

Fire and Police Pension Fund, San Antonio

Report of an Actuarial Audit

Final Actuarial Audit Report in Accordance with
Section 802.1012(h) of the Texas Government Code
April 1, 2019



April 1, 2019

Ms. Melanie S. Keeton, CPA
Assistant Finance Director
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San Antonio, Texas 78283-3966
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Re: Final Actuarial Audit Report in Accordance with Section 802.1012(h) of the Texas Government Code

Dear Ms. Keeton:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the January 1, 2018 Actuarial Valuation of the Fire and Police Pension Fund, San Antonio (SAFPPF). The following documents are intended to demonstrate that the City of San Antonio (the City) has complied with Section 802.1012 of the Texas Government Code which requires an actuarial audit of public retirement systems with total assets of at least \$100 million.

The following three documents will constitute the final actuarial audit report, as required by Section 802.1012(h) of the Texas Government Code:

1. This cover letter,
2. Preliminary draft of the actuarial audit report, dated February 7, 2019, and
3. Retained actuary response to the preliminary draft of the actuarial audit report, dated March 6, 2019.

Following the delivery of the preliminary draft of the actuarial audit report to SAFPPF on February 7, 2019, GRS requested a response to the preliminary draft, as required by Section 802.1012(g) of the Texas Government Code. The retained actuary for SAFPPF provided a response to the preliminary draft on March 6, 2019.

GRS is pleased to report to the City that, in our professional opinion, the January 1, 2018 Actuarial Valuation prepared by the retained actuary provides a fair and reasonable assessment of the financial position of SAFPPF.

Mr. Falls is a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



R. Ryan Falls, FSA, MAAA, EA
Senior Consultant



Bill Detweiler
Senior Analyst

Fire and Police Pension Fund, San Antonio

Report of an Actuarial Audit
Preliminary Draft in Accordance with Section
802.1012(f) of the Texas Government Code
February 7, 2019



February 7, 2019

Ms. Melanie S. Keeton, CPA
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Dear Ms. Keeton:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the January 1, 2018 Actuarial Valuation of the Fire and Police Pension Fund, San Antonio (SAFPPF). We are grateful to the City of San Antonio (the City) staff, the SAFPPF staff and Segal Consulting, the retained actuary, for their cooperation throughout the actuarial audit process.

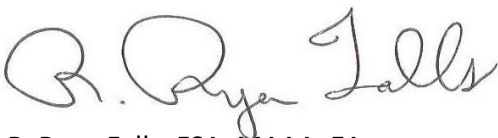
This actuarial audit involves an independent verification and analysis of the assumptions, procedures, methods, and conclusions used by the retained actuary for SAFPPF, in the valuation of SAFPPF as of January 1, 2018, to ensure that the conclusions are technically sound and conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board.

GRS is pleased to report to the City that, in our professional opinion, the January 1, 2018 Actuarial Valuation prepared by the retained actuary provides a fair and reasonable assessment of the financial position of SAFPPF.

Throughout this report we make suggestions for ways to improve the work product. We hope that the retained actuary and SAFPPF find these items helpful. Thank you for the opportunity to work on this assignment.

Mr. Falls is a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



R. Ryan Falls, FSA, MAAA, EA
Senior Consultant



Bill Detweiler
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SECTION A

EXECUTIVE SUMMARY

Executive Summary

The City of San Antonio (the City) issued a Request for Proposal (RFP) for actuarial services that included an Actuarial Audit of the Fire and Police Pension Fund, San Antonio (SAFPPF) as required by the Texas Government Code. The actuarial audit included the January 1, 2018 actuarial valuation performed by the retained actuary. The City selected Gabriel, Roeder, Smith & Company (GRS) to perform the actuarial audit and the project formally commenced in November of 2018.

This Actuarial Audit includes the following:

- A full replication of the January 1, 2018 actuarial valuation based on the same census data, assumptions, and actuarial methods used by the retained actuary.
- Review and analysis of the results as well as a review of the mathematical calculations for completeness and accuracy, based on a detailed review of a representative sample of the current plan participants.
- Verification that all appropriate benefits have been valued and valued accurately.
- Evaluation of the actuarial cost method and the actuarial asset valuation method in use and whether other methods may be more appropriate for SAFPPF.
- Verification of the reasonableness of the calculation of the unfunded actuarial accrued liability and the amortization period used under the actuarial cost method.
- Review of the demographic and economic actuarial assumptions for consistency, reasonableness and compatibility. Such assumptions shall include, but are not limited to: mortality, retirement and separation rates, levels of pay adjustments, rates of investment return, and disability factors.
- Assessment of the adherence to relevant Actuarial Standards of Practice (ASOPs) published by the American Academy of Actuaries.
- Assessment of the adherence to the Texas Pension Review Board (PRB) Pension Funding Guidelines.

This actuarial audit will satisfy the requirements of Section 802.1012 of the Texas Government Code which requires an actuarial audit of public retirement systems in Texas with total assets of at least \$100 million every five years.

Summary of Findings

Based on our review, the actuarial valuation, studies, and reports of SAFPPF are reasonable, used appropriate assumptions and adhered to Actuarial Standards of Practice and Texas PRB Pension Funding Guidelines. We offer the following recommendations based on the valuation methods and assumptions used by the retained actuary in the January 1, 2018 actuarial valuation.

Actuarial Assumptions

- 1) Due to the size of the retirement benefit relative to the disability benefit after 21 years of service, we recommend that the assumed disability incidence rates no longer apply after 21 years of service and only the assumed retirement rates apply for each subsequent year.
- 2) We recommend that the retained actuary better describe their rationale for applying modifications to the base mortality table and the base mortality improvement scale in the next experience study report, if applicable.
- 3) With the understanding that the plan liability is not very sensitive to changes in the inflation assumption as long as the assumed real rate of return remains the same, we recommend that the retained actuary monitor the inflation assumption closely to ensure the assumption continues to comply with ASOP No. 27.
- 4) During the next experience review, we recommend that the retained actuary consider the suggested approaches for developing the proposed assumptions for termination rates and the salary increases.

