Travis Co. ESD No. 6 Firefighters' Relief and Retirement Fund

Actuarial Valuation as of December 31, 2023

September 19, 2024

Rudd and Wisdom, Inc.

Rudd and Wisdom, Inc.
Consulting Actuaries

September 19, 2024

Board of Trustees
Travis Co. ESD No. 6 Firefighters' Relief
and Retirement Fund
c/o Mr. Scott Falltrick, Chairman
P.O. Box 340196
Austin, TX 78734

Members of the Board of Trustees:

At your request, we have prepared this report of the results of the actuarial valuation of the fund as of December 31, 2023. This valuation was prepared to determine whether the fund has an adequate contribution arrangement.

In a separate June 6, 2024 report, we provided the necessary disclosures for the fund's compliance with the Governmental Accounting Standards Board (GASB) Statement No. 67 for the plan year ending December 31, 2023. We will also provide a separate report later containing the pension expense, net pension liability, and disclosure information for the district's compliance with GASB 68 for the fiscal year ending September 30, 2024. GASB 68 prescribes the district's accounting for your fund, while this actuarial valuation report reflects the assumed contribution policy described in this report.

We certify that we are members of the American Academy of Actuaries who meet Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report.

Sincerely,

Mark R. Fenlaw

Mark R. Fenlaw, F.S.A.

Rebecca B. Morris

Rebecca B. Morris, A.S.A.

MRF/RBM:nlg

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Section I

Valuation Summary

An actuarial valuation of the assets and liabilities of the Travis Co. ESD No. 6 Firefighters' Relief and Retirement Fund as of December 31, 2023 has been completed. The valuation was based on the Present Plan (plan effective February 20, 2023) and the provisions of the Texas Local Fire Fighters' Retirement Act (TLFFRA) which were in effect on December 31, 2023. Section II shows the key results of the actuarial valuation as of December 31, 2023 and discusses the changes since the prior valuation as of December 31, 2021 we prepared.

This valuation reflects an actuarially assumed total contribution rate of 39.2%, comprised of 20% by the firefighters and an assumed 19.2% by the district. The total contribution rate of 39.2% exceeds the normal cost rate of 34.32%, leaving 4.88% available to amortize the unfunded actuarial accrued liability (UAAL) of $7,620,753. Assuming that the total payroll increases at the rate of 2.75% per year in the future, the contributions in excess of the normal cost **will amortize the UAAL in 26.6 years.**

In order for a retirement plan to have an adequate contribution arrangement, contributions must be made that are sufficient to pay the plan's normal cost and to amortize the plan's UAAL over a reasonable period of time. Based on the Texas State Pension Review Board guidelines for pension funding, our professional judgment, and the actuarial assumptions and methods used in making this valuation, we consider periods of under 20 years to be preferable and 30 years to be the current maximum acceptable period. Since the total contributions are sufficient to pay the fund's normal cost and to amortize the fund's UAAL within the maximum acceptable period, we are of the opinion that the fund, based on present levels of benefits and contributions, **has an adequate contribution arrangement.** Section III has considerations for benefit improvements.

Changes in Plan Provisions

Since the prior actuarial valuation, the plan was amended effective February 20, 2023 in three ways. First, the minimum age for normal retirement eligibility was lowered from 53 to 52. Second, a one-year DROP for a member retiring as early as age 52 with at least 20 years of service was added. Third, the averaging period in the definition of Highest Average Monthly Pay was reduced from 60 to 48 consecutive months of service.

Projected Actuarial Valuation Results

In addition to completing this actuarial valuation, we estimated the amortization periods as of December 31, 2025 and as of December 31, 2027 by making projections from the December 31, 2023 actuarial valuation. These projections examine the effect on the amortization period in the next two biennial actuarial valuations of the actuarial investment gains and losses that the fund experienced in the four years prior to the valuation date (gains in 2020, 2021, and 2023 and a loss in 2022) that have been only partially recognized as of December 31, 2023. As shown in Exhibit 8, a smoothing method is used to determine the actuarial value of assets (AVA) for this valuation. This method phases in over a five-year period any investment gains or losses (net actual investment return greater or less than the actuarially assumed investment return) that the fund has had. The AVA used in this current valuation is deferring recognition of various portions of the gains and losses in 2020-2023 that the fund experienced. The AVA used in this valuation is $50,697,322. The market value of assets (MVA) is $48,884,210. The $1.8 million difference between the MVA and the AVA is the deferred net loss over the past four years that will be recognized in the next two biennial actuarial valuations.

The theory behind the AVA method is to allow time for investment gains and losses to partially offset each other and thereby dampen the volatility associated with the progression of the MVA over time. In practice, the timing and amounts of investment gains and losses can result in irregular effects on the AVA in a given year. However, as intended, the pattern of the AVA is smoother over time than the pattern of the MVA, as seen in Exhibit 9.

For the purpose of projecting the amortization period through 2027 we used six scenarios of various assumed annual rates of investment return, net of investment-related expenses. These projections show the expected effects over the next four years after the valuation date of (1) the recognition of the portions of the investment gains and losses over the past four years that are deferred as of December 31, 2023, (2) investment returns over the next four years different from the 6.5% assumption used in this valuation, and (3) the significant increase in the aggregate payroll beginning in 2025 as the result of the general compensation increases effective in October 2024 of 15% or more.

	Scenario					
	1	2	3	4	5	6
Assumed Investment Return for Calendar Year						
2024	6.5%	4.0%	4.0%	10.0%	10.0%	12.0%
2025	6.5	6.5	4.0	6.5	10.0	10.0
2026	6.5	6.5	10.0	6.5	6.5	6.5
2027	6.5	6.5	10.0	6.5	6.5	6.5
2028 and later	6.5	6.5	6.5	6.5	6.5	6.5
Amortization Period in Years as of December 31:						
2023 (actual)	26.6	26.6	26.6	26.6	26.6	26.6
2025 (projected)	26.7	29.8	31.4	22.9	21.2	19.3
2027 (projected)	27.7	34.7	31.9	20.1	15.0	11.9

The projected future December 31, 2027 valuation in Scenario 1 reveals that instead of decreasing by the expected four years to 22.6 years, the amortization period is projected to increase by 1.1 years to 27.7 years because the recognition of the deferred net loss has a stronger effect than the significant increase in the aggregate payroll. Scenarios 2 and 3 assume modestly adverse investment experience that would result in an inadequate contribution arrangement, while Scenarios 4-6 project increasingly favorable experience. Scenarios 5 and 6 are examples of favorable experience in 2024-2025 that would more than offset the $1.8 million deferred net loss by December 31, 2027.

We do not know what the investment experience will be for each of the four calendar years in the projections. Variations in experience from the underlying assumptions, other than investment return, will cause the actual amortization periods to be different from the periods shown above, but investment experience is the biggest influence on future actuarial valuations. In addition, the future investment experience in each of the four years could be better or worse than the assumed rates shown. These scenarios present a range of scenarios for the next four years assuming no changes in the total contribution rate and no changes in benefits.

