	0.000368	0.000344	0.000418	0.000393
37	0.000485	0.000450	0.000673	0.000628	0.000595	0.000551	0.000285	0.000265	0.000416	0.000386	0.000445	0.000415
38	0.000532	0.000490	0.000719	0.000667	0.000635	0.000585	0.000312	0.000287	0.000449	0.000414	0.000484	0.000449
39	0.000563	0.000516	0.000779	0.000718	0.000674	0.000617	0.000349	0.000320	0.000497	0.000455	0.000511	0.000471
40	0.000610	0.000554	0.000837	0.000766	0.000714	0.000649	0.000375	0.000341	0.000545	0.000495	0.000549	0.000503
41	0.000668	0.000604	0.000910	0.000827	0.000750	0.000679	0.000412	0.000372	0.000605	0.000547	0.000587	0.000534
42	0.000723	0.000652	0.000978	0.000885	0.000807	0.000728	0.000446	0.000408	0.000648	0.000584	0.000623	0.000564
43	0.000790	0.000711	0.001056	0.000952	0.000850	0.000764	0.000491	0.000441	0.000703	0.000633	0.000668	0.000602
44	0.000852	0.000767	0.001130	0.001017	0.000900	0.000810	0.000521	0.000469	0.000755	0.000679	0.000699	0.000629
45	0.000942	0.000848	0.001213	0.001091	0.000961	0.000864	0.000562	0.000506	0.000820	0.000738	0.000738	0.000664
46	0.001031	0.000927	0.001306	0.001176	0.001022	0.000918	0.000615	0.000553	0.000885	0.000796	0.000777	0.000699
47	0.001130	0.001016	0.001413	0.001270	0.001091	0.000981	0.000666	0.000599	0.000948	0.000852	0.000815	0.000733
48	0.001241	0.001116	0.001516	0.001363	0.001159	0.001042	0.000716	0.000644	0.001009	0.000907	0.000864	0.000776
49	0.001349	0.001213	0.001642	0.001476	0.001248	0.001122	0.000765	0.000687	0.001082	0.000973	0.000899	0.000809
50	0.001482	0.001332	0.001765	0.001587	0.001335	0.001200	0.000812	0.000730	0.001154	0.001038	0.000946	0.000850
51	0.001611	0.001448	0.001886	0.001695	0.001420	0.001276	0.000870	0.000782	0.001238	0.001113	0.001002	0.000900
52	0.001738	0.001562	0.002029	0.001824	0.001525	0.001370	0.000937	0.000842	0.001320	0.001187	0.001056	0.000950
53	0.001886	0.001697	0.002168	0.001949	0.001626	0.001463	0.000991	0.000891	0.001413	0.001272	0.001110	0.000998
54	0.002032	0.001830	0.002316	0.002084	0.001725	0.001554	0.001054	0.000949	0.001504	0.001355	0.001161	0.001045
55	0.002174	0.001960	0.002460	0.002216	0.001843	0.001662	0.001127	0.001016	0.001619	0.001460	0.001222	0.001101
56	0.002339	0.002109	0.002625	0.002367	0.001980	0.001786	0.001199	0.001081	0.001733	0.001562	0.001282	0.001156
57	0.002513	0.002266	0.002800	0.002524	0.002115	0.001907	0.001279	0.001153	0.001857	0.001674	0.001351	0.001218
58	0.002709	0.002437	0.002994	0.002699	0.002278	0.002049	0.001379	0.001241	0.001992	0.001792	0.001429	0.001289
59	0.002923	0.002625	0.003196	0.002876	0.002456	0.002206	0.001486	0.001334	0.002148	0.001929	0.001496	0.001346
60	0.003168	0.002842	0.003404	0.003057	0.002640	0.002368	0.001610	0.001444	0.002325	0.002086	0.001580	0.001419
61	0.003454	0.003092	0.003629	0.003255	0.002848	0.002550	0.001751	0.001567	0.002510	0.002247	0.001662	0.001491
62	0.003766	0.003365	0.003869	0.003464	0.003080	0.002752	0.001916	0.001712	0.002713	0.002424	0.001741	0.001559
63	0.004103	0.003655	0.004125	0.003685	0.003323	0.002960	0.002096	0.001867	0.002946	0.002624	0.001837	0.001641
64	0.004486	0.003984	0.004403	0.003922	0.003576	0.003176	0.002308	0.002049	0.003207	0.002848	0.001929	0.001718
65	0.004914	0.004355	0.004693	0.004167	0.003860	0.003421	0.002542	0.002253	0.003483	0.003087	0.002026	0.001799
66	0.005362	0.004743	0.005006	0.004437	0.004320	0.003821	0.002806	0.002481	0.003797	0.003359	0.002121	0.001880
67	0.005854	0.005173	0.005340	0.004723	0.004823	0.004262	0.003100	0.002739	0.004149	0.003666	0.002404	0.002127
68	0.006390	0.005658	0.005708	0.005043	0.005416	0.004795	0.003447	0.003052	0.004536	0.004016	0.002717	0.002401
69	0.006971	0.006184	0.006122	0.005420	0.006070	0.005385	0.003852	0.003417	0.004961	0.004401	0.003092	0.002738
70	0.007571	0.006737	0.006591	0.005847	0.006816	0.006066	0.004316	0.003841	0.005439	0.004840	0.003513	0.003117
71	0.008187	0.007301	0.007111	0.006328	0.007651	0.006823	0.004848	0.004323	0.005961	0.005315	0.003993	0.003553
72	0.008826	0.007878	0.007687	0.006854	0.008586	0.007663	0.005453	0.004867	0.006522	0.005821	0.004540	0.004048
73	0.009482	0.008464	0.008304	0.007412	0.009619	0.008585	0.006125	0.005467	0.007128	0.006362	0.005159	0.004605
74	0.010149	0.009050	0.008975	0.008011	0.010757	0.009592	0.006890	0.006144	0.007782	0.006939	0.005851	0.005222
75	0.010898	0.009728	0.009693	0.008643	0.012076	0.010778	0.007767	0.006932	0.008517	0.007602	0.006626	0.005909
76	0.012366	0.011049	0.010509	0.009380	0.013545	0.012102	0.008819	0.007879	0.009322	0.008329	0.007529	0.006720
77	0.014059	0.012587	0.011395	0.010181	0.015229	0.013635	0.010034	0.008983	0.010212	0.009143	0.008555	0.007643
78	0.015969	0.014312	0.012392	0.011095	0.017101	0.015326	0.011403	0.010219	0.011186	0.010024	0.009744	0.008723
79	0.018174	0.016321	0.013447	0.012051	0.019245	0.017283	0.012977	0.011653	0.012268	0.011017	0.011084	0.009933
80	0.020696	0.018622	0.014634	0.013142	0.021659	0.019489	0.014785	0.013304	0.013461	0.012113	0.012629	0.011340