Actuarial Methods and Funding Policy

- 5) We recommend that the retained actuary enhance future actuarial communications by aligning the actuary's "Recommended Contribution" in the actuarial valuation report with the maximum amortization period of 20-years outlined in the Board's Actuarial Funding Policy.

Actuarial Valuation Results

- 6) In the next actuarial valuation, we recommend that the retained actuary update their procedures for projecting compensation for purposes of projecting plan benefits for current active members to a procedure that more appropriately reflects the stated assumptions for salary increases.
- 7) We recommend that the retained actuary consider the enhancement to include an estimate of the new entrant loss into the calculation of the Recommended Contribution and the Effective Amortization Period in future actuarial valuation reports.

Content of Valuation Report

- 8) In order to improve the ability of the report to communicate the assumptions, methods and benefit provisions incorporated into the January 1, 2018 actuarial valuation, we recommend that the retained actuary incorporate the enhancements noted in Section F to future actuarial valuation reports.

SECTION B

GENERAL ACTUARIAL AUDIT PROCEDURE

General Actuarial Audit Procedure

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

- The five most recent actuarial valuation reports, with the most recent performed as of January 1, 2018,
- The Board presentation associated with the January 1, 2017 and January 1, 2018 actuarial valuations,
- The most recent experience study, dated October 8, 2015, including the associated Board presentation,
- SAFPPF Investment Policy Statement, approved March 27, 2013,
- SAFPPF Statement of Actuarial Funding Policy, amended July 25, 2018,
- SAFPPF Pension Law, as amended on October 1, 2009, and
- A full set of census data for plan participants and beneficiaries as of January 1, 2018 used by the retained actuary for the actuarial valuation.

In performing our review, we:

- Reviewed the Pension Law to understand the benefits provided by SAFPPF,
- Reviewed the appropriateness of the actuarial assumptions,
- Reviewed the actuarial reports/studies, and
- Replicated the actuarial valuation process using the same assumptions, methods, and data used by the retained actuary.

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

Key Actuarial Concepts

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

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

This simulated dynamic is applied to each active participant of the plan. This simulation results in a set of expected future benefit payments to that participant. Discounting those future payments for the likelihood of survival and at the assumed rate of investment return, produces the Total Present Value of

Plan Benefits (TPV) for that participant. The actuarial cost method will allocate this TPV between the participant's past service (actuarial accrued liability) and future service (future normal costs).

These key actuarial concepts will be discussed in more detail throughout this report.

PRB Pension Funding Guidelines

During our actuarial audit of SAFPPF, we reviewed the actuarial valuation of SAFPPF from the perspective of the Texas Pension Review Board's Pension Funding Guidelines, as adopted January 26, 2017, effective June 30, 2017. The Guidelines are:

1. The funding of a pension plan should reflect all plan obligations and assets.
2. The allocation of the normal cost portion of the contributions should be level or declining as a percent of payroll over all generations of taxpayers, and should be calculated under applicable actuarial standards.
3. Funding of the unfunded actuarial accrued liability should be level or declining as a percentage of payroll over the amortization period.
4. Actual contributions made to the plan should be sufficient to cover the normal cost and to amortize the unfunded actuarial accrued liability over as brief a period as possible, but not to exceed 30 years, with 10 - 25 years being the more preferable target range.* For plans that use multiple amortization layers, the weighted average of all amortization periods should not exceed 30 years. Benefit increases should not be adopted if all plan changes being considered cause a material increase in the amortization period and if the resulting amortization period exceeds 25 years.
5. The choice of assumptions should be reasonable, and should comply with applicable actuarial standards.
6. Retirement systems should monitor, review and report the impact of actual plan experience on actuarial assumptions at least once every five years.

** Plans with amortization periods that exceed 30 years as of 06/30/2017 should seek to reduce their amortization period to 30 years or less as soon as practicable, but not later than 06/30/2025.*

These guidelines will be discussed in more detail throughout this report.

SECTION C

ACTUARIAL ASSUMPTIONS

Actuarial Assumptions

Overview

The actuarial valuation report contains a description of the actuarial assumptions which were used in the actuarial valuation as of January 1, 2018. Additionally, the retained actuary published an actuarial experience report, dated October 8, 2015. We have reviewed this report in detail in order to assess the reasonableness of the assumptions used in the actuarial valuation.

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

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

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

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

Demographic Assumptions

General

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

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

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

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

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

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

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

The measurement of experience is normally affected by simply counting occurrences of an event. Thus, for example, in reviewing retirement patterns, an actuary might count the number of actual retirees among males aged 55 with 30 years of service. These retirements would be compared against the number of total people in that group to generate a raw rate of retirement for that group.

Actuarial Standards of Practice (ASOP) No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, applies to actuaries when they are selecting demographic assumptions. In accordance with ASOP No. 35, an actuary should identify the types of demographic assumptions to use for a specific measurement. In doing so, the actuary should determine the following:

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

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

Observations on Assumptions

Overall, it appears that the current demographic assumptions are reasonable. Below, we offer general observations and considerations for the retained actuary based on our experiences with similar plans.

Retirement – Members are eligible to retire after 20 years of service. The rates at which participants are assumed to retire are based on the member’s service. The current assumption was developed to be consistent with the actual experience for Firefighters and Police Officers, separately, over the most recent experience study period and includes a reasonable level of conservatism. We believe the retirement rate assumption is appropriate for SAFPPF.

BackDROP Utilization – 95% of retiring Firefighters with at least 24 years of service are assumed to elect a four-year BackDROP. Similarly, 75% of retiring Police Officers with at least 23 years of service are assumed to elect a three-year BackDROP. The current assumption was developed to be consistent with the actual experience for Firefighters and Police Officers, separately, over the most recent experience study period. We believe the BackDROP Utilization assumption is appropriate for SAFPPF.

Turnover – The rates at which members are assumed to withdraw (or turnover) prior to eligibility for retirement were reviewed in the experience study based on the member’s age. In our experience, the rates of turnover are more closely related to the member’s years of service at termination for public safety employees (compared to age). The current assumption is relatively small and is the same for members of all ages and all service amounts so this is a fairly immaterial point. However, we recommend that the retained actuary consider reviewing the rates of turnover by years of service in the next experience study to see if any patterns emerge.