Participant and Asset Data

We have relied on and based our valuation on the active firefighter data and pensioner data provided on behalf of the board of trustees by Ms. Ana Tinsley, the board's plan administrator. We also have relied on asset data provided by Mr. Scott Falltrick, board chairman. We have not audited the data provided but have reviewed it for reasonableness and consistency relative to the data provided for the December 31, 2021 actuarial valuation. Exhibit 1 is a distribution of the active firefighters by age and service. The assumed 2024 compensation used for projecting future contributions and benefits for each active firefighter in the valuation was the actual covered compensation for calendar year 2023 without adjustment. This approach was to approximately reflect the effect of the general compensation increase effective October 10, 2023 of less than 1%. The total of these assumed compensation amounts is our assumed annualized covered payroll for the plan year beginning January 1, 2024 and is used in the valuation to determine the UAAL amortization period. The averages of the assumed compensation amounts for the 2024 plan year are shown in Exhibit 1.

Exhibit 2 contains summary information on the pensioners. Exhibit 3 is a reconciliation of firefighters and pensioners from December 31, 2021 to December 31, 2023. Until there are more retirees, we will continue to exclude Exhibit 4. Exhibit 5 shows a historical comparison of the actuarial accrued liability and the actuarial value of assets.

The summary of assets contained in Exhibit 6 is based on the allocation of the December 31, 2023 market value of assets in the December 31, 2023 report from the fund's investment consultant adjusted for the total audited net assets amount. This exhibit also shows a comparison with the market values and actuarial values of assets as of December 31, 2021 and December 31, 2023. Exhibit 7 contains the statement of changes in assets for 2023 and 2022. Exhibit 8 shows the development of the actuarial value of assets. Exhibit 9 shows a historical comparison between the market value and actuarial value of assets. A market value asset allocation by major asset class as of December 31, 2021 and December 31, 2023 is shown in Exhibit 10.

Assumptions

As a part of each actuarial valuation, we review the actuarial assumptions used in the prior actuarial valuation. As a result of our review, we have selected actuarial assumptions we consider to be reasonable and appropriate estimates of future experience for the fund for the long-term future. Their selection complies with the applicable actuarial standards of practice. Significant actuarial assumptions used in this valuation are:

1. 6.5% annual investment return net of investment-related expenses;
2. 2.75% general annual compensation increase, except with a 15% increase for 2025, combined with pay increases due to promotion, step, and longevity increases that average 2.41% per year over a 30-year career;
3. 2.75% aggregate payroll growth (for the purpose of amortizing the UAAL); and
4. PubS-2010 (public safety employees) total dataset mortality tables for employees and for retirees, projected for mortality improvement generationally using the projection scale MP-2019.

The following actuarial assumption changes have been made, and the new assumptions are compared to those used in the December 31, 2021 valuation:

1. We increased the assumed disability rates because there were three new disabilities in 2022 and 2023. The new rates are still relatively low because the experience of the last two years may turn out to be very atypical. The new and prior assumed disability rates were compared in an exhibit in the September 9 letter to the board documenting our review of actuarial assumptions and recommended changes. The prior rates projected approximately one disability retirement in six years while the new rates project one disability every four years.
2. We changed the assumed rates of retirement to be the same rates used in the February 15, 2023 special studies that included the changes in plan provisions (in particular, changing retirement eligibility to age 52 with 20 years of service) that became effective later that month. The effect of this change was included in the effect of the new plan provisions.
3. We made a temporary change in the general compensation increase assumption from the long-term annual assumption of 2.75% to 15% for the year 2025 because of the very significant general compensation increases effective in October 2024 in the new collective bargaining agreement.
4. We changed the assumed promotion, step, and longevity increases that vary by year of service to increases that average 2.41% per year over a 30-year career. The assumption in the prior actuarial valuation was assumed promotion, step, and longevity increases that average 2.31% per year over a 30-year career. The average increase is small, but the new pattern of increases is greater in years 1-20 primarily based on the pattern as of December 31, 2023 and less in years 21-30 to reflect the removal of anniversary increases in those years in the new collective bargaining agreement pay schedules. The prior and new assumptions were compared in the September 9 letter to the board on assumptions. We believe this new assumption is more reasonable for the long-term future.

5. We changed the assumed administrative expenses from 0.55% of payroll to 0.60% of payroll. This percentage is based on the average historical relationship in the last six years, as shown in Appendix A, and is added to the normal cost.

The effects of these changes in assumptions in the UAAL and in the UAAL amortization period are mentioned in Section II. A summary of all the assumptions and methods used in the valuation is shown in Exhibits 11 and 12. In our opinion, the assumptions used, both in the aggregate and individually, are reasonably related to the experience of the fund and to reasonable expectations. The assumptions represent a reasonable estimate of anticipated experience of the fund over the long-term future.

Supporting Exhibits

Exhibit 13 contains definitions of terms used in this actuarial valuation report. Exhibit 14 summarizes the plan provisions of the Present Plan. Appendix A documents our review of the economic assumptions.

Funding Policy

The funding policy adopted by the board of trustees at its January 29, 2020 board meeting says that each actuarial valuation report will include a benchmark actuarially determined contribution (ADC) rate using a closed 30-year amortization period beginning January 1, 2020. The closed amortization period declines by one each year; so it is 26 years for the December 31, 2023 actuarial valuation. The table below compares the benchmark ADC rate to the actuarial valuation results in the two key metrics, the amortization period and the total contribution rate. The differences in the two metrics are very small. See Section III for our comments on benefit improvements.

	Amortization Period	Total Contribution Rate
Benchmark ADC rate	26 years	39.27%
Actuarial valuation	26.6 years	39.20%
Difference	+0.6 years	-0.07%

Variability in Future Actuarial Measurement

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following:

- Plan experience differing from that anticipated by the current economic or demographic assumptions;
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements;
- Changes in economic or demographic assumptions; and
- Changes in plan provisions.

Analysis of the potential range of such future measurements resulting from possible sources of measurement variability was provided on pages 1-3 in the projected amortization periods for the next two biennial actuarial valuations under six scenarios. These projections were designed to assess the risk of variance of potential future investment rates of return in the four years following the actuarial valuation date from the assumed 6.5% rate and the potential effect on the amortization period. Additional or other sensitivity analysis could be performed in a subsequent report if desired by the board of trustees.

Respectfully submitted,
RUDD AND WISDOM, INC.

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Section II

Key Results of the Actuarial Valuation

	December 31, 2021[1]	December 31, 2023
1. Actuarial present value of future benefits		
a. Those now receiving benefits or former firefighters entitled to receive benefits	$ 1,109,453	$ 5,282,163
b. Firefighters	72,050,609	89,301,984
c. Total	$ 73,160,062	$ 94,584,147
2. Actuarial present value of future normal cost contributions	$ 29,816,804	$ 36,266,072
3. Actuarial accrued liability (Item 1c – Item 2)	$ 43,343,258	$ 58,318,075
4. Actuarial value of assets	$ 39,421,197	$ 50,697,322
5. Unfunded actuarial accrued liability (UAAL) (Item 3 - Item 4)	$ 3,922,061	$ 7,620,753
6. Contributions (percent of pay)		
a. Firefighters	20.00%	20.00%
b. Travis Co. ESD No. 6	19.20%	19.20%
c. Total	39.20%	39.20%
7. Normal cost (percent of payroll)	30.48%	34.32%
8. Percent of payroll available to amortize the UAAL (Item 6c - Item 7)	8.72%	4.88%
9. Annualized covered payroll	$ 8,633,614	$ 9,244,730
10. Years to amortize the UAAL	5.9 years	26.6 years
11. Funded ratio (Item 4 ÷ Item 3)[2]	91.0%	86.9%

[1] All items are from the December 31, 2021 actuarial valuation reflecting the prior plan that was in effect.

