Corpus Christi Fire Fighters' Retirement System

Actuarial Valuation as of December 31, 2022

November 10, 2023

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November 10, 2023

Board of Trustees
Corpus Christi Fire Fighters'
Retirement System
American Bank Plaza
711 N. Carancahua, Suite 724
Corpus Christi, TX 78475

Members of the Board of Trustees:

At the request of the Board of Trustees of the Corpus Christi Fire Fighters' Retirement System, we have prepared this report of the results of the actuarial valuation of the system as of December 31, 2022. This valuation was prepared to determine whether the system has an adequate contribution arrangement.

In a separate April 26, 2023 report, we provided the necessary disclosures for the system's compliance with the Governmental Accounting Standards Board (GASB) Statement No. 67 for the plan year ending December 31, 2022. Similarly, we will provide a separate report later this year containing the pension expense, net pension liability, and disclosure information for the city's compliance with GASB 68 for the fiscal year ending September 30, 2023. GASB 68 prescribes the city's accounting for your system, while this actuarial valuation report reflects the assumed continuation of the anticipated contribution policy.

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

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Section I

Valuation Summary

An actuarial valuation of the assets and liabilities of the Corpus Christi Fire Fighters' Retirement System as of December 31, 2022 has been completed. The valuation was based on the Present Plan (plan effective February 1, 2022) and the provisions of the Texas Local Fire Fighters' Retirement Act (TLFFRA) which were in effect on December 31, 2022. Section II shows the key results of the actuarial valuation as of December 31, 2022 and discusses the changes since the prior valuation that we prepared as of December 30, 2020.

This valuation reflects an actuarially assumed total contribution rate of 40.3%, comprised of 14.1% by the firefighters and a phase-in 26.2% by the city. (See "Plan Changes" on page 3 for information about an additional 1% city contribution rate to fund a $110 permanent increase in the monthly benefit of certain retirees and surviving spouses.) The total contribution ultimate rate of 40.3% exceeds the normal cost rate of 17.22%, leaving 23.08% available to amortize the unfunded actuarial accrued liability (UAAL) of $112,051,853. Assuming that the total payroll increases at the rate of 2.65% per year in the future, the contributions in excess of the normal cost **will amortize the UAAL in 17.2 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 (PRB) pension funding guidelines, our professional judgment, and the actuarial assumptions and methods used in making this valuation, we consider periods of 10 years to 25 years to be preferable and 40 years to be the maximum acceptable period. The PRB guidelines will change to a maximum of 30 years in 2025. Since the total contributions are sufficient to pay the system's normal cost and to amortize the system's UAAL within the maximum acceptable period, we are of the opinion that the system, based on present levels of benefits and contributions, **has an adequate contribution arrangement.** Section III presents information on contribution policy and benefit improvements.

Projected Actuarial Valuation Results

In addition to completing this actuarial valuation, we estimated the amortization periods as of December 31, 2024 and as of December 31, 2026 by making projections from the December 31, 2022 actuarial valuation. These projections examine the effect on the amortization period in the next two actuarial valuations of the actuarial investment gains and losses that the system experienced in the four years prior to the valuation date (gains in 2019, 2020 and 2021 and a loss in 2022) that have been only partially recognized as of December 31, 2022. 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 system has had. The AVA used in this current valuation is deferring recognition of various portions of the gains and losses in 2019-2022 that the system experienced. The AVA used in this valuation is $190,524,854. The market value of assets (MVA) is $166,298,921. The $24.2 million difference between the MVA and the AVA is the deferred net loss that will be recognized in the next two 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 2026, we used six scenarios of various assumed annual rates of investment return, net of investment-related expenses, over the 2023-2026 projection period. These projections show the expected effects over the next four years after the valuation date (1) of the recognition of the portions of the investment gains and losses over the past four years that are deferred as of December 31, 2022, and (2) of investment returns over the next four years different from the 7.15% assumption used in this valuation.

