

Tacoma Employees' Retirement System

Actuarial Audit of the January 1, 2024
Actuarial Valuation





October 16, 2024

Ms. Catherine Marx
Retirement Director
Tacoma Employees' Retirement System

Dear Ms. Marx:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the January 1, 2024 Actuarial Valuation of the Tacoma Employees' Retirement System (TERS). We are grateful to the TERS staff, and Milliman LLC, the retained actuary, for their cooperation throughout the actuarial audit process.

This actuarial audit involves an independent verification and analysis of the assumptions, procedures, methods, and conclusions used by the retained actuary for TERS, in the valuation of TERS as of January 1, 2024, to ensure that the conclusions are technically sound and conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board.

GRS is pleased to report to the TERS Board and Staff that, in our professional opinion, the January 1, 2024 Actuarial Valuation prepared by the retained actuary provides a fair and reasonable assessment of the financial position of TERS.

The undersigned are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Thank you for the opportunity to work on this assignment.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

A handwritten signature in black ink that reads "Dana Woolfrey".

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SECTION A

EXECUTIVE SUMMARY

Executive Summary

This Actuarial Audit includes the following:

- A full replication of the January 1, 2024 actuarial valuation based on the same census data, assumptions, and actuarial methods used by the retained actuary.
- A replication of key January 1, 2024 actuarial valuation results following incorporation of the recommendations from the most recent Investigation of Experience January 1, 2020 – December 31, 2023.
- Review and analysis of the results as well as a review of the mathematical calculations for completeness and accuracy, based on a detailed review of a representative sample of the current plan participants.
- Verification that all appropriate benefits have been valued and valued accurately.
- Evaluation of the actuarial cost method and the actuarial asset valuation method in use and whether other methods may be more appropriate for TERS.
- Verification of the reasonableness of the calculation of the unfunded actuarial accrued liability and the funding period, given the funding policy.
- Review of the demographic and economic actuarial assumptions for consistency, reasonableness and compatibility. Such assumptions shall include, but are not limited to: mortality, retirement and separation rates, levels of pay adjustments, rates of investment return, and disability factors.
 - This review was completed in the context of both the Investigation of Experience January 1, 2016 – December 31, 2019, which produced the assumptions used in the valuation as of January 1, 2024 *as well as* the recommendations from the Investigation of Experience January 1, 2020 – December 31, 2023.
- Assessment of the adherence to relevant Actuarial Standards of Practice (ASOPs) published by the American Academy of Actuaries.

Summary of Findings

Based on our review, the actuarial valuation, studies, and reports of TERS are reasonable, used appropriate assumptions and adhered to Actuarial Standards of Practice. We feel that no changes are required for the actuarial valuation as of January 1, 2024. We offer the following recommendations for consideration for the next experience study.

Actuarial Assumptions

- 1) GRS recommends deep dive review of retirement assumption to fully minimize consistent small liability losses associated with this decrement.
- 2) We recommend that exposure and actual decrement data be included at a more complete age and service level such that the reviewing actuary can follow the decision-making process.



Actuarial Methods and Funding Policy

We found no issues with the asset smoothing method and the funding policy. We find them to be best practice.

Actuarial Valuation Results

We found no significant issues in the replication of the aggregate actuarial valuation results and found them to be presented in a reasonable manner.

Content of Valuation Report

In general, GRS found the report to be comprehensive and informative.

Resolution of Prior Findings

Decrement eligibility

One of the primary, albeit still minor, findings from the prior audit report related to the rounding used in decrement application. GRS referenced cases in which the Milliman valuation program will deem a member ineligible for retirement, but that member will be eligible within the calendar year and may appear as a retiree in the next valuation. Milliman responded to that finding on page 39 of the Investigation of Experience January 1, 2016 – December 31, 2019 that their method would ultimately balance out based on different fractional ages.

Ultimately, the retained actuary has firsthand knowledge on the way the information is being collected and applied, and the gain/loss experience does not give us any reason to think there is a material bias. What is most important is consistency of application within the valuation system, the gain/loss analysis and the experience study data. GRS recommends that Milliman continue to closely examine the experience data and gain/loss analysis to ensure that the system is recognizing retirements as such in cases where the system would deem them ineligible, but considers the matter closed.

Salary increase timing

Milliman confirmed with the System that most salary adjustments occur January 1 and are included in the valuation data, thus, end of year salary increase timing remains appropriate.