Ultimately, the current assumption was developed to be consistent with the actual experience for Firefighters and Police Officers, separately, over the most recent experience study period. We believe that the turnover rate assumption is appropriate for SAFPPF.

Mortality – The main demographic assumption in an actuarial valuation is mortality because this assumption is a predictor of how long pension payments will be made by the trust. The current mortality assumption for each type of plan member (i.e., active members, healthy retirees, and disability retirees) is generally based on the applicable RP-2014 mortality tables published by the Society of Actuaries (SOA). The female mortality rates are loaded by 7% in all cases. Additionally, the retained actuary utilizes a generational mortality assumption to incorporate future mortality improvements into the actuarial valuation using 50% of the MP-2014 mortality improvement scale.

This mortality assumption is a reasonable assumption. However, the number of actual deaths for SAFPPF during the experience period was not sufficient to provide full credibility to the actual plan experience. As a result, the retained actuary must rely on other rationale to justify the adjustments made to the base tables. We recommend that the retained actuary better describe their rationale for applying modifications to the base mortality table and the base mortality improvement scale in the next experience study report, if applicable.

It should also be noted that the SOA also issued the Pub-2010 Public Retirement Plans Mortality Tables Report in January 2019 which presents public plan mortality tables based on public plan participant mortality experience from 2008 to 2013. The report separately identifies mortality tables for three separate job classifications, comprised of General Employees, Teachers, and Public Safety Employees. We

recommend that the retained actuary consider the applicability of these Pub-2010 tables in the next actuarial experience study.

Disability Incidence –The disability incidence rates are currently applied to active members through age 49. However, an active member with more than 21 years of service would be better off taking a retirement benefit than a disability benefit. Therefore, a portion of active members with over 21 years of service but less than 49 years old are assumed to take a less valuable benefit if they become disabled.

Very little disability incidence experience generally exists in order to set a reasonable assumption based on actual disability incidence experience. The current assumption for disability incidence seems reasonable and appropriately applied. However, we recommend that the assumed disability incidence rates no longer apply after 21 years of service and only the assumed retirement rates apply for each subsequent year.

Economic Assumptions

General

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

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

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

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

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

Inflation

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

The current explicit inflation assumption is 3.00%. The inflation assumption was lowered from 3.50% resulting from the experience study report, dated October 8, 2015, to 3.00% in the October 1, 2015 actuarial valuation and remained at 3.00% for the January 1, 2018 actuarial valuation.

All investment consulting firms used in our analysis, in setting their capital market assumptions, currently assume that inflation will be at or below 2.50%. In our review of the 2018 capital market assumption sets for the twelve investment consulting firms listed on the next page, the average assumption for inflation was approximately 2.20%, with a range of 1.95% to 2.50%. It should be noted that all of these investment consulting firms set their assumptions based on approximately a ten-year outlook, while actuaries generally must make longer projections.

In the Social Security Administration's 2018 Trustees Report, the Office of the Chief Actuary projected a long-term average annual inflation rate of 2.60% under the intermediate cost assumption. (The low-cost assumption was 3.20% and the high-cost assumption was 2.00%.) These inflation assumptions forecasts have not materially changed for several years.

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. In their forecast for the first quarter of 2018, they forecasted inflation over the next ten years to average 2.20% to 2.25%. Over the shorter term, the society of Professional Forecasters are predicting inflation to average 2.20% for the calendar years 2017 and 2018, so they are expecting inflation to consistently stay around 2.20% over the next 10 years.

Whereas the current 3.00% assumption was reasonable at the time of the last experience study, the forward-looking economic data indicate that the expectation for inflation in the future is notably lower than the current assumption. It should be noted that virtually all of the benefits for SAFPPF are tied to the inflation assumption due to the COLA provisions. As a result, the plan liability is not very sensitive to changes in the inflation assumption as long as the assumed real rate of return remains the same (i.e., as long as the COLA assumption and the nominal investment return assumption move in tandem). We recommend that the retained actuary monitor this assumption closely to ensure the assumption continues to comply with ASOP No. 27.

Investment Return

The investment return assumption is one of the principal assumptions in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date, in order to determine the liabilities of the retirement plan. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates. The current assumption incorporates inflation of 3.00% per annum plus an annual real rate of return of 4.25%, net of investment-related expenses paid from the trust, for an assumed nominal rate of return of 7.25%.

We believe an appropriate approach to reviewing an investment return assumption is to determine the median expected portfolio return given the SAFPPF target asset allocation and a given set of capital market assumptions. Per the SAFPPF Investment Policy Statement, approved March 27, 2013, the SAFPPF current target asset allocation is:

Asset Class	Target
Large Cap U.S. Equities	15%
Small Cap U.S. Equities	3%
Developed International Equities	15%
Emerging International Equities	6%
Hedge Funds	10%
Private Equity	7%
Risk Parity	5%
High Yield	5%
Bank Loans	5%
Global Fixed Income	0%
Emerging Market Debt	7%
Private Debt	7%
Unconstrained Fixed Income	3%
Real Estate	9%
Real Assets	3%
Cash	0%
Total	100%

Because GRS is a benefits consulting firm and does not develop or maintain our own capital market assumptions, we reviewed assumptions developed and published by the following investment consulting firms:

- Aon
- BNY Mellon
- Callan
- JP Morgan
- Marquette
- Mercer
- NEPC
- PCA
- RV Kuhns
- Summit
- Wilshire
- VOYA

These investment consulting firms periodically issue reports that describe their capital market assumptions, that is, their estimates of expected returns, volatility, and correlations. While these assumptions are developed based upon historical analysis, many of these firms also incorporate forward looking adjustments to better reflect near-term expectations. The estimates for core investments (i.e. fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds.