	Scenario					
	1	2	3	4	5	6
Assumed Investment Return for Calendar Year						
2023	7.15%	10.00%	12.00%	7.15%	0.00%	0.00%
2024	7.15	10.00	12.00	0.00	0.00	-10.00
2025	7.15	10.00	12.00	10.00	15.00	15.00
2026	7.15	10.00	12.00	10.00	15.00	15.00
2027 and later	7.15	7.15	7.15	7.15	7.15	7.15
Amortization Period in Years as of December 31:						
2022 (actual)	17.2	17.2	17.2	17.2	17.2	17.2
2024 (projected)	17.6	16.9	16.4	18.2	19.5	24.6
2026 (projected)	19.4	16.6	14.8	20.8	22.3	26.1

The projected future December 31, 2026 valuation in Scenario 1 reveals that instead of decreasing by the expected four years from 17.2 years to 13.2 years, the amortization period is projected to increase to 19.4 years due to the recognition of the deferred net loss of $24.2 million as of December 31, 2022. This result is not surprising when you consider that if the AVA were set equal to the MVA, recognizing all of the past gains and losses in this December 31, 2022 actuarial valuation, the amortization period would have been 23.7 years instead of 17.2 years. The primary conclusion from Scenario 1 is that without any future gains or losses, the amortization period would increase each of the next two actuarial valuations because of the deferred net investment loss. Scenarios 2 and 3 show examples of how favorable the rates of return in each of the four years following the valuation date would have to be to result in amortization period decreases. It is more likely that the amortization period will increase in the next two actuarial valuations.

Scenarios 4, 5 and 6 show the effects of various levels of adverse investment experience in 2023 and 2024 followed by a significant recovery in returns in 2025 and 2026. The system's amortization period is not very sensitive in these scenarios because of the starting 17.2-year amortization period and the large contribution rate going to pay off the unfunded liability, over 23% of payroll as shown in Section II.

We do not know what the investment experience will be for each of the next four fiscal years. 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. In addition, the future investment experience in each of the next four fiscal years could be better or worse than the assumed rates shown. These scenarios present a range of plausible scenarios for the next two valuations assuming no changes in benefits or in the expected city contribution policy.

Plan Changes Since the Prior Actuarial Valuation

The firefighters voted to increase their contribution rate from 13.1% to 14.1% in order to reduce the minimum age and service requirements for the four-year RETRO DROP from age 60 and 26 years to age 58 and 24 years. The 1% increase in the firefighter contribution rate was determined as a part of a special study requested by the board so that the increases in the normal cost contribution rate and in the unfunded liability would be offset so that the amortization period of the resulting unfunded liability would be unchanged at 21.5 years from the amortization period of 21.5 years in the December 31, 2020 actuarial valuation. These changes became effective February 1, 2022.

The city requested a series of special studies of various increases in monthly benefits with various commencement dates. The eventual decision by the city was to increase its contribution rate by an additional 1% effective October 1, 2023 in order to increase the monthly benefit beginning October 31, 2023 of retirees and surviving spouses retired at least three years as of September 30, 2023. It was determined that the increase could be $110.00 if the additional 1% is paid by the city for 12 years.

Participant and Asset Data

We have relied on and based our valuation on the active firefighter data, pensioner data, and asset data provided on behalf of the board of trustees by the system's administrator, Ms. Gracie G. Flores. We have not audited the data provided but have reviewed it for reasonableness and consistency relative to the data provided for the December 31, 2020 actuarial valuation. Exhibit 1 is a distribution of the active firefighters by age and service. The assumed 2023 compensation used for projecting future contributions and benefits in the valuation was generally based on the actual pay for the 2022 calendar year without an adjustment because of the relatively small general pay increase of 2% effective October 1, 2022 and elevated overtime included in 2022. Special adjustment was made for firefighters with less than four years of service. The total of these assumed compensation amounts is our assumed annualized covered payroll for the plan year beginning January 1, 2023 and is used in the valuation to determine the UAAL amortization period. The averages of the assumed compensation amounts for the 2023 plan year are shown in Exhibit 1.

Exhibit 2 contains summary information on the pensioners. The monthly benefit payments are generally based on the amounts paid January 31, 2023. Exhibit 3 is a reconciliation of firefighters and pensioners from December 31, 2020 to December 31, 2022. Exhibit 4 shows a breakdown of the dollar level of the monthly benefits for retirees and surviving spouses. 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 December 31, 2022 market value of assets shown in the system's audited financial statements. This exhibit also shows a comparison of the market values and actuarial values of assets as of December 31, 2020 and December 31, 2022. Exhibit 7 contains the statement of changes in assets for the plan years ending December 31, 2022 and 2021. 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 comparison of the market value asset allocation by asset class as of December 31, 2020 and December 31, 2022 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 and with the input of the board of trustees during a special October 30th meeting, we have selected and used actuarial assumptions we consider to be reasonable and appropriate estimates of future experience for the system for the long-term future. Their selection complies with the applicable actuarial standards of practice. Significant actuarial assumptions used in the valuation are:

1. 7.15% annual investment return net of investment-related expenses;
2. 2.65% annual general compensation increase combined with promotion, step, and longevity increases that average of 2.65% per year over a 30-year career;
3. Retirement rates which result in an average expected age at retirement of 58.0;
4. PubS-2010 (public safety employees) total dataset mortality tables for employees and for retirees, projected for mortality improvement generationally; and
5. City contribution rates increasing 0.984% each October through October 2024, and attaining the ultimate anticipated contribution rate of 26.2% over the remainder of the UAAL amortization period.