Demographic Assumptions (*continued*)

Mortality Improvement Scale

Unisex Social Security Data Mortality Projection Scale					
Based on 60-year average of experience through 2015					
Age	Improvement Rate	Age	Improvement Rate	Age	Improvement Rate
15	1.41%	50	1.06%	85	0.77%
16	1.32%	51	1.06%	86	0.71%
17	1.22%	52	1.06%	87	0.65%
18	1.12%	53	1.05%	88	0.59%
19	1.01%	54	1.04%	89	0.54%
20	0.92%	55	1.03%	90	0.50%
21	0.84%	56	1.03%	91	0.45%
22	0.78%	57	1.03%	92	0.41%
23	0.71%	58	1.05%	93	0.37%
24	0.65%	59	1.07%	94	0.33%
25	0.58%	60	1.08%	95	0.30%
26	0.53%	61	1.10%	96	0.27%
27	0.48%	62	1.12%	97	0.26%
28	0.45%	63	1.15%	98	0.24%
29	0.43%	64	1.18%	99	0.24%
30	0.42%	65	1.20%	100	0.23%
31	0.43%	66	1.22%	101	0.22%
32	0.45%	67	1.23%	102	0.21%
33	0.50%	68	1.21%	103	0.20%
34	0.56%	69	1.19%	104	0.20%
35	0.62%	70	1.16%	105	0.19%
36	0.68%	71	1.14%	106	0.18%
37	0.75%	72	1.13%	107	0.17%
38	0.82%	73	1.13%	108	0.17%
39	0.88%	74	1.14%	109	0.16%
40	0.95%	75	1.13%	110	0.15%
41	1.00%	76	1.12%	111	0.14%
42	1.03%	77	1.10%	112	0.13%
43	1.05%	78	1.09%	113	0.13%
44	1.05%	79	1.07%	114	0.12%
45	1.05%	80	1.05%	115	0.11%
46	1.06%	81	1.01%	116	0.11%
47	1.06%	82	0.96%	117	0.11%
48	1.06%	83	0.91%	118	0.11%
49	1.06%	84	0.84%	119	0.11%