SECTION B

GENERAL ACTUARIAL AUDIT PROCEDURE

General Actuarial Audit Procedure

At the commencement of this engagement, GRS requested the information necessary to thoroughly review the work product of the retained actuary. Specifically, GRS received and reviewed the following items:

- The most recent actuarial valuation reports as of January 1, 2024,
- The Board presentation associated with the January 1, 2024 actuarial valuation,
- The two most recent experience studies, dated September 1, 2020 and September 9, 2024
- TERS Investment Policy Statement, dated August 2023
- TERS Funding and Benefits Policy, and
- A full set of census data for plan participants and beneficiaries as of January 1, 2024 used by the retained actuary for the actuarial valuation as well as the original data received from TERS Staff.

In performing our review, we:

- Reviewed the appropriateness of the actuarial assumptions,
- Reviewed the actuarial reports/studies,
- Reviewed the census data used for valuation purposes to ensure appropriate use of the raw data,
- Reviewed the census data used to ensure that records were not being lost during processing, and
- Replicated the actuarial valuation process using the same assumptions, methods, and data used by the retained actuary.

The entire review, which follows, is based on our review of this information and subsequent correspondence with the retained actuary for clarification and further documentation.

Key Actuarial Concepts

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement plan using the set of actuarial assumptions adopted by the Board. It is designed to simulate all of the dynamics of such a retirement plan for each current participant of the plan, including:

- Accrual of future service,
- Changes in compensation,
- Leaving the plan through retirement, disability, withdrawal, or death, and
- Determination of and payment of benefits from the plan.

This simulated dynamic is applied to each active participant of the plan. This simulation results in a set of expected future benefit payments to that participant. Discounting those future payments for the likelihood of survival and at the assumed rate of investment return, produces the Total Present Value of Plan Benefits (TPV) for that participant. The actuarial cost method will allocate this TPV between the participant's past service (actuarial accrued liability) and future service (future normal costs).



SECTION C

ACTUARIAL ASSUMPTIONS

Actuarial Assumptions

Overview

The actuarial valuation report contains a description of the actuarial assumptions which were used in the actuarial valuation as of January 1, 2024. The retained actuary published an actuarial experience report, dated September 1, 2020, which was used to set the assumptions in this 2024 valuation. Most recently, Milliman issued an actuarial experience report dated September 9, 2024 which will be used to recommend assumptions for the actuarial valuation as of January 1, 2025. We have reviewed both reports in detail in order to assess the reasonableness of the assumptions in both contexts.

The set of actuarial assumptions is one of the foundations upon which an actuarial valuation is based. An actuarial valuation is, essentially, a statistical projection of the amount and timing of future benefits to be paid under the retirement plan. In any statistical projection, assumptions as to future events will drive the process. Actuarial valuations are no exception.

It is important to understand the nature of the retirement plan and the plan sponsor when assessing the reasonableness of the actuarial assumptions. No projection of future events can be labeled as “correct” or “incorrect”. However, there is a “range of reasonableness” for each assumption. We evaluate individual elements as follows:

- Whether or not they fall within the range of reasonableness, and
- If they fall within that range, whether they are reasonable for the actuarial valuation of the plan.

Actuarial assumptions for the valuation of retirement plans are of two types: (i) demographic assumptions, and (ii) economic assumptions. We have assessed the reasonableness of both types as part of this actuarial audit.

Demographic Assumptions

General

These assumptions simulate the movement of participants into and out of plan coverage and between status types. Key demographic assumptions are:

- turnover among active participants,
- retirement patterns among active participants, and
- healthy retiree mortality.

In addition, there are a number of other demographic assumptions with less substantial impact on the results of the process, such as:

- disability incidence and mortality among disabled benefit recipients,
- mortality among active participants,
- distribution of form of payment selection, and
- percent of active participants who are married and the relationship of the ages of participants and spouses.



Demographic assumptions for a retirement plan such as TERS are normally established by statistical studies of recent actual experience, called experience studies. Such studies underlie the assumptions used in the valuations.

Once it is determined whether or not an assumption needs adjustment, setting the new assumption depends upon the extent to which the current experience is an indicator of the long-term future.

- Full credibility may be given to the current experience. Under this approach, the new assumptions are set very close to recent experience.
- Alternatively, the recent experience might be given only partial credibility. Thus, the new assumptions may be set by blending the recent experience with the prior assumption.
- If recent experience is believed to be atypical of the future, such knowledge is taken into account.
- Finally, it may be determined that the size of the plan does not provide a large enough sample to make the data credible. In such cases, the experience of the plan may be disregarded and the assumption is set based upon industry standards for similar groups.

The measurement of experience is normally affected by simply counting occurrences of an event. Thus, for example, in reviewing retirement patterns, an actuary might count the number of actual retirees among males aged 55 with 30 years of service. These retirements would be compared against the number of total people in that group to generate a raw rate of retirement for that group. In many cases, especially for the development of withdrawal and healthy mortality rates, these counts are weighted by liability or benefit amount.