The following actuarial assumption changes have been made, and the new assumptions are compared to those used in the December 31, 2020 valuation:

1. We changed the investment return assumption from 7.25% to 7.15%, lowering the assumed inflation rate from 2.75% to 2.65%. We think that the 0.10% reduction in the long-term rate of inflation is appropriate.

2. We changed the assumed general compensation increase from 2.75% per year to 2.65%, making it the same as the underlying price inflation assumption. As a result, we also changed the aggregate payroll increase assumption from 2.75% per year to 2.65%.

3. We reduced the assumed administrative expenses as a percent of payroll from 0.85% to 0.80% based on the experience of the last four plan years.

The effects of these changes in assumptions on the UAAL and on the UAAL amortization period are identified 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 system and to

reasonable expectations. The assumptions represent a reasonable estimate of anticipated experience of the system 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 summarizes our review of the economic assumptions.

Funding Policy

The funding policy adopted by the board of trustees effective December 20, 2019 says that each actuarial valuation report will include a benchmark actuarially determined contribution (ADC) rate using a closed amortization period of 30 years beginning December 31, 2020. The closed amortization period declines by one each year; so the benchmark is 28 years for the December 31, 2022 actuarial valuation. The fund's actuary is to compare the benchmark ADC rate and the actuarial valuation results in the two key metrics, the amortization period and the total contribution rate.

	Amortization Period	Total Contribution Rate*
Benchmark ADC rate	28.0 years	34.32%
Actuarial valuation	17.2 years	40.30%
Difference	-10.8 years	+5.98%

The actuarially determined amortization period in this actuarial valuation of 17.2 years is significantly less than the 28-year amortization period in the benchmark ADC rate. The total ultimate contribution rate reflected in this actuarial valuation of 40.3% is significantly more than the benchmark ADC rate of 34.32%*. Therefore, there is a positive divergence between the total anticipated contribution rate in this actuarial valuation and the cost of the benefits as measured by the benchmark ADC rate. Even though there is a positive divergence from the benchmark ADC rate, there is not enough of a divergence to indicate any changes in benefits. If the city had decided to return to a contribution rate of 21.28% effective January 1, 2023, the rate when it agreed to phase into 26.2%* over five years, the amortization period would have been 25.0 years. The city agreed to the planned phase-in increased contribution rate to strengthen the system by increasing the funded ratio, which takes time.

*Not including the additional 1% city contribution increase for 12 years for the $110 COLA.

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 the possible sources of measurement variability in investment experience 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 7.15% rate and the potential effect on the amortization period. In addition, we provided a report with preliminary results of this actuarial valuation with three different sets of economic assumptions showing key results. Additional or other sensitivity analysis could be performed in a subsequent report if desired by the board of trustees.

Respectfully submitted,

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Section II

Key Results of the Actuarial Valuation

	December 31, 2020[1]	December 31, 2022
1. Actuarial present value of future benefits		
a. Those now receiving benefits or former firefighters entitled to receive benefits	$ 135,601,665	$ 144,672,031
b. Firefighters	200,878,187	221,471,346
c. Total	$ 336,479,852	$ 366,143,377
2. Actuarial present value of future normal cost contributions	$ 58,377,462	$ 63,566,670
3. Actuarial accrued liability (Item 1c – Item 2)	$ 278,102,390	$ 302,576,707
4. Actuarial value of assets	$ 167,695,254	$ 190,524,854
5. Unfunded actuarial accrued liability (UAAL) (Item 3 - Item 4)	$ 110,407,136	$ 112,051,853
6. Contributions (percent of pay)		
a. Firefighters	14.10%	14.10%
b. City of Corpus Christi	26.20%	26.20%
c. Total	40.30%	40.30%
7. Normal cost (percent of payroll)	17.04%	17.22%
8. Percent of payroll available to amortize the UAAL (Item 6c - Item 7)	23.26%	23.08%
9. Annualized covered payroll	$ 35,823,542	$ 39,549,022
10. Years to amortize the UAAL	21.5 years[2]	17.2 years[2, 3]
11. Funded ratio (Item 4 ÷ Item 3)[4]	60.3%	63.0%

