ACTUARIAL REVIEW OF THE 2020 ACTUARIAL VALUATION OF THE LOUISIANA TEACHERS' RETIREMENT SYSTEM

ACTUARIAL SERVICES

PRESENTED TO THE
PUBLIC RETIREMENT SYSTEMS' ACTUARIAL COMMITTEE
ON DECEMBER 14, 2020

LOUISIANA LEGISLATIVE AUDITOR
DARYL G. PURPERA, CPA, CFE

November 30, 2020

Ms. Katherine Whitney, Director
Teachers' Retirement System of Louisiana
P.O. Box 94123
Baton Rouge, LA 70804-9123

Re: Actuarial Review of the 2020 Actuarial Valuation

Dear Ms. Whitney:

To fulfill the requirements of R.S. 11:127(C) to the Public Retirement Systems' Actuarial Committee (PRSAC) for 2020, the Louisiana Legislative Auditor (LLA) has conducted an Actuarial Review for the Teachers' Retirement System of Louisiana (TRSL or System).

The remainder of this letter contains the results of our Actuarial Review of your June 30, 2020 Actuarial Valuation (prepared by Foster & Foster and dated October 1, 2020). More specifically, we have evaluated for appropriateness certain actuarial assumptions and methods employed by the System and its actuary.

I would like to thank you, your staff, and the board's actuary for the cooperation and assistance provided for this review.

Sincerely,

Daryl G. Purpera, CPA, CFE
Legislative Auditor

DGP:LPG:JJR:ch

cc: Foster & Foster

2020 ACTUARIAL REVIEW FOR TRSL

Scope of Review

The 2020 actuarial valuation report for the Teachers' Retirement System of Louisiana (TRSL) for funding purposes was prepared by Foster & Foster, and dated October 1, 2020.

This Actuarial Review of that report was prepared by James J. Rizzo, Senior Consultant and Actuary, and Piotr Krekora, Consultant and Actuary, both employed by Gabriel, Roeder, Smith and Company (GRS). This Actuarial Review includes evaluations of the appropriateness of key actuarial assumptions and methods. However, a full actuarial valuation replicating the System actuary's results was not performed; nor was a full actuarial valuation performed using recommended assumptions and methods. Finally, we did not perform a full and detailed research analysis to determine our preferred or most appropriate net return assumption, but we applied reasonable estimating techniques to develop our recommendations.

This Actuarial Review is limited to (1) recommendations for a more appropriate treatment of TRSL's gain-sharing COLA benefits, (2) recommendations for a more appropriate investment return assumption, (3) the actuary's use of acceptable mortality tables, and (4) sensitivity estimates on the funded ratio and the employer contribution rate.

Our Findings

1. Gain-sharing Cost-of-Living Adjustments (COLAs).

The System and its actuary assume that future gain-sharing COLAs are reasonably likely to occur and, therefore, recognize its cost in advance for funding purposes. In other words, the incidence of a gain-sharing COLA being granted has actuarially measurable probabilities. As a result, taxpayers will be required to contribute in advance for COLA benefits that are actuarially likely to occur in the future, as they do all other plan benefits.

We agree with the decision of TRSL's board and actuary to advance-recognize the likelihood of future gain-sharing COLAs in their funding valuations. There is an expectation that gain-sharing COLAs will be paid in the future, and that expectation is both reasonable and measurable. Not to do so would be to (a) deny the reasonable expectation that COLAs will be granted in the future with some frequency and (b) imprudently push the cost of providing COLAs out to future generations of taxpayers.

The *actuarial method* currently used to recognize the cost of future COLAs is to reduce the investment return assumption by 35 basis points to obtain a discount rate (revised from the 40-basis points reduction used in the prior year). The System's actuary estimates that 35 basis points represents the average investment gains expected to be transferred to the Experience Account each year. This actuarial method implicitly recognizes the costs of TRSL's COLA program.

Of course, such a transfer is not expected to occur every year. Some years will have none; some years will have a smaller amount; and some years will have a larger amount transferred. Regular and consistent granting of COLAs by the Legislature (whenever permitted by the template) causes the Experience Account to be emptied, leaving room for more transfers in future years. That is a reasonable and measurable expectation. TRSL's actuary has measured that expectation at approximately 35 basis points of plan assets each year.

