

ACTUARIAL REVIEW OF THE
2021 ACTUARIAL VALUATION OF THE
PAROCHIAL EMPLOYEES' RETIREMENT SYSTEM



ACTUARIAL SERVICES
PRESENTED TO THE PUBLIC RETIREMENT SYSTEMS' ACTUARIAL COMMITTEE
ON AUGUST 17, 2022



LOUISIANA LEGISLATIVE AUDITOR
MICHAEL J. "MIKE" WAGUESPACK, CPA

August 4, 2022

The Honorable Edward J. Price
Chairman, Public Retirement Systems' Actuarial Committee
Louisiana State Senate
Post Office Box 94183
Baton Rouge, Louisiana 70804

Re: Actuarial Review of PERS' 2021 Actuarial Valuation

Dear Chairman Price and PRSAC Members:

In accordance with La. R.S. 11:127(C) and 24:513(C)(1), the Louisiana Legislative Auditor has conducted an Actuarial Review for the Parochial Employees' Retirement System (PERS).

The following presents the results of our Actuarial Review of PERS' December 31, 2021 Actuarial Valuation (prepared by G.S. Curran & Company and dated June 9, 2022). In doing so, we have reviewed certain actuarial assumptions and methods employed by PERS and its actuary for appropriateness.

I would like to thank PERS' director, staff, and actuary for the cooperation and assistance provided for this review.

Sincerely,

Michael J. Waguespack, CPA
Legislative Auditor

MJW:KJH:ch

cc: Dainna S. Tully, Administrative Director
Parochial Employees' Retirement System

Gregory M. Curran, FCA, MAAA, ASA, EA
Curran Actuarial Consulting, Ltd.

LLA'S ACTUARIAL REVIEW OF PERS' 2021 ACTUARIAL VALUATION

Executive Summary

The Louisiana Legislative Auditor (LLA) performed an Actuarial Review (AR or Review) of the Parochial Employees' Retirement System (PERS) December 31, 2021 Actuarial Valuation dated June 9, 2022.

This Review is a limited scope review intended to:

1. Evaluate the appropriateness of certain actuarial assumptions and methods adopted by PERS' board.
2. Identify potential improvements to these actuarial assumptions and methods.
3. Identify any actuarial assumption or method that clearly violates any relevant Actuarial Standard of Practice (ASOPs).

Summary of Conclusions

We did not identify any actuarial assumption or method that violates any ASOPs. Nevertheless, we offer the following recommendations for consideration by the PERS' board and by the Public Retirement Systems' Actuarial Committee:

1. *Cost-of-Living Adjustments (COLAs)*. Currently, PERS' board and its actuary do not anticipate future COLAs in the actuarial valuations. For PERS' 2021 Actuarial Valuation for funding purposes, we accept the 2021 treatment of not recognizing future COLAs in the *funding* calculations of costs and liabilities as appropriate treatment in this situation.

However, it is our opinion that the recent pattern of COLA-granting may require advance-recognition of future COLAs in the *accounting* calculations under the GASB standards, affecting the balance sheets and note disclosures of the local participating entities.

2. *Investment Return Assumption*. The System's assumption is 90 basis points higher than the approximate investment return benchmark calculated by the LLA. We recommend the System continue to lower its investment return assumption and consider:
 - Incorporating conservatism in the assumption by consistently targeting a rate that is closer to a 60% probability of achieving the assumption over time; and
 - Reflecting the impact of cash flow timing on total expected returns.

Introduction

The Louisiana Legislative Auditor (LLA) performed an Actuarial Review (Review) of the Parochial Employees' Retirement System (PERS) December 31, 2021 Actuarial Valuation dated June 9, 2022, as prepared by G.S. Curran & Company. This Review is being performed in accordance with La. R.S. 11:127(C) and 24:513(C)(1). This Review, in conjunction with the System's full actuarial valuation, is intended to fulfill the requirements of La. R.S. 11:127(C) to the Public Retirement Systems' Actuarial Committee (PRSAC).

Actuarial Standards of Practice (ASOPs) are principles-based, rather than prescriptive, in nature, and therefore actuarial valuations involve significant use of an actuary's professional judgement when developing actuarial assumptions and methods. This can result in different actuaries utilizing different assumptions and methodologies when approaching similar, or even the same, benefit structures and legislative constraints.

