COMPREHENSIVE ACTUARIAL REVIEW OF THE 2020 ACTUARIAL VALUATION OF THE LOUISIANA ASSESSORS' RETIREMENT FUND

ACTUARIAL SERVICES

PRESENTED TO THE PUBLIC RETIREMENT SYSTEMS' ACTUARIAL COMMITTEE

AUGUST 2021

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

July 22, 2021

Ms. Kathy Bertrand
Executive Director and Retirement Benefits Coordinator
Louisiana Assessors' Retirement Fund
3060 Valley Creek Drive
Baton Rouge, Louisiana 70808

Re: Comprehensive Actuarial Review of the 2020 Actuarial Valuation

Dear Ms. Bertrand:

To fulfill the requirements of R.S. 11:127(C) to the Public Retirement Systems' Actuarial Committee for 2020, the Louisiana Legislative Auditor has conducted a Comprehensive Actuarial Review for the Louisiana Assessors' Retirement Fund.

The remainder of this letter contains the results of our Comprehensive Actuarial Review of your September 30, 2020, Actuarial Valuation (prepared by G.S. Curran & Company and dated January 12, 2021). More specifically, we have evaluated for reasonableness the actuarial assumptions and methods employed by the System and its actuary.

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

Sincerely,

Michael J. Waguespack, CPA
Legislative Auditor

MJW:JJR:ch

cc: G.S. CURRAN & COMPANY

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Scope of Review

The September 30, 2020, Actuarial Valuation Report for the Louisiana Assessors' Retirement Fund (LARF) for funding purposes was prepared by G.S. Curran & Company (GSC) and dated January 12, 2021. The 2020 Experience Study Report for LARF was also prepared by GSC and dated July 17, 2020. The results of the Experience Study Report were used by the board in adoption of the actuarial assumptions in the September 30, 2020, Actuarial Valuation Report.

This Comprehensive Actuarial Review (CAR) of that report was prepared 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 Louisiana Legislative Auditor (LLA) to provide backup, research, calculations, actuarial services, and advice to the LLA.

This CAR includes evaluations of the appropriateness of key actuarial assumptions and methods employed in the 2020 Actuarial Valuation and the 2020 Experience Study, as well as documented support for opinions presented herein. A full actuarial valuation replicating the actuary's results was not performed; nor was a full actuarial valuation performed using recommended assumptions and methods.

Summary of Findings

A summary of our findings follows. Additional details are addressed in the remainder of this report.

1. **Appropriate Return Assumption**. We consider the System's 2020 investment return assumption (5.75%) to be appropriate (a) considering the System's asset allocation and cash flow and (b) compared to the mainstream of numerous professional forecasting organizations. Refer to *Section 1: Investment Return Assumption* for more details.

2. **Treatment of Cost-of-Living Adjustments (COLAs)**. The cost of future COLAs is currently not included in the 2020 Actuarial Valuation. Given the prior and expected use and magnitude of the System's Funding Deposit Account balance, we consider this an appropriate treatment for the System for this year's *funding* requirements, but not for this year's *accounting* purposes. Refer to *Section 2: Treatment of Cost-of-Living Adjustments* for more details.

3. **Appropriate Mortality Assumption**. Careful analysis was undertaken by the System's actuary, in compliance with current actuarial literature, to develop appropriate mortality tables for use in the 2020 Actuarial Valuation. Refer to *Section 3: Mortality Assumption* for more details.

4. **2020 Experience Study.** We reviewed the 2020 Experience Study Report, prepared by the System's actuary, and found all the sections relating to the demographic and other assumptions to be described with reasonable detail and careful recognition of relevant experience. Therefore, we accept all the demographic and other assumptions proposed in the experience study report and find them appropriate for the 2020 Actuarial Valuation. Refer to *Section 4: 2020 Experience Study* for more details.

5. **Financing Calculations.** We reviewed the 2020 Actuarial Valuation with additional emphasis on the exhibits presenting the financing calculations and found them to be appropriately complete and accurate using the board's assumptions and methods.

Section 1: Investment Return Assumption

While we prefer a slightly lower return assumption for the 2020 Actuarial Valuation, we find the Board's 5.75% return assumption to be acceptable. This section and the Appendices set forth a disciplined process for setting or assessing a return assumption that ensures the assumption is mainstream and defensible. They set forth the details for how we arrived at our "most appropriate" net return assumption (5.70%), compared to LARF's 2020 return assumption (5.75%).

There are slight differences in the assumptions and methods in our development of the most appropriate return assumption, compared to those of the System's actuary and the board's final selection. The end result is that our most appropriate return assumption is very close to the System's assumption for the 2020 Actuarial Valuation. We find the board's return assumption to be in the mainstream of professional forecasters' expectations, using an objective and disciplined process.

A Disciplined Process

The cost of being materially wrong is substantial, whether it is over a 10-year period or a 30-year period, and could be detrimental to plan members (jeopardizing actuarial benefit security) and detrimental to taxpayers (unexpected contribution increases).

The process of our assessment of LARF's 2020 actuarial return assumption is captured in our treatment of the most significant factors in setting, defending or assessing the appropriateness of an assumed return. We assessed the following factors:

1. Forecasts of future rates of *inflation* (forward-looking), as expected by experts who are both independent and nationally recognized in the field of inflation forecasting; refer to Appendix A (*Sources of Inflation Forecasts*) for more details;

2. Forecasts of future *investment returns* (forward-looking) and other capital market assumptions for various asset classes as expected by experts who are both independent and nationally recognized in the field of investment return forecasting; refer to Appendix B (*Sources of Investment Return Forecasts*) for more details;

3. The current and future *asset allocation percentages*, by broad asset class, are embodied in LARF's investment policy; refer to Appendix C (*Asset Allocation*) for more details;

4. *Future investment performance* of the pension fund's portfolio: (1) as expected by each independent forecaster, (2) considering the consensus average of their 50th percentile expectations for the retirement fund's compound return over time; refer to Appendix D (*Portfolio's Expected Returns*) for more details; and

5. *Expected benefit cash flow* influences how much of a retirement fund's future earnings will be affected by mid-term forecasts versus long-term forecasts; refer to Appendix E (*Single Equivalent Cash-flow Adjusted Expectations*) for more details.

