



City of Dallas Section 802.102 Review

Presentation of Results

Dallas Police and Fire Pension System (DPFP)
Employees' Retirement Fund of the City of Dallas (ERF)

Deloitte Consulting LLP
November 7, 2024



Requirements of Texas Government Code Section 802.1012

- Applies only to a public retirement system with total assets the book value of which, as of the last day of the preceding fiscal year, is at least \$100 million.
- Every five years, the actuarial valuations, studies, and reports of a public retirement system most recently prepared for the retirement system... must be audited by an independent actuary

Prior to Commencing Audit

- Agree in writing with the City to maintain the confidentiality of any non-public information provided by the pension funds for the audits
- Meet with manager of the pension funds to discuss appropriate assumptions to use in conducting audits

No later than 30th Day After Completion

- **Submit draft report to pension funds for discussion and clarification**
- **Discuss draft report with pension funds' Boards**
- **Request in writing that the pension funds submit any response to accompany the final report within 30 days of receiving draft report**

31st to 60th Day After Submitting Draft Report

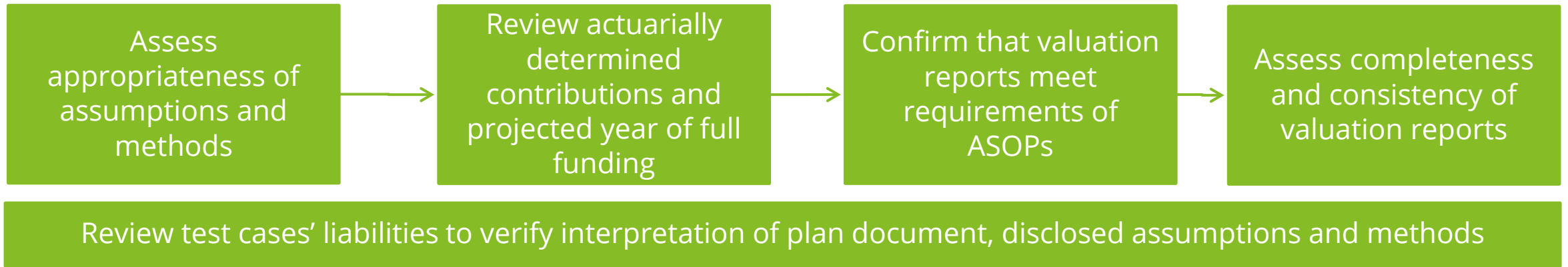
- Submit final audit report to the City
- At first regularly scheduled open meeting after receiving final report, City Council will:
 - Include presentation of audit report on the agenda
 - Present final audit report and any response from the retirement system
 - Provide printed copies of final audit report and response from retirement system to individuals attending meeting

City's responsibility - No later than 30th day After Receiving Final Report

- Submit a copy of the final report to the pension funds and the State Pension Review Board
- Maintain a copy of the final report at main office for public inspection

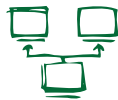
Deloitte's Process

Our approach to the requested scope is to perform a level two actuarial review, where Deloitte does not replicate the retained actuary's valuation



Items received from the Plan for Deloitte's Process

System data from
DPFP/ERF



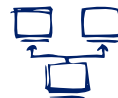
Test cases from
retained actuary



Most recent
valuation report



Final valuation data
from retained actuary



Most recent
experience study



Plan document



Results and Findings

Results

- It is our opinion that the most recent actuarial valuation report and experience study for DPFP (January 1, 2023 actuarial valuation report and December 31, 2019 experience study) and ERF (December 31, 2022 actuarial valuation report and December 31, 2019 experience study) were performed in compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.
- For the DPFP, the assumptions used in the January 1, 2023 actuarial valuation were updated as recommended in the experience study, with the exception of several assumptions that were updated between January 1, 2020 and January 1, 2023 to reflect recent pertinent changes (for example, the Salary Scale was updated to reflect the 2023 Meet & Confer Agreement).
- For the ERF, the assumptions used in the December 31, 2022 actuarial valuation were updated as recommended in the experience study.
- Plan provisions, methods, and assumptions disclosed in actuarial valuation reports were appropriately valued based on our review of the sample life outputs.

Findings

- We have noted findings that could provide additional detail and improve the understanding of the actuarial work performed, including clarifications for certain assumptions and plan provisions being valued. The full list of findings is shown in the Appendix.
- As required by Section 802, the DPFP and ERF provided responses to our findings. In general, the retained actuaries confirmed that they will implement or will consider implementing changes to the valuation report and experience study based on our findings.

Appendix A - DPFP

Full Summary of Findings

DPFP: Summary of Key Findings

Valuation Report

Below are the findings from the review of the valuation report to be considered for future modifications.

Area	Findings	Purpose
Plan Provisions	Add a description that a member on active service who has 10 years or more of participation in DROP shall no longer have the amount of the member's retirement pension credited to the member's DROP account while the member is on active service .	Provide additional detail on plan design
Report Content	Disclose the history of the projected fully funded year in the valuation report	Enhance understanding of the plan's projected full funding history
Report Content	Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study	Improve ability to validate investment return assumption
Report Content	Disclose 10-20 years of undiscounted cash flows	Enhance understanding of the plan's financial obligation
Report Content	In <i>Exhibit A: Table of plan demographics</i> , add a line for retirees that shows Average monthly DROP annuity	Enhance understanding of data
Report Content	In <i>Exhibit A: Table of plan demographics</i> , add a footnote that average age for beneficiaries excludes child beneficiaries	Enhance understanding of data

DPFP: Summary of Key Findings

Experience Study

Below are the findings from the review of the experience study to be considered for future modifications.

Area	Findings	Purpose
Payroll Growth	Revisit the 2.50% payroll growth assumption in light of the Meet and Confer Agreement and other national data.	Improve appropriateness of Assumption Selection
Investment Return	Include these details to support the assumption: <ul style="list-style-type: none"> the target asset allocation used in the analysis expected returns by asset class used in the forecast description of whether the arithmetic or geometric return was considered when developing the reasonable range of investment returns 	Support assumption selection
Investment Return	Revisit the assumption considering recent capital market assumptions	Improve Appropriateness of Assumption Selection
Salary Increase Assumption	Include supporting detail for the assumption for years after the Meet and Confer agreement	Support assumption selection
Cost-of-Living Adjustment Assumption	Provide the rationale for the selection of the 1.5% COLA assumption	Support assumption selection
Cost-of-Living Adjustment Assumption	Consider performing stochastic analysis on the COLA Assumption due to the presence of both an upper limit on the annual COLA (4% maximum COLA) and a lower limit of 0%	Improve appropriateness of assumption selection
Mortality	Discuss the basis for the selection of the set back/forward period, including a credibility analysis	Support assumption selection

DPFP: Summary of Key Findings

Experience Study (Cont.)

Below are the findings from the review of the experience study to be considered for future modifications.

Area	Findings	Purpose
Retirement	Include detail to support the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017), and experience for DROP Actives.	Support assumption selection
Retirement for non-DROP Active Members	Consider whether members who may become eligible for the 20 & Out provision warrant a separate assumption	Align assumption selection with expected behavior based on plan provisions
Retirement for non-DROP Active Members	Consider supplementing the experience study analysis with qualitative considerations, such as an analysis of the plan provisions or an assessment of peer retirement systems with similar provisions	Align assumption selection with expected behavior based on plan provisions
Withdrawal	Include detail to support the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017)	Support assumption selection
Withdrawal	Consider adding a separate withdrawal assumption for members hired after March 1, 2011	Align assumption selection with expected behavior based on plan provisions
Disability	The next experience study should include an analysis on the incidence of service versus non-service related disabilities	Improve appropriateness of assumption selection

Appendix B - ERF

Full Summary of Findings

ERF: Summary of Key Findings

Valuation Report

Below are the findings from the review of the valuation report to be considered for future modifications.

Area	Findings	Purpose
Plan Provisions	Consider adding a description that nonvested terminated employees who do not request a refund of member's contributions within three years forfeit their refund.	Provide additional detail on plan design
Census Data	Correct the application of 401(a)(17) limits in the valuation data	Improve accuracy of census data
Funding Method	Consider modifying the amortization method to conform to the PRB Guidelines, which recommend using a finite or closed, funding period, over as brief a period possible.	Enhance selection of methodology
Report Content	Disclose the history of projected fully funded year in the valuation report	Enhance understanding of the plan's projected full funding history
Report Content	Disclose 10-20 years of undiscounted cash flows	Enhance understanding of the plan's financial obligation
Report Content	Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study	Improve ability to validate appropriateness of asset management policies and investment return assumption

ERF: Summary of Key Findings

Experience Study

Below are the findings from the review of the experience study to be considered for future modifications.

Area	Findings	Purpose
Payroll Growth	Consider using a consistent payroll growth assumption between the open group projections (3.00%) and the assumption used for estimating payroll for the following fiscal year (2.50%).	Improve Appropriateness of Assumption Selection
Administrative Expense Assumption	Clarify that the estimated administrative expenses are expected to increase with inflation for purposes of the ADC calculation and projection of fully funded year	Support assumption selection
Administrative Expense Assumption	Provide additional disclosure on the difference between “administrative expense” and “depreciation expense”	Support assumption selection
Administrative Expense Assumption	Consider alternate approaches to determining the assumption to reduce volatility	Support assumption selection
Retirement	Include rationale and basis for the selection of the Tier B retirement assumption.	Enhance support assumption selection
Retirement	Consider developing a separate retirement assumption for the first year in which someone becomes eligible for Tier B.	Align assumption selection with expected behavior based on plan provisions
Retirement	Consider studying the retirement behavior of deferred vested participants.	Enhance support for assumption selection
Withdrawal	Consider adding a separate withdrawal assumption for Tier B employees.	Align assumption selection with expected behavior based on plan provisions
Age of Survivor	Provide justification for the female spouse age assumption.	Enhance support for assumption selection



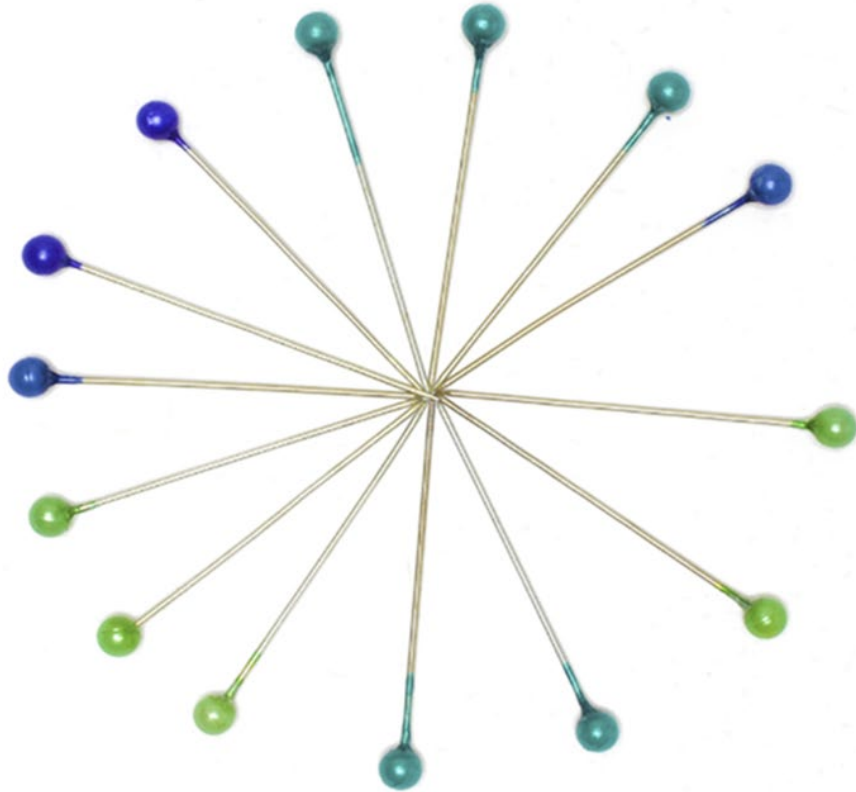
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Dallas Police and Fire Pension System

Review under Texas Government Code Section
802.1012

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Actuarial Opinion

This report presents the results of the actuarial review of the January 1, 2023 actuarial valuation and experience study for the Dallas Police and Fire Pension System ("DPFP", or "System", or "plan"), a plan sponsored by the City of Dallas ("City"), to satisfy the requirements of Texas Government Code Section 802.1012 ("Section 802").