Given the SAFPPF current target asset allocation and the investment firms' capital market assumptions for 2018, the development of the average nominal return, net of investment fees paid from the trust, is provided in the following table:

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	5.26%	2.20%	3.06%	3.00%	6.06%	10.92%
2	5.98%	2.26%	3.72%	3.00%	6.72%	9.44%
3	5.72%	2.00%	3.72%	3.00%	6.72%	9.14%
4	6.41%	2.50%	3.91%	3.00%	6.91%	11.41%
5	6.57%	2.50%	4.07%	3.00%	7.07%	11.36%
6	6.10%	2.00%	4.10%	3.00%	7.10%	10.10%
7	6.35%	2.21%	4.14%	3.00%	7.14%	10.87%
8	6.47%	2.31%	4.16%	3.00%	7.16%	10.26%
9	6.55%	2.26%	4.29%	3.00%	7.29%	12.24%
10	6.71%	1.95%	4.76%	3.00%	7.76%	10.94%
11	7.10%	2.25%	4.85%	3.00%	7.85%	13.65%
12	7.29%	2.00%	5.29%	3.00%	8.29%	9.29%
Average	6.38%	2.20%	4.17%	3.00%	7.17%	10.80%

We determined for each firm the expected nominal return rate based on the SAFPPF target asset allocation, and then subtracted that firm's expected inflation to arrive at their expected real return in column (4). Then we added back the SAFPPF current 3.00% inflation assumption to get a net nominal return. As the table shows, the resulting average one-year expected return of the 12 firms is 7.17%.

In addition to examining the expected one-year return, it is important to review anticipated volatility of the investment portfolio and understand the range of long-term net returns that could be expected to be produced by the investment portfolio. Therefore, the following table provides the 40th, 50th, and 60th percentiles of the 20-year geometric average of the expected nominal return, net of investment-related expenses paid from the trust, as well as the probability of exceeding the current 7.25% assumption.

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding 7.25%
	40th	50th	60th	
(1)	(2)	(3)	(4)	(5)
1	4.89%	5.51%	6.12%	24%
2	5.78%	6.31%	6.84%	33%
3	5.82%	6.33%	6.85%	33%
4	5.67%	6.31%	6.95%	36%
5	5.84%	6.47%	7.11%	38%
6	6.06%	6.62%	7.19%	39%
7	5.99%	6.59%	7.21%	39%
8	6.10%	6.67%	7.25%	40%
9	5.91%	6.60%	7.29%	41%
10	6.60%	7.21%	7.83%	49%
11	6.23%	6.99%	7.76%	47%
12	7.37%	7.89%	8.42%	62%
Average	6.02%	6.63%	7.23%	40%

The table above shows that the resulting 20-year geometric average of the expected nominal return is 6.63%. Additionally, the table above documents that the average probability of exceeding the current 7.25% investment return assumption over a 20-year period is 40%.

As a point of reference, the National Association of State Retirement Administrators (NASRA) published an issue brief updated as of February 2018 of 129 large public retirement systems which reflects the nominal assumption in use, or announced for use, as of the date of the survey. The average investment return assumption for responding systems was 7.50%. The brief also noted that approximately 75% of the 129 plans measured have reduced their investment return assumption since fiscal year 2010.

The current investment return assumption is consistent with our best-estimate and we believe that the assumption is reasonable for this purpose. However, we would like to note a trend regarding changes to the real rate of return assumption beginning with the 2012 actuarial valuation.

The investment return assumption is generally composed of two pieces: inflation and the real rate of return on investments. Currently the inflation assumption is 3.00% and the real rate of return assumption is 4.25%. While we believe each of the assumptions is reasonable we would like to point out that the real rate of return on assets is more aggressive than in past years. Beginning with the 2012 actuarial valuation, the inflation assumption has decreased by 100 basis points from 4.00% to 3.00%. However, during that same time period the investment return assumption has only decreased by 50 basis points from 7.75% to 7.25%. Therefore, the real rate of return assumption has actually increased by 50 basis points from 3.75% to 4.25% over the time period. While we believe the 4.25% real rate of return assumption is reasonable, increasing this assumption is contrary to most national trends.

Expenses

As previously noted, the investment return assumption is stated net of expected investment-related expenses from the trust. Additionally, the actuarial valuation included an explicit assumption for administrative expenses of \$2,950,000 for the year beginning January 1, 2018 which is approximately equal to the recent actual administrative expenses of SAFPPF. These are reasonable procedures for accounting for anticipated plan expenses.

Earnings Progression

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

- Price inflation – currently 3.00%
- Economic Productivity Increases – currently 0.75%
- Merit, Promotion, and Longevity – This portion of the salary increase assumption reflects components such as promotional increases as well as increases for merit and longevity. This portion of the assumption is not related to inflation. The current assumptions vary this component based on the participant's current service.

In the context of a typical employer pay scale, pay levels are set for various employment grades. In general, this pay scale is adjusted as follows:

- The inflation and economic productivity assumptions, collectively referred to as wage inflation, reflect the overall increases of the entire pay scale, and
- The Merit, Promotion, and Longevity increase assumption reflects movement of participants through the pay scale.

In the last experience review, the retained actuary recommended a 0.50% decrease in the salary scale due to the associated change in the inflation assumption. During the period reviewed, the actual price inflation was significantly lower than the assumed price inflation. As a result, the actual economic productivity and merit increases observed during the experience period must have been significantly higher than the assumed increases.

The retained actuary has experience with SAFPPF and may have additional information regarding the appropriateness of the long-term expectation for salary increases above inflation. As a result, this comment is not intended to imply that the current assumption is unreasonable, but only that the retained actuary consider modifying the methodology used in selecting the recommended assumption. Since the retained actuary uses a building block approach to set the salary scale assumption (which is the preferred approach), we recommend that the retained actuary use the actual price inflation to determine the economic productivity and merit increases observed during the next experience review.

Summary

The set of actuarial assumptions and methods, taken in combination, are within the range of reasonableness and established in accordance with ASOP No. 27, ASOP No. 35, and the Texas PRB Pension Funding Guidelines.

We have the following recommendations regarding the actuarial assumptions:

- Due to the size of the retirement benefit relative to the disability benefit after 21 years of service, we recommend that the assumed disability incidence rates no longer apply after 21 years of service and only the assumed retirement rates apply for each subsequent year.
- We recommend that the retained actuary provide additional justification for applying modifications to the base mortality table and the base mortality improvement scale in the next experience study report, if applicable.
- With the understanding that the plan liability is not very sensitive to changes in the inflation assumption as long as the assumed real rate of return remains the same, we recommend that the retained actuary monitor the inflation assumption closely to ensure the assumption continues to comply with ASOP No. 27.
- During the next experience review, we recommend that the retained actuary consider the suggested approaches for developing the proposed assumptions for termination rates and the salary increases.