[1] All items are from the special study based on the December 31, 2020 actuarial valuation and reflect the Present Plan.
[2] Calculated reflecting the anticipated timing of increases in the city contribution rate each October through October 1, 2024 to 26.2% effective October 1, 2024.
[3] Calculated reflecting the city's agreement to contribute an extra 1% for 12 years beginning October 1, 2023 to fund the $110 increase in the monthly benefit of certain retirees and surviving spouses by subtracting the present value of the extra 1% contributions from the UAAL.
[4] 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 63.5% as of December 31, 2020 and 55.0% as of December 31, 2022. **The best indicator of the system's health is Item 10.**

Changes in the Unfunded Actuarial Accrued Liability

In comparing this actuarial valuation to the special study based on the prior one, the UAAL increased by $1,644,717 from $110,407,136 as of December 31, 2020 to $112,051,853 as of December 31, 2022. The table below summarizes the reasons for the increase.

Reason for Change	Amount
• Expected increase (interest on UAAL exceeding assumed amortization payments accumulated with interest)	$ 3,331,673
• Investment loss for the two years (based on the AVA average annual return of 6.8%)	1,606,533
• Experience gain (net difference between actual experience and assumed experience for pay increases, retirements, mortality, and terminations, but primarily due to pay increases being less than assumed and to fewer retirements than expected)	(9,871,035)
• Change in assumptions	3,106,155
• Increase in monthly benefit ($110) for certain pensioners	3,471,391
Total	$ 1,644,717

Changes in the Amortization Period

The amortization period, based on the Present Plan provisions, was determined in the special study based on the actuarial valuation as of December 31, 2020 to be 21.5 years. Since two years have passed since that valuation date, a 19.5-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 or contribution rates had been made. Instead, the amortization period is now 17.2 years based on the Present Plan provisions. The actual experience occurring between December 31, 2020 and December 31, 2022 differed from the expected experience, and in combination with the changes in assumptions, the resulting amortization period was 17.2 years, which is 2.3 years less than the expected 19.5-year period 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 plan years 2021 and 2022 was -2.8%. 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 plan years 2021 and 2022 was 6.8%, less than the assumed rate of return for those years of 7.25%. This resulted in an **increase** in the amortization period of 0.4 of a year.

2. The aggregate payroll increased an average of 5.1% per year from two years earlier instead of increasing at the assumed 2.75% per year rate, which caused the amortization period to **decrease** by 1.3 years. There was an increase in the number of active firefighters from two years earlier that averaged 2.0% per year.

3. The net result of all experience other than the investment experience and the aggregate payroll experience had the combined effect of **decreasing** the amortization period by 2.3 years. This was primarily the result of lower than assumed individual compensation increases and fewer retirements and more terminations than expected.

4. The changes in the actuarial assumptions (the general compensation increase and aggregate payroll increase assumptions from 2.75% to 2.65%, the investment return assumption from 7.25% to 7.15% and the administrative expenses) had the combined effect of **increasing** the amortization period by 0.9 of a year.

5. The increase in the monthly benefit for certain retirees and surviving spouses of $110 had no effect on the amortization period due to the increase in the city contribution rate of 1% which is expected to be paid for 12 years.

Section III

Contribution Policy and Benefit Improvements

The results of this actuarial valuation as of December 31, 2022 reveal that the system, 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 17.2 years. In order for benefit improvements to be made to the plan, they must be made in accordance with Section 7 of TLFFRA which requires approval of the board's actuarial firm, approval of the board, and approval of the firefighters.

The plan provisions in Section 3.9 of the Present Plan say that an amortization period of under 25 years is the first condition required for increases in benefits. The second condition required is that the actuary determines that the financial condition of the system allows the actuary to approve benefit increases. There are two reasons why we are unable to approve benefit increases at this time under the second condition.

Contribution Policy

The city agreed in 2020 to a change in its contribution policy in order to strengthen the actuarial condition of the system over the long term. As a result, the city began to phase over five years from the 21.28% contribution rate that was in effect at the end of its fiscal year ending September 30, 2020 to a rate of 26.2%, with five uniform annual increases of 0.984% effective each October 1 from October 1, 2020 to October 1, 2024. This actuarial valuation included the assumption that this anticipated contribution policy will continue to be followed.