This disciplined process assures decision-makers that the result is a net return assumption that:

a. Is unbiased, objective, and free of agency risk (i.e., not overly influenced by what the participating agencies think is affordable);

b. Is developed in a disciplined, robust, and defensible manner; and

c. Improves actuarial benefit security, intergenerational equity, and contribution stability.

Professional investment forecasters are expecting future returns to be lower than what we have seen in certain time frames in the past. Expert forecasters are not guaranteed to be right, of course. However:

- There are no better sources to turn for input when selecting, defending or assessing a pension return assumption;

- It is not prudent to be out of step with the mainstream of subject matter experts; and

- It is a fiduciary's responsibility to select the best estimate of the future expectations of the System's portfolio, with professional input and without outside influences that may detract from attaining and maintaining actuarial benefit security for plan members.

The LARF trustees are to be commended for lowering the return assumption over the years. LARF has demonstrated that a retirement system can make significant progress toward full actuarial funding, even while moving toward lower and more appropriate return assumptions.

Preview of 2021 forecasts

Professional forecasters have reduced their 2021 expectations, as compared to their 2020 forecasts. This continues the consistently downward trend during the past several years of professional forecasts for future pension investment returns over the mid-term and long-term horizons.

The same robust methodology was applied to obtain a preview of the most appropriate return assumption for the 2021 Actuarial Valuation. The continued rise in equity price/earnings ratios has moved professional forecasters' 2021 expectations even lower. Events between now and September 30, 2021, could change this preview (such as changes in inflation expectations or the System's asset allocation), but this is how it looks in the first part of 2021. The most appropriate return assumption for the 2021 Actuarial Valuation appears to be going down further, to 5.20% - 5.40%%.

Conclusion – Based on this analytical process for assessing the return assumption, we consider 5.70% to be our preferred net return assumption for the 2020 valuation and consider LARF's 2020 return assumption of 5.75% to be fully acceptable for funding purposes.

Section 2: Treatment of Cost-of-Living Adjustments (COLAs)

The cost of future COLAs is currently not included in the 2020 Actuarial Valuation. Future COLAs are currently recognized in the calculations of costs and liabilities only after they are granted. This is an appropriate treatment for this year for this System for *funding* purposes, but not for *accounting* purposes.

There are, basically, two broad categories of COLAs available to LARF:

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 LARF's Funding Deposit Account (FDA).

There are many other 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.

Whether and how *future* COLAs should be recognized in annual actuarial valuations for *funding* purposes and for *accounting* purposes 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"

When there is a reasonable expectation (not a guaranteed expectation) of "Gain-sharing COLAs" being granted in the future by any retirement system, it is appropriate for an actuary to recognize the likelihood and magnitude of future "Gain-sharing COLAs" in the measurement of system costs and liabilities for *funding* purposes, provided the Gain-sharing COLAs are material and are actuarially measurable. They should be recognized in costs and liabilities for *accounting* purposes under a different standard (described below).

As discussed below, however, it is more likely than not that future COLAs for LARF members will be paid under the FDA statutes, <u>not</u> under the Gain-sharing COLA statutes.

LARF differs from many other Louisiana state and 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 LARF may be used to fund COLAs when otherwise permitted under the rules.

We expect that future COLAs granted for LARF would be of the "FDA COLA" type. The two most recent COLAs granted were FDA COLAs, effective October 1, 2017, and October 1, 2019, at times when "Gain-sharing COLAs" could have been granted; however, the board of trustees opted for financing COLAs with the balance in the FDA rather than with "excess" interest (i.e., gain-sharing).

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 and granting FDA COLAs, rather than granting Gain-sharing COLAs. This opinion may not hold in future years for LARF and is not our opinion for other Louisiana retirement systems.

Actuarial Treatment of "FDA COLAs"

When there is a reasonable expectation that future COLAs will be of the "FDA COLA" type under Louisiana statutes, the appropriate actuarial treatment is different from that of Gain-sharing COLAs:

- For *funding* purposes, future FDA COLAs are already being pre-funded by making higher contributions than what is required under a non-COLA version of the future. The excess contributions are set aside and not counted as plan assets in the actuarial valuation until such time an FDA COLA is granted, when an equivalent amount is released from the FDA into the actuarial value of assets. For *funding* purposes, if there is a reasonable expectation that future COLAs would be granted from the balance in the FDA, then no advance-recognition in actuarial calculations is necessary because the advance-recognition is already happening more directly, in the additional contributions. Therefore, the System's current treatment of <u>not</u> recognizing future COLAs in advance is appropriate for *funding* purposes.

- However, for *accounting* purposes, the Governmental Accounting Standards Board (GASB) does not consider whether the contributions are exceeding a minimum funding requirement in its accounting standards for advance-recognition of future COLAs. The GASB is not focused on *funding*, but on *accounting*. The GASB requires advance-recognition of future COLAs for accounting purposes when there is a reasonable pattern expected for granting future COLAs (regardless of whether they are FDA COLAs or otherwise).

  Therefore, even when COLAs are actually paid and expected to be paid out of the FDA balance, the GASB standards would require advance-recognition in the actuarial calculations of costs and liabilities that appear in the financial statements of the System and the participating employers if there is a pattern of FDA COLAs expected[1], regardless of whether the actual contributions are exceeding the minimum recommended contributions.

  When applying the GASB accounting standards to the Louisiana statutes for granting FDA COLAs to LARF members, the GASB accounting standards consider the COLAs to be "ad hoc" (not automatic). However, the GASB requires any COLAs that are "substantively automatic" to be recognized in advance in the actuarial costs and liabilities of the financial statement for the System and the participating employers.

  We believe there is compelling evidence that the historical pattern of COLAs, coupled with the statutory template applied to future COLAs, would require the System to recognize reasonably expected future FDA COLAs in the actuarial calculations (using the same pattern) for the financial statements of the System and the participating employers.

  Consider the exhibit on the following page, which illustrates the recent history of COLAs granted to LARF members. The GASB considers COLAs to be "postemployment benefit changes."

[1] GASBS No. 67 paragraph 39 states, "In addition, projected benefit payments should include the effects of (a) projected ad hoc postemployment benefit changes, including ad hoc COLAs, to the extent that they are considered to be substantively automatic;[14] . . .". Footnote 14 states, "[14]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." Similar requirements appear in GASBS No. 68 relative to accounting and financial reporting for participating employers. Refer also to 2015 CIG No. 2015-1 Q&A 5.178.4 for cost-sharing employers.