Demographic Assumptions (continued)

Retirement Assumptions

Retirement from Active Status (Tier 1/Tier 2)

Age	Police & Fire			General Service / School Districts						Judges	
	<13 Years	13 - 24	25+ Years	General Service			School Districts				
				< 15 years	15-29 Years	30+ Years	< 15 years	15-29 Years	30+ Years		
< 50						15.0%				25.0%	
50	1.5%	2.5%	27.5%			15.0%				25.0%	
51	1.5%	2.5%	21.5%			15.0%				25.0%	
52	1.5%	2.5%	21.5%			15.0%				25.0%	
53	1.5%	2.5%	21.5%			15.0%				25.0%	
54	1.5%	3.5%	21.5%			15.0%				25.0%	
55	3.0%	12.0%	25.0%	1.5%	2.5%	15.0%	1.5%	3.5%		25.0%	
56	3.0%	8.0%	25.0%	1.5%	2.5%	15.0%	1.5%	3.5%		25.0%	
57	3.0%	8.0%	25.0%	1.5%	2.5%	15.0%	1.5%	3.5%		25.0%	
58	6.0%	8.0%	25.0%	1.5%	9.0%	21.0%	1.5%	11.0%		27.5%	
59	6.0%	8.0%	25.0%	3.5%	9.0%	21.0%	4.5%	11.0%		27.5%	
60	6.0%	11.0%	25.0%	6.0%	11.0%	21.0%	6.5%	12.5%		27.5%	8.5%
61	6.0%	14.0%	25.0%	6.0%	11.0%	21.0%	6.5%	12.5%		27.5%	8.5%
62	15.0%	25.0%	38.0%	13.0%	19.5%	31.0%	15.0%	23.5%		34.0%	8.5%
63	15.0%	15.0%	28.0%	11.5%	16.5%	23.0%	13.0%	19.5%		26.5%	8.5%
64	15.0%	15.0%	28.0%	12.5%	16.5%	23.0%	13.0%	19.5%		31.5%	8.5%
65	100.0%	100.0%	100.0%	19.5%	28.0%	35.5%	25.5%	33.5%		45.0%	8.5%
66				27.5%	36.0%	40.5%	23.0%	36.5%		45.0%	8.5%
67				22.5%	26.5%	28.5%	21.0%	34.5%		42.0%	16.0%
68				19.5%	26.5%	28.5%	21.0%	28.0%		28.5%	16.0%
69				19.5%	26.5%	28.5%	21.0%	28.0%		28.5%	16.0%
70				100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%

Retirement from Active Status (OPSRP)

Age	Police & Fire			General Service / School Districts							
	<13 Years	13 - 24	25+ Years	General Service			School Districts				
				< 15 years	15-29 Years	30+ Years	< 15 years	15-29 Years	30+ Years		
50	0.5%	1.5%	5.5%								
51	0.5%	1.5%	5.5%								
52	0.5%	1.5%	5.5%								
53	0.5%	1.5%	25.0%								
54	0.5%	1.5%	21.5%								
55	2.0%	5.0%	25.0%	1.0%	2.5%	5.0%	1.0%	2.5%		5.0%	
56	2.0%	5.0%	25.0%	1.0%	2.5%	5.0%	1.0%	2.5%		5.0%	
57	2.0%	5.0%	25.0%	1.0%	2.5%	7.5%	1.0%	2.5%		7.5%	
58	5.0%	5.0%	25.0%	1.5%	3.0%	30.0%	1.5%	3.0%		30.0%	
59	5.0%	5.0%	25.0%	2.0%	3.0%	25.0%	1.5%	3.0%		25.0%	
60	5.0%	15.0%	25.0%	3.0%	3.8%	20.0%	2.5%	3.8%		20.0%	
61	5.0%	8.5%	25.0%	3.0%	5.0%	20.0%	3.0%	5.0%		20.0%	
62	10.0%	25.0%	38.0%	8.0%	12.0%	30.0%	6.0%	12.0%		30.0%	
63	7.0%	15.0%	28.0%	7.0%	10.0%	20.0%	6.0%	10.0%		20.0%	
64	7.0%	15.0%	28.0%	7.0%	10.0%	20.0%	6.0%	10.0%		20.0%	
65	100.0%	100.0%	100.0%	14.5%	35.0%	20.0%	11.5%	35.0%		20.0%	
66				18.5%	33.0%	20.0%	12.5%	33.0%		20.0%	
67				17.0%	22.0%	30.0%	11.0%	22.0%		30.0%	
68				13.0%	17.0%	20.0%	9.0%	17.0%		20.0%	
69				13.0%	17.0%	20.0%	9.0%	17.0%		20.0%	
70				100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%