Our review was based on participant data and financial information provided by the DPFP and their retained actuary, Segal Consulting ("Segal" or "actuary"), and our interpretation of the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

In our opinion, the January 1, 2023 actuarial valuation (actuarial valuation) and the December 31, 2019 actuarial experience study (experience study) for the DPFP were performed in compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

Future measurements of the financial metrics associated with the actuarial valuation may differ significantly from the measurements presented in this report due to factors such as actual plan experience not evolving as anticipated due to the selection of economic and demographic assumptions; changes in economic or demographic assumptions; changes in certain valuation parameters, perhaps triggered by the plan financial condition, such as a different amortization period, or additional cost or contribution requirements based on the plan's funding status; and changes in plan provisions or applicable law. The scope of our work does not include an analysis of the impacts of these and similar contingencies.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

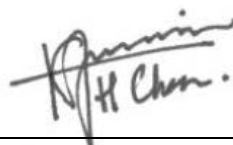
This report was prepared solely for the benefit and internal use of the City. This report is not intended for the benefit of any other party and may not be relied upon by any third party for any purpose, and Deloitte Consulting accepts no responsibility or liability with respect to any party other than the City.

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DELOITTE CONSULTING LLP



Michael de Leon, ASA, EA, FCA, MAAA
Managing Director



Jeannie Chen, ASA, EA, FCA, MAAA
Specialist Leader



Joe Kropiewnicki, FSA, EA, MAAA, CERA
Manager

Executive Summary

Intent

The intent of this report is to review the January 1, 2023 actuarial valuation and the December 31, 2019 actuarial experience study reports prepared by the retained actuary for compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board, and to satisfy the requirements of Texas Government Code Section 802.1012.

Process

To achieve the above-stated goals, the following were reviewed: DPFP-provided and actuary-provided census data, sample life output from the actuary's valuation software, the January 1, 2023 actuarial valuation report, and the December 31, 2019 experience study report. The DPFP-provided data was used by the retained actuary to develop the census data that was the basis for the actuarial valuation.

Results and Findings

As stated in the previous section, it is our opinion that the January 1, 2023 actuarial valuation and the December 31, 2019 actuarial experience study for the DPFP were performed in compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

The assumptions used in actuarial valuation were updated as recommended in the experience study, with the exception of several assumptions that were updated between January 1, 2020 and January 1, 2023 to reflect recent pertinent changes (as discussed later in this report). Plan provisions, methods, and assumptions disclosed in the January 1, 2023 actuarial valuation report were appropriately valued based on our review of the sample life outputs.

Findings in this report could provide additional detail and improve the understanding of the actuarial work performed, including clarifications for certain assumptions and plan provisions being valued.

These comments are discussed in the Summary of Key Findings section as well as the detailed sections that follow.

Summary of Key Findings

The tables below summarize findings from the review of the valuation report and the experience study to be considered for future modifications. These findings are discussed in the following sections.

Valuation Report

Area	Findings	Purpose
Plan Provisions	Add a description that a member on active service who has 10 years or more of participation in DROP shall no longer have the amount of the member's retirement pension credited to the member's DROP account while the member is on active service.	Provide additional detail on plan design
Report Content	Disclose the history of the projected fully funded year in the valuation report	Enhance understanding of the plan's projected full funding history
Report Content	Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study	Improve ability to validate investment return assumption
Report Content	Disclose 10-20 years of undiscounted cash flows	Enhance understanding of the plan's financial obligation
Report Content	In <i>Exhibit A: Table of plan demographics</i> , add a line for retirees that shows Average monthly DROP annuity	Enhance understanding of data
Report Content	In <i>Exhibit A: Table of plan demographics</i> , add a footnote that average age for beneficiaries excludes child beneficiaries	Enhance understanding of data

Experience Study

Area	Findings	Purpose
Payroll Growth	Revisit the 2.50% payroll growth assumption in light of the Meet and Confer Agreement and other national data.	Improve appropriateness of Assumption Selection
Investment Return	Include these details to support the assumption: <ul style="list-style-type: none"> the target asset allocation used in the analysis expected returns by asset class used in the forecast description of whether the arithmetic or geometric return was considered when developing the reasonable range of investment returns 	Support assumption selection
Investment Return	Revisit the assumption considering recent capital market assumptions	Improve Appropriateness of Assumption Selection
Salary Increase Assumption	Include supporting detail for the assumption for years after the Meet and Confer agreement	Support assumption selection
Cost-of-Living Adjustment Assumption	Provide the rationale for the selection of the 1.5% COLA assumption	Support assumption selection
Cost-of-Living Adjustment Assumption	Consider performing stochastic analysis on the COLA Assumption due to the presence of both an upper limit on the annual COLA (4% maximum COLA) and a lower limit of 0%	Improve appropriateness of assumption selection
Mortality	Discuss the basis for the selection of the set back/forward period, including a credibility analysis	Support assumption selection
Retirement	Include detail to support the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017), and experience for DROP Actives.	Support assumption selection
Retirement for non-DROP Active Members	Consider whether members who may become eligible for the 20 & Out provision warrant a separate assumption	Align assumption selection with expected behavior based on plan provisions
Retirement for non-DROP Active Members	Consider supplementing the experience study analysis with qualitative considerations, such as an analysis of the plan provisions or an assessment of peer retirement systems with similar provisions	Align assumption selection with expected behavior based on plan provisions

Area	Findings	Purpose
Withdrawal	Include detail to support the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017)	Support assumption selection
Withdrawal	Consider adding a separate withdrawal assumption for members hired after March 1, 2011	Align assumption selection with expected behavior based on plan provisions
Disability	The next experience study should include an analysis on the incidence of service versus non-service related disabilities	Improve appropriateness of assumption selection

Review of Plan Provisions

The plan provisions and some actuarial assumptions and methods are prescribed in Article 6243a-1 of the Texas Statutes (as amended as of September 1, 2021 by HB3375) ("Plan Document"). This review compares the key plan provisions in the Plan Document against the provisions disclosed in the report prepared by the retained actuary.

Comments and Findings

Pages 54-60 of the valuation report outline the summary of plan provisions. The provisions in the summary of benefits do not conflict with the provisions in the Plan Document, nor do they omit plan provisions that could have a significant impact on plan benefits. The finding below is a way to improve transparency and completeness of the valuation report's summary of plan provisions.

Provision	Findings
DROP Account	Add a description that a member on active service who has 10 years or more of participation in DROP shall no longer have the amount of the member's retirement pension credited to the member's DROP account while the member is on active service.

Review of Census Data

Actuarial valuations require certain adjustments to the census data. This section assesses the reasonableness of data adjustments and reconciliation performed by the retained actuary, as well as the completeness of the documentation in the valuation report. The analysis is based on data files supplied by DFPF, valuation data files created by the retained actuary, and sample life output from the actuary's valuation software. The retained actuary utilized DFPF data to build appropriate census data for the actuarial valuation.

Comments and Findings

Documentation of data review procedures performed by the actuary

Page 13 of the DFPF valuation report states the following:

An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.

This statement appropriately addresses the requirements of Section 3.5 of ASOP 23.

Data reconciliation and adjustment process performed by the actuary

The actuary's valuation file is generally consistent with the data supplied by DFPF based on a review of information in key fields. Additionally, the actuary's valuation file is consistent with the summary statistics in the valuation report.

Page 52 of the DFPF valuation report mentions that for unknown data for participants:

Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

This statement appropriately addresses Section 3.4c of ASOP 23.

Verification of Sample Life Data

The data used in the sample life calculation is consistent with the actuary's valuation data and the data provided by the DFPF. Details of the sample life review are in the *Review of Sample Lives* section below.

Review of Actuarial Methods

This section determines if the actuarial cost method, actuarial value of asset method, and funding method are reasonable and consistent with generally accepted actuarial practice, relevant ASOPs, and the Pension Review Board Guidelines for Developing a Funding Policy¹ ("PRB Guidelines"), in particular the component on selecting Actuarial Methods.

Cost Method

The actuarial cost method used is Entry Age Normal (EAN) as a level percentage of pay. Under this method, the present value of future benefits (PVFB) is determined for each employee and is then spread evenly as a level percentage of pay over each employee's career. This method therefore produces employer contributions that are level as a percentage of payroll.

The actuarial cost method is consistent with the requirements of ASOP 4 and PRB Guidelines.

Actuarial Value of Asset Method

The actuarial valuation report describes the actuarial value of asset method as follows:

Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.

Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

The actuarial value of asset method is consistent with the requirements of ASOP 44 and PRB Guidelines.

Funding Method

The actuarial valuation report describes the amortization method used to calculate the Actuarially Determined Contribution (ADC) as follows:

The unfunded actuarial accrued liability as of January 1, 2020 is amortized on a closed, 25-year period. Beginning January 1, 2021, each year's gains and losses are amortized over a closed, 20-year period.

¹ <https://www.prb.texas.gov/wp-content/uploads/2024/07/Funding-Policy-Guidance-Adopted-07.25.2024.pdf>

The amortization method is consistent with the requirements of ASOP 4 and PRB Guidelines.

While the ADC amortization method meets PRB Guidelines, the HB 3158 prescribed statutory contribution rate of 34.50% raises the period to full funding to 82 years. As stated in the January 1, 2023 valuation report:

The Board's funding policy meets the standard of targeting 100% funding of the actuarial accrued liability if the ADC is contributed.

[...]

The effective amortization period of 82 years based on current funding methodology is not a reasonable period for paying off the UAL.

Review of Report Content

This section reviews the content of the actuarial report for required disclosures.

Comments and Findings

The actuarial report meets applicable actuarial standards of practice as outlined in Actuarial Standards of Practice No. 41, *Actuarial Communications*, and appears to accurately represent the funded status of the plan. However, Deloitte presents the following considerations for the retained actuary:

- The retained actuary should disclose the history of the projected fully funded year in the valuation report.
- Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study.
- Disclose the undiscounted cash flows, a beneficial tool for understanding the plan's financial obligation. This could be for a 10 to 20 year period, showing current and future retirees separately.
- In *Exhibit A: Table of plan demographics*, add a line for retirees that shows Average monthly DROP annuity. Currently, "Average monthly benefit" does not include any DROP annuities.
- In *Exhibit A: Table of plan demographics*, add a footnote that average age for beneficiaries excludes child beneficiaries.

Review of Economic Assumptions

Actuarial calculations inherently make predictions about future events to estimate financial costs on a present value basis and to quantify and/or qualify the risks and volatility associated with the financial costs. To do so, actuaries must make best-estimate assumptions about these possible future events and establish methods for performing the calculations. Actuarial assumptions are needed to determine the value of plan obligations to its participants, and actuarial methods create a schedule for allocating costs over a participant's career. The assumptions and methods are established by adhering to best practices for determination, studying historical experience, utilizing relevant external data, and considering internal and reputable external opinions on expected future experience. Comprehensive reporting of the assumptions and methods is required under ASOPs 27, 35, and 41.

This section considers assumptions categorized as economic, which include assumptions dependent on economic factors, such as the inflation rate, payroll growth rate, investment return, and salary increase rate. **Actuarial Standards of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations***, provides guidance to actuaries in selecting economic assumptions, and this ASOP is relied upon for the review below.

Inflation

The inflation assumption is not directly used to measure the liabilities of the plan; rather it is a component of all economic assumptions, including payroll growth, investment return, and salary increase.

Retained Actuary's Assumption

The inflation assumption is 2.50%.

Comments and Findings

The experience study considered inflationary data from several sources, including the 2019 OASDI Trustee Report and historical CPI-U. The inflation assumption is consistent with general trends in public sector plans; the average inflation assumption for public sector plans has decreased steadily from 3.84% in 2002 to 2.47% in 2022 per the March 2024² NASRA Survey.