COLA History for the Louisiana Assessors' Retirement Fund											
Actuarial Measurement Date	**Statutory Conditions for Authorizing All COLAs: The Window Rule[2] for Any COLA**	**Statutory Conditions Authorizing Gain-sharing (G-s) COLAs Pct and Recipients[3]**			**Authorizing Funding Deposit Account COLAs**						
		The Sufficient Actuarial Return Rule[4] for G-s COLAs	**R.S. 11:1461 G-s COLA [Up to 3%, to All Elg]**	**R.S. 11:246 G-s COLA [2% or Nothing, to Elg Over 65]**	**Balance in the FDA**	**R.S. 11:1461 FDA COLA [Up to 3%, to All Elg]**	**R.S. 11:246 FDA COLA [2% or Nothing, to Elg Over 65]**	**Amount Granted by Board**	**Date Approved by Board**	**Effective Date of COLA**	**Comments**
9/30/2020	**Satisfied** (For YE 2021)	**Satisfied** (7.6% vs. 6.0%)	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	$43,246,189	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	TBD	TBD	TBD	TBD
9/30/2019	Not Satisfied (For YE 2020)	Not Satisfied (5.8% vs. 6.25%)	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	$38,100,032	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	NA	NA	NA	None permitted for failure of the Window Rule
9/30/2018	**Satisfied** (For YE 2019)	**Satisfied** (7.0% vs. 6.75%)	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	$37,949,749	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	Based on the $1 x (A + B) formula	7/23/2019	10/1/2019	*Avg approx. 1% COLA* granted from Funding Deposit Account
9/30/2017	Not Satisfied (For YE 2018)	**Satisfied** (7.6% vs. 7.0%)	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	$34,439,283	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	NA	NA	NA	None permitted for failure of the Window Rule
9/30/2016	**Satisfied** (For YE 2017)	**Satisfied** (8.2% vs. 7.0%)	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	$31,866,114	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	Based on the $1 x (A + B) formula	7/25/2017	10/1/2017	*Avg approx. 1% COLA* granted from Funding Deposit Account
9/30/2015	Not Satisfied (For YE 2016)	**Satisfied** (7.4% vs. 7.25%)	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	$21,170,541	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	NA	NA	NA	None permitted for failure of the Window Rule
9/30/2014[5]	Not Satisfied (For YE 2015)	**Satisfied** (9.8% vs. 7.5%)	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	$17,024,774	None Permitted [To All Eligibles]	None Permitted [To Elg Over 65]	NA	NA	NA	None permitted for failure of the Window Rule
9/30/2013	**Satisfied** (For YE 2014)	**Satisfied** (9.2% vs. 7.5%)	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	$13,720,700	**3.0% Permitted** [To All Eligibles]	**2% Permitted** [To Elg Over 65]	Based on the $1 x (A + B) formula	NA	10/1/2014	*Avg approx. 1% COLA* for Gain-sharing granted

[2] 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.

[3] Per R.S. 11:1461, the Board is authorized to provide a COLA of up to 3% of the original benefit (with a maximum of $25 per month) to all eligible pensioners. Additionally, per R.S. 11:246, the Board is authorized to provide a 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.

[4] Per R.S. 11:1461, the Board is authorized to use interest earnings on investments of the system in excess of normal requirements to provide a COLA of up to 3% of the original benefit (with a maximum of $25 per month) to all eligible pensioners. 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.

[5] The 9/30/14 valuation date marks the first year that Act 170 applies, after the trustees elected to be covered under R.S. 11:243 by 12/31/13.

Following are the "considerations that might be relevant to determining whether such changes are substantively automatic."

1. "the historical pattern of granting the changes,"

2. "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" *[notice the "or" is highlighted for emphasis]*, and

3. "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".

These are specific *considerations* that might be relevant to determining whether such "postemployment benefit changes" are substantively automatic. This is not an exhaustive or exclusive list of *considerations,* and all three *considerations* are not required in order to treat the pattern of postemployment benefit changes to be treated as "substantively automatic." But these are among considerations enumerated by the GASB that might be relevant.

Consideration 1 is satisfied: In the past seven years, every time the statutes permitted a COLA to be granted, the board granted one. There were three such times:

- As of October 1, 2014, based on the September 30, 2013, Actuarial Valuation;

- As of October 1, 2017, based on the September 30, 2016, Actuarial Valuation; and

- As of October 1, 2019, based on the September 30, 2018, Actuarial Valuation.

This is a clear historical pattern of granting COLAs whenever permitted, thus satisfying *Consideration 1*.

Consideration 2 is satisfied: The amounts of the change in benefits (i.e., the COLA amounts) have been consistent. In each of the three times, the board based the amount of the COLA on the statutory method commonly called the "A + B method". Therefore, there has been "consistency in the amounts of the change" in benefits.

This consideration does not require that the COLA granted must be consistent "in the amounts of the changes relative to a defined cost-of-living or inflation index" in order to be treated as "substantively automatic." The consideration may be consistency "in the amount of the change" in benefits granted.

The amount of the COLA granted in each of these three instances (every time one was permitted) used the A + B method of R.S. 11:241, and averaged approximately 1% of the current benefits. That satisfies the *Consideration 2* for consistency in amounts of the changes in benefits.

Consideration 3 is satisfied: There is no "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." Such evidence, if it were to exist, might override the

Considerations 1 and 2. However, we find no such evidence: no statute change, no board resolution, etc. Thus, *Consideration 3* is satisfied.

Using the GASB's own stated *considerations*, it is clear that the value of expected future COLAs should be recognized in the actuarial calculations of costs and liabilities in the financial statements of the System and the participating employers; not for funding, but for accounting.

Another consideration (not specifically enumerated in the GASB standard) is "reasonable likelihood". Based on LARF's expected funded status, expected contributions per the current funding policy, expected FDA balances, and the current Louisiana COLA statutes, it is highly likely that LARF will be permitted to grant an FDA COLA every other year in the foreseeable future. Furthermore, it is reasonably likely that the LARF board will indeed grant the FDA COLAs each time it is permitted (every other year) or possibly a Gain-sharing COLA when permitted if the FDA balance falls significantly. Of course, there is a chance the board will not grant one (whether FDA or Gain-sharing) when permitted to do so. But, at this point, there is a reasonable likelihood the board will grant them when permitted.