Actuarial Standards of Practice (ASOP) No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, applies to actuaries when they are selecting demographic assumptions. As noted by Milliman, ASOP 35 was recently combined with ASOP 27 for valuations on or after January 1, 2025, but no guidance was changed. In accordance with ASOP No. 35, an actuary should identify the types of demographic assumptions to use for a specific measurement. In doing so, the actuary should determine the following:

- a) The purpose and nature of the measurement;
- b) The plan provisions or benefits and factors that will affect the timing and value of any potential benefit payments;
- c) The characteristics of the obligation to be measured (such as measurement period, pattern of plan payments over time, open or closed group, and volatility);
- d) The contingencies that give rise to benefits or result in loss of benefits;
- e) The significance of each assumption; and
- f) The characteristics of the covered group.

Not every contingency requires a separate assumption. For example, for a plan that is expected to provide benefits of equal value to employees who voluntarily terminate employment or become disabled, retire, or die, the actuary may use an assumption that reflects some or all of the above contingencies in combination rather than selecting a separate assumption for each.

Observations on Statistical Data Reported and Used

We find that the statistical data included in the experience study was minimal, including only actual and expected counts in total. **We recommend that exposure data be included, and that actual and expected counts be included at individual age and service levels for major decrements, if only as an appendix to the report.** Including this information in the next experience study, in conjunction with including a status reconciliation report in the actuarial valuation each year, will allow future reviewing actuaries to make a better assessment of the reasonability of assumptions.

Observations on Assumptions

Overall, it appears that the current demographic assumptions are reasonable and the gains and losses in the report indicate no significant biases. Below, we offer general observations and considerations for the retained actuary based on our experiences with similar plans.

Retirement –The rates at which participants are assumed to retire are based on the member’s age and eligibility for full or reduced benefits. In the most recent experience study, Milliman proposes moving from a gender-based assumption to a unisex assumption and instead delineating unreduced retirement rates for those with more or less than 30 years of service. Given the benefit design (and maximum 30 year multiplier), this recommended change to assumption structure and the proposed rates seem reasonable.

We did notice that the retirement component of the gain/loss analysis over the last four years has shown small but consistent losses.

TERS Retirement Loss History					
Year	2020	2021	2022	2023	Average
\$ amounts in millions	\$1.3	\$1.0	\$0.6	\$2.3	\$1.3
As a % of Active Liabilities	0.2%	0.1%	0.1%	0.3%	0.2%

\$ amounts from page 33 of the actuarial valuation as of January 1, 2024 as determined by Milliman.

As such, we would have expected changes to the retirement assumption resulting from the most recent experience study to *increase* expected costs to minimize losses going forward. However, we found, and Milliman concurred, that the changes to the retirement assumption were the primary driver in the slight *reduction* in expected costs shown in Exhibit A from “Changes to active decrements and portability.” The directional mismatch could indicate that the retirement rates could be further refined. Milliman indicated that in addition to the counts weighted analysis included in the report, they did also examine liability weighted experience and found it to be similar. We recommend that Milliman work to identify the source of any future discrepancy between gain/loss experience and observed plan experience. Although we did note this directional mismatch, the gain/loss analysis notes that it does also include experience related to final average pay experience which could explain the mismatch and, more importantly, the losses have been small. GRS finds the Milliman recommendation results in a reasonable assumption.

Turnover – The rates at which participants are assumed to terminate for reasons other than retirement, death or disability are based on the member’s service. This assumption structure is reasonable and typical. There has been modest deviation from the assumption over the four years since the adoption of the assumption, and Milliman recommended modest changes in the most recent experience study. GRS is in agreement with the recommendation.

Mortality – The main demographic assumption in an actuarial valuation is mortality because this assumption is a predictor of how long pension payments will be made by the trust. The current mortality assumption for each type of plan member (i.e., active members, healthy retirees, and disability retirees) is generally based on the applicable PUB-2010 amount-weighted mortality tables published by the Society of Actuaries (SOA) with a 105% load on male retiree mortality rates.

We concur with using the PUB-2010 mortality tables. They are the most recently published mortality tables based on public plan participant mortality experience. Although the actual to expected ratios did show some conservatism in the current tables, Milliman chose not to change the base table rates to better fit the experience citing the anomalous experience associated with the COVID-19 pandemic.