[2] The funded ratio is not appropriate for assessing either the need for or the amount of future contributions or the adequacy of the assumed contribution rates. Using the market value of assets instead of the actuarial value of assets for Item 11 would have resulted in funded ratios of 99.5% as of December 31, 2021 and 83.8% as of December 31, 2023. **The best indicator of the fund's health is Item 10.**

Changes in the Unfunded Actuarial Accrued Liability

In comparing this actuarial valuation to the prior one, the UAAL increased by $3,698,692 from $3,922,061 as of December 31, 2021 to $7,620,753 as of December 31, 2023. The table below summarizes the reasons for the increase.

Reason for Change	Amount
• Expected decrease (interest on UAAL less than expected amortization payments accumulated with interest)	$ (795,220)
• Investment loss for the two years (based on the AVA average annual return of 5.6%)	797,028
• Experience loss (net difference between actual experience and assumed experience such as pay increases, retirements, disabilities, mortality, terminations, and contributions)	865,864
• Change in compensation increase and disability assumptions (net effect of all changes)	1,716,054
• Benefit provision changes	1,114,966
Total	$ 3,698,692

Changes in the Amortization Period

The amortization period, based on the Present Plan provisions, was determined in the special study of the Present Plan based on the prior actuarial valuation as of December 31, 2021 to be 5.9 years. Since two years have passed since that valuation date, a 3.9-year amortization period would be expected if all actuarial assumptions had been exactly met, no changes had occurred (other than those expected) in the firefighter and pensioner data, and no changes in assumptions or benefits had been made. The amortization period is now 26.6 years, reflecting changes in assumptions and in plan provisions. The actual experience occurring between December 31, 2021 and December 31, 2023 differed from the expected experience, and in combination with the changes in assumptions and benefits, the resulting amortization period is 26.6 years for the following reasons:

1. The average annual rate of investment return, net of investment-related expenses, on the market value of assets during the two years 2022 and 2023 was -1.2%. However, the actuarial value of assets (AVA) used in the valuation and the determination of the amortization period is based on an adjusted market value. The average annual rate of return on the AVA, net of investment-related expenses, for years 2022 and 2023 was 5.6%, less than the assumed rate of return of 6.5%. This resulted in an **increase** in the amortization period of 1.4 years.

2. The aggregate payroll increased at an average rate of 3.5% per year instead of the assumed 2.75% per year rate, which caused the amortization period to **decrease** by 0.1 of a year.

3. The net result of all experience other than the investment experience and the aggregate payroll experience had the combined effect of **increasing** the amortization period by 2.5 years. This was primarily the result of greater-than-assumed disabilities.

4. The changes in the assumptions, primarily the recognition of the 15% pay increase effective October 1, 2024, had the effect of **increasing** the amortization period by 16.0 years.

5. The changes in the benefit provisions effective February 20, 2023 had the effect of **increasing** the amortization period by 2.9 years.

Section III

Benefit Improvements

The results of this actuarial valuation as of December 31, 2023 reveal that the fund, based on the Present Plan of benefits, has an adequate contribution arrangement. As disclosed in both Sections I and II, the amortization period of the UAAL is 26.6 years. With an amortization period of 26.6 years, we are not willing to give the actuarial approval required by the provisions of Section 7 of the Texas Local Fire Fighters' Retirement Act (TLFFRA) to increase benefits.

There are a number of other reasons why it will be necessary to wait for the next two actuarial valuations to assess the fund's ability to provide benefit formula improvements. The first reason is the headwind from the $1.8 million deferred net loss, as shown in the six scenarios on page 2, and the near-term uncertainty in the economy. Another reason is that the fund's normal cost as a percent of payroll (34.32%) is a relatively high portion (88%) of the total contribution rate of 39.20%. With only 4.88% of payroll available to amortize the UAAL, we recommend waiting until the UAAL amortization period is less than 10 years before considering a benefit improvement in order to provide a cushion against any adverse experience in the future. The last reason is that the new Pension Review Board Pension Funding Guidelines include a long-term guideline that any benefit increases result in a UAAL amortization period no more than the greater of 15 years and the average future working lifetime of the active members. The cautious application of that guideline would be to use 15 years as the maximum UAAL amortization period after any benefit increase.

On the other hand, favorable investment experience could accelerate the reduction in the amortization period. It will be the key to the fund's health. In addition, the significant compensation increases in October 2024 due to the new collective bargaining agreement will significantly increase the contributions to fund in 2025 and beyond.

Exhibit 1

Distribution of Firefighters by Age and Service on December 31, 2023 with Average Annual Compensation

Years of Service	Age									Total	Average Compen-sation
	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 or Over		
0	2	3	2	0	0	0	0	0	0	7	$ 58,000
1	0	0	0	0	0	0	0	0	0	0	0
2	1	1	0	3	0	0	0	0	0	5	61,857
3	0	0	3	0	0	0	0	0	0	3	65,558
4	0	0	0	0	0	0	0	0	0	0	0
5	0	3	8	5	0	0	0	0	0	16	69,735
6	0	0	0	0	0	0	0	0	0	0	0
7	0	0	1	2	0	0	0	0	0	3	72,983
8	0	0	1	3	3	0	0	0	0	7	76,803
9	0	0	0	0	0	0	0	0	0	0	0
10	0	0	3	2	0	0	0	0	0	5	80,788
11	0	0	0	2	1	2	0	0	0	5	88,939
12	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	1	1	0	0	0	0	2	91,780
16	0	0	0	1	1	0	1	0	0	3	94,290
17	0	0	0	1	1	5	0	0	0	7	94,690
18	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	1	2	0	0	0	3	105,196
20-24	0	0	0	0	9	10	2	1	0	22	115,423
25-29	0	0	0	0	0	8	2	1	0	11	147,969
30-34	0	0	0	0	0	0	0	0	0	0	0
35+	0	0	0	0	0	0	0	0	0	0	0
Totals	3	7	18	20	17	27	5	2	0	99	$ 93,381

	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 or Over	Total
Average Compensation	$59,293	$62,809	$69,932	$77,169	$101,876	$118,120	$130,286	$125,158	$ 0	$93,381

Average age	39.7
Average years of service	13.2
Average age at hire	26.5

Exhibit 2

Summary of Pensioner Data

Type of Benefit	Pensioner Data Used in December 31, 2023 Valuation	
	Number of Recipients	Total Monthly Benefit Payments
Service Retirement	2	$ 11,880
Disability Retirement	5 [1]	16,864
Vested Terminated (Deferred)	1	4,712
Surviving Spouse	0	0
Surviving Child	0	0
Total	8	$ 33,456

Type of Benefit	Comparison of Pensioner Count by Type as of The Prior and Current Actuarial Valuations			
	December 31, 2021	New	Ceased	December 31, 2023
Service Retirement	0	+2	0	2
Disability Retirement	1	+4 [1]	0	5 [1]
Vested Terminated (Deferred)	1	0	0	1
Surviving Spouse	0	0	0	0
Surviving Child	0	0	0	0
Total	2	+6	0	8

[1] Includes one alternate payee receiving benefits according to the terms of a Qualified Domestic Relations Order (QDRO).

Exhibit 3

Firefighter and Pensioner Reconciliation

	Firefighters	Current Payment Status	Vested Terminated Firefighters	Total
1. As of December 31, 2021	100	1	1	102
2. Change of status				
a. retirement	(2)	2	0	0
b. disability	(3)	3	0	0
c. death	0	0	0	0
d. survivor payment begins	0	0	0	0
e. withdrawal	(3)	0	0	(3)
f. vested termination	0	0	0	0
g. QDRO alternate payee	0	1	0	1
h. child benefit ceases	0	0	0	0
i. net changes	(8)	6	0	(2)
3. New firefighters	7	0	0	7
4. As of December 31, 2023	99	7[1]	1	107

[1] Includes one alternate payee receiving benefits according to the terms of a Qualified Domestic Relations Order (QDRO).