Demographic Assumptions *(continued)*

Lump Sum Option at Retirement

Partial Lump Sum	3.0% for all years
Total Lump Sum	1.0% for 2019, declining by 0.5% per year until reaching 0.0%

Purchase of Credited Service at Retirement

Money Match Retirements	0%
Non-Money Match Retirements	70%

Oregon Residency Status

For purposes of determining eligibility for SB 656/HB 3349 benefit adjustments, 85% of retirees are assumed to remain Oregon residents after retirement.

Disability Assumptions

Age	Duty Disability		
	Police & Fire	General Service	Ordinary Disability
20	0.0060%	0.0002%	0.0090%
25	0.0086%	0.0003%	0.0129%
30	0.0128%	0.0005%	0.0192%
35	0.0196%	0.0008%	0.0294%
40	0.0316%	0.0013%	0.0474%
45	0.0518%	0.0021%	0.0777%
50	0.0896%	0.0036%	0.1344%
55	0.1690%	0.0068%	0.1800%
60	0.2408%	0.0096%	0.1800%
65	0.3080%	0.0123%	0.1800%

Demographic Assumptions *(continued)*

Termination Assumptions

Duration	School District	School District	General	General	Police & Fire
	Male	Female	Service Male	Service Female	
0	16.63%	13.50%	15.00%	15.50%	10.00%
1	14.25%	12.50%	12.50%	14.50%	5.97%
2	11.50%	10.50%	10.46%	11.81%	5.02%
3	9.50%	9.13%	9.23%	10.39%	4.22%
4	7.93%	8.07%	8.15%	9.14%	3.54%
5	6.86%	7.13%	7.19%	8.04%	3.31%
6	5.93%	6.31%	6.35%	7.07%	3.06%
7	5.12%	5.58%	5.60%	6.22%	2.83%
8	4.43%	4.93%	4.94%	5.44%	2.61%
9	3.82%	4.36%	4.42%	5.09%	2.41%
10	3.31%	3.85%	4.13%	4.77%	2.23%
11	3.04%	3.45%	3.85%	4.47%	2.06%
12	2.84%	3.24%	3.60%	4.18%	1.90%
13	2.65%	3.04%	3.36%	3.92%	1.76%
14	2.47%	2.85%	3.13%	3.67%	1.63%
15	2.30%	2.68%	2.93%	3.43%	1.50%
16	2.15%	2.51%	2.73%	3.22%	1.39%
17	2.00%	2.36%	2.55%	3.01%	1.28%
18	1.87%	2.21%	2.38%	2.82%	1.19%
19	1.74%	2.08%	2.22%	2.64%	1.10%
20	1.62%	1.95%	2.08%	2.47%	1.01%
21	1.52%	1.83%	1.94%	2.32%	0.94%
22	1.41%	1.72%	1.81%	2.17%	0.87%
23	1.32%	1.61%	1.69%	2.03%	0.80%
24	1.23%	1.50%	1.58%	1.90%	0.80%
25	1.20%	1.50%	1.47%	1.78%	0.80%
26	1.20%	1.50%	1.40%	1.67%	0.80%
27	1.20%	1.50%	1.40%	1.56%	0.80%
28	1.20%	1.50%	1.40%	1.46%	0.80%
29	1.20%	1.50%	1.40%	1.40%	0.80%
30 +	1.20%	1.50%	1.40%	1.40%	0.80%