Nevertheless, all three GASB-stated *considerations* are satisfied and sufficient to require the actuarial value of future COLA increases to be included for *accounting* purposes in the costs and liabilities presented in the financial statements of the System and participating employers.

Conclusion – For LARF's 2020 Actuarial Valuation for *funding* purposes, we accept the 2020 treatment of not recognizing future COLAs in the *funding* calculations of costs and liabilities as appropriate treatment in this situation. However, we disagree with the non-recognition of future COLAs to LARF members for *accounting* purposes in the financial statements of the System and participating employers.

Section 3: Mortality Assumption

The 2020 Actuarial Valuation (pages 39, 40 and 41) states that the mortality assumption:

- For active member mortality is "Pub-2010 Public Retirement Plans Mortality Table for General Employees multiplied by 120% for males and 120% for females, each with full generational projection using the appropriate MP2019 scale."

- For annuitant and beneficiary mortality is "Pub-2010 Public Retirement Plans Mortality Table for General Healthy Retirees multiplied by 120% for males and 120% for females, each with full generational projection using the appropriate MP2019 scale."

- For disabled lives mortality is "Pub-2010 Public Retirement Plans Mortality Table for General Disabled Retirees multiplied by 120% for males and 120% for females, each with full generational projection using the appropriate MP2019 scale."

These tables constitute a revision from those used in the 2019 Actuarial Valuation, and were recommended by the System's actuary in the LARF Experience Study, dated July 17, 2020.

To evaluate appropriateness in a mortality assumption, we reviewed the base mortality (Pub-2010) and the plan/gender-specific adjustment factors separately from the projection scale (MP2019).

Base Mortality Table

The Pub-2010 Public Retirement Plans Mortality Tables Report was published in January 2019. This table was developed by the Society of Actuaries based on data obtained from public sector pension plans across the U.S. It is the most recent reliable broad-based mortality table available, for purposes of national estimates of mortality for public pension plans.

The observed mortality rates were compared to the standard reference table in order to set the appropriate adjustment factors to determine the best fitting table to use for the final mortality assumption. Because the plan is too small for a full statistical credibility of its own mortality experience, observed rates were blended with standard tables. The resulting adjustment factor of 120% was determined by System's actuary to be the best fit for males and an adjustment factor of 120% was determined to be the best fit for females.

Mortality Improvement Scale

Once the base table was found to be appropriate, we turned our attention to the projection scale used in the mortality assumption to reflect expected mortality improvements over time. The 2020 Actuarial Valuation stated that the Pub-2010 table was projected generationally using scale MP2019. We note that the projection scale MP2019 was the most recent projection scale available as of that valuation date.

Conclusion – We consider the base mortality tables and the mortality improvement scale as applied to both non-disabled and disabled lives to be appropriate.

Section 4: 2020 Experience Study

An actuarial Experience Study was prepared by the System's actuary for the period from October 1, 2014, through September 30, 2019. The Experience Study report, dated July 17, 2020, summarized the results. The Experience Study report includes the following demographic assumptions:

- Mortality Rates
- Retirement Rates
- Disability Rates
- Withdrawal Rates
- Salary Increases
- Post-DROP Retirement Rates

In addition, the Experience Study report includes the following other assumptions:

- Vesting Election Percentage
- Family Statistics
- Actuarial Equivalence Factors

Mortality Assumption

The mortality assumption is based on the most recently developed broad-based mortality tables and on reasonable applications of actuarial credibility principles. For details of the mortality assumption, please refer to Section 3 of this 2020 Comprehensive Actuarial Review.

Other Demographic Assumptions

Without performing an actuarial audit, we reviewed the Experience Study report thoroughly and found all the sections relating to the other demographic assumptions to be described with reasonable detail and careful recognition of relevant experience.

Other Assumptions

We also found all the sections relating to the other assumptions to be described with reasonable detail and careful recognition of relevant experience.

Conclusion – We accept all the other demographic assumptions and other non-demographic assumptions proposed in the Experience Study report, and find them to be appropriate for use in the LARF's 2020 Actuarial Valuation.

Actuarial Certification

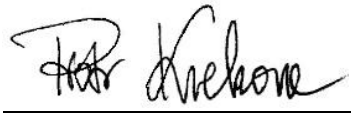
This Comprehensive Actuarial Review report constitutes a Statement of Actuarial Opinion. It has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents information it is purported to present. 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.

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 Louisiana Assessors' Retirement Fund.

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

July 8, 2021
Date



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

July 8, 2021
Date

Appendix A
Sources of Inflation Forecasts

An assumed rate of future inflation is a major component of both the return and the salary increase assumptions. Expected future inflation is a critical component of the other pension finance calculations as well. Therefore, much care and objectivity should be given to the expected future rates of inflation.

In the 2020 Experience study, the System's actuary recommends and uses a 2.20% inflation rate assumption in the development of the recommendations concerning the return assumption. The 2020 Actuarial Valuation (page 39) uses an inflation rate assumption of 2.10%. We find an inflation assumption closer to 2.00% is more supported by the research on expected inflation rates from national experts as illustrated in the exhibits below.

What other retirement systems assume for inflation and what the past actual rates of inflation have been, are not directly pertinent to setting, defending or assessing an assumption about future inflation. Even having one expert's forward-looking opinion is not sufficient. Without having multiple inputs, a board would not know if there are other expert opinions that differ. It is well-established that a consensus average of diverse forecasters improves forecast accuracy.

Currently, expert professional inflation forecasts generally lie between 1.34% and 2.40% across mid-term (10 years) and long-term (20-30+ years) horizons. Actuaries are not generally qualified to forecast future rates of inflation. Therefore, consider the forward-looking forecasts from 10 sources published by the following independent organizations.

Major National Inflation Forecasters	
Congressional Budget Office	Federal Reserve Bank of Cleveland
Federal Reserve Bank of Philadelphia (2)	Federal Reserve Bank of New York (2)
Federal Reserve Board (OMC)	Social Security Trustees Report
Investment Forecaster Survey (GRS)	U.S. Department of the Treasury

Some of these organizations provide multiple surveys and horizons for their inflation forecasts. Following is a summary of the historical inflation forecasts of these eight major national organizations.