Exhibit 5

Historical Comparison of Actuarial Accrued Liability and Actuarial Value of Assets
(Present Plan Valuations as of December 31)

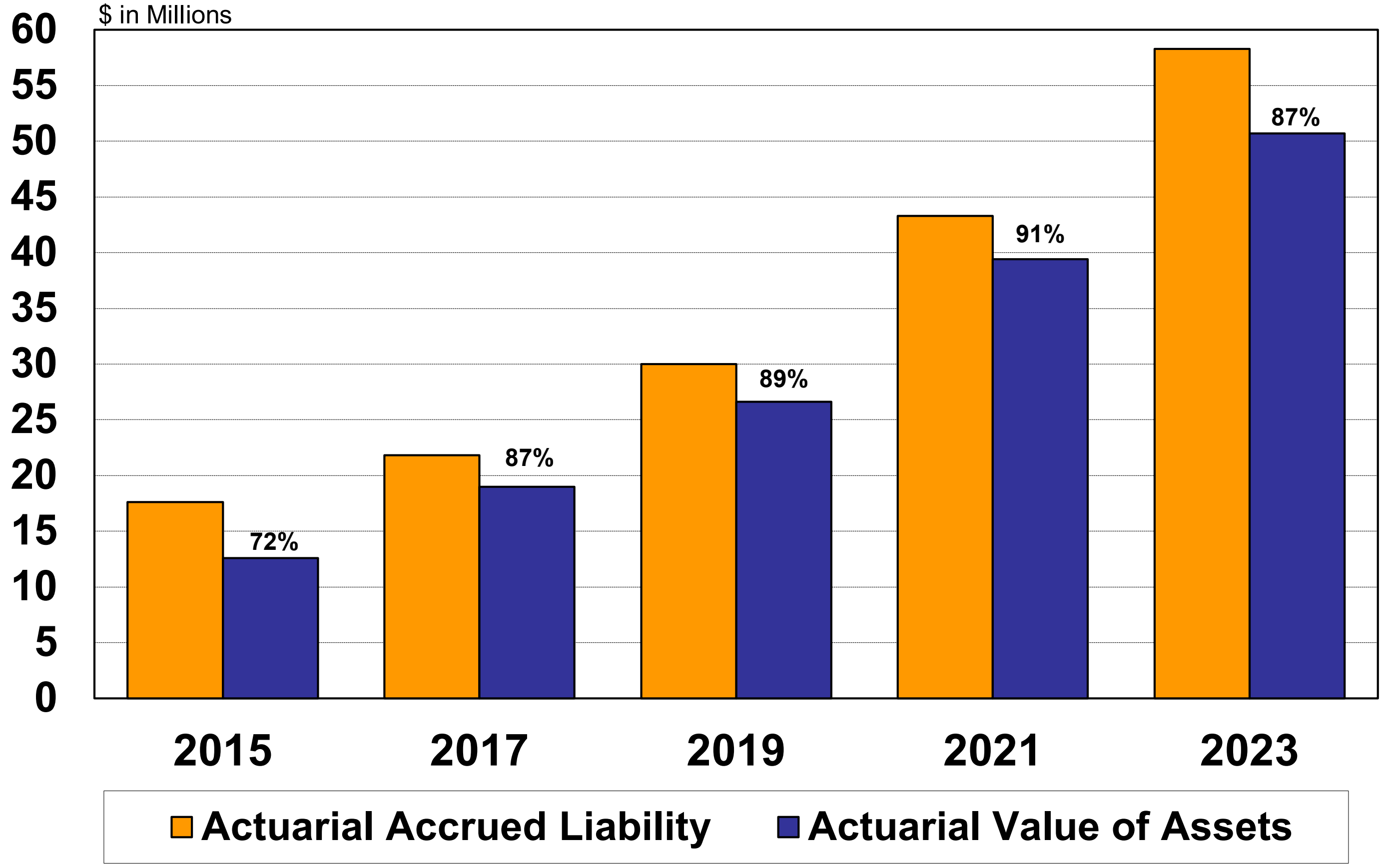


Exhibit 6

Summary of Asset Data

Asset Type	Market Value as of December 31, 2023	Allocation As a Percent of Grand Total
Equities		
Domestic Large Cap	$ 9,819,784	20.1%
Domestic Mid Cap	6,778,726	13.9
Domestic Small Cap	6,355,370	12.9
International Developed	4,414,483	9.0
International Developing	2,449,329	5.0
Total	29,817,692	60.9
Alternatives		
Real Estate	1,937,142	4.0
Fixed Income		
Domestic Core	10,745,098	22.0
Domestic High Yield	1,526,301	3.1
Global	2,031,849	4.2
Domestic Bank Loan	2,454,644	5.0
Total	16,757,892	34.3
Cash Equivalents	371,484	0.8
Grand Total	$48,884,210[1]	100.0%

[1] The grand total is the audited amount. All of the invested amounts except cash are from the December 31, 2023 report from the investment consultant. Cash is the balancing item.

Comparison of Asset Values as of the Prior and Current Actuarial Valuation Dates		
	December 31, 2021	December 31, 2023
Market Value	$43,124,916	$48,884,210
Actuarial Value	$39,421,197	$50,697,322
Actuarial Value as a Percent of Market Value	91.4%	103.7%

Exhibit 7

Statement of Changes in Audited Assets for the Years Ended December 31, 2023 and 2022

	12/31/2023	12/31/2022
Additions		
1. Contributions		
a. Employer	$ 1,751,096	$ 1,721,021
b. Employees	1,824,065	1,790,484
c. Total	$ 3,575,161	$ 3,511,505
2. Investment Income		
a. Interest and dividends	$ 1,557,804	$ 1,502,829
b. Net appreciation in fair value	4,590,219	(7,971,669)
c. Total	$ 6,148,023	$ (6,468,840)
3. Other Additions	0	0
Total Additions	**$ 9,723,184**	**$ (2,957,335)**
Deductions		
4. Benefit Payments	$ 441,362	$ 182,282
5. Expenses		
a. Investment-related	$ 143,294	$ 131,416
b. Administrative	64,356	43,845
c. Total	$ 207,650	$ 175,261
Total Deductions	**$ 649,012**	**$ 357,543**
Net Increase in Assets	**$ 9,074,172**	**$ (3,314,878)**
Market Value of Assets (Fiduciary Net Position)		
Beginning of Year	$ 39,810,038	$ 43,124,916
End of Year	$ 48,884,210	$ 39,810,038
Rate of Return		
Net of All Expenses	14.36%	(14.83)%
Net of Investment-Related Expenses	14.52%	(14.74)%
Gross	14.90%	(14.47)%
Direct Investment-Related Expenses	0.38%	0.27%

Exhibit 8

Development of Actuarial Value of Assets

Calculation of Actuarial Investment Gain/(Loss) Based on Market Value for Plan Years Ending December 31				
	2023	2022	2021	2020
1. Market Value of Assets as of beginning of year	$39,810,038	$43,124,916	$35,534,338	$28,086,052
2. Firefighter Contributions	1,824,065	1,790,484	1,656,452	1,464,853
3. City Contributions	1,751,096	1,721,021	1,592,102	1,404,151
4. Benefit Payments and Administrative Expenses[1]	(505,718)	(226,127)	(83,142)	(27,846)
5. Expected Investment Return[2]	2,687,409	2,909,894	2,598,193	2,065,464
6. Expected Market Value of Assets as of end of year	45,566,890	49,320,188	41,297,943	32,992,674
7. Actual Market Value of Assets as of end of year	48,884,210	39,810,038	43,124,916	35,534,338
8. Actuarial Investment Gain/(Loss)	3,317,320	(9,510,150)	1,826,973	2,541,664
9. Market Value Rate of Return Net of Expenses	14.52%	(14.74)%	11.92%	15.61%
10. Rate of Actuarial Investment Gain/(Loss)	8.02%	(21.24)%	4.92%	8.61%

[1] Administrative expenses are included for all years to retroactively make the investment return assumption net of investment-related expenses.
[2] Assuming uniform distribution of contributions and payments during the plan year; investment return assumption was 7% per year in 2020 and 2021 and was 6.5% in 2022 and 2023.