For this reason, TRSL's board has adopted an *assumed rate of return on assets* that differs from the *discount rate* for the last several years. Following are the most recent three years.

Actuarial Valuation Date	Return Assumption	Reduction to Recognize Future COLAs	Discount Rate*
June 30, 2020	7.80%	0.35%	7.45%
June 30, 2019	7.95%	0.40%	7.55%
June 30, 2018	8.05%	0.40%	7.65%

** Used in the actuarial valuation to measure costs and liabilities of all other non-COLA benefits; this is treated as the return assumption applicable to all such other benefits.*

While we agree with TRSL's practice of recognizing the cost of future COLAs in advance, this implicit *actuarial method* of reducing the return assumption by 0.35% rather than a more explicit method has contributed to the public's conflation of the two types of rates in our opinion. We recognize that Actuarial Standards of Practice (ASOPs) No. 27 section 3.5.1 allows for the use of a reduction in the return assumption to accomplish the advance-funding of COLAs. However, we believe there are reasons outside of purely actuarial reasons that compel us to recommend alternative methods.

The most serious confusion that has occurred in the last few years is that many in the public have concluded erroneously that the Return Assumption has been 7.55% and 7.65%, rather than 7.95% and 8.05%, respectively, making the System's assumption *appear* more in line with other systems around the country. In fact, for a number of years, TRSL's Return Assumption has been at or near the highest of any retirement system. Refer to Section 1 and Section 2 of the LLA's Comprehensive Actuarial Review of the System's 2019 Actuarial Valuation of the Teachers' Retirement System of Louisiana for specific examples of such confusion and for reasons why the Actuary for the LLA recommends a more explicit approach.

In our experience, use of a separate discount rate from the return assumption is unusual for funding public retirement systems. With few exceptions, public retirement systems' return assumptions are identical to their discount rate for funding, and no confusion or misunderstanding arises about that. In the vast majority of public retirement systems, the assumed rate of return is used to discount all of a plan's projected future benefits to present values to determine the contribution rates and the unfunded actuarial accrued liabilities.

Conclusion – The following summarizes two alternative approaches that are more acceptable and preferable, in our opinion, to TRSL's current method.

Either of these two approaches would:

- Be less confusing to the public;
- Be more transparent and promote accountability;
- Bring TRSL's methods in line with more common actuarial practice, in Louisiana and nationally; and
- Not change the contribution rates or unfunded actuarial accrued liabilities materially, according to our 2018 actuarial valuation calculations.

Each of these two explicit methods use the same type of Monte Carlo stochastic simulation as needed to measure the cost of COLAs (which the System estimated by adjusting the return assumption by 35 basis points):

1. *Single equivalent annual COLA assumption (preferred).* The simulation spins off information about the frequency and magnitude of each year's potential transfer to the Experience Account. The mean (average) transfer amount can be considered a benefit stream. Solving for x, an annual equivalent COLA having the same actuarial present value over the next 30 years as the average simulated transfer amount can be determined.

2. *Single equivalent benefit load assumption.* Dividing that same mean (average) transfer stream for each year by its regular benefits payable for that year, as spun off from the open group forecast valuation, provides an estimate of the load on benefits that approximates the average transfer amount.

Either of these two alternative *actuarial methods* is acceptable and preferable, in our opinion, to TRSL's current method. The primary benefit of adopting either of them is that they eliminate the confusion and the inconsistencies inherent in the current implicit *actuarial method* of having a separate return assumption and discount rate. Both of these two alternatives are transparent and explicit *actuarial methods* for recognizing the actuarially measurable likelihood of future gain-sharing COLAs for funding purposes.

2. Investment Return Assumption

For this Actuarial Review, a detailed analysis of independent experts' 2020 forecasts for TRSL's portfolio was not undertaken.

The last detailed analysis was prepared by the Actuary for the LLA for the 2018 valuation report (presented in an Actuarial Valuation Report dated December 14, 2018) using forecasts published in 2018. For this 2020 Actuarial Review, we present only observational commentary and estimates on the recommended return assumption.

TRSL's 2018 valuation report used an annual return assumption of 8.05%. The 2018 Actuarial Valuation prepared by the LLA suggested a "most appropriate" return assumption of 7.00%, based on a consensus average among several independent national investment forecasters. These forecasters' expectations were applied to TRSL's own asset allocation, investment expenses and expected cash flow.