SECTION D

ACTUARIAL METHODS AND FUNDING POLICY

Actuarial Methods and Funding Policy

Actuarial Cost Methods

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

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

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

The Entry Age Normal actuarial cost method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain relatively stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers. Historically, most public plans have used the Entry Age Normal actuarial cost method. Therefore, the retained actuary’s stated methods for allocating the liabilities of SAFPPF are certainly in line with national trends.

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

Asset Valuation Method

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

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

The actuarial valuation of SAFPPF currently utilizes a smoothed asset valuation method that immediately recognizes income equal to the expected return on plan assets, based on the assumed valuation interest rate (7.25%). Differences between the assumed investment return and the actual investment return on plan assets is recognized over a five-year period. Further, the AVA is constrained to be within 80% and 120% of the MVA. This “corridor” assures that the AVA will always be within a reasonable range around the MVA.

The smoothing method used for the actuarial valuation of SAFPPF is very common among public employee retirement systems and complies with ASOP No. 44. Additionally, this method is reasonable and appropriately applied for the valuation.

Funding Policy

The SAFPPF Board of Trustees has adopted an Actuarial Funding Policy, most recently amended on July, 25, 2018, to help ensure the systematic funding of future benefit payments for members of SAFPPF. However, the actual contributions made to SAFPPF are set by statute. As a result, the statutory contributions are compared to the contributions developed under the Actuarial Funding Policy in order to assess the appropriateness of the statutory contributions.

The Actuarial Funding Policy defines the “Board Recommended Contribution” (or, BRC) which is defined as the contribution necessary to fund the normal cost and plus a contribution to eliminate the Unfunded Actuarial Accrued Liability (UAAL). The BRC will equal the statutory required contribution rate as long as the effective amortization period generated by such contribution rate is no longer than 20 years. If for any given actuarial valuation, the effective amortization period is greater than 20 years then the amortization of the UAAL for the BRC will be 20 years.

The Board’s funding policy aligns with current best practice and provides a reasonable comparison for purposes of assessing the statutory contributions.

We noted that the January 1, 2018 actuarial valuation report presents a “Recommended Contribution” which determines a contribution sufficient to eliminate the UAAL over a rolling 30-year period. This recommended contribution is a lower funding threshold than the maximum amortization period of 20-years outlined in the Board’s Actuarial Funding Policy. Additionally, the rolling 30-year amortization of the UAAL could be considered outside of current best practice for calculating actuarially determined contributions. We recommend that the retained actuary enhance future actuarial communications by aligning the actuary’s “Recommended Contribution” with the maximum amortization period of 20-years outlined in the Board’s Actuarial Funding Policy.

As a reference for current best practices on funding policy, the Conference of Consulting Actuaries published a white paper in October, 2014 on public pension funding policies. According to this white paper, a 20-year rolling funding policy (similar to the maximum period included in the Board’s Actuarial Funding Policy) is considered “Acceptable” practice; whereas, a 30-year rolling funding policy (consistent with the “Recommended Contribution” in the actuarial valuation report) is considered “Non-Recommended” due to the high likelihood of “negative amortization.” In this context, negative amortization is a situation where the UAAL is expected to grow over the next year because contributions

are expected to be less than the sum of the normal cost and interest on the UAAL. Furthermore, the Texas PRB Pension Funding Guidelines preferable target range is 10 to 25 years.

Summary

We have the following recommendation regarding the application of the actuarial methods and funding policy:

- We recommend that the retained actuary enhance future actuarial communications by aligning the actuary's "Recommended Contribution" in the actuarial valuation report with the maximum amortization period of 20-years outlined in the Board's Actuarial Funding Policy.

SECTION E

ACTUARIAL VALUATION RESULTS

Actuarial Valuation Results

Benefits

Every employer is different and every employer's retirement plan is different. Each employer has a set of business needs that dictate the type of retirement benefit that is most appropriate for their employees. Additionally, the amount of resources available to allocate to the retirement plan will dictate the level of benefits provided by the retirement plan. Regardless of the reasons for the benefit design, the employer must understand the liability and contribution requirements associated with the benefits promised. As a result, the actuarial valuation and the resulting funding policy contribution must properly reflect the benefit structure of the retirement plan.

In general, the benefits promised by SAFPPF were reasonably incorporated in the actuarial valuation of SAFPPF.

Replication of Plan Liability and Recommended Contribution

To verify the accuracy of the retained actuary's valuation results, GRS performed an independent valuation of SAFPPF as of January 1, 2018. The replication valuation was based on the final valuation data provided by the retained actuary and the same methods and procedures that were used by the retained actuary. The results show that the retained actuary's numerical results are reproducible within acceptable tolerance ranges.

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

As the following tables show, our initial replication of the Total Present Value of Benefits was within 1% of the retained actuary's actual result. Further, the replication of the actuarial cost method resulted in an active Actuarial Accrued Liability (AAL) within approximately 4% of the retained actuary's actual result and a normal cost within 1%. As a result, our initial replication of the actuarial accrued liabilities indicates that the liabilities presented in the retained actuary's valuation reports provided a reasonable representation of the AAL based on the assumptions, methods and procedures used by the retained actuary in the actuarial valuation. The following table summarizes our initial replication.