Plan Year	Investment Gain/(Loss)	Deferral Percentage	Deferred Gain/(Loss) as of 12/31/2023
2023	$ 3,317,320	80%	$ 2,653,856
2022	(9,510,150)	60%	(5,706,090)
2021	1,826,973	40%	730,789
2020	2,541,664	20%	508,333
Total			$ (1,813,112)

Actuarial Value of Assets as of December 31, 2023	
11. Market Value of Assets as of December 31, 2023	$ 48,884,210
12. Deferred Gain/(Loss) to be Recognized in Future	(1,813,112)
13. Preliminary Value (Item 11 – Item 12)	$ 50,697,322
14. Corridor for Actuarial Value of Assets	
a. 80% of Market Value as of December 31, 2023 (minimum)	$ 39,107,368
b. 120% of Market Value as of December 31, 2023 (maximum)	$ 58,661,052
15. Actuarial Value as of December 31, 2023	$ 50,697,322
16. Write Up/(Down) of Assets (Item 15 – Item 11)	$ 1,813,112

Exhibit 9

Historical Comparison of Market and Actuarial Value of Assets
(Valuation as of December 31)

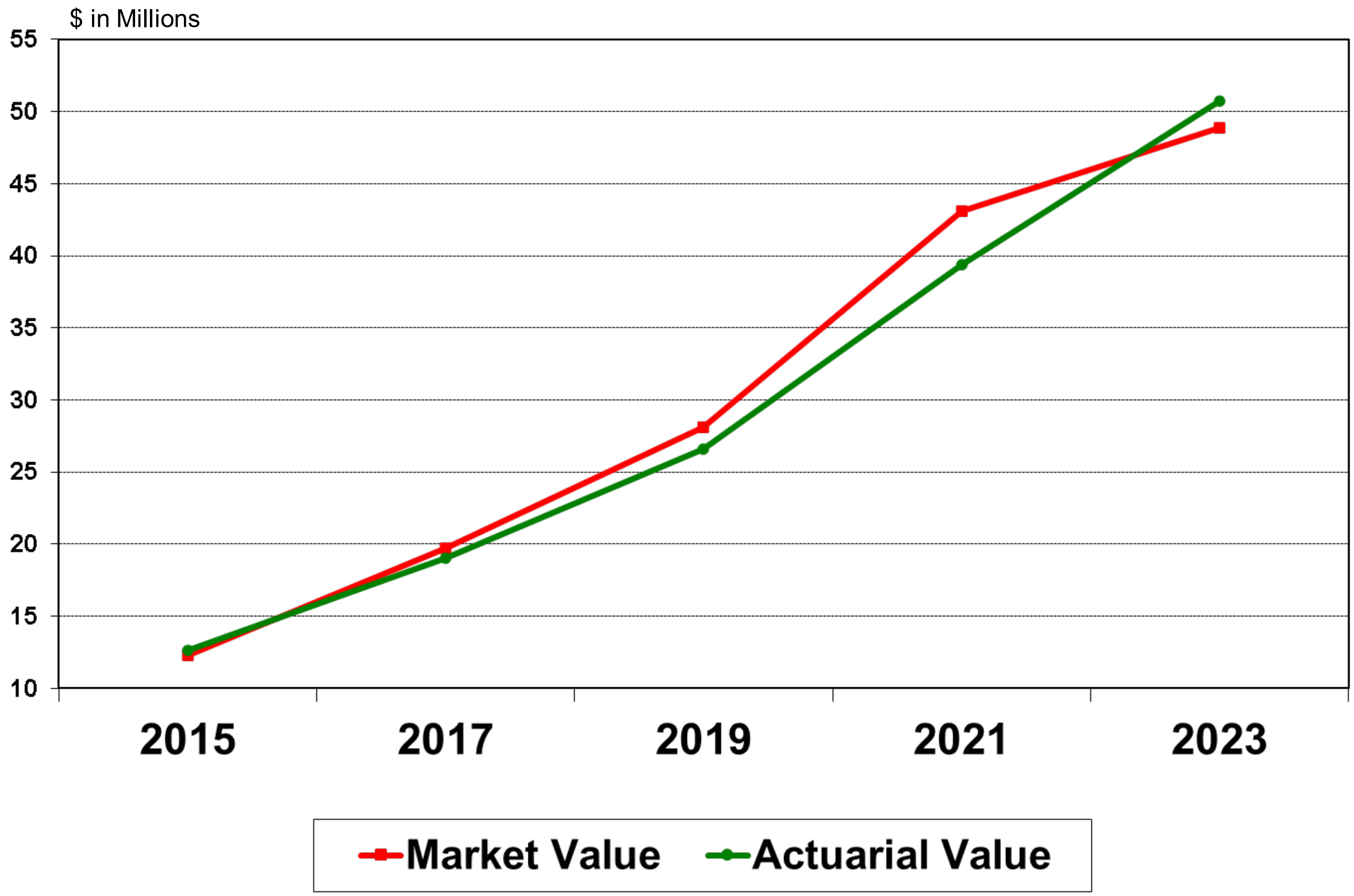
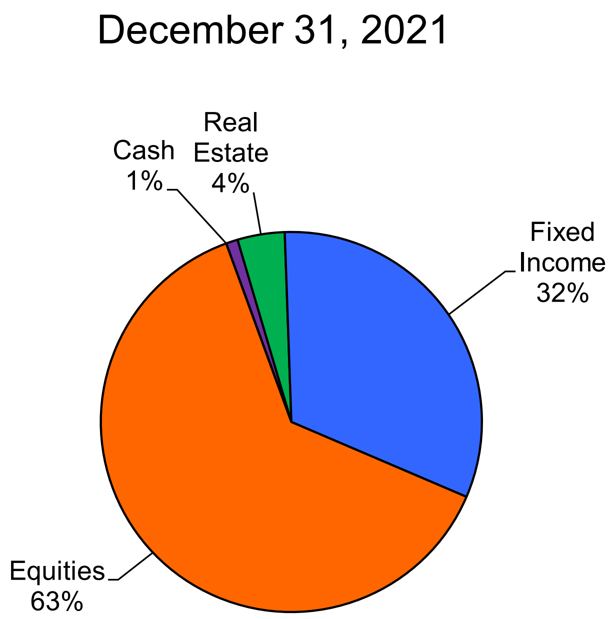


Exhibit 10

Market Value Asset Allocation as of the Prior and Current Actuarial Valuation Dates



