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January 25, 2016

VIA E-MAIL

Steve Rodeman
Executive Director
Oregon PERS

Re: Request Number: 2016-002
Analysis of Potential Legislative Concepts

Dear Steve:

Per the request noted above, we have estimated the system-wide average effects of several potential legislative concepts for modifying the benefits and/or financing of PERS. Our analysis is based upon our understanding of each concept as informed by discussions with PERS staff.

Based on these discussions, our analysis includes the following concepts:

- **Redirect IAP contributions:** The 6% member contribution currently made to the IAP would be redirected to fund Tier 1/Tier 2 and OPSRP benefits. These contributions would not add to the Money Match-eligible account balance for Tier 1/Tier 2 members. For estimating financial impact, we assumed redirected contributions would commence January 2017.
- **Money Match Annuitization:** The Money Match annuitization interest rate to convert account balances to monthly lifetime annuities would be lowered, possibly tied to a market index, and would be independent of the long-term investment return assumption adopted by the PERS Board. For estimating financial impact, we used an interest rate of 3.5% and assumed this provision was first effective for 2017 retirements.
- **OPSRP Final Average Salary Cap:** The Final Average Salary (FAS) definition for OPSRP benefits would be limited to no more than $100,000 on a prospective basis. This limit would not be indexed. If an OPSRP member's FAS is greater than $100,000 at the time the concept is implemented, we understand the FAS amount will be frozen and will apply to all service in the member's benefit calculation. For estimating financial impact, we assumed this provision took effect in 2015.
- **Tier 1/Tier 2 Sick Leave and Vacation Payments**: We understand concepts have been discussed that could limit the amount of unused sick leave or vacation time payments that are included in a Tier 1/Tier 2 member's FAS calculation. While we have not analyzed a specific proposal, we estimated the financial impact if such a concept either reduced or eliminated the benefit increase we assume (based on recent experience) to result from such payments. For estimating financial impact, we assumed any such change affected benefit amounts beginning with 2017 retirements.

The first concept can be considered a financing modification, as it does not change the projected benefits paid under Tier 1/Tier 2 and OPSRP but rather adds an additional source of contributions used to fund those benefits. (Of course, this change would modify IAP benefits by lowering the account balance members are projected to accumulate in the IAP.) The remaining concepts can be considered benefit modifications. They would reduce the projected benefits paid under Tier 1/Tier 2 and OPSRP and hence the system's accrued liability.

Other than as described herein, our analysis used the same assumptions as the December 31, 2014 actuarial valuation. Changes in member retirement patterns could significantly affect the liability reduction ultimately realized if these concepts were enacted. In particular, if a window of time existed for retirements prior to the effective date of changes reducing benefits for future retirees, we would expect to see at least some "anti-selection", where a portion of members who would be most affected by the changes accelerate their retirements to precede the effective date.

The analysis estimates the impact on accrued liability and system-wide average advisory contribution rates calculated in the December 31, 2014 actuarial valuation of the changes and assumed implementation dates described above.

The consultants who worked on this assignment are pension actuaries. We have not explored any legal issues with respect to these change concepts. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

SUMMARY OF LIABILITY RESULTS

The table below summarizes key December 31, 2014 valuation results for pension benefits prior to reflecting any legislative concept.

"Accrued Liability" refers to the net present value of projected future benefits allocated to service already completed as of the valuation date in accordance with the current actuarial cost allocation method, while "Total Liability" includes the value attributable to anticipated future service for current active members. The contribution rate shown is a blended rate reflecting the weighted averages of Tier 1, Tier 2 & OPSRP payroll as of the valuation date. The base contribution rate is shown on an "uncollared" basis.