The long-range inflation forecasts from the Office of the Chief Actuary of the Social Security Administration provided in the 2024 OASDI Trustees Report³ is as follows:

Scenario	CPI
Low Cost	3.0%
Intermediate Cost	2.4%
High Cost	1.8%

² <https://www.nasra.org/files/Issue%20Briefs/NASRAInvReturnAssumptBrief.pdf>

³ <https://www.ssa.gov/OACT/TR/2024/tr2024.pdf>

Note that while the experience study was performed as of December 31, 2019, the inflation assumption of 2.50% remains reasonable as of January 1, 2023 based on the information above.

Payroll Growth and Wage Inflation

The assumed aggregate payroll growth is used in the amortization of the unfunded actuarial accrued liability. Payroll growth is chosen using a building block approach in which the inflation assumption is added to the assumed real wage growth. Real wage growth includes wage growth due to productivity, but excludes individual compensation increases above wage growth, also called “merit” increases.

Retained Actuary’s Assumption

The payroll growth assumption is 2.50%. While the wage inflation assumption is not explicitly disclosed, the inflation rate is 2.50%, implying that the real wage growth assumption is 0.0%.

Comments and Findings

National real wages can be studied by reviewing increases in the historical Average Wage Index, or AWI, published by the Social Security Administration. The AWI from 1982 to 2022, is shown below. Real Payroll Growth is the AWI less the CPI-U.

Period	Years	AWI	CPI-U (US)	Real Payroll Growth
2017-2022	5	4.12%	3.11%	1.00%
2012-2022	10	3.58%	2.31%	1.27%
2002-2022	20	3.19%	2.35%	0.84%
1992-2022	30	3.44%	2.38%	1.06%
1982-2022	40	3.64%	2.73%	0.91%

Additionally, the long-range real payroll growth forecasts from the Office of the Chief Actuary of the Social Security Administration provided in the 2024 OASDI Trustees Report is as follows:

Scenario	Payroll Differential
Low Cost	1.74%
Intermediate Cost	1.14%
High Cost	0.53%

The DFP’s salary increases are governed by the 2023 Meet and Confer Agreement, which prescribes salary increases through 2025. The ultimate salary increase in the agreement is 3.00% for Officers, Corporals, Drivers, Senior Officers, and Chiefs, and 2.50% for Sergeants, Lieutenants, Captains, Majors, Deputy Chiefs, and Assistant Chiefs.

Based on the national data above, as well as the 3.00% ultimate salary increase for a majority of positions in the 2023 Meet and Confer Agreement, the DFP should revisit the 2.50% payroll growth assumption (and implied 0.0% real wage growth assumption).

Investment Return

The investment return assumption reflects anticipated returns on the plan's current and future assets. It is also used to calculate the present value of all plan liabilities and generally has the greatest impact of all assumptions reviewed in this report. The investment return assumption is chosen using a building block approach in which the inflation assumption is added to the assumed real rate of return.

Retained Actuary's Assumption

The rate of investment return assumption is 6.50%. This consists of a 2.50% inflation assumption and a 4.00% real rate of return assumption.

Comments and Findings

The experience study considered the assumption for peer plans from the Public Fund Survey published by NASRA, DFPF's historical returns, and a high-level description of the reasonable range based on DFPF's inflation assumption and target asset allocation. A reasonable range of 6.50% to 7.25% was determined.

The following details could be included in the next study to support the assumption:

- the target asset allocation used in the analysis
- expected returns by asset class used in the forecast
- description of whether the arithmetic or geometric return was considered when developing the reasonable range of investment returns.

The validity of the 2.50% inflation assumption is detailed in the prior section. This section assesses the validity of the 4.00% real rate of return assumption based on the target asset allocation and the anticipated risk premiums of each of the portfolio's asset classes disclosed in the January 1, 2023 valuation report. The retained actuary's projected real rates of return are based on the Segal Marco Advisors.

To provide another source of data, Deloitte corroborated this assumption using the plan's target asset allocation and the publicly available JPMorgan Asset Management Long-Term Capital Market Assumptions for 2024 (published 9/30/2023)⁴. The results are summarized in the table below:

⁴ JPMorgan Asset Management provides a publicly available summary of long-term investment yield forecasts by asset class. JPMorgan Chase is a well-known and recognizable source for this type of information. Accordingly, we believe this information is an appropriate source to corroborate the information provided in support of the Long-Term Rate of Return. <https://am.jpmorgan.com/us/en/asset-management/institutional/insights/portfolio-insights/lcma/archive/>

Asset Class	Target Allocation	Segal Marco Advisors		JPMorgan	
		Long-Term Expected Real Rate of Return	Long-Term Expected Nominal Rate of Return ¹	Long-Term Expected Nominal Rate of Return - Arithmetic	Average Expected Risk (Standard Deviation)
Global Equity	55.00%	7.01%	9.51%	9.05%	16.68%
Emerging Markets Equity	5.00%	8.71%	11.21%	10.77%	21.20%
Private Equity	5.00%	9.96%	12.46%	11.46%	20.06%
Short-Term Investment Grade Bonds	6.00%	0.96%	3.46%	3.91%	1.58%
Investment Grade Bonds	4.00%	1.61%	4.11%	6.04%	7.14%
High Yield Bonds	4.00%	3.71%	6.21%	6.83%	8.36%
Bank Loans ³	4.00%	3.21%	5.71%	6.79%	7.89%
Emerging Market Debt	4.00%	3.71%	6.21%	7.23%	9.64%
Real Estate	5.00%	3.61%	6.11%	8.02%	10.60%
Natural Resources	5.00%	4.86%	7.36%	5.31%	18.00%
Cash	3.00%	0.71%	3.21%	2.90%	0.59%
Expected Portfolio Arithmetic Return			8.28%	8.15%	
Expected Portfolio Standard Deviation					12.62%
Expected Portfolio Geometric Return (JPMorgan's Inflation Assumption)					7.36%
Expected Portfolio Geometric Return (Adjusted for Plan's Inflation Assumption)²					7.36%

¹Adjusted for the DFPF's inflation assumption of 2.50%.

²Adjusted for Plan's Inflation Assumption of 2.50% compared to JPMorgan's Inflation Assumption of 2.50%.

Additionally, considering the short-term volatility of the expectations contrasted with the long-term nature of this assumption, the JPMorgan Asset Management Long-Term Capital Market Assumptions for 2020-2024 was also considered, based on the same target asset allocation and methodology as above. The 2020-2024 historical range of expected portfolio geometric return is 5.18%-7.56%.

JPMorgan Year	2024	2023	2022	2021	2020
Expected Portfolio Geometric Return (Adjusted for Plan's Inflation Assumption)	7.36%	7.56%	5.18%	5.54%	6.59%

Based on the above analysis, while the 6.50% Investment Return assumption is reasonable, the DFPF should revisit this assumption considering 1) it was at the low end of the reasonable range in the retained actuary's December 31, 2019 experience study and 2) long-term return expectations have increased since the time of the experience study.

Salary Increase

The salary increase assumption is used to project an employee's salary from the valuation date to the assumed termination date(s). It is comprised of inflation, real wage growth, and a merit scale. Inflation and real wage growth were already discussed above. This section focuses on the merit scale.

Retained Actuary’s Assumption

The actuarial valuation report describes the salary scale assumption as follows:

The salary scale assumption is based on the City’s pay plan, along with analysis completed in conjunction with an Experience Study Report for the five-year period ended December 31, 2019 and the 2019 and 2023 Meet and Confer Agreements.

Year	Officers	Corporals, Drivers, Senior Officers	Sergeants, Lieutenants, Captains, Majors, Deputy Chiefs, Assistant Chiefs, Chiefs
2023	7.25%	6.75%	6.25%
2024+	3.00%	3.00%	2.50%

Comments and Findings

The experience study noted that salary increases are constructed using a “building block” approach as the sum of inflation, productivity, and merit/promotion. Since the 2019 experience study, the assumption has been updated to align with the schedules in the 2023 Meet and Confer Agreement. As discussed in the *Payroll Growth* section, the ultimate salary growth of 3.00% implies a productivity and/or merit/promotion increase of 0.50%, while the payroll growth of 2.50% implies no productivity and/or merit/promotion increases (the 2019 experience study recommended an ultimate salary growth of 2.50% which was used for the 2020 through 2022 valuations. This was updated to 3.00% for Officers, Corporals, Drivers, and Senior Officers in the 2023 valuation).

While the assumption is reasonable, the next study should include supporting detail for the assumption for years after the Meet and Confer agreement is in effect, such as considering a combination of a) historical experience and b) long-term expectations of market-based pay philosophy as outlined in the latest Meet and Confer agreement.

Cost-of-Living Adjustment

The cost-of-living-adjustment (COLA) assumption is used to estimate the plan’s future COLA adjustments for retirees, which are often based on an inflation index.

COLA Plan Provision

As described in Section 6.12 of the Plan Document, the Board may grant an ad hoc COLA based on the actual market return over the prior five years less 5%, not to exceed 4% of the base benefit, if, after granting a COLA, the funded ratio on a market value of assets basis is no less than 70%.

Retained Actuary’s Assumption

Prior to October 1, 2073, the assumed COLA is 0.00%, and beginning October 1, 2073, the assumed COLA is 1.50% on the original benefit. The assumption for the year the COLA begins will be updated on an annual basis and set equal to the year the DFPF is projected to be 70% funded on a market

value basis after the COLA is reflected. The COLA assumption will automatically be updated as needed to remain five percentage points less than the net investment return assumption.

Comments and Findings

The DFPF's COLA assumption ties to actual market returns less 5%, with the added complexity of a 4% maximum. Section 3.5.1 of ASOP 27 provides guidance on assumptions for plan provisions that are difficult to measure, such as a COLA with a maximum:

Depending on the purpose of the measurement, the actuary may determine that it is appropriate to adjust the economic assumptions to provide for considerations such as adverse deviation or plan provisions that are difficult to measure, as discussed in ASOP No. 4. Any such adjustment made should be disclosed in accordance with section 4.1.1.

The 1.5% assumption aligns with the 6.50% net investment return assumption less five percentage points. While the assumption of 1.5% is reasonable, the retained actuary should provide the rationale for the selection of the 1.5% COLA assumption. The retained actuary could also consider performing stochastic analysis on this assumption due to the presence of both an upper limit on the annual COLA (4% maximum COLA) and a lower limit of 0%. Because of these bounds, the expected COLA could be different from simply taking the expected net investment return less five percentage points.

Overall, the COLA assumption is reasonable and appropriately reflects the plan provisions and the updated year in which the DFPF is projected to be 70% funded.

Administrative Expense

The administrative expense assumption is used to estimate the plan's future costs for administering the pension plan.

Retained Actuary's Assumption

The actuarial valuation report describes the administrative expense assumption as follows:

\$7,000,000 per year, payable monthly (equivalent to \$6,783,022 at the beginning of the year), or 1% of computation pay, if greater.

Comments and Findings

The retained actuary discloses the following in the 2022 actuarial valuation report:

Because it is expected that expenses will continue at a lower level, we have lowered the assumption to \$7,000,000 for the current year.

The table below shows the administrative expenses for the DFPF for the past five years.

DPFP Administrative Expense History	
2022	\$6,361,999
2021	\$6,390,829
2020	\$6,534,350
2019	\$6,445,251
2018	\$5,861,410
5-Year Average	\$6,318,768

Given the recent experience of the DPFP and the explanation from the retained actuary, the assumption is reasonable.

Review of Demographic Assumptions

This section considers assumptions categorized as demographic, which include any non-economic assumption and generally include assumptions regarding how the workforce will behave. **Actuarial Standard of Practice No. 35, *Selection of Demographic and other Noneconomic Assumptions for Measuring Pension Obligations***, provides guidance to actuaries in selecting demographic and other assumptions not covered by ASOP No. 27, and this ASOP is relied upon for the review below.

Mortality

The mortality assumption is used to determine when an active employee or retired employee will become deceased.