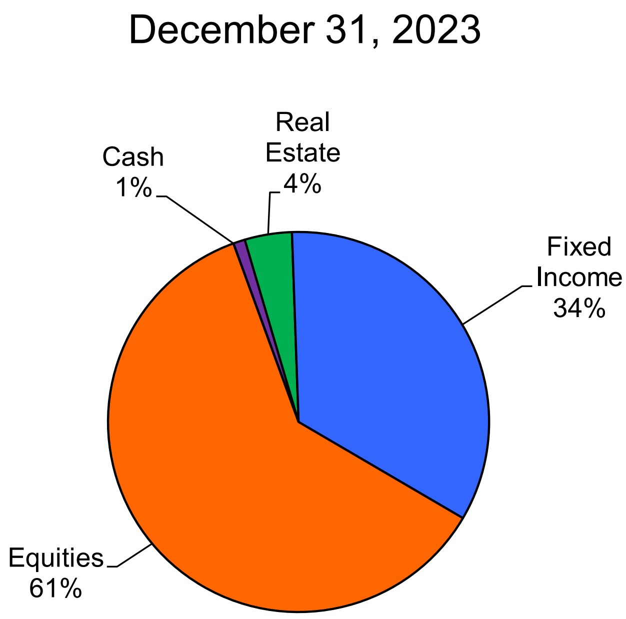


Exhibit 11

Actuarial Methods and Assumptions

A. Actuarial Methods

1. Actuarial Cost Method

The Entry Age Actuarial Cost Method is an actuarial cost method in which the actuarial present value of projected benefits of each active firefighter included in the valuation is allocated as a level percentage of compensation over the period from age at hire to the last age before 100% assumed retirement. Each active firefighter's normal cost is the current annual contribution in a series of annual contributions which, if made throughout the firefighter's total period of employment. The normal cost for the fund is the sum of the normal costs for each active firefighter for the year following the valuation date. The normal cost as a percent of payroll reflects that contributions are made biweekly.

The fund's actuarial accrued liability is the excess of the actuarial present value of projected benefits over the actuarial present value of all future remaining normal cost contributions. The unfunded actuarial accrued liability (UAAL) is the amount by which the actuarial accrued liability exceeds the actuarial value of assets. The UAAL is recalculated each time a valuation is performed. Experience gains and losses, which represent deviations of the UAAL from its expected value based on the prior valuation, are determined at each valuation and are amortized as part of the newly calculated UAAL.

2. Amortization Method

The UAAL is assumed to be amortized with level percentage of payroll contributions (total assumed contribution rate less normal cost contribution rate) based on assumed payroll growth of 2.75% per year. The actuarial determination of the amortization period reflects that contributions are made biweekly.

3. Actuarial Value of Assets Method

All assets are valued at market value with an adjustment made to uniformly spread actuarial gains or losses (as measured by actual market value investment return vs. expected market value investment return) over a five-year period. The total adjustment amount shall be limited as necessary such that the actuarial value of assets shall not be less than 80% of market value nor greater than 120% of market value.

B. Actuarial Assumptions

As a part of each actuarial valuation, we review the actuarial assumptions used in the prior actuarial valuation. The investment return assumption is reviewed using the building block approach that includes several asset allocations, assumed real rates of return for each asset class, an assumed rate of investment-related expenses, and an assumed rate of inflation, with all assumptions for the long-term future. Our economic assumptions are influenced both by long-term historical experience and by future expectations of investment consultants and economists, but we select the economic assumptions and normally discuss them with the board when presenting the actuarial valuation. See Appendix A for our review of the economic assumptions.

We review the termination and retirement experience since the prior valuation and periodically look back more than two years. We also periodically review the average salaries by years of service to get insights into the promotion, step, and longevity compensation patterns for the purpose of reviewing our compensation increase assumption. For the mortality assumptions, we use an appropriate published mortality table with projections for improvement beyond the valuation date. We are guided in our review and selection of assumptions by the relevant actuarial standards of practice. As a result of our review, we have selected actuarial assumptions we consider to be reasonable and appropriate estimates of future experience for the fund for the long-term future.

1. Investment Return

   6.5% per year net of investment-related expenses.

2. Inflation

   2.5% per year included in compensation increases and investment return assumptions.

3. Mortality Rates

   PubS-2010 (public safety) total dataset mortality tables for employees and for retirees (sex distinct), projected for mortality improvement generationally using the projection scale MP-2019.

4. Compensation Increases

   General increase of 2.75% per year combined with promotion, step, and longevity increases that average 2.41% per year over a 30-year career. See Exhibit 12. The general increase for the year 2025 is 15%. After 2025, it is the long-term 2.75% annual increase.

5. Retirement Rates

Age	Rate per Year for Firefighters Eligible to Retire
52	25%
53	75
54	10
55	100

   The average expected retirement age (excluding those firefighters currently beyond retirement eligibility) based on these rates is 53.3.

6. RETRO DROP Election

   a. 100% of the retirements at ages 52 are assumed to elect a one-year lump sum.

   b. 100% of the retirements at ages 53 and 54 are assumed to elect a two-year lump sum.

   c. 100% of the retirements at age 55 are assumed to elect a three-year lump sum.

7. Termination Rates

   See Exhibit 12.

8. Disability Rates

   See Exhibit 12.

9. Reduction in Benefit after 2½ Years of Disability Retirement

   15% weighted average reduction in benefit.

10. Percent Married

    100% of the active firefighters are assumed to be married at retirement, disability, or death while employed, with male firefighters having a spouse three years younger and female firefighters having a spouse three years older. Actual marital status and spouse date of birth are used for retirees.

11. Payment Form for Retirement Benefits Due to Service Retirement, Disability Retirement, or Vested Termination

    - Joint and two-thirds to surviving spouse

12. Surviving Child's Death Benefit

    None are assumed as a result of future deaths.

13. Firefighters' Contribution Rate

    20.0% of covered compensation.

14. District's Assumed Contribution Rate

    19.2% of covered compensation for at least as long as the period required to amortize the UAAL.

15. Covered Payroll for First Year Following Valuation Date

    The sum of the actual (or annualized) covered compensation for 2023 for each firefighter active as of December 31, 2023 without adjustment to approximately reflect the effect of the general compensation increase effective October 8, 2023 of less than 1%.

16. Administrative Expenses

The expenses paid by fund assets for other than investment-related expenses are assumed to be 0.60% of payroll. The normal cost rate as a percent of payroll is assumed to be 0.60% of payroll higher to reflect these expenses.