Demographic Assumptions (continued)

Merit Salary Increase Assumptions

Duration	School	Other General	
	District	Service	Police & Fire
0	3.72%	3.70%	4.44%
1	3.43%	3.37%	3.95%
2	3.15%	3.06%	3.50%
3	2.87%	2.77%	3.09%
4	2.60%	2.49%	2.72%
5	2.34%	2.24%	2.39%
6	2.08%	2.00%	2.10%
7	1.83%	1.78%	1.83%
8	1.59%	1.57%	1.60%
9	1.36%	1.39%	1.40%
10	1.14%	1.21%	1.23%
11	0.92%	1.05%	1.08%
12	0.72%	0.90%	0.95%
13	0.53%	0.77%	0.85%
14	0.34%	0.65%	0.76%
15	0.17%	0.54%	0.69%
16	0.01%	0.45%	0.64%
17	-0.14%	0.36%	0.59%
18	-0.28%	0.29%	0.56%
19	-0.42%	0.22%	0.53%
20	-0.53%	0.16%	0.52%
21	-0.64%	0.12%	0.50%
22	-0.73%	0.08%	0.49%
23	-0.79%	0.05%	0.48%
24	-0.85%	0.03%	0.46%
25	-0.89%	0.01%	0.44%
26	-0.92%	0.00%	0.42%
27	-0.94%	0.00%	0.38%
28	-0.95%	0.00%	0.34%
29	-0.95%	0.00%	0.28%
30 +	-0.95%	0.00%	0.21%

Demographic Assumptions *(continued)*

Unused Sick Leave Adjustment

Actives	
• State General Service Male	7.0%
• State General Service Female	3.75%
• School District Male	7.75%
• School District Female	5.75%
• Local General Service Male	5.25%
• Local General Service Female	3.50%
• State Police & Fire	4.00%
• Local Police & Fire	7.25%
Dormants	3.25%

Unused Vacation Cash Out Adjustment

Tier 1	
• State General Service	2.25%
• School District	0.25%
• Local General Service	3.25%
• State Police & Fire	2.75%
• Local Police & Fire	4.25%
Tier 2	0.00%

Retiree Healthcare Assumptions

Retiree Healthcare Participation

RHIPA	
• 8 – 9 years of service	10.0%
• 10 – 14 years of service	10.0%
• 15 – 19 years of service	15.0%
• 20 – 24 years of service	19.0%
• 25 – 29 years of service	26.0%
• 30+ years of service	34.0%
RHIA	
• Healthy Retired	32.0%
• Disabled Retired	20.0%

RHIPA Subsidy Cost Trend Rates

Year	Rate
2019	7.10%
2020	5.80%
2021	5.20%
2022-2024	5.00%
2025	5.10%
2026-2029	5.00%
2030	5.40%
2031-2033	5.90%
2034	5.80%
2035	5.90%
2036-2039	5.80%
2040	5.70%
2041	5.80%
2042	5.70%
2043	5.80%
2044	5.70%
2045	5.60%
2046-2047	5.50%
2048-2050	5.40%
2051-2053	5.30%
2054-2058	5.20%
2059-2063	5.10%
2064	5.00%
2065	4.90%
2066-2067	4.80%
2068	4.70%
2069	4.60%
2070	4.50%
2071-2072	4.40%
2073	4.30%
2074-2093	4.20%
2094+	4.10%



Oregon

Kate Brown, Governor

Public Employees Retirement System

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Tigard, OR 97281-3700
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July 26, 2019

TO: Members of the PERS Board
FROM: Stephanie Vaughn, Manager, Policy Analysis & Compliance Section
SUBJECT: Adoption of Assumed Rate Rule:
OAR 459-007-0007, *Assumed Rate*

OVERVIEW

- Action: Adopt modifications to the Assumed Rate rule.
- Reason: Specify the effective date to implement an assumed rate change for PERS transactions.
- Policy Issue: None identified.