	12/31/2014 Total Liability ($B)	12/31/2014 Accrued Liability ($B)	2017-2019 Advisory Uncollared Base Pension Employer Contribution Rates (% of Payroll)		
			Normal Cost	UAL	Total
12/31/2014 Pension Valuation Results	$81.0	$73.5	12.3%	14.7%	27.0%

ANALYSIS OF FINANCING MODIFICATION: REDIRECTING MEMBER IAP CONTRIBUTIONS

The offset to the employer contribution rate provided by member contributions represents 6% of payroll for the affected member population. The estimated dollar amount of contributions can be calculated for each biennium and converted to a percentage of system-wide payroll that would offset the share of the total contribution paid by employers. If the member contributions were only redirected for Tier 1/Tier 2 members, the amount of this offset would diminish over time as the payroll associated with the closed Tier 1/Tier 2 group declines. If contributions were redirected for all members, the offset would remain at 6% of system payroll. The estimated impact by biennium using the valuation assumptions is shown in the following table.

System-Wide Average Employer Rate Offset Provided by Redirecting Member Contributions Starting January 2017 to Fund Defined Benefits

	Redirect Tier 1/Tier 2 Only	Redirect for All Members*
2015-2017	0.7%	1.6%
2017-2019	2.5%	6.0%
2019-2021	2.1%	6.0%
2021-2023	1.7%	6.0%
2023-2025	1.4%	6.0%
2025-2027	1.1%	6.0%
2027-2029	0.8%	6.0%

*Redirection is shown prior to any estimated effects of a return of member contributions for OPSRP members who fail to satisfy minimum vesting requirements. Estimating any such effects would require an articulated policy regarding interest crediting on returned member contributions.

The 2015-2017 impact is lower than the 2017-2019 impact because the assumed implementation date falls 18 months into the 2015-2017 biennium. The estimates under the option for redirecting only Tier 1/Tier 2 contributions are sensitive to the actual rates of retirement and termination for Tier 1/Tier 2 members and employer hiring practices.

This analysis assumes that total system payroll grows at the valuation assumption of 3.5% per year. The projected system payroll for each biennium is shown below.

Estimated System Payroll – Subject Salary ($Billions)	
2015-2017	$18.9
2017-2019	$20.2
2019-2021	$21.7
2021-2023	$23.2
2023-2025	$24.9
2025-2027	$26.6
2027-2029	$28.5

Another way to illustrate the effect of redirecting IAP contributions is to consider the present value of the future employee contributions that would fund the pension benefits under such a concept. At the December 31, 2014 valuation, considering only active members of the system at that date and assuming that contributions were redirected beginning in 2017, the present value of the redirected 6% IAP contributions for Tier 1/Tier 2 members is approximately $1.4 billion. The present value for OPSRP members is approximately $2.0 billion. As a result, if the full IAP contribution was redirected for all members, the present value would be $3.4 billion. For reference, the system's unfunded actuarial liability, excluding side accounts, for pension benefits as of December 31, 2014 was $17.9 billion.

ANALYSIS OF BENEFIT MODIFICATIONS

The decrease in both Total Liability and Accrued Liability associated with each benefit modification concept is shown separately below. **Please note that if multiple concepts are implemented together, the resulting effect would not be the cumulative amount of the separate concepts illustrated below. Instead, the interactions between the various benefit modifications would produce a liability reduction of smaller magnitude than the sum of the reductions shown below. If more than one concept will be incorporated into a legislative proposal, a separate analysis should be conducted to study the combined effects.**

The effects of the different change concepts are discussed individually below.

Annuitize Money Match at 3.5%

The Money Match benefit formula calculation for Tier 1/Tier 2 members annuitizes the member account balance plus the matching employer amount. The annuitization calculation uses the system's life expectancy tables and an annuitization interest rate.

For a given account balance, using a lower annuitization interest rate provides a smaller initial monthly benefit, all else equal. Mathematically, the conversion from account balance to monthly annuity is accomplished by assuming the member lives to his or her life expectancy while receiving level monthly payments and that the unused portion of the account balance increases with the annuitization interest rate due to investment returns. Please note the emphasis on the word "level" in the prior sentence, as the annuitization calculation for Money Match retirees has historically been performed without regard to future cost of living allowance (COLA) increases. This means that account balances are annuitized to provide a lifetime annuity without COLA, and then employer contribution rates are calculated in a way to provide 100% employer funding of the COLA increase on the calculated annuity benefits, as directed by statute.