If the city had decided to return to a contribution rate of 21.28% effective January 1, 2023 (the rate in effect before the phase to 26.2% began), the UAAL amortization period would have been 25.0 years. We believe that it would be wise for the board to wait until the city agrees that its ultimate 26.2% (and 27.2% for 12 years for the $110 COLA) contribution rate has made enough progress in the city's intended purpose of strengthening the actuarial condition of the system before considering benefit improvements that would rely on the continuation of the 26.2% (and 27.2% for 12 years for the $110 COLA) city contribution policy. That is the first reason we are not willing to approve benefit improvements based on this actuarial valuation alone.

Benefit Improvements

In addition to believing it is appropriate to wait until the actuarial condition of the system is stronger, we believe that Section 3.9 of the present plan should be amended in two ways. The 25-year amortization period threshold in Section 3.9 was appropriate when it was incorporated into the plan document in 2007, but we believe that 25-year threshold is now too high. In addition, Section 3.9 includes provisions that require a complicated formula for increases to retirees and surviving spouses that we believe is no longer appropriate.

We recommend that Section 3.9 be amended to remove the 25-year threshold and the complicated formula for increases to pensioners and to add language that would give the board and the retained actuary the responsibility to work together to determine when it would be appropriate to approve benefit improvements and to design increases to pensioners.

Exhibit 1

Distribution of Firefighters by Age and Service on December 31, 2022 with Average Annual Salary

Years of Service	Age									Total	Average Salary
	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 or Over		
0	0	0	0	0	0	0	0	0	0	0	$ 0
1	12	11	6	3	0	0	0	0	0	32	48,000
2	5	9	5	3	0	0	0	0	0	22	60,000
3	7	14	12	2	0	0	0	0	0	35	70,000
4	0	12	13	2	0	0	0	0	0	27	77,838
5	0	0	0	1	1	0	0	0	0	2	82,901
6	0	8	12	5	1	0	0	0	0	26	82,811
7	0	0	0	0	0	0	0	0	0	0	0
8	0	3	14	7	5	0	0	0	0	29	83,333
9	0	0	0	6	0	0	0	0	0	6	83,839
10	0	0	13	3	2	0	0	0	0	18	87,438
11	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0
13	0	0	1	9	4	3	0	0	0	17	92,016
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	3	8	0	4	0	0	15	93,807
16	0	0	0	4	12	3	1	0	0	20	96,510
17	0	0	0	2	5	5	2	0	0	14	93,783
18	0	0	0	0	5	8	4	0	0	17	91,944
19	0	0	0	0	5	15	6	0	0	26	99,527
20-24	0	0	0	0	2	25	14	15	0	56	97,562
25-29	0	0	0	0	1	5	18	17	5	46	102,545
30-34	0	0	0	0	0	0	4	20	7	31	104,958
35+	0	0	0	0	0	0	0	5	9	14	109,242
Totals	24	57	76	50	51	64	53	57	21	453	$ 87,305

Average Salary	$56,917	$68,508	$76,551	$83,774	$92,877	$97,439
	$101,834	$101,099	$101,849	$87,305		

Average age	41.6
Average years of service	15.0
Average age at hire	26.6

Exhibit 2

Summary of Pensioner Data

Type of Benefit	Pensioner Data Used in December 31, 2022 Valuation	
	Number of Recipients	Total Monthly Benefit Payments
Service Retirement[1]	147	$ 515,482
Disability Retirement[1]		
Not Eligible for Service Retirement	48	106,736
Eligible for Service Retirement	80	307,807
Vested Terminated (Deferred)	15	40,021
Surviving Spouse	57	175,300
Surviving Child	1	4,325
Total	348	$ 1,149,671

[1] Includes alternate payees.

Type of Benefit	Comparison of Pensioner Count by Type as of The Prior and Current Actuarial Valuations			
	December 31, 2020	New[1]	Ceased	December 31, 2022
Service Retirement[1]	146	+12	-11	147
Disability Retirement[1]				
Not Eligible for Service Ret.	51	+1	-4	48
Eligible for Service Ret.	78	+4	-2	80
Vested Terminated (Deferred)	12	+3	0	15
Surviving Spouse	49	+12	-4	57
Surviving Child	2	0	-1	1
Total	338	+32	-22	348

[1] Includes alternate payees.