This Review is a limited scope review intended to:

1. Evaluate the appropriateness of certain actuarial assumptions and methods adopted by PERS' board.
2. Identify potential improvements to these actuarial assumptions and methods.
3. Identify any actuarial assumption or method that clearly violates any relevant ASOPs.

We hope the recommendations help the PERS board in its decision-making process, as well as PRSAC in its "review and study" of the retirement systems.

As a limited scope review, we relied on previously-published LLA analyses and, where necessary, reasonable estimating techniques to advance the analysis to the current valuation date. We did not attempt to replicate the System actuary's results; perform a full actuarial valuation using alternative assumptions and methods developed by the LLA; nor did we perform a full and detailed analysis of any assumptions or methods.

Further, the discussion included in this Review is limited to (1) the treatment of future COLA benefits and (2) the investment return assumption. The limited discussion does not indicate that other assumptions and methods were not considered, nor that recommendations for improvement in other assumptions and methods will not be included in future reviews.

This Review was prepared by Kenneth J. Herbold, Director of Actuarial Services for the LLA; and by James J. Rizzo, Senior Consultant and Actuary, and Piotr Krekora, Senior Consultant and Actuary, both employed by Gabriel, Roeder, Smith & Company (GRS). GRS is under contract with the LLA to provide backup, research, calculations, actuarial services, and advice.

Our Recommendations

We did not identify any actuarial assumption or method that violates any ASOPs. Nevertheless, we offer the following recommendations for consideration by the PERS' board and by PRSAC:

1. Cost-of-Living Adjustments (COLAs)

La. R.S. 11:241, 11:243, 11:246, and 11:1937, outline the provisions for the funding and granting of COLAs. The board may grant ad-hoc COLAs subject to certain limitations. We are calling the ad-hoc COLA methodology outlined in the statutes a statutory "template" for granting COLAs.

Currently, PERS' board and its actuary do not anticipate future COLAs in the actuarial valuations. Future COLAs are recognized only after they are granted.

There are many rules for COLAs relating to how often and when they may be granted, minimum and maximum percentage and dollar increases granted, and who is eligible to receive the increases. However, there are basically two broad categories of COLAs available to PERS, defined by how the COLA is funded:

1. "Gain-sharing COLA." This is a COLA granted when the actuarial earnings exceed the actuarial assumption by a sufficient margin, and
2. "FDA COLA." This is a COLA granted and paid out of the balance accumulated in PERS' Funding Deposit Account (FDA).

Whether and how *future* COLAs should be recognized in annual actuarial valuations depends on whether the future COLAs expected are of the "Gain-sharing COLA" variety or the "FDA COLA" variety.

Actuarial Treatment of "Gain-sharing COLAs"

Currently, Gain-sharing COLAs are funded by an increase in the contribution rate after the COLA is granted. Therefore, the use of the phrase "gain-sharing" is primarily to distinguish this type of COLA from the "FDA COLAs" discussed below and is not an indication of how the COLA is funded.

While the granting of this type of COLA is limited to "good" years (i.e. when actuarial earnings exceed the actuarial assumption), actuarial assumptions are generally developed such that these "excess investment earnings" are expected to finance current plan benefits. Therefore, when there is a reasonable expectation (not a guaranteed expectation) of Gain-sharing COLAs being granted in the future, an actuary should consider recognizing the likelihood and magnitude in the measurement of system costs and liabilities. This helps avoid pushing the cost of benefits out to future generations of taxpayers.

Actuarial Treatment of "FDA COLAs"

FDA COLAs for PERS are being pre-funded in the form of additional contributions made prior to granting the COLA.

FDA COLAs may only be granted when there are sufficient assets available in the FDA to cover the full estimated cost of the increased benefits. The FDA can only be funded when the PERS' board elects to set the employer contribution rate higher than the actuarially required employer contribution rate. These excess contributions are set aside and not counted as plan assets in the actuarial valuation until used to fund an FDA COLA. Therefore, the current practice by PERS of not recognizing future FDA COLAs when developing the actuarially required contribution rate is reasonable.