Exhibit 12
Disability and Termination Rates per 1,000 Active Members
Compensation Increases by Years of Service

Disability Rates		Termination Rates		Compensation Increases	
Attained Age	Rate per 1,000	Years of Service	Rate per 1,000	Years of Service	Increase Percent
20	0.14	0	30	1	10.46%
21	0.15	1	27	2	10.46
22	0.16	2	24	3	6.35
23	0.17	3	21	4	6.35
24	0.18	4	18	5	6.35
25	0.19	5	16	6	6.35
26	0.21	6	14	7	6.35
27	0.23	7	12	8	6.35
28	0.25	8	11	9	6.35
29	0.28	9	10	10	6.35
30	0.31	10	8	11	5.83
31	0.35	11	7	12	5.83
32	0.40	12	6	13	5.83
33	0.46	13	5	14	5.83
34	0.53	14	5	15	5.83
35	0.61	15	5	16	5.83
36	0.71	16	5	17	5.83
37	0.83	17	4	18	5.83
38	1.00	18	4	19	5.83
39	1.22	19	4	20	5.83
40	1.50	20 & Over	0	21	2.75
41	1.85			22	2.75
42	2.28			23	2.75
43	2.80			24	2.75
44	3.42			25	2.75
45	4.14			26	2.75
46	4.86			27	2.75
47	5.58			28	2.75
48	6.30			29	2.75
49	7.02			30	2.75
50	7.74			31	2.75
51	8.46			32	2.75
52	9.18			33	2.75
53	9.90			34	2.75
54	10.62			35	2.75
55	0.00			36	2.75
56	0.00			37	2.75
57	0.00			38	2.75
58	0.00			39	2.75
59	0.00			40	2.75

Exhibit 13

Definitions

1. Actuarial Accrued Liability	That portion, as determined by the particular actuarial cost method used, of the Actuarial Present Value of future pension plan benefits as of the Valuation Date that is not provided for by the Actuarial Present Value of future Normal Costs.
2. Actuarial Assumptions	Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, termination, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation; and other relevant items.
3. Actuarially Equivalent	Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
4. Actuarial Gain (Loss)	A measure of the difference between actual experience and that expected based on the Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with the particular actuarial cost method used.
5. Actuarial Present Value	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date (the Valuation Date) by the application of the Actuarial Assumptions.
6. Actuarial Valuation	The determination, as of a Valuation Date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets and related Actuarial Present Values for a pension plan.
7. Actuarial Value of Assets	The value of cash, investments and other property belonging to a pension plan, as determined by a method and used by the actuary for the purpose of an Actuarial Valuation.

8. Entry Age Actuarial Cost Method	An actuarial cost method under which the Actuarial Present Value of the Projected Benefits of each individual included in the Actuarial Valuation is allocated as a level percentage of compensation over the period from age at hire to the last age before 100% assumed retirement. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a Valuation Date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability. Under this method, Actuarial Gains (Losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.
9. Plan Year	A 12-month period beginning January 1 and ending December 31.
10. Normal Cost	That portion of the Actuarial Present Value of pension plan benefits that is allocated to a valuation year by the actuarial cost method.
11. Projected Benefits	Those pension plan benefit amounts that are expected to be paid at various future times according to the Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future qualified service.
12. Overfunded Actuarial Accrued Liability	The excess, if any, of the Actuarial Value of Assets over the Actuarial Accrued Liability.
13. Unfunded Actuarial Accrued Liability	The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.
14. Valuation Date	The date upon which the Normal Cost, Actuarial Accrued Liability and Actuarial Value of Assets are determined. Generally, the Valuation Date will coincide with the end of a Plan Year.
15. Years to Amortize the Unfunded Actuarial Accrued Liability	The period is determined in each Actuarial Valuation as the number of years, beginning with the Valuation Date, to amortize the Unfunded Actuarial Accrued Liability with a level percent of payroll that is the difference between the expected total contribution rate and the Normal Cost contribution rate.

Exhibit 14

Summary of Present Plan

1.	Normal Service or Disability Retirement Monthly Benefit - Percentage of Highest Average Monthly Pay	
	(a) for each of the first 20 years of service	3.4%
	(b) for each year in excess of 20 years but not more than 10 years	2.2%
	(c) for each year in excess of 30 years	1.0%
2.	Normal Service Retirement Eligibility (Minimum)	Age 52 and 20 Years
3.	One-Year Deferred Retirement Option Plan (DROP)	
	(a) Earliest DROP benefit calculation date	Age 51 and 19 Years
	(b) Earliest employment termination date with maximum DROP benefit accumulation period	Age 52 and 20 Years
	(c) Maximum DROP benefit accumulation period	12 Months
4.	Two-Year DROP	
	(a) Earliest DROP benefit calculation date	Age 51 and 18 Years
	(b) Earliest employment termination date with maximum DROP benefit accumulation period	Age 53 and 20 Years
	(c) Maximum DROP benefit accumulation period	24 Months
5.	Three-Year DROP	
	(a) Earliest DROP benefit calculation date	Age 52 and 19 Years
	(b) Earliest employment termination date with maximum DROP benefit accumulation period	Age 55 and 22 Years
	(c) Maximum DROP benefit accumulation period	36 Months

6. DROP lump sum includes
   (a) Monthly benefit determined at the DROP date multiplied by number of months between DROP benefit calculation date and termination of employment,
   (b) accumulated contributions made by the firefighter after the DROP benefit calculation date, and
   (c) no interest

7.	Vested Terminated Benefit	
	(a) Eligibility for firefighters (minimum service)	10 Years
	(b) Benefit is based on formula in item 1	
	(c) Benefit is deferred to date person would have satisfied normal service retirement eligibility date	

8. Disability Retirement Monthly Benefit for Firefighters Who Become Disabled while Employed
   (a) For initial 30-month period is (i) plus (ii) if not able to perform job in fire department
      (i) Minimum monthly amount based on 20 years
      (ii) Additional amount per year of service over 20 years
   (b) Following initial 30-month period is (i), or (ii), or (iii), depending upon status at that time and annually thereafter
      (i) Initial benefit
      (ii) Initial benefit reduced
      (iii) Zero
   (c) Upon attaining eligibility for normal retirement if the member would have remained employed by the fire department, the board may modify or waive the yearly review of status

9. Surviving Spouse's Monthly Death Benefit for a Firefighter with Under 20 Years of Service as a Percent of Highest Average Monthly Pay 45.4%

10. Surviving Spouse's Monthly Death Benefit for a firefighter who dies with at least 20 years of service will be equal to two-thirds of the monthly benefit the firefighter could have received on the date of death if the firefighter had otherwise been eligible for normal service retirement.

11. Surviving Children's Monthly Death Benefit
   (a) Where the spouse is receiving a benefit: 7.47% of Highest Average Monthly Pay
   (b) Where the spouse is not receiving a benefit or there is no spouse: same as surviving spouse benefit per item 8 or 9, as appropriate

12. Contributions as a Percent of Compensation by:
   (a) Firefighters 20.0%
   (b) ESD 19.2%

13. The normal form of annuity payment at retirement is a Joint and Two-Thirds to Surviving Spouse, and payment is on the first day of each month. No optional forms of annuity payments are available.

14. Compensation used to determine contributions and the Highest Average Monthly Pay includes all pay but excluding (1) lump sum distribution of termination pay for unused sick leave and vacation, (2) pay due to overtime other than standard overtime pay and "step-up" service, and (3) incentive pay as a result of certain degree status or classification. The average is based on the 48 consecutive months with the fire department which yield the highest monthly average.

15. Refund of firefighters' accumulated contributions without interest will be made to firefighters who terminate employment and either are not eligible for any other benefit from the fund or request a refund from the fund.

