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December 9, 2016

VIA E-MAIL

Ms. Debra Hembree
Actuarial Services Coordinator
Oregon PERS

Re: Request Number: 2016-009
Effect of Increasing UAL Amortization Period

Dear Debra:

As requested, we have analyzed the actuarial impact and other considerations around the selection of an amortization policy for the Unfunded Accrued Liability (UAL) and the associated calculation of employer UAL Rates. This letter summarizes our analysis of the current amortization policies used by PERS in comparison with longer illustrative amortization periods of either 25 or 30 years. In addition, a discussion of the current environment relevant to the selection of amortization periods is included.

BACKGROUND AND OUR UNDERSTANDING

The current policy of the PERS Board is to amortize all unanticipated changes in UAL that occur during a biennium over a fixed period based upon the rate-setting actuarial valuation in which the unanticipated UAL change occurs. During a biennium, unanticipated changes in UAL can occur from a variety of sources. Those sources include actual investment or demographic experience differing from actuarial assumptions, changes in the assumptions used in the valuation, and changes in projected benefits via legislative or judicial actions. Currently, the fixed amortization period is 20 years for Tier 1/Tier 2 experience, 16 years for OPSRP experience, and 10 years for RHIA and RHIPA experience. Since rates are set biennially, every two years a new biennial experience "amortization base" is established. Effective December 31, 2013, the remaining balances of all Tier 1/Tier 2 amortization bases were combined and reamortized over 20 years.

When a new amortization base is established as part of a rate-setting valuation, a first year amortization payment is calculated based on the size of the base, the length of the amortization period, and the system payroll growth and investment return assumptions. That payment is then combined with calculated payments for prior amortization bases to develop a total UAL amortization payment for the year. Dividing the total payment by the expected applicable payroll for the coming year results in the uncollared UAL rate.

An amortization approach that uses fixed periods and establishes multiple amortization bases is referred to as a "fixed", "layered", or "closed" amortization method. This contrasts with an "open"

or “rolling” amortization method, where a first year payment is recalculated each rate period for the entire UAL as of the calculation date. If the amortization period of an open method calculation is set too high, the UAL would continue to grow even in the event that all assumptions are met.

For PERS, amortization payments for each base are calculated using a “level percent of payroll” amortization method based on the expected growth in annual system payroll, currently assumed to be 3.5% per year. Most large public pension systems with actuarially calculated contribution rates use a level percent of payroll amortization approach. A budgeting advantage for employers of this approach is that the annual amortization payment associated with each amortization base remains level as a percent of payroll throughout the amortization period as long as payroll grows at the assumed rate. This contrasts with a “level dollar” amortization method, in which the annual amortization payment remains constant in dollar terms over the amortization period. Assuming payroll increases during the amortization period, a level dollar amortization payment becomes smaller as a percentage of payroll as the payoff period progresses.

For Oregon PERS, any new amortization base established is set to the selected amortization period for the given benefit program (Tier 1/Tier 2, OPSRP, RHIA, RHIPA), regardless of the nature of the event that gave rise to the base. This contrasts to the practice of some systems, which may vary the length of the amortization period according to the source or magnitude of the amortization base. An amortization base arising from a method or assumption change, for example, might be amortized over a different number of years than an amortization base arising from gains or losses on demographic or investment experience.

As part of its regular biennial review of actuarial methods and assumptions, the PERS Board could choose to change the current amortization policy. Alternatives could include lengthening or shortening amortization periods, employing a “rolling” amortization method rather than a “fixed” method, using a level dollar instead of a level percent of payroll approach, or introducing varying amortization periods based on the source or magnitude of the unanticipated UAL change.

For this request, we have been asked to analyze the impact of increasing the UAL amortization period to either 25 or 30 years while retaining the level percent of payroll approach.