TRSL's asset allocation is somewhat riskier than many other pension funds, and, therefore, the fund is expected to earn somewhat more than others with more conservative portfolios. The asset allocation targets embodied in the 2020 investment policy statement remain unchanged from 2019 and 2018.

In our opinion, the appropriate benchmark for whether the System's 2020 assumption of 7.80% is conservative or optimistic would be to compare it to a consensus average of several expert investment forecasters and, applying the fund's asset allocation, with adjustments for investment expenses and cash flow expectations.

Based on our 2018 analysis, the most appropriate investment return assumption was estimated to be 7.0% at the time.

TRSL's board and actuary lowered the investment return assumption from 8.05% for the 2018 valuation to 7.95% for the 2019 valuation, and lowered it again to 7.80% for this 2020 valuation. Also, TRSL resolved in a recent board meeting that for the 2021 valuation the investment return assumption will be reduced further to 7.75%.

Nevertheless, the downward movement in return expectations among professional investment forecasters over the last several years has generally been at a more rapid and significant pace. What we have seen in the mainstream of professional forecasters since 2018 has been an increase in 2019's forecasts, then a decrease for 2020's mid-term and longer-term forecasts.

If we were to undertake a full analysis, we estimate the most appropriate return assumption for TRSL's 2020 actuarial valuation would remain at approximately the same 7.00% (compared to the System's 7.80% and 7.75% assumptions for 2020 and 2021, respectively).

Over the last four years, the System's return assumptions have been approximately one percentage point higher than the LLA's most appropriate rate.

An overly optimistic return assumption in a retirement system, applied repeatedly, can (a) create repeated actuarial losses, (b) cause underfunding, and (c) undermine the actuarial integrity of the pension-promise made to career public servants.

Furthermore, a return assumption that is an outlier compared to the mainstream of professional forecasters is not a "best estimate" and obscures the fair representation of future costs and liabilities in public financial disclosures.

Assessing the Reasonableness of a Return Assumption

The appropriateness of a retirement system's return assumption for any given year's pension valuation is assessed with the same robust and disciplined process as we would employ for recommending and setting the return assumption. Such process would incorporate the following steps:

1. Obtain the future inflation rates (mid-term and long-term) expected by several reputable and independent professional inflation forecasters (mostly economists and investors); if only one inflation forecaster is considered, we would never know that there are many other differing expectations among professional and reputable forecasters;

2. Obtain future capital market assumptions (mid-term and long-term) expected by several reputable and independent professional investment forecasters for relevant asset classes; again, if only one investment forecaster is considered, we would never know that there are many other differing expert opinions; while experts' forecasts are not certain or guaranteed, in our opinion, they are the best sources for actuaries and decision-makers to turn for guidance – a consensus average of the collective expectations of independent subject matter experts applied to the System's own characteristics;

3. Apply these forecasts to the pension fund's own asset allocation targets;

4. Reduce the portfolio's return expectations by its own expected investment-related expenses (both in-house and external) - for passive management fees, for custodial and trade-execution fees, and for external investment consulting; and

5. Solve for a single equivalent return, lying between mid-term and long-term forecasts due to the pension plan's expected benefit cash flow timing over the mid-term and long-term, or the duration calculation (a proxy for adjustments due to expected benefit cash flows); whenever there is a different expectation for returns over the next 10 years as compared to years 11 through 30, Actuarial Standards of Practice (ASOP) No. 27 section 3.8.3(f) requires that actuaries address plan-specific factors like the expected benefits cash flow timing to recognize a time horizon somewhere between the mid-term and longer-term time horizons.

Time Horizon of Future Expectations

In the supporting documentation for their discount rate and investment return assumption, TRSL's actuary used the long-term set of assumptions (30 years) of the capital market assumptions from its investment consulting firm. However, we believe an assumed rate of return selected from a range between mid-term and long-term is more appropriate for TRSL and for most other retirement systems. Long-term horizon forecasts (e.g., 20-30 years) are useful for one component of the process, but not to the exclusion of mid-term horizons. Pension funds are, indeed, usually long-term arrangements. However, in our opinion 30 years is too long for the selection of most pension funds' assumed rate of return.