There are competing schools of thought among experts regarding long-term impacts to mortality rates from COVID-19. On one hand, COVID-19 continues to be a not insignificant cause of death. On the other hand, there is the idea that the initial wave of the pandemic mortality was concentrated within the most vulnerable among us and left a healthier remaining population. Given the uncertainty, we concur with the recommendation to take a “wait and see” approach for now and have made similar recommendations in our recent experience studies.

Additionally, the retained actuary utilizes a generational mortality assumption to incorporate future mortality improvements into the actuarial valuation using a one-dimensional mortality improvement scale. They recommended moving to using the ultimate rates of the most recent mortality improvement tables published by the Society of Actuaries. This is a modest change from the prior assumption, a very common approach, and we agree with this recommendation.

Disability Incidence –The disability incidence rates are age-based, appear reasonable and are largely immaterial to the valuation.

Portability Loads – While difficult to assess this assumption without the actual data, there is evidence that Milliman investigated this assumption to the extent possible with the data that is available and made modest adjustments based on experience.

Economic Assumptions

General

These assumptions simulate the impact of economic forces on the amounts and values of future benefits. Key economic assumptions are the assumed rate of investment return and assumed rates of future salary increase. All economic assumptions are built upon an underlying inflation assumption.

ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, applies to actuaries when they are selecting economic assumptions. ASOP No. 27 states that each economic assumption selected by the actuary should be reasonable. For this purpose, an assumption is reasonable if it has the following characteristics:

- a) It is appropriate for the purpose of the measurement;
- b) It reflects the actuary's professional judgment;
- c) It takes into account historical and current economic data that is relevant as of the measurement date;
- d) It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and
- e) It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included and disclosed, or when alternative assumptions are used for the assessment of risk.

Additionally, ASOP No. 27 states that communications regarding actuarial reports subject to this standard should contain the following:

- a) A description of each significant assumption used in the measurement and whether the assumption represents an estimate of future experience, and
- b) A description of the information and analysis used in selecting each economic assumption that has a significant effect on the measurement.

Inflation

Inflation refers to mean price inflation as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It primarily impacts investment return and salary increases.

The current explicit price inflation assumption is 2.50%. The inflation assumption was lowered from 2.75% to 2.50% following the Investigation of Experience for the period January 1, 2016 – December 31, 2019 and was left unchanged at 2.50% following the Investigation of Experience for the period January 1, 2020 – December 31, 2023. **GRS finds that both the decision to lower the assumption at the prior cycle and the recommendation to leave the assumption unchanged at 2.50% during the current cycle were reasonable and appropriate.**

The exhibit on the following page shows some of the key metrics GRS uses in making inflation recommendations. Although some metrics *could* be used to support a lower inflation assumption, GRS feels the benefits of stability of the economic assumptions outweigh the benefits of a possible change and concurs with the recommendation to leave it as is at 2.50%.



Forward-Looking Price Inflation Forecasts^a	
Congressional Budget Office^b	
5-Year Annual Average	2.44%
10-Year Annual Average	2.32%
Federal Reserve Bank of Philadelphia^c	
5-Year Annual Average	2.50%
10-Year Annual Average	2.33%
Federal Reserve Bank of Cleveland^d	
10-Year Expectation	2.37%
20-Year Expectation	2.41%
30-Year Expectation	2.46%
Federal Reserve Bank of St. Louis^e	
10-Year Breakeven Inflation	2.26%
20-Year Breakeven Inflation	2.43%
30-Year Breakeven Inflation	2.27%
U.S. Department of the Treasury^f	
10-Year Breakeven Inflation	2.19%
20-Year Breakeven Inflation	2.43%
30-Year Breakeven Inflation	2.27%
50-Year Breakeven Inflation	2.36%
100-Year Breakeven Inflation	2.43%
Social Security Trustees^g	
Ultimate Intermediate Assumption	2.40%

^aEnd of the Second Quarter, 2024. Version 2024-07-12 by Gabriel, Roeder, Smith & Company

^bAn Update to the Budget and Economic Outlook: 2024 to 2034 , Release Date: June 2024, Consumer Price Index (CPI-U), Percentage Change from Year to Year, 5-Year Annual Average (2024 - 2028), 10-Year Annual Average (2024 - 2033).

^cSecond Quarter 2024 Survey of Professional Forecasters , Release Date: May 10, 2024, Headline CPI, Annualized Percentage Points, 5-Year Annual Average (2024 - 2028), 10-Year Annual Average (2024 - 2033).

^dInflation Expectations, Model output date: June 1, 2024.

^eThe breakeven inflation rate represents a measure of expected inflation derived from X-Year Treasury Constant Maturity Securities and X-Year Treasury Inflation-Indexed Constant Maturity Securities. Observation date: June, 2024.