Retained Actuary's Assumption

The following table shows the current mortality assumptions for each group of participants:

Participant Group	Assumption
Healthy pre-retirement	Pub-2010 Public Safety Employee Amount-Weighted Mortality Table, set forward five years for males, projected generationally using Scale MP-2019
Healthy annuitants and dependent spouses	Pub-2010 Public Safety Retiree Amount-Weighted Mortality Table, set back one year for females, projected generationally using Scale MP-2019
Healthy contingent beneficiaries	Pub-2010 Public Safety Contingent Survivor Amount-Weighted Mortality Table, set back one year for females, projected generationally using Scale MP-2019
Disabled annuitants	Pub-2010 Public Safety Disabled Retiree Amount-Weighted Mortality Table, set forward four years for males and females, projected generationally using Scale MP-2019

Comments and Findings

The experience study does not provide sufficient discussion for the selection of these adjustments or if credible experience exists by cohort. The high-level description of the development of the assumption is reasonable, as it takes the most current published tables into account and considers plan experience. In accordance with ASOP 35 Section 3.5.3, the retained actuary considered the mortality for participants in post-retirement status (for both retirees and beneficiaries), disabled retirement status, and pre-retirement (active) status.

While the assumption is reasonable, the next study should include a discussion of the basis for the selection of the set back/forward period including a credibility analysis to enhance support for the assumption.

Retirement

The retirement assumption is used to determine when an employee is expected to commence benefits.

Retained Actuary's Assumption

For DROP active members, the assumption is based on age, with separate rates for Police and Fire. Additionally, 75% retirement is assumed after ten years in DROP.

For non-DROP actives, the assumption is based on age, with separate rates based on hire date and attainment of 20 years of service as of September 1, 2017. Additionally, 100% retirement is assumed once the benefit multiplier hits 90% maximum.

DROP Active Members

Age	Rate (%)	
	Police	Fire
Under 50	1.00%	0.75%
50	10.00%	0.75%
51	15.00%	0.75%
52-53	15.00%	10.00%
54	25.00%	10.00%
55-57	25.00%	15.00%
58-62	30.00%	40.00%
63	40.00%	50.00%
64	50.00%	50.00%
65 & Over	100.00%	100.00%

75% retirement rate after ten years in DROP

Non-DROP Active Members

Age	Rate (%)	
	Members hired prior to March 1, 2011 with at least 20 years of service as of September 1, 2017	Members hired prior to March 1, 2011 with less than 20 years of service as of September 1, 2017 & Members hired on or after March 1, 2011
Under 50	1.00%	1.00%
50-51	8.00%	2.00%
52	10.00%	2.00%
53	15.00%	2.00%
54	20.00%	2.00%
55	35.00%	2.00%
56-57	40.00%	2.00%
58-60	75.00%	25.00%
61	75.00%	50.00%
62	100.00%	100.00%

100% retirement rate once benefit multiplier hits 90% maximum

Additionally, assumptions with respect to deferred vested members are as follows:

- members who terminated prior to September 1, 2017 are assumed to retire at age 50.
- members who terminated on or after September 1, 2017 are assumed to retire at age 58.

Comments and Findings

For DROP actives, the assumption generally aligns to plan experience and has a large number of exposures. While the experience study recommended assuming 100% retirement after ten years in DROP, as of 1/1/2023 this assumption was changed from 100% to 75% but did not provide details supporting this assumption change. Note that after ten years in DROP, a member shall no longer have the amount of the member's retirement pension credited to the member's DROP account while the member is on active service.

For non-DROP actives, it is appropriate to separate the analysis for actives based on hire date and attainment of 20 years of service as of September 1, 2017 to align to the benefit provisions applicable to each cohort.

Based on the information provided, the assumptions are reasonable.

While the assumptions are reasonable, the following should be considered in the next study to enhance support for the assumption:

- include supporting detail for the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017).
- consider whether non-DROP actives who may become eligible for the 20 & Out provision warrant a separate assumption given that the benefit reduction is lower post HB-3158 and the plan assumes higher retirement rates for those who have attained 20 years of service.
- consider supplementing the experience study analysis with qualitative considerations, such as an analysis of the plan provisions or an assessment of peer retirement systems with similar provisions for non-DROP active members hired prior to March 1, 2011 with less than 20 years of service as of September 1, 2017 and Members hired on or after March 1, 2011, given that there are very few retirement exposures during the study period.

Withdrawal

The withdrawal assumption is used to determine when an employee who is not eligible for retirement will terminate employment.

Retained Actuary's Assumption

The withdrawal assumption is based on years of service, with separate rates for Police and Fire:

Years of Service	Rate (Police)	Rate (Fire)
0	20.00%	10.00%
1	5.50%	5.50%
2	5.50%	5.50%
3	5.50%	5.50%
4	5.50%	5.50%
5	5.50%	5.50%
6	3.50%	5.50%
7	3.50%	1.00%
8	3.50%	1.00%
9	3.50%	1.00%
10	3.50%	1.00%
11-14	2.00%	1.00%
15-24	1.00%	1.00%
25 and over	0.00%	0.00%

There is 0% assumption of termination for members eligible for retirement.

Comments and Findings

This is a robust basis for the assumption because it reflects the general tendency of shorter-tenured employees to incur higher rates of turnover. The assumed rates reflect higher expected turnover within the first several years of service, which is not uncommon. Based on the information provided, the withdrawal assumption appears reasonable.

While the assumption is reasonable, the following should be considered in the next study to enhance support for the assumption:

- include supporting detail for the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017).
- consider adding a separate withdrawal assumption for members hired after March 1, 2011. As benefits for employees hired after March 1, 2011 are less valuable, withdrawals may be higher for later years of service than for employees hired before March 1, 2011.

Disability

The disability assumption is used to determine when an employee becomes disabled and qualifies for disability benefits.

Retained Actuary's Assumption

The disability assumption is based on age, with sample rates as follows:

Age	Rate
20	0.010%
25	0.015%
30	0.020%
35	0.025%
40	0.030%
45	0.035%
50	0.040%

100% of disabilities are assumed to be service related.

Comments and Findings

The current disability rates appear reasonable and consistent with the experience reviewed, and in line with rates for other Texas public safety plans. Using a single table for Police and Fire groups is an appropriate simplification due to the small sample size and inability to infer significant information about each group separately.

While the assumption is reasonable, the next study should consider including an analysis on the incidence of service versus non-service related disabilities, as service-related disabilities are calculated with a 20-year minimum on benefit service. While there is a high likelihood of disabilities

being service-related for Police and Fire, the assumption that 100% of disabilities are service-related should be addressed in the next experience study.

Marital Status

It is common for actuaries to make an assumption regarding the marital status of plan participants for use in assuming future benefit eligibility and election. Like the inflation assumption, the marital status assumption is often a component of several other assumptions.

Retained Actuary's Assumption

75% of participants are assumed to be married.

Comments and Findings

The observed data in the experience study supports the assumption of 75%. Based on the information provided, the assumption is reasonable.

Age of Survivor

Future Joint & Survivor annuity payment amounts are based in part on the age of the survivor. Because valuation mortality and interest rates are not equal to those used to calculate optional forms of payment, the age of survivors impacts liability amounts.

Retained Actuary's Assumption

The female spouse is assumed to be 3 years younger than the male spouse.

Comments and Findings

Based on the information provided, the assumption is reasonable.

Form of Payment and Refund of Contributions Assumptions

In cases where participants receive no subsidy among payment forms and valuation actuarial equivalence matches that of optional payment forms, this assumption is not necessary. However, because valuation mortality and interest rates are not equal to those used to calculate optional forms of payment, this assumption impacts liabilities.

Retained Actuary's Assumption

Married participants are assumed to elect the Joint and Survivor annuity form of payment and non-married participants are assumed to elect a Life Only annuity.

Additionally, assumptions with respect to refunds of contributions are as follows:

- members elect an annuity or refund based on which has the greater actuarial value.
- 75% of members who terminated prior to age 40 are assumed to take a lump sum cash out at age 40.

Actuarial equivalence for optional forms are based on an 85% male/15% female blend of the current healthy annuitant mortality tables at an interest rate of 6.50%,

Comments and Findings

Considering the actuarial equivalence for optional forms of benefit payments is the same as the valuation assumptions except for the blending of male/female mortality rates, there will be minimal gain or loss when an active transitions to a retiree regardless of the payment form selected (Life, 50% or 100% Joint and Survivor annuity). Therefore, it is reasonable that the retained actuary did not study or further breakdown the optional form election assumption.

Based on the plan provisions, the deferred vested members assumptions are reasonable.

Validation of Results

This section will validate the retained actuary's calculation of several key items in the valuation report, including Actuarial Accrued Liability (AAL), Normal Cost, ADC, and AVA.

Actuarial Accrued Liability and Normal Cost

Representative sample lives have been selected and reviewed as summarized in the *Review of Sample Lives* section below. By confirming decrement rates, benefit amounts, and select Present Value of Benefit calculations, Deloitte determined the reasonableness of liabilities and normal cost for sample participants.

Actuarially Determined Contribution

The DFPF's contribution policy was discussed in the *Review of Actuarial Methods* section above. The purpose of this section is to verify the retained actuary's calculation of the ADC. Note that the DFPF's actual employer contribution is a fixed percentage of payroll and is not dependent on the ADC.

The table below shows Deloitte's verification of the ADC, based on the information provided.

DFPF Plan		Retained Actuary	Deloitte
		1/1/2023	1/1/2023
1	UAAL	3,195,626,728	
2	Payment to Amortize UAAL over 30 Years	215,845,468	215,845,468
3	Employer Normal Cost¹	27,961,953	
4	Adjustment for Timing²	<u>7,799,003</u>	<u>7,799,002</u>
5	ADC	251,606,424	251,606,423

¹ Includes Administrative Expenses

² Actuarially determined contributions are assumed to be paid at the middle of every year.

The results confirm that the actuary's calculation of the ADC is consistent with the method described in the valuation report.

Actuarial Value of Assets

The components of DFPF's Actuarial Value of Assets (AVA) are the Market Value of Assets (MVA) as of the Valuation Date, as well as the excess (shortfall) between expected investment return and actual investment income for each of the five previous years.

The table below shows Deloitte's verification of the AVA calculation.

(In \$'s)		Retained Actuary	Deloitte
		12/31/2022	12/31/2022
1	MVA	1,806,567,341	1,806,567,341
2	Avg. Bal. Calc.		
a	Total assets, BOY	2,157,840,430	2,157,840,430
b	Total assets, EOY	1,806,567,341	1,806,567,341
c	Net Investment Income	-240,891,386	-240,891,386
d	Avg. Balance (a+b-c)/2	2,102,649,579	2,102,649,579
3	Expected Return (6.5% * 2.d.)	136,672,223	136,672,223
4	Actual Return	-240,891,386	-240,891,386
5	Current Year G/(L) (4-3)	-377,563,609	-377,563,609
6	Unrecognized asset returns	Unrecognized AMT	Unrecognized AMT
a	FYE 2022	80% -302,050,887	80% -302,050,887
b	FYE 2021	60% 118,918,410	60% 118,918,410
c	FYE 2020	40% -59,717,728	40% -59,717,728
d	FYE 2019	20% -3,970,539	20% -3,970,539
		-246,820,744	-246,820,744
7	AVA at EOY	2,053,388,085	2,053,388,085
8	AVA / MVA =	1.137	1.137

The results confirm that the actuary's calculation of the AVA is consistent with the method described in the valuation report.

Review of Sample Lives

Summary of Reviewed Sample Lives

Sample life output is used by actuaries to confirm the actuarial assumptions, plan provisions, and actuarial methods used in actuarial valuations.

The retained actuary provided sample life data for active and inactive participants. For inactive sample lives, the present value of benefits was provided. For active sample lives, the present value of benefits, accrued liability, and normal cost were provided. The tables below summarize the sample lives that Deloitte reviewed.