Currently the interest rate used for the annuitization calculation is the same as the Board's adopted assumption for long-term future average investment return. For retirements in 2016, this rate is currently 7.5%. We understand the legislative concept under discussion would require a different, lower rate for the calculation. For our analysis, we showed the effect of using a 3.5% annuitization interest rate.

The impact on system liability attributable to the lower annuitization interest rate is shown in the table below. The change primarily results from the effect of the annuitization change on Tier 1 General Service active members and on inactive members, who have not yet commenced benefits. These two groups are most affected because they are the not-yet-retired members most likely to receive benefits under the Money Match formula.

	12/31/2014 Total Liability ($B)	12/31/2014 Accrued Liability ($B)	2017-2019 Advisory Uncollared Base Pension Employer Contribution Rates (% of Payroll)		
			Normal Cost	UAL	Total
12/31/2014 Pension Valuation Results	$81.0	$73.5	12.3%	14.7%	27.0%
Change in Money Match Interest Rate	(1.1)	(0.9)	(0.3%)	(0.7%)	(1.0%)

For reference, we provided an analysis of a similar concept in a letter dated February 1, 2013, which illustrated a 4% annuitization rate. While several aspects of the analysis have changed since that time (including the investment return assumption, the proposed annuitization rate, and the actuarial cost method), a comparison to the prior analysis illustrates the diminishing impact of such a change over time due to changes in the demographics of not-yet-retired members. The prior analysis, which assumed the lower annuitization rate would apply to retirements beginning in 2012, reduced Total Liability by $2.7 billion. As shown in the table above, our current analysis shows a Total Liability reduction of $1.1 billion, approximately 40% of the effect from the prior analysis. This is largely due to the passage of five years between the effective dates of the annuitization change in the two studies. Because the share of members whose benefits are determined by the Money Match formula is declining, a change in the Money Match annuitization factors has a diminishing impact over time.

The table below shows the percentage decrease in the factors of a single life annuity retirement for non-disabled Tier 1 / Tier 2 members at two sample retirement ages.

	Change to Money Match Benefit Factor*	
	Age 55 Retirement	Age 65 Retirement
3.5% Annuitization Rate	-36.7%	-30.9%

**Based on mortality assumption in effect for 2016-2017 retirements*

Tier 1/Tier 2 members have benefits calculated under both Money Match and Full Formula, and get the larger of the two calculated benefits. (Members eligible for the Formula Plus Annuity benefit have a comparison of three benefit formulas.) Of members currently projected to have their benefit determined by Money Match, some would continue to be projected as Money Match retirements when valued under the lower annuitization rate while others would be projected to retire under Full Formula after reflecting the lower rate. For the first group of members, the changes shown above for the Money Match benefit factor are representative of their anticipated changes in their initial benefits. For the second group of members, the changes would be less than shown above because the Full Formula calculation, which is unaffected by the annuitization rate change, would serve as a floor limiting the decrease in the initial benefit amount.

The combined impact of these two outcomes would be to reduce benefits for some members and to accelerate the system's transition towards Full Formula serving as the dominant benefit formula. This reduces both the Accrued Liability and Normal Cost determined under the actuarial cost method.

Of the $0.9 billion reduction in Accrued Liability shown above, approximately $0.6 billion is attributable to the effect of the change on inactive members. Inactive members no longer work in PERS-covered employment but have not yet commenced receipt of benefits. Many of these members, particularly those with the highest individual liabilities, may currently be eligible to retire immediately. A change to the Money Match annuitization rate that lowered benefits may cause inactive members who otherwise would have deferred retirement to accelerate their retirement to before the effective date of the change. This could significantly limit the liability reduction associated with a change and lead to a smaller effect than shown above.

Please note that the rate changes illustrated above are calculated assuming a 20-year amortization period is used to reflect the decreased Accrued Liability arising out of this change. If a shorter period was used – such as an average expected future working lifetime of affected members – the reduction in near-term contribution rates could be larger.