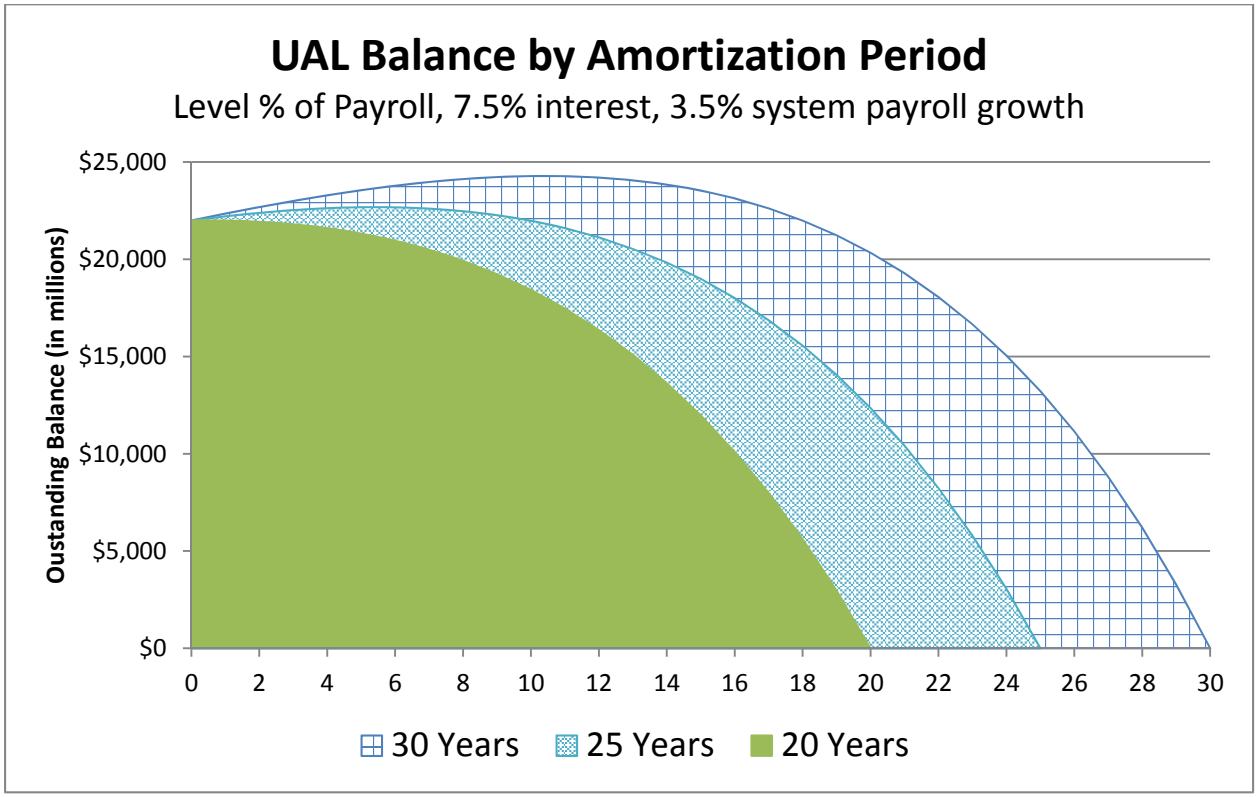
ILLUSTRATION OF VARYING AMORTIZATION PERIODS

For comparison, we will consider the current 20-year amortization period for new Tier 1/Tier 2 bases along with alternative illustrative 25-year and 30-year amortization periods. While we are illustrating the current policy using a 20-year period, this is not to say that all currently existing UAL has a full 20 years of future amortization remaining. In the December 31, 2015 actuarial valuation, each Tier 1/Tier 2 rate pool and independent employer generally had two amortization bases, with remaining periods of 18 and 20 years, while the UAL associated with OPSRP, RHIA and RHIPA are amortized over shorter periods, as described above. For illustration purposes, however, it is simpler to compare a single, unified 20-year amortization base to the alternatives.

Given that over 93 percent of current system-wide shortfall is Tier 1/Tier 2, focusing on the Tier 1/Tier 2 amortization period is appropriate.

The graphs below illustrate the impact of the alternative periods on a single amortization base calculated as a level percentage of payroll using the current valuation assumptions of 7.5% interest and 3.5% system payroll growth. For this purpose, we have illustrated a beginning UAL balance of $22 billion, approximately equal to the system-wide UAL excluding side accounts in the December 31, 2015 actuarial valuation report, and a projected first year system-wide payroll amount of approximately $9.54 billion from the same valuation report.

The first chart illustrates the progression of the unamortized UAL balance over the amortization period. Both the 25 and 30-year amortization periods lead to an extended period of net negative amortization – wherein the UAL balance actually grows, even if expected payments are made and all assumptions are met – before payroll grows to the point where contribution amounts exceed interest on the UAL balance, reducing the balance and ultimately drawing it down to zero. The current amortization period of 20 years does not have a period of material net negative amortization, and more rapidly pays down the balance than either of the longer periods.