However, for *accounting* purposes, the manner in which the COLA benefits are funded is not part of the consideration. The Governmental Accounting Standards Board (GASB) requires advance recognition of future COLAs when there is a reasonable pattern expected for granting future COLAs (whether they are FDA COLAs or otherwise), called "substantively automatic". GASB standards indicate factors such as the historical pattern, consistency in amounts or changes in the ability to continue to grant COLAs should be considered when making this determination.¹ Further, GASB guidance indicates an "ad hoc" COLA, i.e., not fully automatic but requires board action for approval, can be deemed substantively automatic.

We note there has been a historical pattern of PERS granting benefit increases once every 3 years beginning January 1, 2015; the amount granted has been consistent; and the current FDA balance is sufficient to fund multiple COLAs in the future. Therefore, in our opinion, GASB standards may require advance-recognition in the actuarial calculations of *accounting* costs and liabilities.

PERS' Statutory Template

The following exhibit illustrates the recent history of tests and rules relating to PERS' COLAs. While there are numerous trigger-points and moving parts in the statutory template mechanism, this exhibit illustrates the two primary statutory rules that govern how the statutes have *permitted* the board of trustees in recent years to grant a gain-sharing COLA:

1. *The Window Rule.* This rule prevents a COLA from being permitted every year based on the funded ratio of the plan. Based on the current funded ratios of 105.88% for Plan A and 112.88% for Plan B, a COLA may be granted (provided other conditions are satisfied) as long as a COLA has not been granted in the most recent fiscal year. The window is now "closed" and is "closed" until January 1, 2023 since the last COLA was granted as of January 1, 2021.
2. *The Sufficient Actuarial Return Rule.* A pension investment return assumption is a type of average return expected over the future, sometimes higher than the average and sometimes lower. After actuarially smoothing out the actual returns, an actual actuarial return is calculated for a given year. If the actuarially smoothed investment earnings for the year exceeds the assumed earnings, the Sufficient Actuarial Return Rule is satisfied.

¹ GASB Statement No. 68, footnote 9: Considerations that might be relevant to determining whether such changes are substantively automatic include the historical pattern of granting the changes, the consistency in the amounts of the changes or in the amounts of the changes relative to a defined cost-of-living or inflation index, and whether there is evidence to conclude that changes might not continue to be granted in the future despite what might otherwise be a pattern that would indicate such changes are substantively automatic.

For example, the 2020 actuarial valuation assumed a 6.40% return. For the year ending December 31, 2021, the actuarially smoothed rate of return was 10.6% for Plan A and 10.5% for Plan B. This Rule was satisfied for the 2021 valuation.

In the future, the fund's investment performance is fully expected to exceed the current 6.40% rate in some years, and fall short in other years. In years when the actual actuarial rate exceeds assumed actuarial rate, the Sufficient Actuarial Return Rule will be satisfied.

Notice in the following exhibit: (a) for a Gain-sharing COLA to be granted, the Window Rule and the Sufficient Actuarial Return Rule must both be satisfied in a given year but (b) for an FDA COLA to be granted, the statutory template only requires the Window Rule to be satisfied coupled with sufficient balance in the FDA Account to cover the cost of the COLA.