OPSRP Final Average Salary Cap

We analyzed the effect of implementing a limit of $100,000 on the three-year Final Average Salary (FAS) used in OPSRP benefit calculations. For our illustration, we assumed the cap went into effect for benefits calculated in 2015. Based on our understanding of the proposed concept, we assumed this limit applied prospectively to the final result of the FAS calculation. This means that if an OPSRP member had a FAS of $120,000 immediately before the cap was introduced, the FAS would remain at $120,000 for the remainder of the member's career. Finally, the $100,000 amount was not indexed for future inflation, which means it would affect a growing percentage of members over time. Our analysis assumed that employer contribution rates would continue to apply to all subject salary.

The change in system-wide December 31, 2014 valuation results is shown below.

	12/31/2014 Total Liability ($B)	12/31/2014 Accrued Liability ($B)	2017-2019 Advisory Uncollared Base Pension Employer Contribution Rates (% of Payroll)		
			Normal Cost	UAL	Total
12/31/2014 Pension Valuation Results	$81.0	$73.5	12.3%	14.7%	27.0%
OPSRP FAS Cap of $100,000	(1.2)	(0.5)	(0.7%)	(0.4%)	(1.1%)

As shown in the table, the decrease in the Total Liability is much larger than the decrease in Accrued Liability. The fixed dollar limit on FAS has a growing impact in the future, and so the reduction in benefits to be earned over the entire working career is larger than the reduction in those benefits considered accrued as of the valuation date under the actuarial cost method.

While noting OPSRP normal cost and UAL rates are pooled at a statewide level, the liability effects of this concept differ significantly between school district general service members and all other general service members. For school district members this concept would decrease key active member liability metrics by approximately 8%. In contrast, for non-school district general service members this concept would decrease active member liability metrics by approximately 20%. This difference in effects based on employer type is primarily caused by differences in the salary distribution between school districts and other types of general service employers. The effects of this concept differ significantly from member to member; members with low salaries may not be impacted by the concept while more highly-paid members are significantly impacted by the concept.

Finally, we understand some versions of this concept would exclude Police & Fire members from the FAS cap. That would change the results of our analysis as shown:

	12/31/2014 Total Liability ($B)	12/31/2014 Accrued Liability ($B)	2017-2019 Advisory Uncollared Base Pension Employer Contribution Rates (% of Payroll)		
			Normal Cost	UAL	Total
12/31/2014 Pension Valuation Results	$81.0	$73.5	12.3%	14.7%	27.0%
OPSRP FAS Cap of $100,000 *(Excluding Police & Fire)*	(0.8)	(0.35)	(0.5%)	(0.3%)	(0.8%)

Tier 1/Tier 2 Sick Leave and Vacation Payments

Currently, certain Tier 1 and Tier 2 members are eligible to receive an increase in their FAS on account of two separate provisions. First, employees of employers who participate in the unused sick leave program can have the value of one-half of their accumulated unused sick leave added to the gross salary used to determine their FAS. This benefit is available to both Tier 1 and Tier 2 members whose employers elect to participate. Second, Tier 1 members are eligible to include the value of any lump sum payment for accrued vacation that occurs in their averaging period as part of the salary that will be used to calculate their FAS. The effect of both provisions is to increase FAS and, ultimately, benefits paid from the system under Tier 1/Tier 2 benefit formulas that use FAS.

OPSRP members are not eligible for an increase to their FAS on account of either unused sick leave or lump sum vacation payouts.

We understand various legislative concepts have been discussed that may reduce the amount of unused sick leave or lump sum vacation payouts a Tier 1/Tier 2 member is likely to have included in FAS. Such changes could take different forms, such as not allowing leave accrued after a specific date to count in the FAS calculation.

The FAS amount calculated for a Tier 1/Tier 2 member affects the benefits determined under both the Full Formula and Formula Plus Annuity benefit formulas, but does not affect the Money Match calculation. Because of this, the effect of reducing such amounts in the salary considered would have a varying effect between members, depending on which formula produces the greatest benefit.

For our analysis, we have not attempted to model the specific effect of any one proposal, but instead have illustrated a range of potential impacts from reducing unused sick leave and lump sum vacation payouts. We did this by calculating system-wide December 31, 2014 actuarial valuation results under two alternate assumption sets: 1.) the estimated FAS increase due to such payments is cut in half compared to that observed in the most recent experience study, or 2.) the estimated FAS increase due to such payments is completely eliminated. For both assumption sets, we assumed the change first affect retirements in 2017. The results are illustrated in the table below.