Status	DPFP
Active	4
Terminated Vested	2
Retiree	1
Disabled	1
Beneficiary	1

Deloitte’s examination involved the following:

- Reviewed the data provided for the sample participants to confirm its consistency with the valuation data. All data was consistent with the valuation data.
- Reviewed sample life results for compliance with the plan provisions, assumptions, and methods disclosed in the actuarial valuation report using Deloitte’s actuarial valuation software. Results were within a reasonable threshold.

Responses Received

Attached are the responses received from the retained actuary after reviewing the preliminary draft audit report. Comments have been incorporated into the final report, as appropriate.



Jeffrey S. Williams
Vice President and Actuary
T 678.306.3147
jwilliams@segalco.com

2727 Paces Ferry Road SE
Building One, Suite 1400
Atlanta, GA 30339-4053
segalco.com

September 20, 2024

Board of Trustees
Dallas Police and Fire Pension System
4100 Harry Hines Blvd.
Suite 100
Dallas, TX 75219-3207

Re: Segal's Response to Deloitte's August 2024 Actuarial Audit

Dear Board Members:

We have had the opportunity to assess the independent actuarial audit completed by Deloitte Consulting LLP for the Dallas Police and Fire Pension System (DPFP). We are pleased to note on page 3 of Deloitte's report that, in their opinion, "*the January 1, 2023 actuarial valuation ... and the December 31, 2019 experience study ... for the DPFP were performed in compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board*".

The responses that follow address the items included in the "Summary of Key Findings" section of Deloitte's report. Deloitte's comments are bulleted, Segal's responses are in italics.

Valuation Report

- Add a description that a member on active service who has 10 years or more of participation in DROP shall no longer have the amount of the member's retirement pension credited to the member's DROP account while the member is on active service.

Appropriate language will be added.

- Disclose the history of the projected fully funded year in the valuation report

The projected year of full funding is included each year in the "Valuation highlights". With the year of full funding so far in the future, and with it fluctuating as much as it does each year based on the statutory contribution rate, we don't believe an historical table would add value to the report at this time. We will add a line in the "Summary of key valuation results" that shows the projected year of full funding for the current and prior valuation.

- Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study

We will consider whether it is appropriate to discuss this item in the upcoming experience study next year.

- Disclose 10-20 years of undiscounted cash flows

Each year we provide the System an Excel spreadsheet with projected cash flows until the year of full funding.

- In Exhibit A: Table of plan demographics, add a line for retirees that shows Average monthly DROP annuity

We do not see the benefit to splitting out average monthly benefit amount for DROP retirees and non-DROP retirees.

- In Exhibit A: Table of plan demographics, add a footnote that average age for beneficiaries excludes child beneficiaries

A footnote will be added.

Experience Study

- Revisit the 2.50% payroll growth assumption in light of the Meet and Confer Agreement and other national data.

This will be reviewed in the upcoming experience study next year.

- Include these details to support the assumption:

- the target asset allocation used in the analysis
- expected returns by asset class used in the forecast
- description of whether the arithmetic or geometric return was considered when developing the reasonable range of investment returns

This will be reviewed in the upcoming experience study next year.

- Revisit the assumption considering recent capital market assumptions

This will be reviewed in the upcoming experience study next year.

- Include supporting detail for the assumption for years after the Meet and Confer agreement

This will be reviewed in the upcoming experience study next year.

- Provide the rationale for the selection of the 1.5% COLA assumption

Section 6.12(b) of the plan document states the base pension benefit may be increased "...by a percentage equal to the average annual rate of actual investment return of the pension system for the five-year period ending on the December 31 preceding the effective date of the adjustment less five percent", dependent on the market value funded percentage.

- Consider performing stochastic analysis on the COLA Assumption due to the presence of both an upper limit on the annual COLA (4% maximum COLA) and a lower limit of 0%

In the January 1, 2023 actuarial valuation, the COLA was not projected to begin until the year 2073. We do not believe a stochastic analysis of the assumption would be meaningful at this time.

- Discuss the basis for the selection of the set back/forward period, including a credibility analysis

Set-backs or set-forwards are typically added in order that projected mortality patterns will better align with the mortality table. We do not anticipate including a credibility analysis of a set-back or set-forward.

- Include detail to support the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017), and experience for DROP Actives.

This will be reviewed in the upcoming experience study next year.

- Consider whether members who may become eligible for the 20 & Out provision warrant a separate assumption

This will be reviewed in the upcoming experience study next year.

- Consider supplementing the experience study analysis with qualitative considerations, such as an analysis of the plan provisions or an assessment of peer retirement systems with similar provisions

Assumptions are set while considering the plan provisions to which they apply. Analysis of peer retirement systems can be useful for plan design or comparison purposes; however, we do not believe the provisions of a different system are pertinent to setting the assumptions for this System.

- Include detail to support the assumption selection, such as the number of exposures at each age, and a description for any adjustments made to anomalies in the plan experience (such as 2016-2017)

This will be reviewed in the upcoming experience study next year.

- Consider adding a separate withdrawal assumption for members hired after March 1, 2011

This will be reviewed in the upcoming experience study next year. We anticipate there is now enough data to make it worthwhile adding separate withdrawal assumptions based on hire date before or after March 1, 2011.

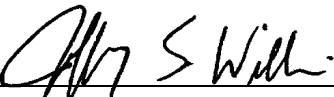
- The next experience study should include an analysis on the incidence of service versus non-service related disabilities

After reviewing the data during the experience study, we will make a determination as to whether a breakdown between service and non-service related disabilities is meaningful. It

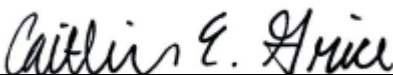
should be noted that in the January 1, 2023 actuarial valuation, there were 110 disability retirees out of 10,479 ongoing members. Liability for the 110 disabled members accounted for 0.81% of total actuarial accrued liability. Instituting a separate assumption for service-related and non-service-related disability would not have a meaningful impact on results.

Please let us know if you have any questions regarding our responses.

Sincerely,

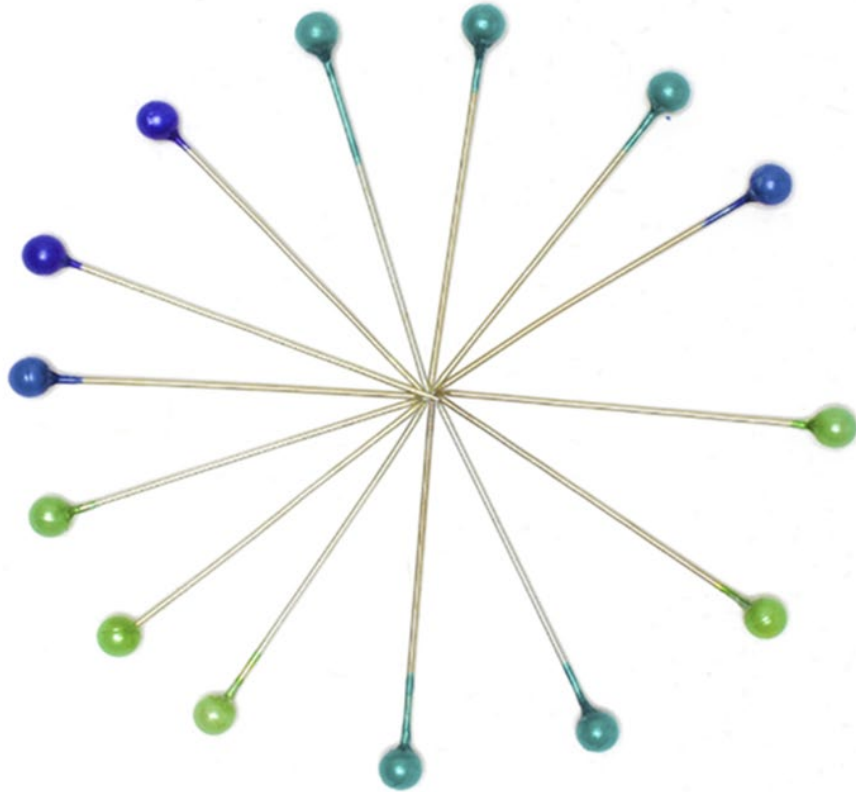


Jeffrey S. Williams
Vice President and Actuary



Caitlin Grice
Vice President and Actuary

cc: Kelly Gottschalk, Executive Director
Joshua Mond, Deputy Executive Director and General Counsel



Employees' Retirement Fund of the City of Dallas

Review under Texas Government Code Section
802.1012

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Actuarial Opinion

This report presents the results of the actuarial review of the December 31, 2022 actuarial valuation and experience study for the Employees' Retirement Fund of the City of Dallas ("ERF" or "Fund" or "plan"), a plan sponsored by the City of Dallas ("City"), to satisfy the requirements of Texas Government Code Section 802.1012 ("Section 802").

Our review was based on participant data and financial information provided by the ERF and their retained actuary, Gabriel Roeder Smith & Company ("GRS" or "actuary"), and our interpretation of the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

In our opinion, the December 31, 2022 actuarial valuation (actuarial valuation) and the December 31, 2019 actuarial experience study (experience study) for the ERF were performed in compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

Future measurements of the financial metrics associated with the actuarial valuation may differ significantly from the measurements presented in this report due to factors such as actual plan experience not evolving as anticipated due to the selection of economic and demographic assumptions; changes in economic or demographic assumptions; changes in certain valuation parameters, perhaps triggered by the plan financial condition, such as a different amortization period, or additional cost or contribution requirements based on the plan's funding status; and changes in plan provisions or applicable law. The scope of our work does not include an analysis of the impacts of these and similar contingencies.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This report was prepared solely for the benefit and internal use of the City. This report is not intended for the benefit of any other party and may not be relied upon by any third party for any purpose, and Deloitte Consulting accepts no responsibility or liability with respect to any party other than the City.

To the best of our knowledge, no employee of the Deloitte U.S. Firms is an officer or director of the employer. In addition, we are not aware of any relationship between the Deloitte U.S. Firms and the employer that may impair or appear to impair the objectivity of the work included in this analysis.

DELOITTE CONSULTING LLP



Michael de Leon, ASA, EA, FCA, MAAA
Managing Director



Joe Kropiewnicki, FSA, EA, MAAA, CERA
Manager



Jeannie Chen, ASA, EA, FCA, MAAA
Specialist Leader

Executive Summary

Intent

The intent of this report is to review the December 31, 2022 actuarial valuation and the December 31, 2019 experience study reports prepared by GRS for compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board, and to satisfy the requirements of Texas Government Code Section 802.1012.

Process

To achieve the above-stated goals, the following were reviewed: ERF-provided and actuary-provided census data, sample life output from the actuary's valuation software, the December 31, 2022 actuarial valuation report, and the December 31, 2019 experience study report. The ERF-provided data was used by the retained actuary to develop the census data that was the basis for the actuarial valuation.

Results and Findings

As stated in the previous section, it is our opinion that the December 31, 2022 actuarial valuation and the December 31, 2019 experience study for ERF were performed in compliance with the applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

The assumptions used in the December 31, 2019 actuarial valuation were updated as recommended in the experience study. Plan provisions, methods, and assumptions disclosed in the December 31, 2022 actuarial valuation report were appropriately valued based on our review of the sample life outputs.

Findings in this report could provide additional detail and improve the understanding of the actuarial work performed, including clarifications for certain assumptions and plan provisions being valued.

These comments are discussed in the Summary of Key Findings section as well as the detailed sections that follow.

Summary of Key Findings

The tables below summarize findings from the review of the valuation report and the experience study to be considered for future modifications. These findings are discussed in the following sections.