Average Forward-looking Annual Inflation Forecasts						
Future Time Horizon	**Number of Sources***	**Mid-Yr 2020 Average**	**Mid-Yr 2019 Average**	**Mid-Yr 2018 Average**	**Mid-Yr 2017 Average**	**Mid-Yr 2016 Average**
10 Years	9	1.92%	2.12%	2.23%	2.19%	2.07%
20 to 30+ Years	6	1.88%	2.10%	2.29%	2.15%	2.01%

** For the Mid-Yr 2020 forecast averages; comprised of inputs over a hundred economists and investment forecasters*

Our preferred inflation assumption for 2020 valuations would be 2.00% for the mid-term and longer-term horizons. Consider the following exhibit, which shows the detailed historical inflation forecasts of these large reputable expert organizations in the field of inflation forecasting.

Forward-looking Annual Inflation Forecasts					
Professional Experts in the Field of Forecasting Inflation	**Mid-Yr 2020**	**Mid-Yr 2019**	**Mid-Yr 2018**	**Mid-Yr 2017**	**Mid-Yr 2016**
Federal Reserve Board's Federal Open Market Committee					
Current "Long-run" Price Inflation Objective (<10 years):					
Objective since Jan 2012; Personal Consumer Expenditures (PCE)	2.00%	2.00%	2.00%	2.00%	2.00%
Consumer Price Index Inflation Objective (CPI = PCE + approx 30-40 bps)	2.30%	2.40%	2.40%	2.40%	2.40%
Congressional Budget Office: ***The Budget and Economic Outlook***					
Overall Consumer Price Index (10 Years)	2.12%	2.39%	2.38%	2.36%	2.33%
Social Security Trustees Report					
CPI-W 75-Year Intermediate Assumption	2.40%	2.60%	2.60%	2.60%	2.60%
Federal Reserve Bank of Philadelphia					
Livingston Survey: 10-Year Median Forecast	2.00%	2.26%	2.28%	2.33%	2.25%
Survey of Professional Forecasters: 10-Year Median Forecast	2.14%	2.20%	2.30%	2.30%	2.20%
Federal Reserve Bank of New York's Trading Desk					
Survey of Market Participants: 10-Year Median Expectation	1.87%	2.05%	2.12%	2.14%	2.00%
Survey of Primary Dealers: 10-Year Median Expectation	2.05%	2.16%	2.10%	2.35%	2.12%
Federal Reserve Bank of Cleveland					
10-Year Expectation	1.34%	1.67%	2.09%	1.85%	1.63%
20-Year Expectation	1.63%	1.88%	2.23%	2.04%	1.87%
30-Year Expectation	1.85%	2.05%	2.32%	2.18%	2.04%
U.S. Department of the Treasury					
10-Year Breakeven Inflation	1.24%	1.70%	2.12%	1.73%	1.44%
20-Year Breakeven Inflation	1.41%	1.74%	2.12%	1.85%	1.38%
30-Year Breakeven Inflation	1.71%	1.90%	2.16%	2.00%	1.77%
GRS Survey of Investment Consultants and Forecasters					
Median expectation (averaging a 10-year horizon)	2.18%	2.21%	2.23%	2.25%	2.23%
Median expectation (averaging a 25-30-year horizons)	2.27%	2.41%	2.31%	2.21%	2.38%

Appendix B
Sources of Investment Return Forecasts

As with inflation forecasting, actuaries are not investment forecasters and are not qualified to forecast capital market assumptions[6] for all relevant asset classes over mid-term and longer-term horizons. Therefore, we must turn to reputable professional forecasters that specialize in that field.

Again, it is not reliable practice to simply look to the past rates of return to guide current decisions about assumed returns for the future. It may also be tempting for board members to be influenced by (a) what boards of trustees of other retirement plans have decided concerning their return assumption or (b) whether the resulting contribution is affordable for the current year's budget. However,

- Other retirement systems have different asset allocation targets.
- Other retirement systems have different investment-related fees and cash flow projections.
- Boards of trustees of other retirement systems around the country have their own agency risks and influences, as well, that are not necessarily best practices.

Retirement system fiduciaries should decide on actuarial assumptions with an emphasis on actuarial benefit security for their plan members and other funding objectives by relying more on mainstream forecasts of what the portfolio is expected to earn rather than what rate looks similar to other systems or what rate would make the contributions more affordable to current taxpayers.

It may be useful information to know what the past has produced and what other retirement systems' return assumptions are, but these should not influence decisions about this System's expected performance over time.

As with inflation, in our opinion it is best to obtain input concerning future rates of return over the mid-term and longer-term horizons based on forward-looking forecasts from several large independent and reputable professional forecasters. Following are the professional forecasting organizations that provide us input concerning forward-looking capital market assumptions. These 13 organizations have significant depth in their research staff and are a trusted source of investment expertise. They also have significant experience with public sector pension funds.

Participating Investment Forecasters			
Aon/Hewitt[IC]	Blackrock[IM]	BNY/Mellon[IM]	Callan[IC]
Cambridge[IC]	J.P. Morgan[IM]	Marquette[IC]	Meketa[IC]
Mercer[IC]	RVK[IC]	NEPC[IC]	VOYA[IM]
		Wilshire[IC]	

[IC] *In the top 25 largest investment consultants, according to the most recent survey from P&I.*

[IM] *In the top 75 largest investment managers, according to the most recent survey from P&I/WTW.*

[6] Capital market assumptions include: expected returns (either geometric or arithmetic) and standard deviations for each asset class, expected correlation coefficients across asset classes, and expected rate of inflation. These may be expectations over a mid-term horizon, a longer-term horizon, or both.

Appendix C
Asset Allocation

It has been generally accepted for many years that a fund's asset allocation is responsible for the vast majority of its investment performance. Therefore, LARF's asset allocation is a core element in process of setting and evaluating assumed future returns.

2020 LARF Target Asset Allocation			
Risk-oriented Assets		**Fixed Income Assets**	
Domestic Broad Cap Equity	35.00%	Core Fixed Income	25.00%
Large Cap Stocks		Non-Core Fixed Income	5.00%
Mid Cap Stocks		High Yield	
Small Cap Stocks		Emerging Market Bonds	
Foreign Equity	20.00%	World Govt Bonds	
International Stocks			
Emerging Market Stocks		*Total Fixed Income Assets*	*30.00%*
Other Assets	5.00%		
Direct Real Estate	10.00%		
Total Risk-oriented Assets	*70.00%*		
		Total Asset Allocation	*100.00%*

Source: Current LARF Investment Policy Statement (October 2020)

We relied on the target asset allocation percentages set forth in the System's formal Investment Policy Statement (IPS) last updated October 2020. We then obtained written confirmation from the System's investment consultant, to further separate these percentages into the following 10 target asset allocation percentages.