	January 1, 2018 <u>Valuation (Segal)</u>	<u>Initial Replication</u> <u>(GRS)</u>	<i>Difference</i> <i>from Val</i>
Total Present Value of Benefits			
Active Members	2,405,499,730	2,396,604,381	-0.4%
Inactive Members	3,766,753	3,771,968	0.1%
Retired Members and Beneficiaries	1,915,171,011	1,911,675,586	-0.2%
TOTAL	4,324,437,494	4,312,051,935	-0.3%
Actuarial Accrued Liability			
Active Members	1,619,292,744	1,549,247,116	-4.3%
Inactive Members	3,766,753	3,771,968	0.1%
Retired Members and Beneficiaries	1,915,171,011	1,911,675,586	-0.2%
TOTAL	3,538,230,508	3,464,694,670	-2.1%
Actuarial Value of Assets	3,196,529,718	3,196,529,718	0.0%
Unfunded Actuarial Accrued Liability	341,700,790	268,164,952	-21.5%
Funded Status	90.3%	92.3%	1.9%
Normal Cost (BOY)	70,546,743	70,766,845	0.3%
Recommended Contribution (MOY)			
Normal Cost	73,104,062	73,332,143	0.3%
Administrative Expenses	2,951,807	2,951,807	0.0%
Payment to UAAL	18,866,908	14,806,648	-21.5%
Total Recommended Contribution (\$)	94,922,777	91,090,598	-4.0%
Projected Payroll	318,753,547	318,753,547	0.0%
Total Recommended Contribution (%)	29.78%	28.58%	-1.20%

It should be noted that the 4% replication difference for the active AAL results in a 20% difference in the Unfunded Actuarial Accrued Liability (UAAL). This proportionally large difference in the UAAL results from the leveraging effect of subtracting the assets from the AAL as well as the strong funded status of SAFPPF. In the end, the Total Recommended Contribution was replicated to within 4%.

As part of our replication valuation, GRS requested sample participant calculations from the retained actuary to ensure that the retained actuary valued the correct benefit levels, used the correct assumptions, and calculated the liabilities correctly on an individual basis. The retained actuary provided individual calculations for four active members and eight inactive members. Our initial replication closely matched these calculations for individual members.

Compensation Used to Project Plan Benefits

As part of the valuation process, the retained actuary estimated a compensation amount for 2017 by dividing the member contributions for the year by the member contribution rate. This compensation amount was also annualized for members hired during the year.

In order to project plan benefits for current active employees expected to terminate in the future, the retained actuary used this compensation amount as the projected compensation expected to be paid to each member during 2018. However, the stated actuarial assumptions indicate that the 2018 compensation amount is assumed to increase by one year of assumed salary increase over the compensation paid during 2017. As a result, we believe that the projected plan benefits used to calculate the Total Present Value of Benefits and the Actuarial Accrued Liability for active members are understated by approximately one year of assumed salary increase.

During the actuarial audit process, we discussed this procedure with the retained actuary and we both agreed that it would be more appropriate to apply one additional year of assumed salary increase to the compensation used to project plan benefits for current active employees. Following this discussion with the retained actuary, we updated our initial replication to incorporate one additional year of assumed salary increase.

	<u>Initial Replication</u> <u>(GRS)</u>	<u>Payroll</u> <u>Correction (GRS)</u>	<i>Difference from Rep</i>
Total Present Value of Benefits			
Active Members	2,396,604,381	2,500,320,390	4.3%
Inactive Members	3,771,968	3,771,968	0.0%
Retired Members and Beneficiaries	1,911,675,586	1,911,675,586	0.0%
TOTAL	4,312,051,935	4,415,767,944	2.4%
Actuarial Accrued Liability			
Active Members	1,549,247,116	1,602,012,530	3.4%
Inactive Members	3,771,968	3,771,968	0.0%
Retired Members and Beneficiaries	1,911,675,586	1,911,675,586	0.0%
TOTAL	3,464,694,670	3,517,460,084	1.5%
Actuarial Value of Assets	3,196,529,718	3,196,529,719	0.0%
Unfunded Actuarial Accrued Liability	268,164,952	320,930,365	19.7%
Funded Status	92.3%	90.9%	-1.4%
Normal Cost (BOY)	70,766,845	74,235,786	4.9%
Recommended Contribution (MOY)			
Normal Cost	73,332,143	76,926,833	4.9%
Administrative Expenses	2,951,807	2,951,807	0.0%
Payment to UAAL	14,806,648	17,720,075	19.7%
Total Recommended Contribution (\$)	91,090,598	97,598,715	7.1%
Projected Payroll	318,753,547	318,753,547	0.0%
Total Recommended Contribution (%)	28.58%	30.62%	2.0%

Based on our replication of the January 1, 2018 actuarial valuation of SAFPPF, this updated procedure would increase the Unfunded Actuarial Accrued Liability by approximately \$53 million. We did not perform a full replication of the Total Pension Liability (TPL) and Net Pension Liability (NPL) calculated for purposes of financial reporting under the Governmental Accounting Standards Board (GASB), Statement Nos. 67 and 68, but the impact on these amounts would be approximately the same amount.

In the next actuarial valuation, we recommend that the retained actuary update their procedures for projecting compensation for purposes of projecting plan benefits for current active members to a procedure that more appropriately reflects the stated assumptions for assumed salary increases. The actuarial valuation prepared as of January 1, 2018 for funding purposes does not impact the contributions received or the benefit paid by SAFPPF. Additionally, SAFPPF remains in a strong financial position after incorporating the updated procedure for projecting compensation. As a result, we do not believe there is any reason for the funding valuation as of January 1, 2018 to be restated based on this updated procedure. However, the City may want to consider requesting that this updated procedure be incorporated into the TPL and NPL used for the City's financial reporting under GASB Statement No. 68.

Recommended Contribution and Amortization Period

Our initial liability replication described above resulted in a reasonable replication of the Recommended Contribution calculated by the retained actuary. We were also able to replicate the retained actuary's calculation of the Effective Amortization Period. In this context, the Effective Amortization Period is period of time over which the current contribution rates are expected to eliminate the UAAL.

We have one recommended enhancement to the calculation of the Recommended Contribution and Effective Amortization Period. Currently, the calculation of the Recommended Contribution and Effective Amortization Period incorporate the AAL and normal cost of the members employed at the beginning of the year. Further, the payroll is expected to grow at 3.50% which indicates that the number of active members is assumed to stay relatively constant. As a result, the payroll growth assumption anticipates that new members will be hired throughout the upcoming year to replace those that are expected to terminate. These new members that are hired during the upcoming year will have an AAL in the subsequent actuarial valuation due to the service they accumulate during their original year of hire. This AAL for new members is a common occurrence and is generally referred to as a "new entrant loss" in the actuarial valuation process. Unlike other sources of actuarial gains and losses that are expected to roughly average out to zero over time, this new entrant loss is always a loss and it is expected to occur every year. As a result, we believe that an estimate of this new entrant loss should be included into the calculation of the Recommended Contribution and Effective Amortization Period. Otherwise, the UAAL is larger than expected in each subsequent year due to the new entrant losses.