In most years, long-term expectations from reputable forecasting experts have been generally higher than mid-term expectations, creating a pattern that actuaries sometimes call a select-and-ultimate expectation. This resembles a yield curve in the fixed income field. A lower rate expected during the select period (e.g., next 10 years) followed by a higher rate for the ultimate period (e.g., years 11 through 30).

Based on the 2018 valuation by the Actuary for the LLA, the majority of TRSL's current assets will be paid out during the next 10 years – and will not be there to experience a higher return expected in the later years.

Gravitating toward a long-term time horizon may *appear* to justify a higher return assumption, but TRSL has substantial negative cash flow (more benefits and expenses are leaving the fund than contributions coming in). This negative cash flow (a) raises concern over the fund's ability to generate sufficient earnings to replace depleted assets and (b) is a sound actuarial reason not to employ a 30-year time horizon to develop the return assumption.

Conclusion -- In the absence of conducting a detailed analysis using updated 2020 expert forecasts and in the absence of applying them to TRSL's own asset allocation, investment expenses and expected cash flow, the Actuary for the LLA estimates and recommends that the TRSL retirement board and actuary consider lowering the return assumption for the 2020 actuarial valuation to 7.00%. Refer to Section 4 below for further discussion and sensitivity analysis associated with revised return assumptions.

Multiple large and reputable independent investment forecasters' current and recent expectations for the next 10 years' investment returns are mostly driven by high stock price valuations, compared to earnings, and currently low yields and interest rates. They are not expecting the next 10 years' investment returns to be anywhere near the high levels we have seen in many prior periods.

Improvements in the stock market since the dramatic lows in March have moved current forecasts back closer to previous expectations published prior to those lows; but we have seen substantial volatility in the stock markets in the last several months and cannot predict where the economy and the markets will be in the coming fiscal year.

3. Mortality Assumption

The 2020 Actuarial Valuation (page 55) states that the base mortality assumptions are:

Active Members Mortality Tables: RP-2014 White Collar Employee tables for males and females, adjusted by 1.010 for males and by 0.997 for females.

Non-Disabled Retiree/Inactive Members: RP-2014 White Collar Healthy Annuitant tables for males and females, adjusted by 1.366 for males and by 1.189 for females.

Disability Retiree Mortality: RP-2014 Disability tables for males and females, adjusted by factors of 1.111 for males and by 1.134 for females.

These 2020 mortality rates are the same as used in the 2019 valuation.

Base Mortality Table

A detailed analysis of the TRSL base mortality tables was undertaken by the Actuary for the LLA for the 2018 valuation report (presented in an Actuarial Valuation Report dated December 14, 2018).

To evaluate the reasonableness of the mortality assumption, we reviewed the base mortality tables (RP-2014 with White Collar Adjustment) and the plan-specific adjustment factors (for males and for females) separately from the projection scale (MP-2017).

We note that the Pub-2010 Mortality Tables are more recently published mortality tables compared to RP-2014 (despite the earlier year in its title). The Pub-2010 Mortality Tables were derived from mortality experience of large public sector retirement systems and were published by the Retirement Plans Experience Committee (RPEC) of the Society of Actuaries (SOA) in January 2019. These tables constitute the most recent and reliable standard reference tables available for purposes of national estimates of mortality for public pension plans.

However, we find TRSL's base tables (RP-2014 with collar-adjustments and experience factors) used in its 2020 Actuarial Valuation to be fully appropriate.

Conclusion – The Actuary for the LLA considers the TRSL's base tables for mortality rates for non-disabled and disabled lives to be reasonable.

Mortality Improvement Scale

Mortality assumptions are usually separated into base tables (discussed above) and mortality improvement tables to recognize future improvements in mortality rates expected following the central date of the base table.

The 2020 Actuarial Valuation (page 55) states that the mortality improvement table was the MP-2017 published by the Society of Actuaries' Retirement Plan Experience Committee.

A detailed analysis of the mortality improvement scale was also undertaken by the Actuary for the LLA for the 2018 valuation report (presented in an Actuarial Valuation Report dated December 14, 2018. We concluded that MP-2017 was reasonable for the 2018 actuarial valuation.