^fThe Treasury Breakeven Inflation (TBI) Curve, Monthly Average Rates, June, 2024.

^gThe 2024 Annual Report of The Board of Trustees of The Federal Old-Age And Survivors Insurance and Federal Disability Insurance Trust Funds , May 6, 2024, p. 10, Key Assumptions and Summary Measures for Long-Range (75-year) Projections, Intermediate, Consumer Price Index (CPI-W).



Investment Return

The investment return assumption is one of the principal assumptions in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date, in order to determine the liabilities of the retirement plan. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates. The current assumption incorporates inflation of 2.50% per annum plus an annual real rate of return of 4.25%, net of investment-related expenses paid from the trust, for an assumed nominal rate of return of 6.75%.

In the most recent study, Milliman examined multiple sources in making their recommendation including Wilshire’s 10 and 30-year expected compound return, Milliman’s 10, 20 and 30-year returns as well as the 10 and 20-year returns from the Horizon survey. GRS finds that these are all appropriate sources. Ultimately, Milliman cited the Wilshire 10-year expected compound return in recommending no change to the 4.25% real rate of return.

GRS concurs with the recommendation to leave the real rate of return at 4.25% unchanged; however, some additional context may provide added support for doing so. The higher returns coming out of these models represent a recent shift in expectations rather than a consistent, long-term trend that happened with the lowering of these investment return assumptions across the public sector over the last decade.

In making our investment return recommendations, GRS uses a survey of capital market assumptions from 12 investment consultants. Using Tacoma’s target asset allocation, the GRS survey of capital market assumptions, and an inflation assumption of 2.50%, we determined the following short and long-term expectations produced by the model:

GRS Survey of Capital Market Assumptions	Median Compound Returns Using 7-10 Year Capital Market Assumptions	Median Compound Returns Using 20-30 Year Capital Market Assumptions
Model Year 2024	6.83%	6.92%
Model Year 2023	6.78%	6.96%
Model Year 2022	5.20%	6.28%
Model Year 2021	5.31%	6.37%

As you can see, based on survey results for capital market assumptions collected during 2023 and 2024, the GRS model would produce results which easily support the 4.25% real rate of return and 6.75% nominal rate of return. However, the survey results for capital market assumptions collected during 2021 and 2022 provide the context for significant caution in considering anything higher than the current 4.25% real rate of return.

Both the volatility of recent capital market assumptions, as well as the asymmetry of outcomes discussed by Milliman in the Funding and Valuation Principles and “Actuarial Risk” section, provide ample evidence for a “wait and see” approach on the real rate of return assumption.

Administrative Expenses

The investment return assumption is stated net of expected investment-related expenses from the trust. Accordingly, the actuarial valuation includes an explicit assumption for administrative expenses. This is our preferred approach and a reasonable assumption based on past experience. Recent experience showed that this assumption could be lowered from the current 0.80% of pay, however based on discussions with staff, Milliman left the assumption unchanged. GRS finds this approach to be reasonable.

Earnings Progression

In general, assumed rates of pay increase are often constructed as the total of three main components:

- Price inflation – currently 2.50%
- Economic Productivity Increases – currently 0.75%
- Merit, Promotion, and Longevity – This portion of the salary increase assumption reflects components such as promotional increases as well as increases for merit and longevity. This portion of the assumption is not related to inflation. The current assumptions vary this component based on the participant's current service.

This structure is reasonable and our preferred approach. The productivity increase assumption is supportable. The merit assumption looks reasonable given the experience study data, both in the most recent four-year period and the prior, which appropriately isolated the merit and longevity component of the salary increase experience.

Cost of Living Assumption

Milliman assumes that participants will receive the maximum 2.125% cost-of-living adjustment. Given the low likelihood for sustained low price inflation such that the cumulative effective rate to the member is meaningfully less than the maximum, GRS concurs with this recommendation.

Summary

The set of actuarial assumptions and methods, taken in combination, are reasonable and established in accordance with ASOP No. 27 and ASOP No. 35 (soon to be combined ASOP 27).

We have no recommended changes to the actuarial assumptions. We recommend that liability weighted experience be considered in the study of retirement and termination experience at the next experience study and that additional exposure data be provided.

SECTION D

ACTUARIAL METHODS AND FUNDING POLICY

Actuarial Methods and Funding Policy

Actuarial Cost Methods

The ultimate cost of TERS is equal to the benefits paid plus the expenses related to operating TERS. This cost is funded through City and member contributions to TERS plus the investment return on accumulated contributions which are not immediately needed to pay benefits or expenses. The level and timing of the contributions needed to fund the ultimate cost are determined by the actuarial assumptions, plan provisions, participant characteristics, investment experience, and the actuarial cost method.