Valuation Report

Area	Findings	Purpose
Plan Provisions	Consider adding a description that nonvested terminated employees who do not request a refund of member's contributions within three years forfeit their refund.	Provide additional detail on plan design
Census Data	Correct the application of 401(a)(17) limits in the valuation data	Improve accuracy of census data
Funding Method	Consider modifying the amortization method to conform to the PRB Guidelines, which recommend using a finite or closed, funding period, over as brief a period possible.	Enhance selection of methodology
Report Content	Disclose the history of projected fully funded year in the valuation report	Enhance understanding of the plan's projected full funding history
Report Content	Disclose 10-20 years of undiscounted cash flows	Enhance understanding of the plan's financial obligation
Report Content	Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study	Improve ability to validate appropriateness of asset management policies and investment return assumption

Experience Study

Area	Findings	Purpose
Payroll Growth	Consider using a consistent payroll growth assumption between the open group projections (3.00%) and the assumption used for estimating payroll for the following fiscal year (2.50%).	Improve Appropriateness of Assumption Selection
Administrative Expense Assumption	Clarify that the estimated administrative expenses are expected to increase with inflation for purposes of the ADC calculation and projection of fully funded year	Support assumption selection
Administrative Expense Assumption	Provide additional disclosure on the difference between “administrative expense” and “depreciation expense”	Support assumption selection
Administrative Expense Assumption	Consider alternate approaches to determining the assumption to reduce volatility	Support assumption selection
Retirement	Include rationale and basis for the selection of the Tier B retirement assumption.	Enhance support assumption selection
Retirement	Consider developing a separate retirement assumption for the first year in which someone becomes eligible for Tier B.	Align assumption selection with expected behavior based on plan provisions
Retirement	Consider studying the retirement behavior of deferred vested participants.	Enhance support for assumption selection
Withdrawal	Consider adding a separate withdrawal assumption for Tier B employees.	Align assumption selection with expected behavior based on plan provisions
Age of Survivor	Provide justification for the female spouse age assumption.	Enhance support for assumption selection

Review of Plan Provisions

The plan provisions and some actuarial assumptions and methods are prescribed by the Dallas City Code Chapter 40A ("Chapter 40A"). This review compares the key plan provisions in the Plan Document against the provisions disclosed in the report prepared by the retained actuary.

Comments and Findings

Pages 57-61 of the valuation report outline the summary of plan provisions. The provisions in the summary of benefits do not conflict with the provisions in the Plan Document, nor do they omit plan provisions that could have a significant impact on plan benefits. The finding below is a way to improve transparency and completeness of the valuation report's summary of plan provisions.

Provision	Findings
Nonvested Forfeitures	Consider adding a description that nonvested terminated employees who do not request a refund of member's contributions within three years forfeit their refund.

Review of Census Data

Actuarial valuations require certain adjustments to the census data. This section assesses the reasonableness of data adjustment and reconciliation performed by the retained actuary, as well as the completeness of the documentation of the valuation report. The analysis is based on data files supplied by ERF, valuation data files created by the retained actuary, and sample life output from the actuary's valuation software. The retained actuary utilized ERF data to build appropriate census data for the actuarial valuation.

Comments and Findings

Documentation of data review procedures performed by the actuary

Page 2 of the letter prefacing the valuation report states the following:

This valuation is based on the provisions of ERF in effect as of the valuation date, data on the ERF membership and information on the asset values of the Fund as of December 31, 2022. The member, annuitant and asset data used in the valuation were all prepared and furnished by ERF staff. While certain checks for reasonableness were performed, the data used was not audited.

This statement appropriately addresses the requirements of Section 3.5 of ASOP 23.

Data reconciliation and adjustment process performed by the actuary

The actuary's valuation file is generally consistent with the data supplied by ERF based on a review of information in key fields. Additionally, the actuary's valuation file is consistent with the summary statistics in the valuation report.

Additions or removals of records between the raw census file and the final valuation file appear appropriate based on our high-level review of data answers received and information in other key fields (for example, active records with a termination date were removed from the active tab).

Page 55 of the ERF valuation report mentions that for unknown data for participants:

Certain records are missing spousal information. For these records we use the marital status assumption and spousal age difference assumption to value these records. No other adjustments are made to the data.

This statement appropriately addresses Section 3.4c of ASOP 23.

During review of the actuary's valuation file, it was noted that the 401(a)(17) limit was being incorrectly applied for seven participants. The 2020 limit of \$285,000 was being applied, while the 2022 limit of \$305,000 should have been applied. Due to the low number of affected participants, this would have a minor impact on liability.

Verification of Sample Life Data

The data used in the sample life calculation is consistent with the actuary's valuation data and the data provided by the ERF. Details of the sample life review are in the *Review of Sample Lives* section below.

Review of Actuarial Methods

This section determines if the actuarial cost method, actuarial value of asset method, and funding method are reasonable and consistent with generally accepted actuarial practice, relevant ASOPs, and the Pension Review Board Guidelines for Developing a Funding Policy¹ ("PRB Guidelines"), in particular the component on selecting Actuarial Methods.

Cost Method

The actuarial cost method used is Entry Age Normal (EAN) as a level percentage of pay. Under this method, the present value of future benefits (PVFB) is determined for each employee and is then spread evenly as a level percentage of pay over each employee's career. This method therefore produces employer contributions that are level as a percentage of payroll.

The actuarial cost method is consistent with the requirements of ASOP 4 and PRB Guidelines.

Actuarial Value of Asset Method

The actuarial valuation report describes the asset method as follows:

The method for determining the actuarial value of assets in future years is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual market value and the expected market value of assets each year and recognizes the cumulative excess return (or shortfall) at a minimum rate of 20% per year. Each year, a base is set up to reflect this difference. If the current year's base is of opposite sign to the deferred bases, then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base.

The actuarial value of asset method is consistent with the requirements of ASOP 44 and PRB Guidelines.

Funding Method

The actuarial valuation report describes the amortization method used to calculate the Actuarially Determined Contribution (ADC) as follows:

The actuarially determined contribution rate is developed using an open group projection. The total contribution rate (member plus City) is the level percentage of pay needed to fund the Normal Cost for each year and pay off the UAAL over 30 years.

¹ <https://www.prb.texas.gov/wp-content/uploads/2024/07/Funding-Policy-Guidance-Adopted-07.25.2024.pdf>

Various assumptions underlying the open group projection, including the new entrant profile, are detailed in the report. Please refer to the *Validation of Results* section for commentary on the development of the new entrant profile.

The ERF should consider modifying the amortization method to conform to the PRB Guidelines, which recommend using a finite or closed, funding period, over as brief a period possible.

While the ADC uses a 30-year amortization, the presence of the plan's statutory contribution rate cap and the Pension Obligation Bond debt repayment raises the period to full funding to 51 years.

Review of Report Content

This section reviews the content of the actuarial report for required disclosures.

Comments and Findings

The actuarial report meets applicable actuarial standards of practice as outlined in Actuarial Standards of Practice No. 41, *Actuarial Communications*, and appears to accurately represent the funded status of the plan. However, Deloitte presents the following considerations for the retained actuary:

- Disclose the history of the projected fully funded year in the valuation report.
- Disclose the undiscounted cash flows, a beneficial tool for understanding the plan's financial obligation. This could be for a 10 to 20 year period, showing current and future retirees separately.
- Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study.

Review of Economic Assumptions

Actuarial calculations inherently make predictions about future events to estimate financial costs on a present value basis and to quantify and/or qualify the risks and volatility associated with the financial costs. To do so, actuaries must make best-estimate assumptions about these possible future events and establish methods for performing the calculations. Actuarial assumptions are needed to determine the value of plan obligations to its participants, and actuarial methods create a schedule for allocating costs over a participant's career. The assumptions and methods are established by adhering to best practices for determination, studying historical experience, utilizing relevant external data, and considering internal and reputable external opinions on expected future experience. Comprehensive reporting of the assumptions and methods is required under ASOPs 27, 35, and 41.

This section considers assumptions categorized as economic, which include assumptions dependent on economic factors, such as the inflation rate, payroll growth rate, investment return, and salary increase rate. **Actuarial Standards of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations***, provides guidance to actuaries in selecting economic assumptions, and this ASOP is relied upon for the review below.

Inflation

The inflation assumption is not directly used to measure the liabilities of the plan; rather it is a component of all economic assumptions, including payroll growth, investment return, and salary increase.

Retained Actuary's Assumption

The inflation assumption is 2.50%.

Comments and Findings

The experience study considered inflationary data from several sources, including the CPI-U and US TIPS. The inflation assumption is consistent with general trends in public sector plans; the average inflation assumption for public sector plans has decreased steadily from 3.84% in 2002 to 2.47% in 2022 per the March 2024² NASRA Survey.

The long-range inflation forecasts from the Office of the Chief Actuary of the Social Security Administration provided in the 2024 OASDI Trustees Report³ is as follows:

Scenario	CPI
Low Cost	3.0%
Intermediate Cost	2.4%
High Cost	1.8%

² <https://www.nasra.org/files/Issue%20Briefs/NASRAInvReturnAssumptBrief.pdf>

³ <https://www.ssa.gov/OACT/TR/2024/tr2024.pdf>

Note that while the experience study was performed as of December 31, 2019, the inflation assumption of 2.50% remains reasonable as of December 31, 2022 based on the information above.

Payroll Growth and Wage Inflation

The assumed aggregate payroll growth is used in the amortization of the unfunded actuarial accrued liability. Payroll growth is chosen using a building block approach in which the inflation assumption is added to the assumed real wage growth. Real wage growth includes wage growth due to productivity, but excludes individual compensation increases above wage growth, also called “merit” increases.

Retained Actuary’s Assumption

For purposes of determining the ADC using open-group projections, payroll growth is 3.00%, consistent with the wage inflation assumption. This is described on page 47 of the valuation report:

In the projection, new members’ pay is assumed to increase at 3.00% year over year (i.e. a new employee in 2023 is assumed to be hired at a salary that is 3.00% greater than a new employee hired in 2022). The 3.00% growth rate is equal to our wage inflation assumption of 3.00% (ultimate salary increase assumption). Note that this is not an assumption that payroll will grow at 3.00% per year. Payroll could grow more slowly in the near-term due to membership demographics.

Page 55 of the valuation report notes that a rate of 2.50% is used to project payroll for the following fiscal year only:

Payroll Growth Rate: Used to estimate projected payroll for the following fiscal year only. Assumed to be equal to the inflation rate of 2.50%. This assumption is not used as part of the open group projection used to calculate the Actuarially Determined Contribution Rate.

Comments and Findings

National real wages can be studied by reviewing increases in the historical Average Wage Index, or AWI, published by the Social Security Administration. The AWI from 1982 to 2022, is shown below. Real Payroll Growth is the AWI less the CPI-U.

Period	Years	AWI	CPI-U (US)	Real Payroll Growth
2017-2022	5	4.12%	3.11%	1.00%
2012-2022	10	3.58%	2.31%	1.27%
2002-2022	20	3.19%	2.35%	0.84%
1992-2022	30	3.44%	2.38%	1.06%
1982-2022	40	3.64%	2.73%	0.91%

Additionally, the long-range real payroll growth forecasts from the Office of the Chief Actuary of the Social Security Administration provided in the 2024 OASDI Trustees Report is as follows:

Scenario	Payroll Differential
Low Cost	1.74%
Intermediate Cost	1.14%
High Cost	0.53%

The plan's experience supports increasing the real wage growth assumption from 0.50% to 1.00%, but the retained actuary also *"believe it would be reasonable to defer increasing the productivity component until the next experience study to determine the impact (if any) of COVID-19 on the pattern of future salary increases"*. The ERF Board elected to defer the increase.

Based on the national data above, as well as the retained actuary's commentary on the future outlook and historical plan experience, the 0.50% real wage growth assumption and 3.00% payroll growth assumption is reasonable. The retained actuary should consider using a consistent payroll growth assumption between the open group projections (3.00%) and the assumption used for estimating payroll for the following fiscal year (2.50%).

Investment Return

The investment return assumption reflects anticipated returns on the plan's current and future assets. It is also used to calculate the present value of all plan liabilities and generally has the greatest impact of all assumptions reviewed in this report. The investment return assumption is chosen using a building block approach in which the inflation assumption is added to the assumed real rate of return.

Retained Actuary's Assumption

The rate of investment return is 7.25%. This consists of a 2.50% inflation assumption and a 4.75% real rate of return assumption.

Comments and Findings

The experience study considered historical returns, peer plan benchmarking, and projected real returns from 14 different investment consultants using the plan's target asset allocation. Additionally, the study included commentary on arithmetic versus geometric returns.