BACKGROUND

The PERS Board reviews the assumed rate in odd-numbered years as part of the board's adoption of actuarial methods and assumptions. The rate is then adopted in an administrative rule; therefore, staff is presenting the administrative rule change for approval after the board decides upon the rate. These rule modifications include a blank space to show the assumed rate, and the exact percentage will be added upon adoption by the board.

The rule specifies that the new assumed rate will be effective for PERS transactions with an effective date of January 1, 2020, consistent with this board's policy decision from 2013 that changes to the assumed rate will be effective January 1, following the board's adoption of the new rate, giving staff ample time to perform the necessary preparations and communicate with members and employers. A January 1 effective date also provides equitable treatment to all members who retire in a year that a change is adopted, no matter which month they retire. The new assumed rate will be aligned with the new actuarial equivalency factors (AEFs), which will allow for a clear effective date for all transactions that involve calculations using both the latest year-to-date rate and AEF components.

Under Section 57 of Senate Bill 1049 (2019), the board must submit a report to the Joint Committee on Ways and Means or the Joint Interim Committee on Ways and Means detailing the proposed changes to PERS' actuarial methods and assumptions and the associated, actuarially determined impact to the total liability of the system, the accrued liability of the system, and employer contribution rates. Note that an adopted rule is not effective until it is filed with the Secretary of State. While staff is seeking adoption of the rule with the new assumed rate today, staff will not file the adopted rule until 30 days after the report required by SB 1049 (2019) is submitted to the legislature.

PUBLIC COMMENT AND HEARING TESTIMONY

A rulemaking hearing was held June 25, 2019, at 2:00 p.m. at PERS headquarters in Tigard. No members of the public attended. The public comment period ended July 2, 2019, at 5:00 p.m. No public comment was received.

LEGAL REVIEW

The attached draft rule was submitted to the Department of Justice for legal review and any comments or changes are incorporated in the rule as presented for adoption.

IMPACT

Mandatory: Yes, the assumed rate determined by the board must be adopted by rule and clearly describe the effective date of the assumed rate change on PERS transactions.

Benefit: The proposed rule benefits members, employers, and staff by setting forth the assumed rate and a clear effective date for implementing a change in the rate.

Cost: There are no discrete costs directly attributable to specifying the assumed rate in rule.

RULEMAKING TIMELINE

May 29, 2019	Staff began the rulemaking process by filing Notice of Rulemaking with the Secretary of State.
May 31, 2019	Secretary of State publishes the Notice in the Oregon Administrative Rules Database. Notice is sent to employers, legislators, and interested parties. Public comment period begins.
May 31, 2019	PERS Board notified that staff began the rulemaking process.
June 25, 2019	Rulemaking hearing held at 2:00 p.m. at PERS in Tigard.
July 2, 2019	Public comment period ended at 5:00 p.m.
July 26, 2019	Board may adopt the rule modifications.

BOARD OPTIONS

The board may:

1. Pass a motion to “adopt modifications to the Assumed Rate rule, including the assumed rate percentage approved at today’s board meeting.”
2. Direct staff to make other changes to the rule or explore other options.

STAFF RECOMMENDATION

Staff recommends the board choose Option #1.

- Reason: Reflect the change in the assumed rate as adopted by the board and specify the effective date for implementation of the rate for PERS transactions.

Adoption – Assumed Rate Rule

07/26/19

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If the board does not adopt: Staff would return with rule modifications that more closely fit the board's policy direction if the board determines that a change is warranted.

C.3. Attachment 1 – 459-007-0007, *Assumed Rate*

**OREGON ADMINISTRATIVE RULE
PUBLIC EMPLOYEES RETIREMENT BOARD
CHAPTER 459
DIVISION 007 – EARNINGS AND INTEREST DISTRIBUTION**

1 **459-007-0007**

2 **Assumed Rate**

3 (1) The Board will review the assumed rate in odd-numbered years as part of the
4 Board's review and adoption of actuarial assumptions and methods.

5 (2) The Board may adopt a change in the assumed rate at any time. A change in the
6 assumed rate is effective the first of the year following the Board's adoption of the change.

7 (3) The assumed rate is set at ~~[7.20]~~ ____ percent, effective on January 1, ~~[2018]~~ 2020.

8 Stat. Auth.: ORS 238.650 & 238A.450

9 Stats. Implemented: ORS 238.255