An actuarial cost method is a mathematical process for allocating the dollar amount of the Present Value of Benefits (PVB) between future normal costs and the Actuarial Accrued Liability (AAL). The retained actuary uses the Entry Age Normal actuarial cost method, characterized by:

- (1) Normal Cost (NC) – the level percent of payroll contribution, paid from each participant’s date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant’s projected benefits from retirement to death.
- (2) Actuarial Accrued Liability – the excess of the PVB over the present value of all future remaining normal costs.

The Entry Age Normal actuarial cost method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain relatively stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers. Historically, most public plans have used the Entry Age Normal actuarial cost method.

We have reviewed the retained actuary’s application of the Entry Age Normal actuarial cost method and we believe that the method is reasonable and appropriately applied.

Asset Valuation Method

Sharp short-term swings in market value can result in large fluctuations in the actuarially determined contributions. Thus, many actuaries use an asset valuation method which smooths out these fluctuations in support of achieving level contributions. A good asset valuation method places values on a retirement plan’s assets which are related to current market value but which will also produce a smoother pattern of costs.

ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*, provides a framework for the determination of the actuarial value of assets (AVA) emphasizing that the method should bear a reasonable relationship to the market value of assets (MVA), recognize investment gains and losses over an appropriate time period, and avoid systematic bias that would overstate or understate the AVA in comparison to MVA.

The actuarial valuation of TERS currently utilizes an asset valuation method that smooths market value gains and losses over four years as compared to the assumed 6.75% rate of return. No change was recommended to the smoothing period.

Milliman recommends that TERS incorporate an additional mechanism that compresses individual gain and loss bases if there are offsetting gains and losses. This approach reduces the volatility of results over traditional methods and was part of the recommendations of the 2019 Actuarial Audit by GRS.

We concur with the recommendation to incorporate this offset approach and find that the overall smoothing approach is reasonable and consistent with ASOP 44.

Funding Policy

The TERS Board of Trustees approved a Funding and Benefits Policy July 14, 2016. We find this policy to be very responsible and thoughtful. Milliman recommends reducing the amortization period from 25 to 20 years consistent with the updated guidance from Actuarial Standard of Practice (ASOP) 4 and from the Government Finance Officers Association (GFOA).

We note that using the 25-year amortization period, and current discount rate and payroll growth, the required payment is not guaranteed to cover the interest on the unfunded liability in all years. Although the component of the funding policy that prevents the contribution rate from going down essentially closes the amortization and guarantees interest will be covered at some point in the near-term, moving to a 20-year amortization would more convincingly meet the new ASOP 4 requirement of a Reasonable Actuarially Determined Contribution. **Therefore, we agree with this recommendation.**

SECTION E

ACTUARIAL VALUATION RESULTS

Actuarial Valuation Results

To verify the accuracy of the retained actuary's valuation results, GRS performed an independent valuation of TERS as of January 1, 2024. The replication valuation was based on the final valuation data provided by the retained actuary and the same methods and procedures that were used by the retained actuary. GRS was pleased to have the chance to perform an audit that included both a full replication and review of individual test cases. Most audits include only one or the other and using this approach does not guarantee that two wrongs aren't making a right in terms of the aggregate results.

Generally accepted actuarial standards and practices provide actuaries with the basic mathematics and frameworks for calculating the actuarial results. When it comes to applying those actuarial standards to complex calculations, differences may exist due to individual opinion on the best way to make those complex calculations. This may lead to differences in the calculated results, but these differences should not be material. Generally, differences in actuarial liabilities of 5% or less are considered within acceptable tolerance ranges.

As the following tables show, our replication of the Total Present Value of Benefits and the Actuarial Accrued Liability (AAL) were nearly spot on and the replication of the retained actuary's normal cost was within 1%. This can be considered a highly successful replication of the aggregate results. This replication of the actuarial accrued liabilities indicates that the liabilities presented in the retained actuary's valuation reports provided a reasonable representation of the AAL based on the assumptions, methods and procedures used by the retained actuary in the actuarial valuation. The following table summarizes our replication.