2020 LARF Target Asset Allocation			
Risk-oriented Assets		**Fixed Income Assets**	
Domestic Broad Cap Equity		Core Fixed Income	27.50%
Large Cap Stocks	29.05%	Non-Core Fixed Income	
Mid Cap Stocks	3.50%	High Yield	1.70%
Small Cap Stocks	3.50%	Emerging Market Bonds	1.65%
Foreign Equity		World Govt Bonds	1.65%
International Stocks	17.00%		
Emerging Market Stocks	4.45%	*Total Fixed Income Assets*	*32.50%*
Other Assets (allocated to other classes)			
Direct Real Estate	10.00%		
Total Risk-oriented Assets	*67.50%*		
		Total Asset Allocation	*100.0%*

Source: Current LARF Investment Policy Statement (October 2020), supplemented with implementation allocations per System's Investment Consultant

Appendix D
Portfolio's Expected Return

We applied LARF's target asset allocations to the expectations (asset class by asset class) of each of the 13 major national investment forecasters. We replaced the investment forecasters' respective inflation assumptions with 2.00%, our preferred assumption based on the consensus of expert inflation forecasters' expectations presented above in order to normalize for a consistent inflation assumption across all forecasters.

We reduced each forecast for LARF's portfolio slightly, by certain expected investment-related expenses. This process results in the System's expected return for any one given year in the forecast horizon (called the expected arithmetic return). Finally, we reduced the resultant one-year arithmetic returns for the correlation among asset classes and the volatility drag in the compound return expected over time, because pensions are all about compounding in a volatile environment over the horizon.

This produces probability distributions of possible compound average returns over the relevant time period by each of the 13 professional forecasters. The most useful metrics for the relevant time period from these probability distributions are (a) the 50th percentile expectation of the compound average return (the 50-50 chance of success) and (b) the probability of achieving the assumption.

It matters not whether the field of forecasting is for hurricanes, earthquakes, elections, inflation, investment returns or economics, using a *consensus average* of many reputable experts increases a forecast's accuracy.

Below are the results of this process for the mid-term horizon.

Investment Forecaster	Distribution of 10-Year Compound Average Percentile Expectations			Probability of exceeding 5.75%
	40th	50th	60th	
(1)	(2)	(3)	(4)	(5)
1	2.67%	3.64%	4.61%	29.15%
2	3.76%	4.69%	5.64%	38.84%
3	3.93%	4.76%	5.59%	38.19%
4	3.96%	4.77%	5.58%	38.02%
5	4.00%	4.94%	5.88%	41.36%
6	4.24%	4.98%	5.73%	39.74%
7	4.30%	5.20%	6.10%	43.81%
8	4.52%	5.42%	6.33%	46.30%
9	4.59%	5.43%	6.29%	46.24%
10	4.62%	5.50%	6.38%	47.13%
11	4.63%	5.54%	6.47%	47.74%
12	4.78%	5.55%	6.32%	47.34%
13	4.99%	5.90%	6.82%	51.69%
Average	**4.23%**	**5.10%**	**5.98%**	**42.73%**

There are three important takeaways from the exhibit above:

a. Over the mid-term horizon the range of expectations of the 50th percentile of compound average return runs from 3.64% to 5.90%. The System's current 5.75% is higher than twelve of the thirteen forecasters for the next 10 years.

b. The 50th percentile consensus average mid-term forecast is 5.10%. In other words, the consensus opinion is that there is a 50-50 chance of returning at least 5.10% when compounded over the next 10 years.

c. The consensus of these experts is that there is a 42.73% chance of achieving at least the current 5.75% adopted by LARF over the mid-term horizon. This does not mean a 42.73% chance of achieving the 5.75% assumption in any one year during the time horizon; it means that the compound return over the next 10 years has only a 42.73% chance of achieving at least the 5.75% assumption.

This is not a forecast opinion of the Actuary for the LLA. This is the consensus average of the opinions of many independent national experts in forecasting inflation and investment returns, i.e., it is the mainstream of professional forecasters' opinions concerning LARF's portfolio in the next 10 years.

Mid-term and Longer-term

In addition, we applied a similar process to longer-term forecasts (20 to 30 years, averaging 27 years) which resulted in a consensus average 50th percentile of the compound average return over the next 27 years of 5.84%.

However, as discussed in the next section, we do not have to choose between the mid-term and long-term horizons of consensus averages. The most appropriate return is somewhere in between the two horizons; and it is derived by recognizing the plan's own expected benefit stream.