COLA History for the Parochial Employees' Retirement System										
Actuarial Measurement Date	Statutory Conditions for Granting a COLA Under:		Authorizing Gain-sharing (G-s) COLAs Pct and Recipients ²		Authorizing Funding Deposit Account COLAs		Amount Granted by Board	Date Approved by Board	Effective Date of COLA	Comments
	The Window Rule ³ for any COLA	The Sufficient Actuarial Return Rule ⁴ for G-s COLAs	R.S. 11:1937 G-s COLA [Up to 2.5%, to Elg Over 62]	R.S. 11:246 G-s COLA [2% or Nothing, to Elg Over 65]	Balance in the FDA	FDA Balance Used?				
12/31/2021	Not Satisfied (For YE 2022)	<u>Satisfied</u> (10.6% and 10.5% vs. 6.40%)	<u>2.5% Permitted</u> [To Elg Over 62]	<u>2% Permitted</u> [To Elg Over 65]	\$69,983,070 (Plan A) and \$5,194,363 (Plan B)	TBD	TBD	TBD	TBD	Permitted if effective 1/1/2023
12/31/2020	Not Satisfied (For YE 2021)	<u>Satisfied</u> (9.7% and 9.7% vs. 6.50%)	None Permitted [To Elg Over 62]	None Permitted [To Elg Over 65]	\$55,177,473 (Plan A) and \$4,881,920 (Plan B)	No	NA	NA	NA	None permitted for failure of the Window Rule
12/31/2019	<u>Satisfied</u> (For YE 2020)	Not Satisfied (6.4% and 6.4% vs. 6.50%)	None Permitted [To Elg Over 62]	None Permitted [To Elg Over 65]	\$83,972,205 (Plan A) and \$6,928,047 (Plan B)	Yes, to grant a COLA	<u>2.5% Granted</u> [To Elg Over 62]	9/21/2020	1/1/2021	COLA granted from Funding Deposit Account
12/31/2018	<u>Satisfied</u> (For YE 2019)	Not Satisfied (4.7% and 4.8% vs. 6.75%)	None Permitted [To Elg Over 62]	None Permitted [To Elg Over 65]	\$78,847,141 (Plan A) and \$6,220,583 (Plan B)	No	NA	NA	NA	G-s COLA not permitted for failure to satisfy the Inv Return Rule; FDA COLA permitted but not granted
12/31/2017	Not Satisfied (For YE 2018)	<u>Satisfied</u> (8.6% and 8.5% vs. 7.00%)	None Permitted [To Elg Over 62]	None Permitted [To Elg Over 65]	\$66,910,393 (Plan A) and \$5,361,971 (Plan B)	No	NA	NA	NA	None permitted for failure of the Window Rule
12/31/2016	<u>Satisfied</u> (For YE 2017)	<u>Satisfied</u> (7.8% and 7.5% vs. 7.00%)	<u><2.5% Permitted</u> [To Elg Over 62]	None Permitted [To Elg Over 65]	\$68,896,088 (Plan A) and \$5,602,259 (Plan B)	Yes, to grant a COLA	<u>2.5% Granted</u> [To Elg Over 62]	Not Available	1/1/2018	COLA granted from Funding Deposit Account
12/31/2015	Not Satisfied (For YE 2016)	<u>Satisfied</u> (7.3% and 7.1% vs. 7.25%)	None Permitted [To Elg Over 62]	None Permitted [To Elg Over 65]	\$49,644,401 (Plan A) and \$4,622,489 (Plan B)	No	NA	NA	NA	None permitted for failure of the Window Rule
12/31/2014	Not Satisfied (For YE 2015)	<u>Satisfied</u> (10.5% and 10.3% vs. 7.25%)	None Permitted [To Elg Over 62]	None Permitted [To Elg Over 65]	\$23,781,823 (Plan A) and \$2,281,164 (Plan B)	No	NA	NA	NA	None permitted for failure of the Window Rule

² Per R.S. 11:1937, the Board is authorized to provide a COLA of up to 2.5% of the current benefit to eligible pensioners over age 62. Additionally, per R.S. 11:246, the Board is authorized to provide an additional or supplemental COLA of 2% to eligible pensioners over age 65. No COLA may be provided during any fiscal year until the lapse of at least one-half of the fiscal year.

³ Per R.S. 107.1(D)(4)(b) and R.S. 11:243(G)(1) and (3), the Board may grant a benefit increase only if any of the following apply: (a) the system has a funded ratio of at least 90% and has not granted a benefit increase to retirees, survivors, or beneficiaries in the most recent fiscal year, (b) the system has a funded ratio of at least 80% and has not granted such an increase in any of the two most recent fiscal years, or (c) the system has a funded ratio of at least 70% and has not granted a benefit increase to retirees, survivors, or beneficiaries in any of the three most recent fiscal years. The funded ratio as of any fiscal year is the ratio of the actuarial value of assets to the actuarial accrued liability under the funding method prescribed by the office of the legislative auditor.

⁴ Per R.S. 11:1937, the Board is authorized to use interest earnings on investments of the system in excess of normal requirements to provide a supplemental COLA of up to 2.5% of the current benefit to eligible pensioners over age 62. Additionally, per R.S. 11:246, the Board has the authority to provide a supplemental COLA of 2% to eligible pensioners over age 65 if there is sufficient excess interest earnings to fund the entire 2% additional COLA.