	12/31/2014 Total Liability ($B)	12/31/2014 Accrued Liability ($B)	2017-2019 Advisory Uncollared Base Pension Employer Contribution Rates (% of Payroll)		
			Normal Cost	UAL	Total
12/31/2014 Pension Valuation Results	$81.0	$73.5	12.3%	14.7%	27.0%
Sick Leave/Vacation Cut in Half	(0.35)	(0.3)	(0.1%)	(0.2%)	(0.3%)
Sick Leave/Vacation Eliminated	(0.7)	(0.6)	(0.2%)	(0.5%)	(0.7%)

The second assumption set – which illustrates the complete elimination of sick leave and vacation adjustments – is shown to estimate the share of system liabilities associated with these provisions for members active as of December 31, 2014, not because we understand legislation to completely eliminate the amounts is being considered.

The assumptions used as a starting point for this analysis are shown below and were developed in the most recent biennial review of assumptions and methods, which was published in September 2015. As part of that study, we evaluated an appropriate assumed increase attributable to both unused sick leave and lump sum vacation payouts to use in the actuarial valuation based on a review of recent retirements. The assumed increases to FAS for active members developed in that study and used in the December 31, 2014 actuarial valuation are shown below. The vacation increase in the table is applied to all Tier 1 members, while the unused sick leave increase in the table is applied only to Tier 1/Tier 2 members who work for an employer that elects to participate in the unused sick leave program.

Assumed Increase to Active Final Average Salary (FAS)	
Unused Sick Leave	
State General Service Male	6.25%
State General Service Female	3.75%
School District Male	7.25%
School District Female	5.75%
Local General Service Male	4.75%
Local General Service Female	3.25%
State Police & Fire	4.75%
Local Police & Fire	7.50%
Dormant members	3.00%

Assumed Increase to Active Final Average Salary (FAS)	
Vacation Pay	
Tier 1 State General Service	1.60%
Tier 1 School District	0.25%
Tier 1 Local General Service	2.20%
Tier 1 State Police & Fire	1.80%
Tier 1 Local Police & Fire	2.90%

DATA, METHODS, ASSUMPTIONS AND PROVISIONS

Other than the exceptions and additions discussed in this letter, the data, methods, assumptions, and plan provisions used to calculate employer contribution rates are the same as those used in the December 31, 2014 system-wide actuarial valuation report. That information, including a discussion of the inherent limitations of use of actuarial valuation results, is herein incorporated to this letter by reference.

Our valuation assumptions portion of the analysis does not include any assumed change in participant behavior such as retirement patterns due to the proposed changes in policy, or to bargaining agreements or employer pay practices as a result of any legislative changes. Such potential impacts merit consideration. In particular, an announced change in the annuitization interest rate to take effect at a future date could lead some affected members who otherwise would have retired after the effective date to accelerate retirement. This would limit the liability reduction associated with a change. Actual experience will vary from assumption, and sometimes the variance from assumption will be significant. The variance will affect the long-term financial impact of any proposed legislation.

In our analysis, it was assumed that a standalone annuitization interest rate change would not affect future interest crediting on Tier 1 member accounts over time.

In calculating the illustrative changes in uncollared employer base contribution rates shown above, we assumed all changes in Accrued Liability were amortized over a 20-year period as a level percent of payroll using current valuation assumptions. This is the method currently used in the valuation when establishing new Tier 1/Tier 2 amortization bases. If a different amortization method were used, the overall impact on employer rates could be significantly different than shown in this letter.

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, additional cost or contribution requirements based on the plan's funded status, or a change in the cost allocation method); 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 valuation assumptions and adopted the assumptions used in the December 31, 2014 valuation in September 2015.

Actuarial computations presented in this estimate are for purposes of providing a high-level analysis of the requested change concepts to the System. 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. 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. We have not explored any legal issues with respect to the change concepts. 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,

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

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

MRL:sdp
encl.

cc: Debra Hembree, Marjorie Taylor

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