The validity of the 2.50% inflation assumption is detailed in the prior section. This section assesses the validity of the 4.75% real return assumption based on the target asset allocation in the 2022 Annual Comprehensive Financial Report. Deloitte corroborated this assumption using the plan's target asset allocation and the publicly available JPMorgan Asset Management Long-Term Capital Market Assumptions for 2024 (published 9/30/2023)⁴. The results are summarized in the table below:

⁴ JPMorgan Asset Management provides a publicly available summary of long-term investment yield forecasts by asset class. JPMorgan Chase is a well-known and recognizable source for this type of information. Accordingly, we believe this information is an appropriate source to corroborate the information provided in support of the Long-Term Rate of Return. <https://am.jpmorgan.com/us/en/asset-management/institutional/insights/portfolio-insights/lcma/archive/>

Asset Class	Target Allocation as of 1/1/2023	JPMorgan	
		Long-Term Expected Nominal Rate of Return - Arithmetic	Average Expected Risk (Standard Deviation)
Domestic Equity	12.50%	8.64%	17.52%
Real Assets	12.50%	8.02%	10.60%
REITS	2.50%	9.36%	16.05%
Private Equity	7.50%	11.46%	20.06%
Marketable Alternatives ¹	2.50%	5.16%	5.80%
International Equity	12.50%	10.58%	17.64%
Global Equity	7.50%	9.05%	16.68%
Global Equity (Low Volatility)	12.50%	9.05%	16.68%
Credit Opportunitites ¹	5.00%	6.83%	8.36%
Global Investment Grade	15.00%	6.04%	7.14%
High Yield	10.00%	6.83%	8.36%
Expected Portfolio Arithmetic Return		8.37%	
Expected Portfolio Standard Deviation		11.47%	
Expected Portfolio Geometric Return (JPMorgan's Inflation Assumption)		7.71%	
Expected Portfolio Geometric Return (Adjusted for Plan's Inflation Assumption)²		7.71%	

¹These asset classes are not included in the JPMorgan report. Marketable Alternatives was mapped to Hedge Funds - Diversified, and Credit Opportunities was mapped to US High Yield Bonds

²Adjusted for Plan's Inflation Assumption of 2.50% compared to JPMorgan's Inflation Assumption of 2.50%.

Additionally, considering the short-term volatility of the expectations contrasted with the long-term nature of this assumption, Deloitte also considered the JPMorgan Asset Management Long-Term Capital Market Assumptions for 2020-2024 was also considered, based on the same target asset allocation and methodology as above. The 2020-2024 historical range of expected portfolio geometric return is 5.36%-7.71%.

JPMorgan Year	2024	2023	2022	2021	2020
Expected Portfolio Geometric Return (Adjusted for Plan's Inflation Assumption)	7.71%	7.66%	5.36%	5.77%	6.60%

Based on the above analysis, within the context of a long-term perspective, the long-term investment return of 7.25% is reasonable.

Salary Increase

The salary increase assumption is used to project an employee's salary from the valuation date to the assumed termination date(s). It is comprised of inflation, real wage growth and a merit scale. Inflation and real wage growth were already discussed above. This section focuses on the merit, promotion, longevity scale.

Retained Actuary’s Assumption

The table below shows the service-based assumption for merit, promotion, and longevity increases:

Years of Service	Merit, Promotion, Longevity	Years of Service	Merit, Promotion, Longevity
0	5.25%	10	1.00%
1	4.25%	11	1.00%
2	3.25%	12	0.75%
3	2.50%	13	0.75%
4	2.00%	14	0.75%
5	1.75%	15	0.75%
6	1.75%	16	0.75%
7	1.25%	17	0.75%
8	1.25%	18	0.50%
9	1.00%	19 & Over	0.00%

These assumptions are combined with a flat 3.00% “general” component which is composed of inflation and real wage growth.

Comments and Findings

The retained actuary noted that historical experience supports increasing the merit/promotion/longevity assumption. The December 31, 2019 valuation report shows that actual pay is close to expected based on experience for 2015 – 2019 and over 10 years.

Based on the information provided, the salary increase assumption is reasonable.

Cost-of-Living Adjustment

The cost-of-living-adjustment (COLA) assumption is used to estimate the plan’s future COLA adjustments for retirees, which are often based on an inflation index.

COLA Plan Provision

As described in Section 28 of Chapter 40A, an annual cost-of-living adjustment to the base pension benefit shall be made based on the greater of:

- The percentage of change in the price index from October of the current year over October of the previous year, up to:
 - 5% for a Tier A retiree or beneficiary; or
 - 3% for a Tier B retiree or beneficiary; or
- The percentage of annual average change in the price index for the latest 12 months available, up to:
 - 5% for a Tier A retiree or beneficiary; or
 - 3% for a Tier B retiree or beneficiary.

Retained Actuary's Assumption

Annual cost-of-living adjustments are assumed to occur on average at the rate of 2.50% per annum for Tier A members and 2.20% for Tier B members (due to the lower maximum on cost-of-living-adjustments).

Comments and Findings

The ERF's COLA assumption ties to inflation, with the added complexity of a 5% maximum for Tier A and a 3% maximum for Tier B. Section 3.5.1 of ASOP 27 provides guidance on assumptions for plan provisions that are difficult to measure, such as a COLA with a maximum:

Depending on the purpose of the measurement, the actuary may determine that it is appropriate to adjust the economic assumptions to provide for considerations such as adverse deviation or plan provisions that are difficult to measure, as discussed in ASOP No. 4. Any such adjustment made should be disclosed in accordance with section 4.1.1.

For Tier A, it is reasonable that the COLA assumption is the same as the inflation assumption – the maximum COLA of 5% is well above the assumed inflation of 2.50%. For Tier B, due to the lower maximum COLA of 3%, it is reasonable that the COLA assumption is adjusted downward to 2.20% to reflect the impact of the 3% maximum, as per Section 3.5.1 of ASOP 27.

Based on the information provided, the COLA assumption is reasonable.

Administrative Expense

The administrative expense assumption is used to estimate the plan's future costs for administering the pension plan.

Retained Actuary's Assumption

The actuarial valuation report describes the administrative expense assumption as follows:

The amount of estimated administrative expenses expected in the next year is assumed to be equal to the prior year's expenses and is incorporated in the Normal Cost.

Comments and Findings

The table below shows the five-year history of administrative expenses for the ERF. As of 12/31/2020, the valuation reports started breaking out the expense into "administrative expense" and "depreciation expense.

ERF Administrative Expense History (\$ thousands)			
	Administrative Expense	Depreciation Expense	Total Expense
2022	\$8,209	\$826	\$9,035
2021	\$6,547	\$802	\$7,349
2020	\$5,699	\$392	\$6,091
2019	Not Broken Out		\$7,516
2018	Not Broken Out		\$10,677
5-Year Average			\$8,134

The administrative expense assumption is used for the projection of fully funded year. While the assumption used by the retained actuary is reasonable, the retained actuary should consider the following:

- Clarify that the estimated administrative expenses are expected to increase with inflation for purposes of the ADC calculation and projection of fully funded year.
- Provide additional disclosure on the difference between “administrative expense” and “depreciation expense” and whether both amounts are projected to continue into future years.
- Considering the volatility in total expense over the past five years (as shown in the table above), consider an alternate method for developing the assumption to reduce volatility by looking at average historical expenses, forward looking expectations, or expenses as a percentage of payroll.

Review of Demographic Assumptions

This section considers assumptions categorized as demographic, which include any non-economic assumption and generally include assumptions regarding how the workforce will behave. **Actuarial Standard of Practice No. 35, *Selection of Demographic and other Noneconomic Assumptions for Measuring Pension Obligations***, provides guidance to actuaries in selecting demographic and other assumptions not covered by ASOP No. 27, and this ASOP is relied upon for the review below.

Mortality

The mortality assumption is used to determine when an active employee or a retiree will become deceased.

Retained Actuary's Assumption

The following table shows the current mortality assumptions for each group of participants:

Participant Group	Assumption
Healthy pre-retirement	Pub-2010 Mortality Table for General Employees tables are used for males and females respectively. The rates are projected on a fully generational basis using Scale UMP.
Benefit recipients	The gender-distinct 2019 Texas Municipal Retirees (TMRS) Mortality Tables are used for males and females respectively. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements.
Disabled annuitants	The gender-distinct 2019 Texas Municipal Retirees Mortality Table for males and females respectively, set forward 4 years for males and 3 years for females. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements.

Comments and Findings

The assumptions are based on the assumptions used by Texas Municipal Retirement Systems ("TMRS") as the plan does not have credible experience to set its own assumption. In accordance with ASOP 35 Section 3.5.3, the retained actuary considered the mortality for participants in post-retirement status, disabled retirement status, and pre-retirement (active) status. For mortality improvement, scale UMP represents the ultimate rates of the SOA's MP projection scale.

Based on the information provided, the assumption is reasonable.

Retirement

The retirement assumption is used to determine when an employee is expected to commence benefits.

Retained Actuary's Assumption

For Tier A, rates are based on age and gender. For participants over age 60, rates are also separated for those with less than 18 years of service and greater than 18 years of service. Additionally, there are separate rates for the first year in which a participant is eligible for unreduced retirement.

For Tier B, rates are based on age and gender, and are also separated for those with less than 40 years of service and greater than 40 years of service.

All deferred vested members are assumed to commence payment at their normal retirement age, which is age 60 for Tier A members and age 65 for Tier B members.

Comments and Findings

The experience study considered the plan's experience over the last ten years to have a more credible experience. In the experience study, the retained actuary stated that the preferred Actual/Expected ("A/E") ratio for retirement rates is between 85% and 95% to have some conservatism in the assumption. While the A/E ratios for the proposed assumptions range from 84% to 98%, the overall A/E ratio is 90% for both males and females.

Based on the information provided, the assumption is reasonable.

While the assumptions are reasonable, the following should be considered in the next study to enhance support for the assumption:

- include rationale and basis for the selection of the Tier B retirement assumption. While there will not be sufficient experience to analyze their retirement behavior until Tier B employees start to retire (20-30 years from now), the study should provide justification for these rates.
- consider developing a separate retirement assumption for the first year in which someone becomes eligible for Tier B, since the data supported such a separation for Tier A.
- consider studying the retirement behavior of deferred vested participants.

Withdrawal

The withdrawal assumption is used to determine when an employee who is not eligible for retirement will terminate employment.

Retained Actuary's Assumption

The withdrawal assumption is based on years of service and gender.

Comments and Findings

This is a robust basis for the assumption because it reflects the general tendency of shorter-tenured employees to incur higher rates of turnover. The assumed rates reflect higher expected turnover within the first several years of service, which is not uncommon. The rates additionally reflect different withdrawal experience between males and females.

The plan's actual withdrawals were greater than expected over the last ten years, as of the date of the experience study, resulting in the proposed assumption being generally higher. Based on the information provided, the withdrawal assumption appears reasonable for Tier A employees.

The next study should consider adding a separate withdrawal assumption for Tier B employees. As Tier B benefits are less valuable, withdrawals may be higher for later years of service than for Tier A employees.

Disability

The disability assumption is used to determine when an employee becomes disabled and qualifies for disability benefits.

Retained Actuary's Assumption

The disability assumption is based on age.

20% of disabilities are assumed to be service-related.

Comments and Findings

Due to plan's low disability incidence, this assumption is based on the 2015 Municipal Retirees of Texas disability rates for males and females. Additionally, duty (service) related disability and ordinary (non-service) related disability were separated because the duty-related disability benefit includes a \$1,000 per month floor.

Based on the information provided, the assumption is reasonable.

Marital Status

It is common for actuaries to make an assumption regarding the marital status of plan participants for use in assuming future benefit eligibility and election. Like the inflation assumption, the marital status assumption is often a component of several other assumptions.

Retained Actuary's Assumption

75% of male participants, and 50% of female participants, are assumed to be married.

Comments and Findings

The plan's experience supports no change to the assumption. Based on the information provided, the assumption is reasonable.

Age of Survivor

Future Joint & Survivor annuity payment amounts are based in part on the age of the survivor. Because valuation mortality and interest rates are not equal to those used to calculate optional forms of payment, the age of survivors impacts liability amounts.