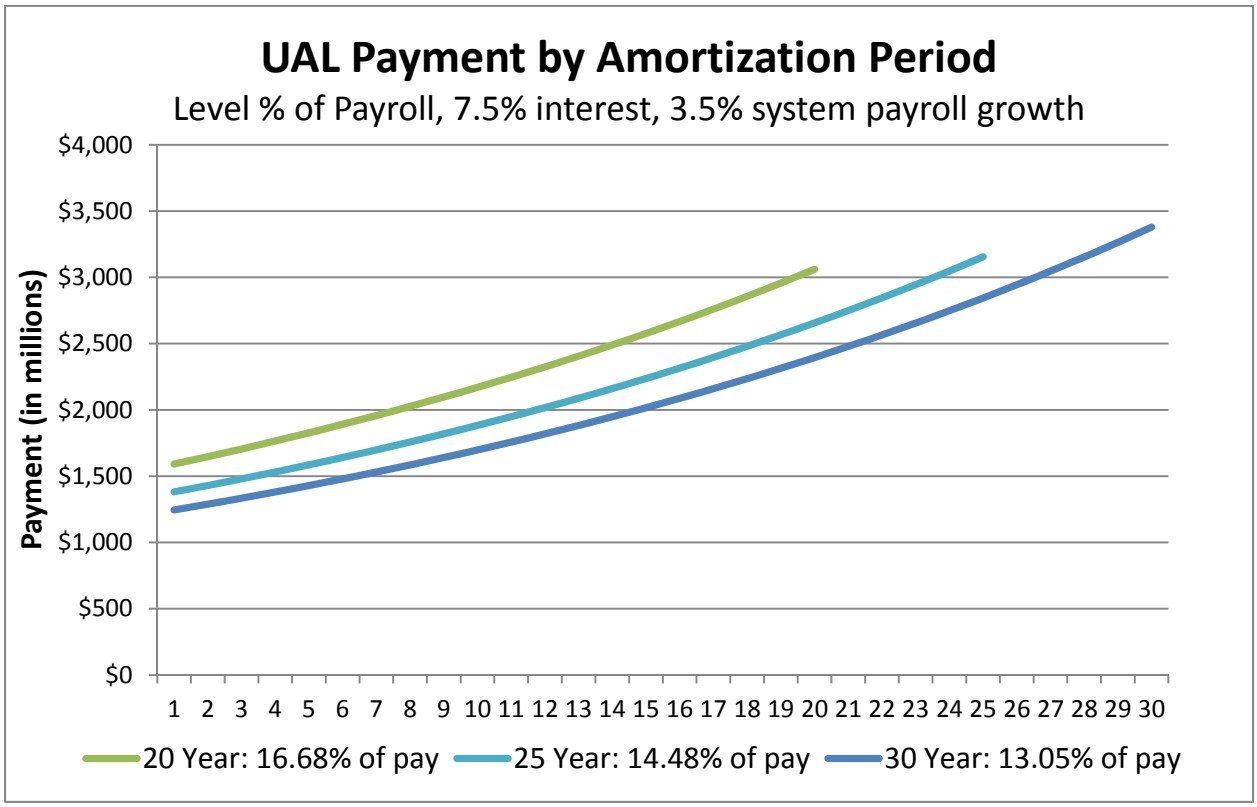


As can be seen above, if all assumptions are met, the 20-year amortization is effectively an "interest only" amortization for the first two years followed by a payoff of the shortfall in the last 18 years of the amortization. On the other hand, the 30-year amortization is markedly less than interest only in the initial years and the associated unamortized UAL for the base grows to more than $24 billion over the first ten years of the amortization period. The "principal" of the original $22 billion UAL does not start to be paid off until 18 years after the first amortization payment. This extended period with no progress in decreasing the shortfall is concerning when viewed from the perspective of intergenerational equity.