Appendix A

Review of the Actuarial Economic Assumptions for the December 31, 2023 Actuarial Valuation

Theoretical Investment Return Assumption Development

	Gross Annual Real Rate of Investment Return (ROR)[1]	Estimated Investment Expenses[2]	Net Real ROR	12/31/23 Actual[3] Asset Allocation
Domestic Equity				
Large Cap	6.5%	0.43%	6.07%	20.1%
Mid Cap	7.0	0.55	6.45	13.9
Small Cap	7.0	0.86	6.14	12.9
				46.9
International Equity				
Developed Large Cap	7.0	0.97	6.03	9.0
Emerging Markets	8.0	1.28	6.72	5.0
				14.0
Fixed Income				
Domestic Core	2.0	0.53	1.47	22.0
Domestic High Yield	3.5	0.93	2.57	3.1
Global	2.5	0.85	1.65	4.2
Domestic Bank Loan	3.0	0.91	2.09	5.0
				34.3
Alternatives				
Real estate	5.0	0.95	4.05	4.0
Cash	0.2	0.20	0.00	0.8
				100.0%

Weighted Average Net Real ROR Assumption	4.52%
Possible Theoretical Annual Investment Return Assumption (Total Net Annual ROR) – Net Real ROR Plus Assumed Annual Rate of Inflation	
Assumed 2.50% Inflation	7.02%

[1] A gross annual real rate of investment return is the long-term total average annual rate of investment return, before any expenses, that is in excess of the assumed annual inflation rate. These are assumptions made by Rudd and Wisdom, Inc.

[2] These assumed investment-related expenses are based on information from the investment consulting firm Robert Harrell, Inc. as of December 31, 2023 and include both direct and indirect expenses, with an addition of 0.05% for bank custody fees plus 0.15% for investment consultant fees. The total investment-related expenses for the Fund, both direct and indirect, are currently on average 0.70% of assets.

[3] This allocation is from the investment consultant's 12/31/2023 report adjusted for the total audited net assets amount.

Appendix A (continued)

Price Inflation in the USA - Average Annual Rates of Increase in the CPI-U

Years (Dec. to Dec.)	Number of Years	Average Annual Increase
1958 – 2023	65	3.70%
1963 – 2023	60	3.90
1968 – 2023	55	4.00
1973 – 2023	50	3.86
1978 – 2023	45	3.41
1983 – 2023	40	2.81
1988 – 2023	35	2.71
1993 – 2023	30	2.51
1998 – 2023	25	2.54
2003 – 2023	20	2.58

Most inflation forecasts are for 10 years or less. For example, the average 10-year forecast in the June 2024 Livingston Survey published by the Federal Reserve Bank of Philadelphia was 2.25%. However, 10 years is too short a forecast period for a public employee defined benefit pension plan. In the 2024 annual report of the OASDI Trust Funds (Social Security), the ultimate inflation assumptions for their 75-year projections are 3.0%, 2.4%, and 1.8% for the low-cost, intermediate, and high-cost assumptions, respectively. Looking at the average annual increase in the CPI-U over historical periods of 30 to 65 years above and considering the Social Security forecasts, we believe that reasonable assumed rates of inflation for the long-term future would range from 2.25% to 3.00%.

Administrative Expenses Paid by the Fund

Plan Year Ending 12/31 (1)	Administrative Expenses Paid by the Fund (2)	Covered Payroll (3)	% of Payroll (2) ÷ (3) (4)
2023	$ 64,356	$ 9,120,325	0.71%
2022	43,845	8,952,420	0.49
2021	45,265	8,292,198	0.55
2020	27,846	7,313,286	0.38
2019	47,153	6,965,200	0.68
2018	38,974	6,074,844	0.64
2018-2023	$267,439	$46,718,273	0.57%

The administrative expenses are not reflected in the investment return assumption but are reflected as a percent of payroll that is added to the normal cost contribution rate. For the December 31, 2023 actuarial valuation, we recommend 0.60%, the average developed above for the last six plan years (rounded up to the next multiple of 0.05%). This is an increase from the 0.55% assumption used in the December 31, 2021 actuarial valuation. (The covered payroll was determined as the firefighter or district contributions for the plan year divided by the appropriate contribution rate during the plan year.)

Appendix A (continued)

Comparison of 12/31/2021 Actuarial Economic Assumptions with 12/31/2023 Actuarial Economic Assumptions

Actuarial Assumption[1]	12/31/2021 Actuarial Economic Assumptions	12/31/2023 Actuarial Economic Assumptions
Inflation (Price)	2.50%	2.50%
Net real rate of return[2]	4.00	4.00
Net total investment return[2]	6.50%	6.50%
Firefighter pay increase[3]	5.06%	5.16%[5]
Aggregate payroll increase	2.75%	2.75%
Administrative expenses[4]	0.55% of payroll	0.60% of payroll

[1] All assumptions are annual rates.
[2] Net of all investment-related expenses.
[3] For 12/31/2021, a 2.75% annual general compensation increase combined with annual promotion, step, and longevity compensation increases that vary by length of service (greater increases in early years of service) that have an annual average of 2.31% over a 30-year career. For 12/31/2023, the same 2.75% combined with annual promotion, step, and longevity compensation increases that vary by length of service (greater increases in early years of service) that have an annual average of 2.41% over a 30-year career.
[4] Administrative expenses are reflected as a percent of payroll that is added to the normal cost contribution rate.
[5] In addition, as described on page 4 and 21, an increase of 15% for 2025 is assumed instead of the 2.75% in order to recognize the significant increase effective October 2024 in the new collective bargaining agreement.

Appendix B

Alternative Measure as of December 31, 2023

At your request, we have determined the actuarial present value of accumulated plan benefits as of December 31, 2023, and compared it to the market value of assets. Accumulated plan benefits are based on the service and compensation history as of December 31, 2023 for each fund member. The measurement is not appropriate for an ongoing plan, but could be appropriate if the plan had been frozen as of December 31, 2023. The total actuarial present value of accumulated plan benefits as of December 31, 2023 was $44,944,083. The market value of assets (fiduciary net position) as of that date was $48,884,210. The ratio of the assets to the present value of accumulated plan benefits was 109%.

Appendix C

Other Disclosures as of December 31, 2023

Negative Amortization

- As of this actuarial valuation, the fund is expected to have negative amortization for about five more years. At that time, the unfunded actuarial accrued liability is expected to gradually decrease from one annual actuarial valuation to the next.

Reasonable Actuarially Determined Contribution Rate

- The benchmark actuarially determined contribution (ADC) rate in the section on funding policy on page 5 of 39.27% is a reasonable ADC rate consistent with actuarial standards of practice.

Actuarial Valuation Software

- We have utilized software licensed from Winklevoss Technologies, LLC in the development of the liabilities summarized in the report. We have independently confirmed the model developed by Winklevoss and have sufficiently tested it to ensure the model is an accurate representation of the system's liabilities.

Low-Default-Risk Obligation Measure (LDROM)

- The LDROM is a new required disclosure calculated as of the date of the actuarial valuation using a discount rate based on high quality bond yields instead of the expected return on the fund's diversified investment portfolio.

Low-Default-Risk Obligation Measure	$94,568,427
Actuarial Accrued Liability	$58,318,075

- The difference between the LDROM and the actuarial accrued liability determined in this actuarial valuation could be viewed as the expected savings from investing in the fund's diversified portfolio instead investing only in high quality bonds.

- For our calculation of the LDROM, we have used the same actuarial cost method and actuarial assumptions from this actuarial valuation summarized in Exhibits 11 and 12, except for an assumed discount rate of 3.26% instead of the investment return assumption of 6.5%. To determine the assumed discount rate, we used the Bond Buyer Index of general obligation bonds with 20 years to maturity, which has an average rating roughly equivalent to Moody's Investors Services' Aa2 rating and Standard and Poor's Corporation AA. The weekly index closest to the December 31, 2023 measurement date was 3.26%.

- Because the fund's assets are not invested only in high-quality bonds, the LDROM does not reflect the fund's actuarial condition, nor does it offer insights into the total contribution required for an adequate contribution arrangement or the security of participant benefits.