Aggregate Results

Actuarial Valuation Results as of January 1, 2024			
\$ in millions			
	<u>GRS</u>	<u>Milliman</u>	<u>% Diff</u>
Present Value of Future Benefits			
Active participants			
Service and early retirement	\$ 1,325.3	\$ 1,331.3	-0.5%
Vested termination and return of member contributions	88.0	88.3	-0.3%
Disability retirement	8.4	8.4	0.0%
Survivors' benefits	21.3	22.2	-4.1%
Total	\$ 1,443.0	\$ 1,450.2	-0.5%
Inactive and retired participants and beneficiaries			
Service retirement	\$ 1,186.8	\$ 1,180.7	0.5%
Disability retirement	6.8	6.8	0.0%
Survivors' benefits	85.8	85.5	0.4%
Terminated vested benefits	127.6	128.1	-0.4%
Total	\$ 1,407.0	\$ 1,401.1	0.4%
Grand Total	\$ 2,850.0	\$ 2,851.3	0.0%

Actuarial Valuation Results as of January 1, 2024		
\$ in millions		
	<u>GRS</u>	<u>Milliman</u>
Accrued Liability		
Active	\$ 868.5	\$ 872.3
Inactives	\$ 1,406.9	\$ 1,401.1
Total	\$ 2,275.4	\$ 2,273.4
Assets	\$ 2,209.9	\$ 2,209.9
Unfunded Actuarial Accrued Liability (UAAL)	\$ 65.5	\$ 63.5
Funded Ratio	97.1%	97.2%
Normal Cost Rate	18.93%	19.12%
25-Year Level-Percent of Pay Amortization	1.11%	1.00%
Normal Cost Rate + Amortization	20.04%	20.12%
Amount Available for Amortization	2.07%	1.88%
Funding Period	11.0 years	11.8 years
Payroll	\$ 353.7	\$ 353.7



Individual Results

GRS was able to replicate the individual test cases with relative precision, with the total present value for each of the selected active test cases being within 1.8%. The following shows the present value of benefits by decrement and in total for each of the three active test cases. GRS is not concerned about some of the larger percentage differences on the low probability, low dollar decrements. On an individual basis, this can be caused by one difference in choice on rounding of eligibility ages or service where neither party is “wrong”. These decremental differences were reasonable on an aggregate basis suggesting the differences were not biased and “came out in the wash” once things were averaged over a larger population.

Case #1

Gender	Female		
Age	45.9		
Service	12.5		
Implied Entry Age	33.4		
	<u>Milliman</u>	<u>GRS</u>	<u>% Diff</u>
Retirement	\$413,939	\$411,223	-0.7%
Termination	57,258	55,657	N/A
Death	5,253	4,894	-6.8%
Disability	4,023	3,994	-0.7%
Refund of EEC	0	0	N/A
Total	\$480,473	\$475,768	-1.0%

Case #2

Gender	Male		
Age	59.8		
Service	0.8		
Implied Entry Age	59.0		
	<u>Milliman</u>	<u>GRS</u>	<u>% Diff</u>
Retirement	\$130,401	\$127,715	-2.1%
Termination	10,337	10,694	N/A
Death	2,936	2,651	-9.7%
Disability	951	970	2.0%
Refund of EEC	3,184	3,162	N/A
Total	\$147,810	\$145,192	-1.8%

Case #3

Gender	Male		
Age	54.3		
Service	11.5		
Implied Entry Age	42.8		
	<u>Milliman</u>	<u>GRS</u>	<u>% Diff</u>
Retirement	\$510,507	\$505,517	-1.0%
Termination	40,988	40,038	-2.3%
Death	11,014	10,811	-1.8%
Disability	5,669	5,612	-1.0%
Refund of EEC	0	0	N/A
Total	\$568,178	\$561,978	-1.1%



The total present value for each of the selected inactive test cases being within 1.3%. The following shows the present value of benefits for each of the eight inactive test cases.

Test Case Detail						Present Value of Future Benefits		
Payee Type	Optional Form	Date of Payment	Age	Age Beneficiary	Annual Benefit	Milliman	GRS	Delta
Retiree	Straight Life Annuity	07/01/20	60.6		76,518.24	1,106,510	1,107,009	0.0%
Retiree	10 Year Certain and Life	01/01/22	69.2		22,209.00	290,499	289,328	-0.4%
Retiree	Joint and Survivor - 100%	07/01/13	72.0	69.9	66,492.84	958,842	952,379	-0.7%
Retiree	Joint and Survivor - 50%	07/01/13	72.3	72.5	37,294.20	450,225	447,592	-0.6%
Beneficiary	Straight Life Annuity	02/01/04	80.0		42,881.76	365,490	362,393	-0.8%
Beneficiary	Straight Life Annuity	07/01/09	63.0		35,293.56	523,733	522,377	-0.3%
Term Vested			44.0		132,927.32	686,418	677,702	-1.3%
Term Vested			52.6		28,779.47	283,569	282,973	-0.2%



Milliman recently released a new experience study dated September 9, 2024 with proposed assumptions for use in the valuation as of January 1, 2025. To increase the relevance of the GRS audit beyond the January 1, 2024 valuation, GRS replicated the results incorporating the recommended assumptions consistent with those shown on page 5 of the Milliman experience study. GRS found that the proposed assumption changes had a similar impact on our results, giving added confidence that the assumptions will be appropriately applied going forward.