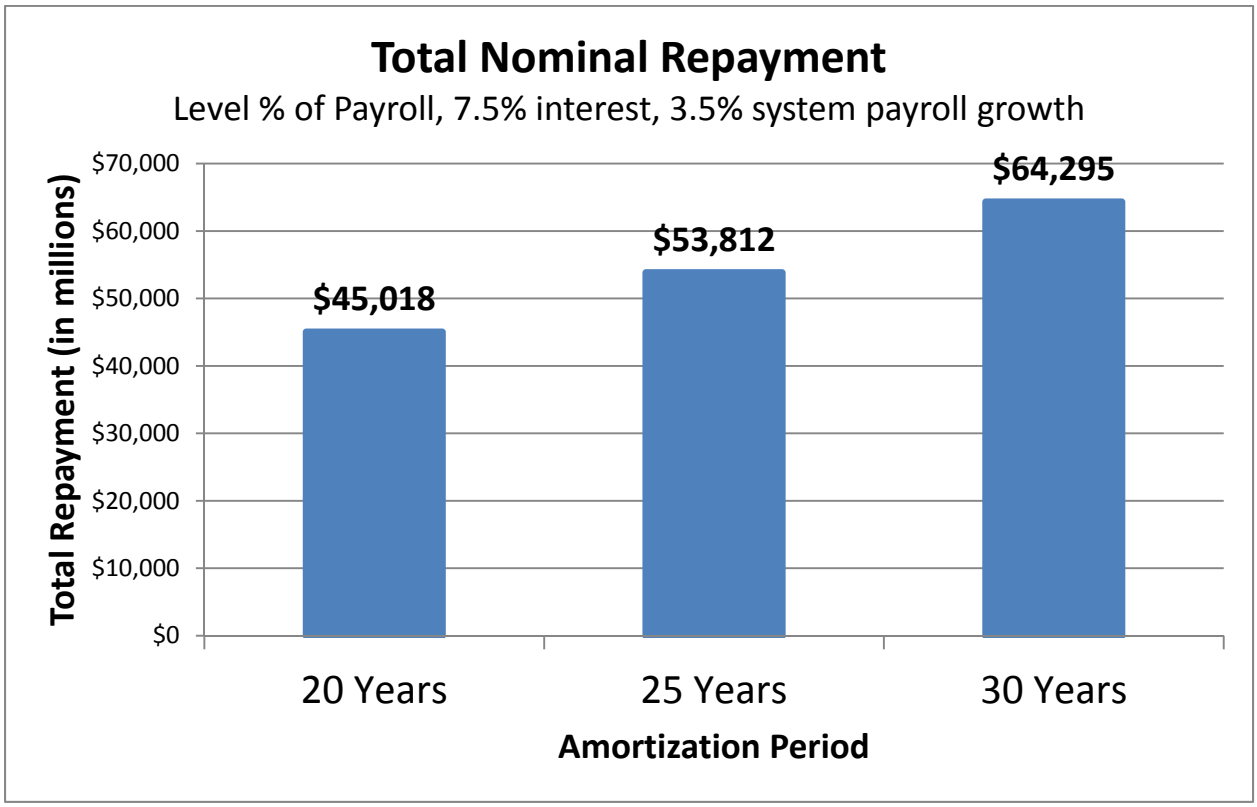
The UAL contribution rates associated with each illustrative amortization period in our example are as follows:

Amortization Period	UAL Contribution Rate (level % of payroll; 7.5% interest & 3.5% system payroll growth)
20-Year	16.68%
25-Year	14.48%
30-Year	13.05%

The chart below shows the expected UAL amortization payments each year as a dollar amount. While changing from a 20-year to a 30-year amortization period would decrease the uncollared UAL rate by 3.63% of payroll, it adds ten additional years of payments and, as noted above, it defers any amortization of the "principal" of the original $22 billion UAL for 18 years.



The final chart shows the total expected amount of repayments to be made over the course of the amortization period in nominal (non-inflation-adjusted) terms. While the 20-year amortization period requires the highest contribution rate of the three options, it produces a lower total repayment amount than the alternatives because of the shorter amortization period. Of course, the net present value (discounted at the 7.5% investment return assumption) of all three repayment patterns is the same, and is equal to the original $22 billion UAL.



CONTEXT FOR AMORTIZATION POLICIES

The PERS Board's selection of an amortization policy is interwoven with two of its established principles: promoting intergenerational equity, and providing predictable and stable rates.

These principles are inherently in tension with one another regarding the length of amortization period. While the concept of intergenerational equity may be interpreted differently by different parties, it commonly is viewed as calling for "demographic matching" of costs by having each generation of taxpayers fund the benefits of government employees who serve them, and to avoid leaving unpaid obligations for future generations to satisfy. In general, intergenerational equity argues for a relatively shorter amortization period. The goal of providing predictable and stable rates, however, argues for a longer amortization period to smooth out the effects of a given period's gains or losses and to lessen volatility of biennium to biennium changes in contribution rates.

The inherent conflict between these two competing principles calls for seeking an appropriate balance in the selection of an amortization policy.