While we note that projection scale MP-2019 was a more recent projection scale available as of the 2020 valuation date, we find the projection scale MP-2017 used in the TRSL's 2020 actuarial valuation to be fully appropriate.

Conclusion -- The Actuary for the LLA considers the mortality improvement scale as applied to both non-disabled and disabled lives to be reasonable.

4. Sensitivity Estimates on Funded Ratio and Employer Contribution Rate

TRSL's 2020 actuarial valuation develops an unfunded actuarial accrued liability and funded ratio as of June 30, 2020, and an employer contribution rate for the year ending June 30, 2022.

The following tables prepared by the Actuary for the LLA provide the estimated 2020 funded ratio and the estimated 2022 employer contribution rate for TRSL under:

- The Actuary for the LLA's preferred explicit *actuarial method* to recognize gain-sharing COLAs and

- Three different investment return assumptions selected by the Actuary for the LLA:
  1. An optimistic investment return assumption (7.50%),
  2. Our estimated most appropriate investment return assumption (7.00%), and
  3. A pessimistic investment return assumption (6.50%).

These investment return assumptions are consistent with the reasonable range around the most appropriate investment return assumption developed in the 2018 actuarial valuation prepared by the LLA (50 basis points above and 50 basis points below the 7.00% most appropriate investment return assumption). All other actuarial assumptions and methods remained unchanged.

Estimated Sensitivity of Changes in Key Assumptions and Methods on June 30, 2020 Funded Ratio	
TRSL	**Funded Ratio**
Per TRSL's June 30, 2020 Valuation	67.9%
After adjusting for LLA-recommended COLA Treatment[1]	68%
After adjustment for LLA-recommended COLA Treatment and LLA-derived Reasonable Range of Investment Return Assumption[2]:	
- Optimistic Investment Return Assumption (7.50%)	64%
- Most Appropriate Investment Return Assumption (7.00%)	61%
- Pessimistic Investment Return Assumption (6.50%)	58%

Estimated Sensitivity of Changes in Key Assumptions and Methods on FYE 2022 Employer Contribution Rate	
TRSL	**Employer Contribution Rate**
Per TRSL's June 30, 2020 Valuation	25.1%
After adjusting for LLA-recommended COLA Treatment[1]	25%
After adjustment for LLA-recommended COLA Treatment and LLA-derived Reasonable Range of Investment Return assumption[2]:	
- Optimistic Investment Return Assumption (7.50%)	27%
- Most Appropriate Investment Return Assumption (7.00%)	29%
- Pessimistic Investment Return Assumption (6.50%)	32%

[1]*It is estimated that there is no material difference in the funded ratio or contribution rates for changing to an explicit actuarial method for pre-funding future COLA benefits. For details of the LLA-recommended COLA treatment, please refer to Section 1 of this 2020 Actuarial Review and to the 2019 Comprehensive Actuarial Review dated November 30, 2019.*

[2]*Please refer to the Appendices in the 2018 Actuarial Valuation prepared by the Actuary for the LLA dated December 14, 2018 for details of the LLA-derived Reasonable Range of Investment Return Assumptions, and to the commentary in Section 2 above concerning our estimate for the 2020 most appropriate return assumption.*

We developed the estimates above by relying on:

- The LLA's 2018 Actuarial Valuation for the change to an explicit *actuarial method* for recognizing future gain-sharing COLA benefits and

- The sensitivity exhibits presented in the System's 2020 Comprehensive Annual Financial Statement for the impact of changing the return assumption to different values.

These estimates are intended as illustration of the magnitude of changes in the valuation results developed under alternative methods and assumptions. They are not intended to replace results developed by the System's actuary. A full actuarial valuation (rather than an estimate) would be needed should a new set of results be desired.

Actuarial Certification

This Actuarial Review report constitutes a Statement of Actuarial Opinion. It has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents information it is purported to present. This review was performed in conformity with generally accepted actuarial principles and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

James J. Rizzo and Piotr Krekora are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the Teachers' Retirement System of Louisiana.

November 30, 2020

James J. Rizzo, ASA, EA, MAAA
Senior Consultant and Actuary
Gabriel, Roeder, Smith & Company

Date

November 30, 2020

Piotr Krekora, ASA, EA, MAAA, PhD
Consultant and Actuary
Gabriel, Roeder, Smith & Company

Date