PERS differs from some other Louisiana statewide retirement systems in that it has accumulated a substantial balance in its FDA in recent years by way of actual contributions that have exceeded the minimum recommended net direct employer contribution. The FDA balance in PERS may be used to fund COLAs when otherwise permitted under the rules.

We expect that future COLAs granted for PERS would be of the “FDA COLA” type.

The last two COLAs granted were FDA COLAs, effective January 1, 2018 and January 1, 2021. In addition, the FDA COLA effective January 1, 2018 was granted at a time when a “Gain-sharing COLA” could have been granted; however, the board of trustees opted for financing a COLA with the balance in the FDA rather than with “excess” interest (i.e., gain-sharing). The PERS’ FDA is expected to continue to have a balance that is sufficient to fund a meaningful level of COLA for the near term.

Unless the balance in the FDA is used repeatedly for other purposes (e.g., reducing the net direct employer contribution or reducing the present value of future costs), thereby depleting the balance available for COLAs, we expect that future COLAs would be financed by using the balance in the FDA as long as contributions exceed the minimum. This opinion may not hold in future years for PERS and is not necessarily our opinion for other Louisiana retirement systems.

Conclusion

Currently, PERS’ board and its actuary do not anticipate future COLAs in the actuarial valuations. For PERS’ 2021 Actuarial Valuation for *funding* purposes, we accept the 2021 treatment of not recognizing future COLAs in the *funding* calculations of costs and liabilities as appropriate treatment in this situation.

However, it is our opinion that the pattern of COLA-granting may require advance-recognition of future COLAs in the *accounting* calculations under the GASB standards, affecting the balance sheets and note disclosures of the local participating entities.

2. Investment Return Assumption

The last comprehensive analysis of the investment return assumption was prepared and presented in the LLA’s *Comprehensive Actuarial Review of the 2018 Actuarial Valuation of the Parochial Employees’ Retirement System* dated July 18, 2019, using forecasts published in 2019. Since that analysis was completed, professional investment forecasters have continued lowering their expectations for the mid-term and longer-term.

For this Review, a detailed analysis of independent experts’ 2021 or 2022 forecasts for PERS’ portfolio was not undertaken. Instead, we provide an estimate of the return assumption calculated using the same methodology as prior LLA analyses, for consistency and illustrative purposes. Those results can be found in the section below entitled *Benchmark Investment Return Assumption*. We also present observational commentary.

Selecting an Investment Return Assumption

ASOP No. 27 provides guidance for selecting “reasonable” economic assumptions. The ASOP outlines multiple characteristics to define what constitutes a reasonable assumption, including that it “is expected to have no significant bias (i.e., it is not significantly optimistic or pessimistic).” However, the ASOP specifically allows assumptions to be adjusted for conservatism.

This is particularly important when considering an appropriate investment return assumption, because the investment return assumption is tied directly to the discount rate, which has the single largest impact on the development of the liability. Small changes in the assumption can have a large impact, which is why an overly optimistic investment return assumption, applied repeatedly, can (a) create repeated actuarial losses, (b) cause underfunding by understating the required contribution, (c) impede the scheduled progress to pay off the unfunded liability and achieve full funding, and (d) undermine the actuarial integrity of the pension-promise.

PERS’s board and actuary lowered the investment return assumption over the past several years, from 6.50% as of December 31, 2018 and 2019 to 6.40% for the December 31, 2020 and 2021 valuations. We commend PERS for lowering its investment return assumption. However, the decline in its assumed return is not keeping pace with the more rapid decline in future returns expected by professional forecasters.

Benchmark Investment Return Assumption

In the supporting documentation for the investment return assumption, PERS’ actuary used the long-term (20-30 years) capital market assumptions from various investment consulting firms.

The LLA has historically developed an investment return assumption that falls between the mid-term (10 years) and long-term expectations. The consensus average expected return is based on the capital market assumptions of several respected and independent professional investment forecasters. Each set of capital market assumptions was applied to PERS’ own asset allocation with adjustments for its approximate benefit cash flow. Following are the professional investment forecasters whose capital market assumptions inform us in deriving a consensus average.