In recent years, several prominent organizations published guidance on striking this balance when selecting amortization periods. In 2013, a "best practice" white paper published by the Government Finance Officers Association (GFOA) titled "*Core Elements of a Pension Funding*

Policy" recommended that plans should amortize unfunded amounts using fixed, layered periods that "ideally fall in the 15-20 year range". The paper also stated that amortization periods should never exceed 25 years. Several other publications – including reports by the Society of Actuaries' Blue Ribbon Panel on Public Pension Funding and the Conference of Consulting Actuaries' Public Plans Community, both published in 2014 – contained similar recommendations regarding amortization periods.

AMORTIZATION POLICY AND RATE COLLAR

The changes in contribution rates for different amortization periods discussed above affect the uncollared UAL contribution rate. Under the current PERS contribution rate calculation policy, a "rate collar" limits the magnitude of changes in contribution rates, spreading large changes in actuarially calculated contribution rates over several biennia. The contribution rate in effect for a biennium after applying the rate collar is known as the "collared" contribution rate.

As discussed in various PERS Board meetings since the *Moro* decision, the uncollared Tier 1/Tier 2 contribution rate is currently significantly higher than the collared Tier 1/Tier 2 contribution rate. If actual future experience is near assumption, the collared Tier 1/Tier 2 contribution rate is expected to increase significantly in both July 2019 and July 2021. This is in addition to the increases already adopted by the PERS Board for July 2017, with the increases occurring in order to have the collared rate reach the actuarially calculated uncollared contribution rate, which is the rate at which amortization of UAL can occur over time if actual future experience matches assumptions.

Because the uncollared Tier 1/Tier 2 rate is currently significantly higher than the collared rate, a change in amortization period may lower the uncollared rate without actually affecting the collared rate (the rate employers actually pay) in the near term. Specifically, even a reduction in the uncollared rate such as the 3.63% of payroll discussed above would not be expected to affect the collared Tier 1/Tier 2 contribution rates effective for employers in July 2019. Instead, it would reduce the difference between the uncollared rate and the collared rate.

OTHER CONSIDERATIONS

In considering any potential change to amortization and contribution rate policy, it is important to keep in mind that actual system experience will deviate from the long-term assumptions. If the system has a significant near-term negative experience event in the future (for example, a year with a negative investment return), the amortization policy in effect at the time of the event would affect the system's ability to recover from such a negative event.

For example, say a system had a 30-year amortization policy in place for a large initial UAL from a negative experience event. Further, say that a subsequent significant negative event occurred 15 years into the amortization period of the large initial UAL. In that case, the 30-year amortization policy would mean at the time of the second negative event the unamortized balance of the initial UAL would be materially greater than even the original amount of the initial UAL due to the effects of an extended period of net negative amortization as discussed above. The additional UAL arising from the second negative event would be layered on top of the

existing unamortized UAL balance from the initial negative event. It would be very challenging for the system to recover financially. If the recovery is accomplished, it likely will not occur in a generationally equitable manner.

Alternatively, if the same situation as above occurred to a system with a 20-year amortization policy the system's path to recovery would be quite different. Most of the UAL from the initial negative event would have been amortized, so the UAL arising from the second negative event would not layer on top of the full UAL of the initial event. Further, the amortization of the initial UAL event would have been conducted in a more generationally equitable manner and the funded status of the system would have materially improved between negative events due to the amortization policy.

DATA, METHODS, ASSUMPTIONS, AND PROVISIONS

Other than the exceptions and additions noted above, the data, methods, assumptions, and plan provisions used to calculate employer contribution rates are the same as those used in the December 31, 2015 system-wide actuarial valuation report.

ACTUARIAL BASIS AND QUALIFICATIONS

In preparing this letter, and the valuation report on which it is based, we relied, without audit, on information (some oral and some in writing) supplied by Oregon PERS. 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 updated estimates depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

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

Future actuarial measurements may differ significantly from the current measurements presented in this estimate due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of this estimate, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted the assumptions used in the December 31, 2015 valuation in September 2015.

Actuarial computations presented in this estimate are for purposes of illustrating the effect of different UAL amortization policies. As such, they cannot be relied upon for financial reporting or

other purposes, and calculations for purposes other than this use may be significantly different from the estimates contained in this letter. Accordingly, additional determinations may be needed for other purposes.

Milliman's work is prepared solely for the use of Oregon PERS. 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.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

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

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

If you have any questions about our response or need any additional information, please let us know.

Sincerely,

Matthew R. Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

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

MRL:sdp