Based on our understanding of the retained actuary's calculation of the Recommended Contribution and Effective Amortization Period, it appears that the retained actuary is not including an estimate of the new entrant loss each year. Estimating the new entrant loss can be accomplished in different ways. In our experience, the most common method involves increasing the normal cost for the upcoming year to include the anticipated partial-year normal cost for the members expected to be hired in the upcoming year.

When this enhancement is incorporated into the calculation of the Effective Amortization Period, the resulting period will be longer due to the additional liability that will be included in the UAAL. The impact of this enhancement has a more significant impact on plans with longer amortization periods. However, the Effective Amortization Period for SAFPPF is currently less than 10 years so this enhancement would only impact the calculation by approximately one year. The following table illustrates the potential impact of calculating the Recommended Contribution and Effective Amortization Period based on enhancing the normal cost to include the expected new entrant losses.

	January 1, 2018	Modified Normal	
	<u>Valuation (Segal)</u>	<u>Cost*</u>	<i>Difference</i>
Recommended Contribution (MOY)			
Normal Cost	73,104,062	76,954,363	5.3%
Administrative Expenses	2,951,807	2,951,807	0.0%
Payment to UAAL	18,866,908	18,866,908	0.0%
Total Recommended Contribution (\$)	94,922,777	98,773,078	4.1%
 Projected Payroll	 318,753,547	 318,753,547	 0.0%
Total Recommended Contribution (%)	29.78%	30.99%	1.21%
Effective Amortization Period (years)	9.88	11.11	1.23

** Estimated based on the original actuarial valuation results prepared by the retained actuary and an estimate by GRS for the impact of the new entrant losses. Provided only for illustration purposes and should be confirmed by the retained actuary, if applicable.*

As noted, the illustration included above is based on the original January 1, 2018 actuarial valuation prepared for SAFPPF by the retained actuary and does not reflect the replication valuations prepared by GRS.

Summary

Besides the comments above, we believe that the valuation results are developed in a reasonable manner. In the next actuarial valuation, we have the following recommendations to enhance the actuarial valuation results:

- In the next actuarial valuation, we recommend that the retained actuary update their procedures for projecting compensation for purposes of projecting plan benefits for current active members to a procedure that more appropriately reflects the stated assumptions for salary increases, and
- We recommend that the retained actuary consider the enhancement to include an estimate of the new entrant loss into the calculation of the Recommended Contribution and the Effective Amortization Period in future actuarial valuation reports.

SECTION F

CONTENT OF THE VALUATION REPORT

Content of the Valuation Report

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

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

In general, the January 1, 2018 actuarial valuation report complied with the applicable ASOPs and communicated the assumptions, methods and benefit provisions in a reasonable manner.

ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions, was issued in November 2017 and is applicable to any actuarial work product with a measurement date on or after November 1, 2018. As a result, the requirements of this new ASOP will apply to the next actuarial valuation for SAFPPF. However, the retained actuary elected to comply early with this new ASOP by adding a new section to the 2018 actuarial valuation

report, titled Risk. We support the retained actuary's decision to comply with this new ASOP a year early and to start communicating the important plan metrics associated with risk.

We have reviewed the actuarial valuation report prepared by the retained actuary and there are a few modifications to the report that would allow it to adhere more closely with ASOP Nos. 4 and 41.

Exhibit I – Actuarial Assumptions and Actuarial Cost Method

The presentation of actuarial methods and assumptions is generally complete and understandable. The methods described in this section are reasonable and appropriate for public retirement plans.

We do have a few suggestions to improve the overall communication of certain components of the valuation report.

Form of Payment – For members assumed to be single at retirement, the actuarial valuation assumes a 10-year certain and life form of payment to approximate the benefit payable to the estate if the retiree dies early in their retirement. This is a reasonable approach and we only recommend that the retained actuary document this procedure in the actuarial valuation report.

13th and 14th Checks – Active liabilities are loaded by 0.03% and non-active liabilities are loaded by 0.1% as an estimate for future payment. However, the description of the assumption notes that “no future Board actions assumed.” It seems contradictory to state that no Board action is assumed and to also include a load on the liability for future payments. There may reasons to state the assumption in such a manner but we recommend that the retained actuary revisit the description of this assumption and ensure it is consistent.

Additional Assumptions – In future actuarial valuation reports, it would improve the description of the assumptions, methods and procedures if the following items were specifically addressed:

- Timing of decrements, pay increases, and benefit payments,
- Decrement are independent probabilities,
- Base year used to project generational mortality improvements,
- Termination rates end at first retirement eligibility,
- 415 and 401(a)(17) limits are disregarded, and
- Timing of annual COLAs.

Summary

In general, the actuarial valuation report complied with the applicable Actuarial Standards of Practice. In order to improve the ability of the report to communicate the assumptions, methods and benefit provisions incorporated into the January 1, 2018 actuarial valuation, we recommend that the retained actuary incorporate the noted enhancements to future actuarial valuation reports.

SECTION G

FINAL REMARKS

Final Remarks

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

We have presented many suggestions for areas where we believe the product can be improved and we hope that SAFPPF, the City of San Antonio and the retained actuary find these suggestions useful. The retained actuary has access to information and a long history of experience with SAFPPF. We understand that the retained actuary may agree with some of our recommendations, while rejecting others. We ask that the retained actuary and SAFPPF consider our recommendations carefully.



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March 6, 2019

Board of Trustees
Fire and Police Pension Fund, San Antonio
11603 W. Coker Loop, Suite 201
San Antonio, Texas 78216-2820

Re: Segal's Response to Gabriel Roeder Smith & Company's February 7, 2019 Actuarial Audit

Dear Board of Trustees:

We have had the opportunity to assess the independent actuarial audit completed by Gabriel Roeder Smith & Company (GRS) for the San Antonio Fire and Police Pension Fund (SAFPPF). We are pleased to note on page 2 of the GRS report that, based on their review, "the actuarial valuation, studies, and reports of SAFPPF are reasonable, used appropriate assumptions and adhered to Actuarial Standards of Practice and Texas PRB Pension Funding Guidelines." We appreciate the comments that GRS provided and will consider incorporating their recommendations into future valuations and experience reviews, pending approval of the Trustees and the Plan Administrator. Segal's specific responses are included below.