Participating Professional Investment Forecasters			
Aon/Hewitt	Blackrock	BNY/Mellon	Callan
Cambridge	J.P. Morgan	Meketa	Mercer
RVK	NEPC	Verus	Wilshire

For this Review, an *estimate* of the benchmark return assumption was developed based on (a) the most recent comprehensive analyses for PERS (2019), (b) our general understanding of the direction and change-magnitude of forecasters’ expectations in recent years (from 2019 to 2021) applied to PERS’ prior target asset allocation, (c) the change in the System’s target asset allocation, and (d) changes in the expected rate of inflation embedded in return expectations (from 2019 to 2021). The LLA methodology results in the benchmark return falling between the mid-term (10 years) expectations and the longer-term (20-30 years) expectations.

The following table compares the System’s investment return assumption and the LLA-developed benchmark.

Actuarial Valuation Date	Fund’s Return Assumption	Benchmark Return Assumption	Difference
December 31, 2021	6.40%	5.50%	0.90%
December 31, 2020	6.40%	5.75%	0.65%
December 31, 2019	6.50%	6.25%	0.25%
December 31, 2018	6.50%	6.25%	0.25%

Conclusion

The System’s assumption is 90 basis points higher than the approximate investment return benchmark calculated by the LLA. We recommend the System continue to lower its investment return assumption and consider:

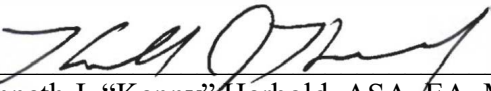
- Incorporating conservatism in the assumption by consistently targeting a rate that is closer to a 60% probability of achieving the assumption over time; and
- Reflecting the impact of cash flow timing on total expected returns.

Actuarial Certification

This Actuarial Review 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.

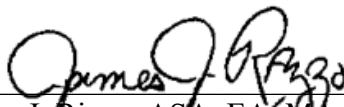
Kenneth J. Herbold, James J. Rizzo, and Piotr Krekora are members of the American Academy of Actuaries and meet the U.S. Qualification Standards necessary to render the actuarial opinions contained herein.

The signing actuaries are independent of the Parochial Employees' Retirement System.



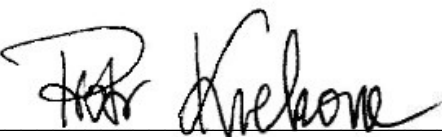
Kenneth J. "Kenny" Herbold, ASA, EA, MAAA
Director of Actuarial Services
Louisiana Legislative Auditor

August 4, 2022
Date



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

August 4, 2022
Date



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

August 4, 2022
Date

Appendix

Qualifications and Caveats

This Actuarial Review was prepared in accordance with La. R.S. 11:127(C) and 24:513(C)(1). This Review, in conjunction with the System's full actuarial valuation, is intended to fulfill the requirements of La. R.S. 11:127(C) to the Public Retirement Systems' Actuarial Committee (PRSAC) for 2021 and is intended for use by PRSAC and those designated or approved by PRSAC. This Actuarial Review may be provided to parties other than PRSAC only in its entirety and only with the permission of PRSAC. The Louisiana Legislative Auditor is not responsible for unauthorized use of this Actuarial Review.

This Actuarial Review should not be construed as providing tax advice, legal advice, or investment advice. It should not be relied on for any purpose other than the purposes described herein. This Actuarial Review assumes the continuing ability of PERS to collect the contributions necessary to fund this Plan. A determination regarding whether or not PERS is actually willing and able to do so in the future is outside our scope of expertise and was not performed.

The findings in this Actuarial Review are based on data and other information as of December 31, 2021, and forecasts published for 2022. This Actuarial Review was based upon information furnished by PERS, the System's investment consultant, the System's actuary, and by numerous external inflation and investment forecasters. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by outside parties.

All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

At the time of this writing, we consider the 2022 forecasts of the future inflation and capital market assumptions (including future investment returns) from the subject matter experts to be suitable for development of the benchmark return assumption for the December 31, 2021 actuarial valuation. All actuarial projections have a degree of uncertainty because they are based on the probability of occurrence of future contingent events. Accordingly, actual results will be different from the results contained in the analysis to the extent actual future experience varies from the experience implied by the assumptions.

This Actuarial Review was prepared using GRS proprietary capital market asset model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of this report and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled. We are relying on the GRS actuaries and Internal Software, Training, and Processes Team who developed and maintain the model.