Retained Actuary's Assumption

The female spouse is assumed to be 3 years younger than the male spouse.

Comments and Findings

The experience study stated that "the male member is slightly more than 3 years older than their spouses, while female members are about 5.6 years younger than their spouses". Based on the information provided, the study should provide justification for maintaining the same female spouse age assumption.

Form of Payment and Refund of Contributions Assumption

In cases where participants receive no subsidy among payment forms and valuation actuarial equivalence matches that of optional payment forms, this assumption is not necessary. However, because valuation mortality and interest rates are not equal to those used to calculate optional forms of payment and because the ERF subsidizes pop-up benefits, this assumption impacts liabilities.

Retained Actuary's Assumption

For Tier A, it is assumed that 60% of married active male members and 84% of married active female employees will elect a Joint & 50% Survivor form of payment.

Taking into consideration the marriage assumption and the inherent subsidy in the System's Joint & 100% Survivor factors, the male employees are valued with Joint and 28.0% Survivor annuities and the female employees are valued with Joint and 19.5% Survivor annuities.

It is also assumed that 100% of Tier B employees will elect the normal form of payment under Tier B.

Additionally, with respect to refunds of contributions, it is assumed that members elect the most valuable termination benefit (they have the choice between a refund of employee contributions and a deferred annuity).

The actuarial equivalence assumptions are disclosed in the actuarial valuation report.

Comments and Findings

The plan provisions allow active participants who terminate prior to retirement eligibility to elect either a lump sum refund of accumulated employee contributions made (without interest), or a deferred annuity at retirement age based on the benefit provisions. There may be a significant difference in the future plan liability between a refund of employee contributions and the deferred annuity. Based on the information provided, the refund of contributions assumption is reasonable.

A form of payment assumption is needed because the actuarial equivalence assumptions to calculate the benefits differ from the valuation assumptions, and because the 10-year certain and life annuity and the Joint and 50% survivor annuity with 10 years certain are unreduced for Tier A (both the Joint and 50% option and the Joint and 100% option are actuarially reduced for Tier B). Based on the plan provisions, the form of payment assumptions are reasonable.

Validation of Results

This section will validate the retained actuary's calculation of several key items in the valuation report, including Actuarial Accrued Liability (AAL), Normal Cost, ADC, and AVA.

Actuarial Accrued Liability and Normal Cost

Representative sample lives have been selected and reviewed as summarized in the *Review of Sample Lives* section below. By confirming decrement rates, benefit amounts, and select Present Value of Benefit calculations, Deloitte determined the reasonableness of liabilities and normal cost for sample participants.

Actuarially Determined Contribution

The ERF's contribution policy is outlined in Section 40A-7 of Chapter 40A and is discussed in detail in the Review of Actuarial Methods section above. The ADC is a component of the ERF's contribution, but the actual employer contribution is determined differently. The purpose of this section is to verify the retained actuary's calculation of the ADC, as well as to verify the determination of the actual employer contribution.

The retained actuary used an open group projection to calculate the actuarially determined total contribution rate of 35.40% of covered payroll ignoring debt service payment, which translates to a contribution of \$172.9 million as of December 31, 2022. Using standard actuarial roll-forward techniques, the ADC of 35.40% of payroll is consistent with the method described in the valuation report.

Page 48 of the valuation report outlines the retained actuary's methodology determining the new entrant profile for purposes of the open group projection:

For the purposes of determining the funding period, an open group projection is used which replaces on a one-to-one basis each active member who leaves employment with an average new hire. The average new hire is determined based on a new entrant profile, which is created from the valuation data by determining the entry age and entry pay for anyone with between one and six years of service as of the valuation date, with salaries normalized to the valuation date.

This methodology is reasonable. Using the census data provided by the retained actuary, the sample new entrant profile disclosed on page 48 of the valuation report reasonably reflects the data.

The actual employer contribution is determined via the Current Adjusted Total Obligation Rate (CATOR). The methodology for the determination of the CATOR is outlined in the Review of Actuarial Methods section. We independently calculated the Current Adjusted Total Obligation Rate (CATOR), and it reflects the funding method outlined in the valuation report and Section 40A-7 of Chapter 40-A.

The results confirm that the actuary's calculation is consistent with the method described in the valuation report.

Actuarial Value of Assets

The components of the ERF's Actuarial Value of Assets (AVA) are the Market Value of Assets (MVA) as of the Valuation Date, as well as the excess (shortfall) between expected investment return and actual investment income for each of the five previous years.

The table below shows Deloitte's verification of the AVA calculation.

<i>(In \$000's)</i>		Retained Actuary	Deloitte
		12/31/2022	12/31/2022
1	BOY MVA	4,093,215	4,093,215
2	External Cash Flow		
a	Contributions	130,715	130,715
b	Benefits and Refunds Paid	-329,686	-329,686
c	Administrative and miscellaneous expenses	-9,035	-9,035
d	Subtotal (2.a + 2.b + 2.c)	-208,006	-208,006
3	EOY Expected MVA*	4,174,559	4,174,559
4	EOY Actual MVA	3,516,280	3,516,280
5	Current Year G/(L) (4 - 3)	-658,279	-658,279
6	Prior Year Remaining Deferrals of Excess/(Shortfall)	220,614	220,614
7	Net Deferrals Remaining (6 + 5)**	-437,665	-437,665
8	Amortization Period	5	5
9	Net Deferral Recognized This Valuation (7 / 8)	-87,533	-87,533
10	Remaining Deferrals After This Valuation (7 - 9)	-350,132	-350,132
11	EOY AVA (4 - 10)	3,866,412	3,866,412
12	Ratio of AVA to MVA (11 / 4)	110.0%	110.0%

* Assumes mid-year external cash flows and compound interest at 7.25%.

** Each year, a base is set up to reflect the cumulative excess return (or shortfall) at a minimum rate of 20% per year. If the current year's base is of opposite sign to the deferred bases, then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base.

The results confirm that the actuary's calculation of the AVA is consistent with the method described in the valuation report.

Review of Sample Lives

Summary of Reviewed Sample Lives

Sample life output is used by actuaries to confirm the actuarial assumptions, plan provisions, and actuarial methods used in actuarial valuations.

The retained actuary provided sample life data for active and inactive participants. For inactive sample lives, the present value of benefits was provided. For active sample lives, the present value of benefits, accrued liability, and normal cost were provided. The tables below summarize the sample lives that Deloitte reviewed.

Status	Number of Sample Lives Reviewed
Active	4
Terminated Vested	2
Retiree	2
Disabled	1
Beneficiary	1

Deloitte's examination involved the following:

- Reviewed the data provided for the sample participants to confirm its consistency with the valuation data. All data was consistent with the valuation data.
- Reviewed sample life results for compliance with the plan provisions, assumptions and methods disclosed in the actuarial valuation report using Deloitte's actuarial valuation software. Results were within a reasonable threshold.

Responses Received

Attached are the responses received from the retained actuary after reviewing the preliminary draft audit report. Comments have been incorporated into the final report, as appropriate.



September 3, 2024

Ms. Cheryl Alston
Executive Director
Employees' Retirement Fund of the City of Dallas
1920 McKinney Avenue, 10th Floor
Dallas, TX 75201

Re: Response to Actuarial Audit of the Employees' Retirement Fund of the City of Dallas

Dear Cheryl:

Gabriel, Roeder, Smith & Company ("GRS") offers our comments below on the "Draft" actuarial audit report prepared by Deloitte Consulting LLP, dated August 2024. The report provides Deloitte's actuarial audit, at the behest of the City of Dallas as required by Texas Government Code Section 802.1012, of the Employees' Retirement Fund of the City of Dallas (ERF).

General Comments

We are pleased with the results of the actuarial audit of ERF. We would like to quote the following two passages from the report:

- From the *Actuarial Opinion* section of the actuarial audit report:
"In our opinion, the December 31, 2022 actuarial valuation and the December 31, 2019 experience study for the ERF were performed in compliance with the applicable standards of practice issued by the Actuarial Standards Board."
- From the Executive Summary section of the actuarial audit report:
"Plan provisions, methods and assumptions disclosed in the December 31, 2022 actuarial valuation report were appropriately valued based on our review of the sample life outputs."

These statements should provide both ERF Staff and the Board with the confidence that the actuarial results they are receiving are both accurate and in compliance with the actuarial standards of practice.

In the remainder of our letter, we will respond to specific recommendations made by Deloitte in its Summary of Key Findings section of the actuarial audit report.

1) Valuation Report Plan Provisions – Findings:

Consider adding a description that nonvested terminated employees who do not request a refund of member's contributions within three years forfeit their refund.

GRS Response: We will add this information to the next valuation report.

2) Valuation Report Census Data – Findings:

Correct the application of 401(a)(17) limits in the valuation data

GRS Response: The issue was resolved in the following actuarial valuation. We will make sure that the appropriate limit continues to be applied in future valuations.

3) Valuation Report Funding Method – Findings:

Consider modifying the amortization method to conform to the PRB Guidelines, which recommend using a finite or closed, funding period, over as brief a period possible.

GRS Response: As you are aware, the Fund is currently working with the City on a Funding Soundness restoration plan. If the current plan is approved by the voters, the amortization period as of December 31, 2024 will comply with the PRB Guidelines.

4) Valuation Report Content – Findings:

Disclose the history of the projected fully funded year in the valuation report.

GRS Response: We will consider this at the next actuarial valuation.

5) Valuation Report Content – Findings:

Disclose 10-20 years of undiscounted cash flows.

GRS Response: We will consider this at the next actuarial valuation.

6) Valuation Report Content – Findings:

Include a description of how closely current actual and target asset allocations align with the target asset allocation used to select the investment return assumption during the experience study.

GRS Response: We will consider this at the next actuarial valuation.

7) Experience Study Payroll Growth – Findings:

Consider using a consistent payroll growth assumption between the open group projections (3.00%) and the assumption used for estimating payroll for the following fiscal year (2.50%)

GRS Response: We will consider this at the next experience study.



8) Experience Study Administrative Expense Assumption – Findings:

Clarify that the estimated administrative expenses are expected to increase with inflation for purposes of the ADC calculation and the projection of fully funded year.

GRS Response: We will clarify this at the next valuation.

9) Experience Study Administrative Expense Assumption – Findings:

Provide additional disclosure on the difference between “administrative expense” and “depreciation expense”.

GRS Response: We will consider this at the next valuation.

10) Experience Study Administrative Expense Assumption – Findings:

Consider alternate approaches to determining the assumption to reduce volatility.

GRS Response: We will consider this at the next experience study.

11) Experience Study Retirement – Findings:

Include rationale and basis for the selection of the Tier B retirement assumption.

GRS Response: We will consider this at the next experience study.

12) Experience Study Retirement – Findings:

Consider developing a separate retirement assumption for the first year in which someone becomes eligible for Tier B.

GRS Response: We will consider this at the next experience study.

13) Experience Study Retirement – Findings:

Consider studying the retirement behavior of deferred vested participants.

GRS Response: We will consider this at the next experience study.

14) Experience Study Withdrawal – Findings:

Consider adding a separate withdrawal assumption for Tier B employees.

GRS Response: We will consider this at the next experience study.

15) Experience Study Age of Survivor – Findings:

Provide justification for the female spouse age assumption.

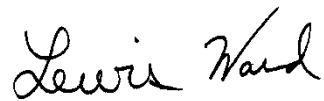
GRS Response: We will consider this at the next experience study.



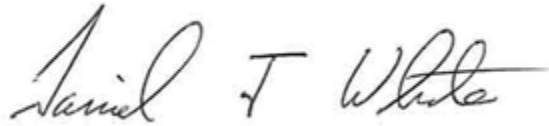
Ms. Cheryl Alston
September 3, 2024
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If you have any questions or need any additional clarifying information with regard to our comments, please do not hesitate to contact either one of us.

Sincerely,
Gabriel, Roeder, Smith & Company



Lewis Ward
Consultant



Daniel J. White, FSA, EA, MAAA
Senior Consultant

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