January 1, 2024 Valuation Results

	Normal Cost Rate (NCR)	Actuarial Accrued Liability	Funded Ratio	NCR + Amortization
Milliman	19.12%	\$ 2,273.4	97.2%	20.12%
GRS	18.93%	\$ 2,275.4	97.1%	20.04%

January 1, 2024 Valuation Results Following Incorporation of All Experience Study Recommendations

	Normal Cost Rate (NCR)	Actuarial Accrued Liability	Funded Ratio	NCR + Amortization
Milliman	18.94%	\$ 2,269.5	97.4%	20.02%
GRS	18.71%	\$ 2,270.3	97.3%	19.90%

Impact of Recommendations

	Normal Cost Rate (NCR)	Actuarial Accrued Liability	Funded Ratio	NCR + Amortization
Milliman	-0.18%	\$ (3.9)	0.2%	-0.10%
GRS	-0.22%	\$ (5.1)	0.2%	-0.14%

Summary

We believe that the valuation results and the communicated impact of the proposed recommended assumptions from the experience study are developed in a reasonable manner.



SECTION F

CONTENT OF THE VALUATION REPORT

Content of the Valuation Report

ASOP No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions, ASOP No. 41, Actuarial Communications, and ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions provide guidance for measuring pension obligations and communicating the results. The Standards list specific elements to be included, either directly or by references to prior communication, in pension actuarial communications. The pertinent items that should be included in actuarial valuation report on a pension plan should include:

- The name of the person and/or firm retaining the actuary and the purposes that the communication is intended to serve.
- A statement as to the effective date of the calculations, the date as of which the participant and financial information were compiled, and the sources and adequacy of such information.
- An outline of the benefits being discussed or valued and of any significant benefits not included in the actuarial determinations.
- A summary of the participant information, separated into significant categories such as active, retired, and terminated with future benefits payable. Actuaries are encouraged to include a detailed display of the characteristics of each category and reconciliation with prior reported data.
- A description of the actuarial assumptions, cost method and the asset valuation method used. Changes in assumptions and methods from those used in previous communications should be stated and their effects noted. If the actuary expects that the long-term trend of costs resulting from the continued use of present assumptions and methods would result in a significantly increased or decreased cost basis, this should also be communicated.
- A summary of asset information and derivation of the actuarial value of assets. Actuaries are encouraged to include an asset summary by category of investment and reconciliation with prior reported assets showing total contributions, benefits, investment return, and any other reconciliation items.
- A statement of the findings, conclusions, or recommendations necessary to satisfy the purpose of the communication and a summary of the actuarial determinations upon which these are based. The communication should include applicable actuarial information regarding financial reporting. Actuaries are encouraged to include derivation of the items underlying these actuarial determinations.
- A disclosure of any facts which, if not disclosed, might reasonably be expected to lead to an incomplete understanding of the communication.
- Identify risks that may reasonably be anticipated to significantly affect the pension plan's future financial condition such as investment risk, asset/liability mismatch risk, interest rate risk, longevity and other demographic risks, and contribution risk.

In general, the January 1, 2024 actuarial valuation report complied with the applicable ASOPs and communicated the assumptions, methods and benefit provisions in a reasonable manner. Since the prior audit, Actuarial Standard of Practice 4 was revised to incorporate the concepts of the Reasonable Actuarially Determined Contribution and the Low Default-Risk Obligation Measure (LDROM). The current report reflects both these changes to the Standard.

All of our recommendations regarding report content from the prior audit were incorporated into the current actuarial valuation report.

We have no additional suggestions based on the current audit.

Summary

The actuarial valuation report complied with the applicable Actuarial Standards of Practice, and effectively communicates key ideas.

SECTION G

FINAL REMARKS

Final Remarks

The auditing actuarial firm, Gabriel, Roeder, Smith & Company (GRS), is independent of TERS, the City of Tacoma and retained actuarial firm. The auditing actuaries are not aware of any conflict of interest that would impair the objectivity of this work.

We again thank the TERS Staff and the retained actuary, Milliman, LLC, for their cooperation in this audit process. We received prompt and thorough responses to all questions asked.

In our professional opinion, the January 1, 2024 Actuarial Valuation prepared by the retained actuary provides a fair and reasonable assessment of the financial position of TERS.