Actuarial Assumptions

GRS proposed some modifications to the presentation and development of certain actuarial assumptions. The suggested changes are as follows, with our responses in italics:

- Due to the size of the retirement benefit relative to the disability benefit after 21 years of service, we recommend that the assumed disability incidence rates no longer apply after 21 years of service and only the assumed retirement rates apply for each subsequent year. The assumed disability rates currently run through age 49, regardless of service.

We concur with GRS's comments that, since the formula for Normal Retirement results in a greater benefit than the formula for Disability Retirement after 21 years of service, it is logical to assume that no new disability retirements will occur for Participants past 21 years of service. The assumed disability rates are quite low, and Segal has confirmed that the impact on the recommended contribution and on the Fund's effective amortization period will be negligible. The change will be implemented with the 2019 actuarial valuation.

- We recommend that the retained actuary better describe their rationale for applying modifications to the base mortality table and the base mortality improvement scale in the next experience study report, if applicable.

Segal's back-up for the selection of the mortality assumption is included on pages 21-27 of the experience study report for the period ended September 30, 2014. We indicated that, had

the new tables been in place during the study period, they would have anticipated a number of deaths close to what actually occurred. This was the goal, and then the generational mortality projection scale was added to reflect future improvements in longevity. Segal monitors the actual experience vs. the assumption annually, and the number of deaths has been close to the assumed number each year, which supports the chosen assumption.

We do acknowledge, however, GRS's comment that the size of the Fund does not yield enough deaths in a five-year study period to be fully credible. With the next experience study, we will consider adding additional narrative regarding data credibility. We also plan to consider the new PUB-2010 tables for Public Safety Employees, recently published by the Society of Actuaries, in our analysis at that time.

- With the understanding that the plan liability is not very sensitive to changes in the inflation assumption as long as the assumed real rate of return remains the same, we recommend that the retained actuary monitor the inflation assumption closely to ensure the assumption continues to comply with ASOP No. 27.

Segal is aware that the average inflation assumption for public funds around the country, as compiled by the National Association of State Retirement Administrators (NASRA), has declined since the Fund's last experience study. The average inflation in NASRA's Issue Brief published last month was 2.80%, and the average assumed rate of return was 7.27%. We believe that the Fund's current assumptions continue to be reasonable, but we will monitor inflation closely and ensure continued compliance with ASOP No. 27.

- During the next experience review, we recommend that the retained actuary consider the suggested approaches for developing the proposed assumptions for termination rates and the salary increases.

With the next experience review, Segal will evaluate the termination rates based on service as well as based on age. However, we do not expect to see a significant difference in results. Public safety employees generally tend to be hired in their 20s and continue their careers in the same place, so there is more correlation between service and age than for other types of pension systems. (Of the existing active participants in the SAFPPF, nearly 80% were hired in their 20s, and 96% were hired prior to 35.) Also, as GRS notes, the current turnover rates are low, and flat across most ages and services.

Regarding salary increases, GRS recommends that Segal use the actual price inflation to determine economic productivity and merit increases observed. When setting salary scale, Segal generally requests input from the sponsoring employer as well as reviewing the actual salary increases during the study period. We do take the underlying inflation assumption into account as well, as one of the building blocks in setting the assumption going forward.

Actuarial Methods and Funding Policy

GRS suggested a modification to the determination of the Recommended Contribution, as follows:

- We recommend that the retained actuary enhance future actuarial communications by aligning the actuary's "Recommended Contribution" in the actuarial valuation report with the maximum amortization period of 20-years outlined in the Board's Actuarial Funding Policy.

We concur with this recommendation, and had already included it in the 2018 valuation as Item 4 in the Significant Issues section of our report (page 5). The Board agreed to have the recommended contribution based on a rolling 20-year amortization in the future, and this change will be included with the January 1, 2019 actuarial valuation.

Actuarial Valuation Results

GRS suggested some modifications to the determination of liabilities for active Fund participants. These suggestions include:

- In the next actuarial valuation, we recommend that the retained actuary update their procedures for projecting compensation for purposes of projecting plan benefits for current active members to a procedure that more appropriately reflects the stated assumptions for salary increases.

We agree with this finding, and will make this change with the January 1, 2019 actuarial valuation. We also concur with GRS, as stated on page 26 of the audit, that there is no reason to restate the January 1, 2018 funding valuation.

- We recommend that the retained actuary consider the enhancement to include an estimate of the new entrant loss into the calculation of the Recommended Contribution and the Effective Amortization Period in future actuarial valuation reports.

Segal's valuation results include a full year of normal cost for each active participant as of the valuation date, including immediate retirees and those assumed to leave employment during the year for other reasons. This is our recognition of potential new entrant loss; those who retire or leave City employment are assumed to be replaced by new employees who will have a comparable normal cost. We believe our current methods are consistent with the GRS recommendation on page 27 of the audit report, and we do not see a reason for a change.

Content of the Valuation Report

GRS has suggested improvements in certain components of the valuation report:

- In order to improve the ability of the report to communicate the assumptions, methods and benefit provisions incorporated into the January 1, 2018 actuarial valuation, we recommend that the retained actuary incorporate the enhancements noted in Section F to future actuarial valuation reports.

We appreciate the suggestions for clarification, particularly related to the description of actuarial assumptions, and we will review them for inclusion in the January 1, 2019 actuarial valuation.

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We look forward to discussing this with you further as we strive to continue to improve our processes and the services we provide the Board and staff of the San Antonio Fire and Police Pension Fund, as well as the plan participants you represent.

Sincerely,



Leon F. (Rocky) Joyner, Jr., FCA, ASA, MAAA, EA
Vice President and Consulting Actuary



Deborah K. Brigham, FCA, ASA, MAAA, EA
Senior Vice President and Consulting Actuary

cc: Warren J. Schott – San Antonio Fire & Police Pension Fund
R. Ryan Falls, FSA, FCA, MAAA, EA – GRS