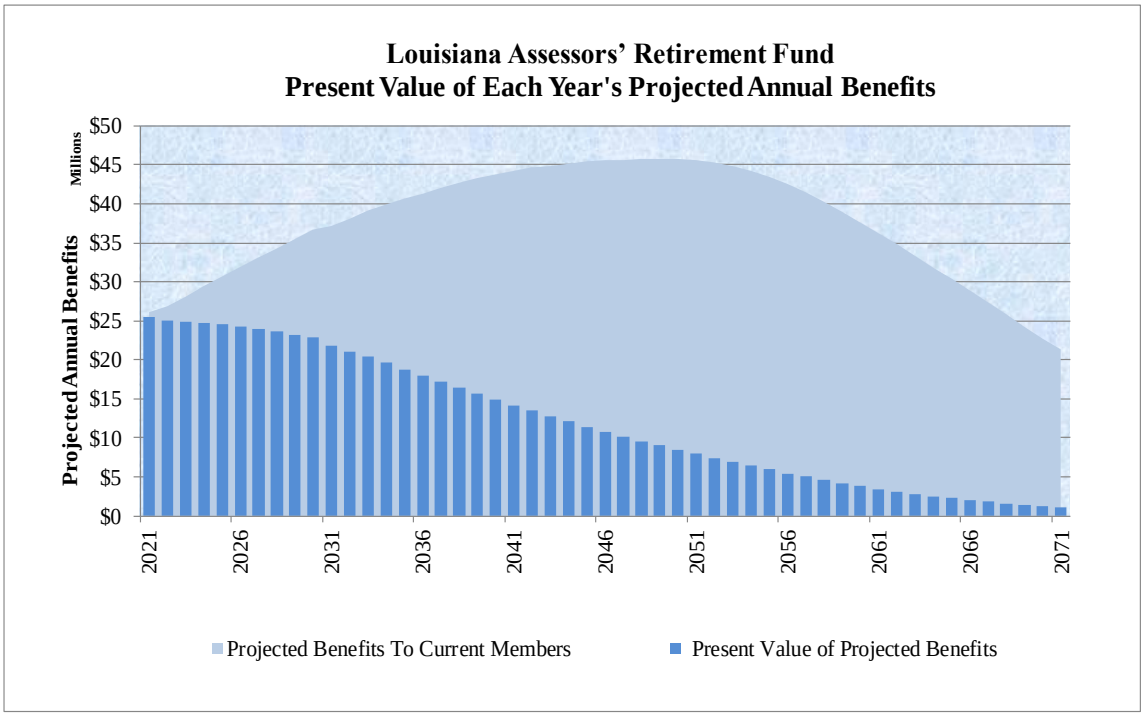
Consider a new pension plan with very little in benefits payable until the third decade. Such a plan can comfortably use a long-term horizon. But a pension plan, like LARF, with a large proportion of its future benefits expected to be paid in the first decade or two should adopt a return assumption that gives due consideration to the mid-term horizon expectations and which lies somewhere between the mid-term and the long-term. This derives from basic actuarial principles. Adopting long-term forecasts without any adjustment for cash flow is not appropriate for a plan that will be paying substantial benefits out of the system in the next 10 to 15 years**.**

If the forecasters are right, years 1-10 will have a compound average of 5.10% per year, but years 1-27 have a compound average 5.84% per year. Mathematically, that means that years 11-27 will have a compound average of 6.28% per year.

The most appropriate return assumption is somewhere between the 5.10% mid-term consensus average and the 5.84% longer-term consensus average, and is derived based on the System's own expected benefit cash flow.

Appendix E
Single Equivalent Cash-flow-adjusted Expectation

The graph below illustrates the LARF actuary's projected annual benefits cash flows[7]. The darker blue bars are the present values (as of September 30, 2020) of each year's projected benefits, discounted at the investment return expectation during years 1-10 and during years 11-30 (and beyond), to illustrate the cash flow effect in terms of current dollars.



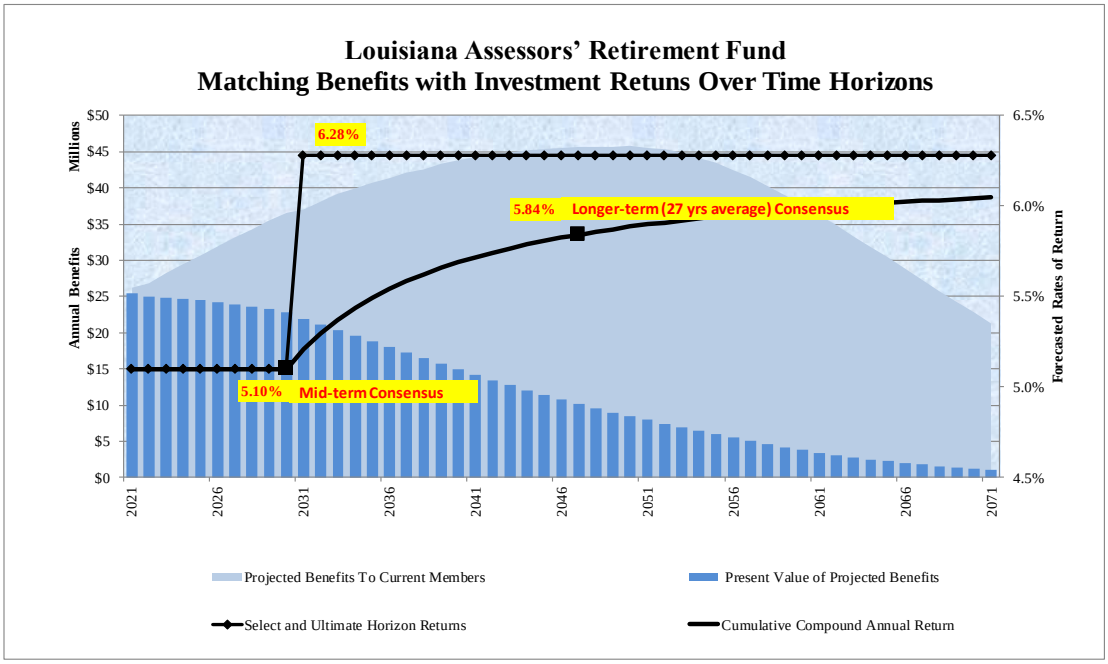
Much of the LARF's projected benefits will be paid with current System assets, which is expected by a consensus average to earn only 5.10% during the next 10 years. The separate forecast of returns for years 1-10 (5.10%) and years 11-30 (6.28%) is what actuaries often call "select and ultimate" return forecasts.

However, since an actuarial valuation uses a single return assumption over the entire period, it is necessary to reflect the select and ultimate periods of return in a single equivalent return assumption, somewhere between the mid-term forecast and the longer-term forecast. Therefore, it is necessary to measure the earnings generated by the System's assets from the valuation date through each year when the benefits are expected to be paid.

The blended rate is always between the years 1-10 mid-term consensus average (5.10% in this case) and the years 1-27 long-term consensus average (5.84% in this case).

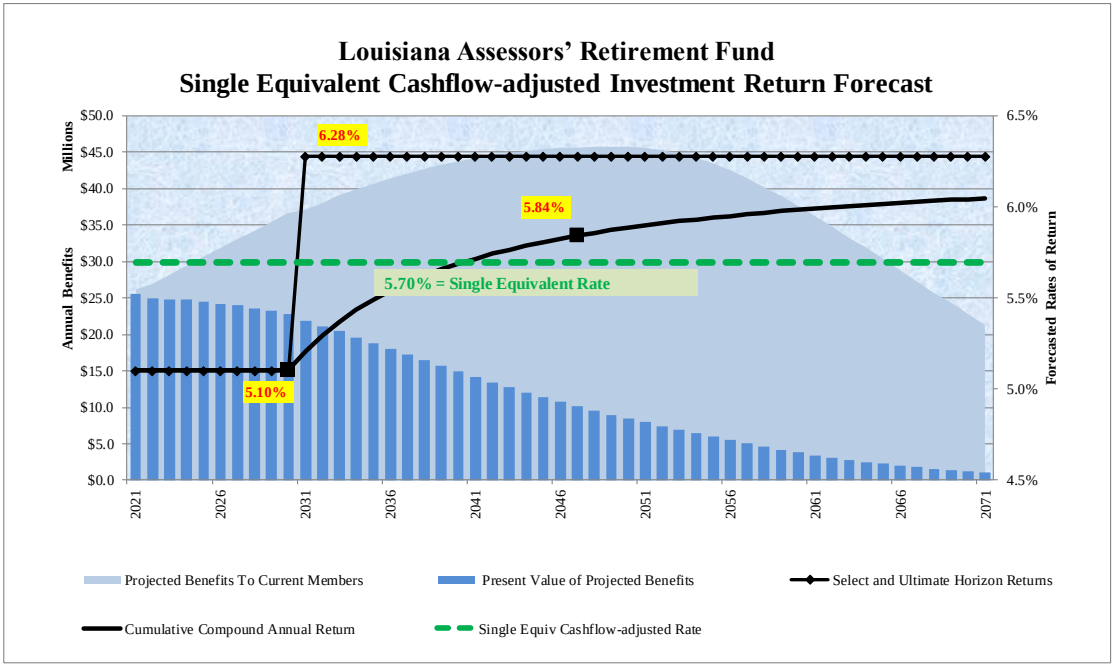
Consider the following graph, with the consensus average forecasts superimposed over the projected benefits and their present values.

[7] Source: Assessors' Retirement Fund Information for Financial Reporting as of September 30, 2020, dated January 26, 2021 (pages 31-32). An actuarial case can be made for using the expected current benefits expected for current retirees and current accrued benefits expected for current actives instead of projected benefits for current actives that includes future accruals and salary increases. However, this Source was readily available and its use does not significantly affect the resulting conclusion.



Under these forecasts, notice the significant amount of benefits (and their present values) that would earn only 5.10% while still in the System (years 1-10). Notice also, that even the benefits paid thereafter are expected to earn only 5.10% during the next 10 years. *The lower expected earnings in the next 10 years should be incorporated into the development of a final return assumption, somewhere between the mid-term and longer-term forecasts.* A straight long-term forecast does not appropriately recognize benefit cash flow demands on the System. This is true regardless of whether the plan is very mature, moderately mature or not mature. This is true regardless of the level of negative cash flow.

Recognizing the LARF's own timing and magnitude of its benefit demand cash flows and the different earnings expectations over years 1-10 versus years 11-27, the single equivalent net investment return on all assets used to pay these benefits is 5.70% – between the mid-term and longer-term forecasts.



Appendix F

Relevant Actuarial Standards of Practice

ASOP No. 4 Section 3.5:

3.5 Plan Provisions - When measuring pension obligations and determining **periodic costs** or **actuarially determined contributions**, the actuary should reflect all significant **plan provisions** known to the actuary as appropriate for the purpose of the measurement. However, if in the actuary's professional judgment, omitting a significant **plan provision** is appropriate for the purpose of the measurement, the actuary should disclose the omission in accordance with section 4.1(d).

ASOP No. 4 Section 3.5.3:

3.5.3 Plan Provisions that are Difficult to Measure - Some **plan provisions** may create pension obligations that are difficult to appropriately measure using traditional valuation procedures. Examples of such **plan provisions** include the following:

a. Gain sharing provisions that trigger benefit increases when investment returns are favorable but do not trigger benefit decreases when investment returns are unfavorable;

b. Floor-offset provisions that provide a minimum defined benefit in the event a **participant's** account balance in a separate plan falls below some threshold;

c. Benefit provisions that are tied to an external index, but subject to a floor or ceiling, such as certain cost-of-living adjustment provisions and cash balance crediting provisions; and

d. Benefit provisions that may be triggered by an event such as a plant shutdown or a change in control of the plan sponsor.

For such **plan provisions**, the actuary should consider using alternative valuation procedures, such as stochastic modeling, option-pricing techniques, or deterministic procedures in conjunction with assumptions that are adjusted to reflect the impact of variations in experience from year to year. When selecting alternative valuation procedures for such **plan provisions**, the actuary should use professional judgment based on the purpose of the measurement and other relevant factors.

The actuary should disclose the approach taken with any **plan provisions** of the type described in this section, in accordance with section 4.1(i).

ASOP No. 27 Section 3.11.2:

3.11.2 Cost-of-Living Adjustments—Plan benefits or limits affecting plan benefits (including the Internal Revenue Code (IRC) section 401(a)(17) compensation limit and section 415(b) maximum annuity) may be automatically adjusted for **inflation** or assumed to be adjusted for **inflation** in some manner (for example, through regular plan amendments). However, for some purposes (such as qualified pension plan funding valuations), the actuary may be precluded by applicable laws or regulations from anticipating future plan amendments or future cost-of-living adjustments in certain IRC limits.

Appendix G

Qualifications and Caveats

This Comprehensive Actuarial Review was prepared to fulfill the requirements of R.S. 11:127(C) to the Public Retirement Systems' Actuarial Committee (PRSAC) for 2020 and is intended for use by PRSAC and those designated or approved by PRSAC. This Comprehensive 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 Comprehensive Actuarial Review.

This Comprehensive Actuarial Review should not be relied on for any purpose other than the purposes described herein. This Comprehensive Actuarial Review assumes the continuing ability of LARF to collect the contributions necessary to fund this Plan. A determination regarding whether or not LARF 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 Comprehensive Actuarial Review are based on data and other information as of September 30, 2020 and forecasts published for 2020. This Comprehensive Actuarial Review was based upon information furnished by LARF, 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 2020 forecasts of the future inflation and capital market assumptions (including future investment returns) from the subject matter experts to be suitable for development of a "most appropriate" net return assumption for the 2020 actuarial valuation. There has been considerable uncertainty about the economy and a lot of volatility in the markets during the past year and a half. But for now, the robust process and results presented herein seem most appropriate.

This Comprehensive Actuarial Review was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation 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.