Exhibit 3

Firefighter and Pensioner Reconciliation

	Firefighters	Current Payment Status	Vested Terminated Firefighters	Total
1. As of December 31, 2020	435	326 [1]	12	773
2. Change of status				
a. retirement	(11)	11	0	0
b. disability	(5)	5	0	0
c. death	(1)	(20)	0	(21)
d. survivor payment begins	0	12	0	12
e. withdrawal	(17)	0	0	(17)
f. vested termination	(3)	0	3	0
g. QDRO alternate payee	0	0	0	0
h. child benefit completion	0	(1)	0	(1)
i. net changes	(37)	7	3	(27)
3. New firefighters	55	0	0	55
4. As of December 31, 2022	453	333 [2]	15	801

[1] Includes 21 alternate payees.
[2] Includes 21 alternate payees.

Exhibit 4

Breakdown of Pensioners by Monthly Benefit Amounts as of December 31, 2022

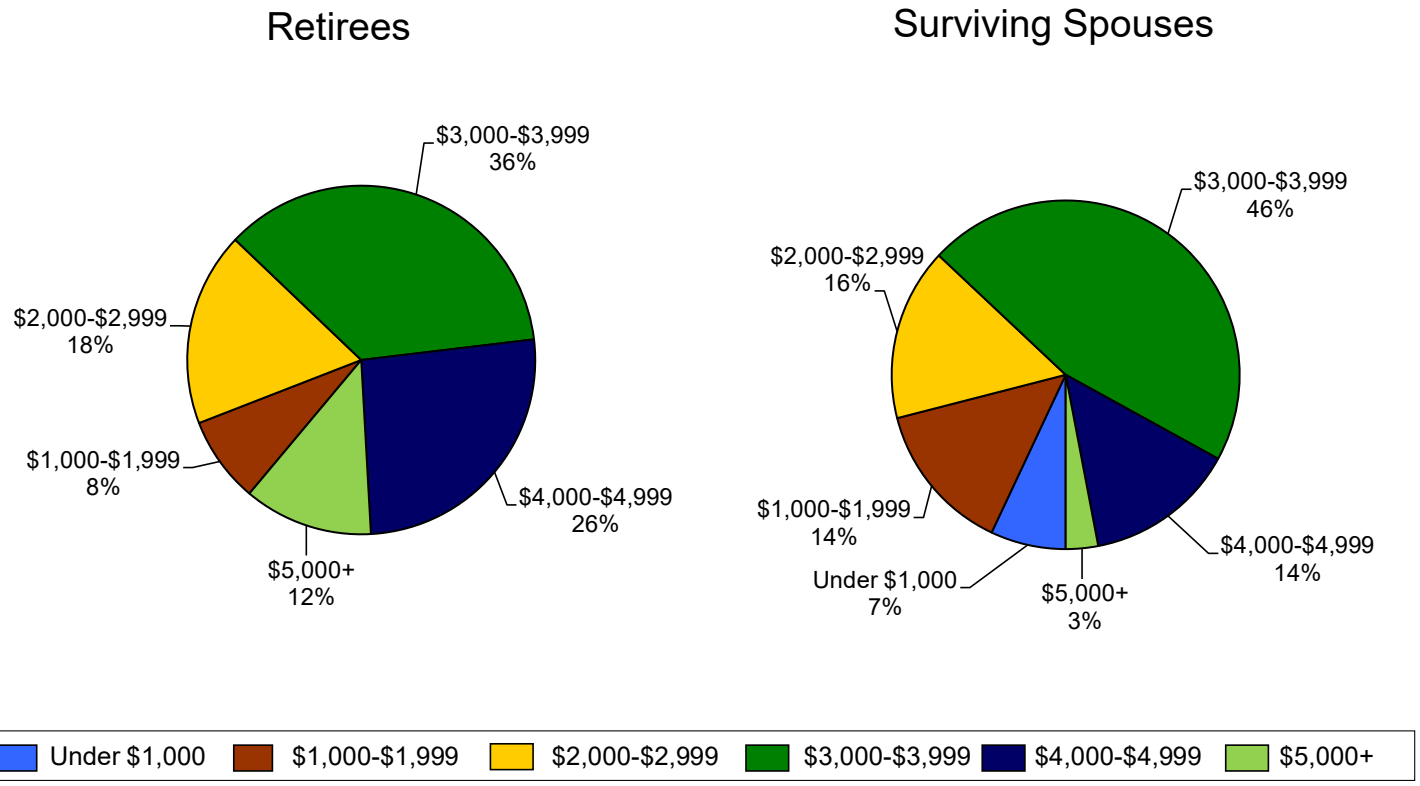


Exhibit 5

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

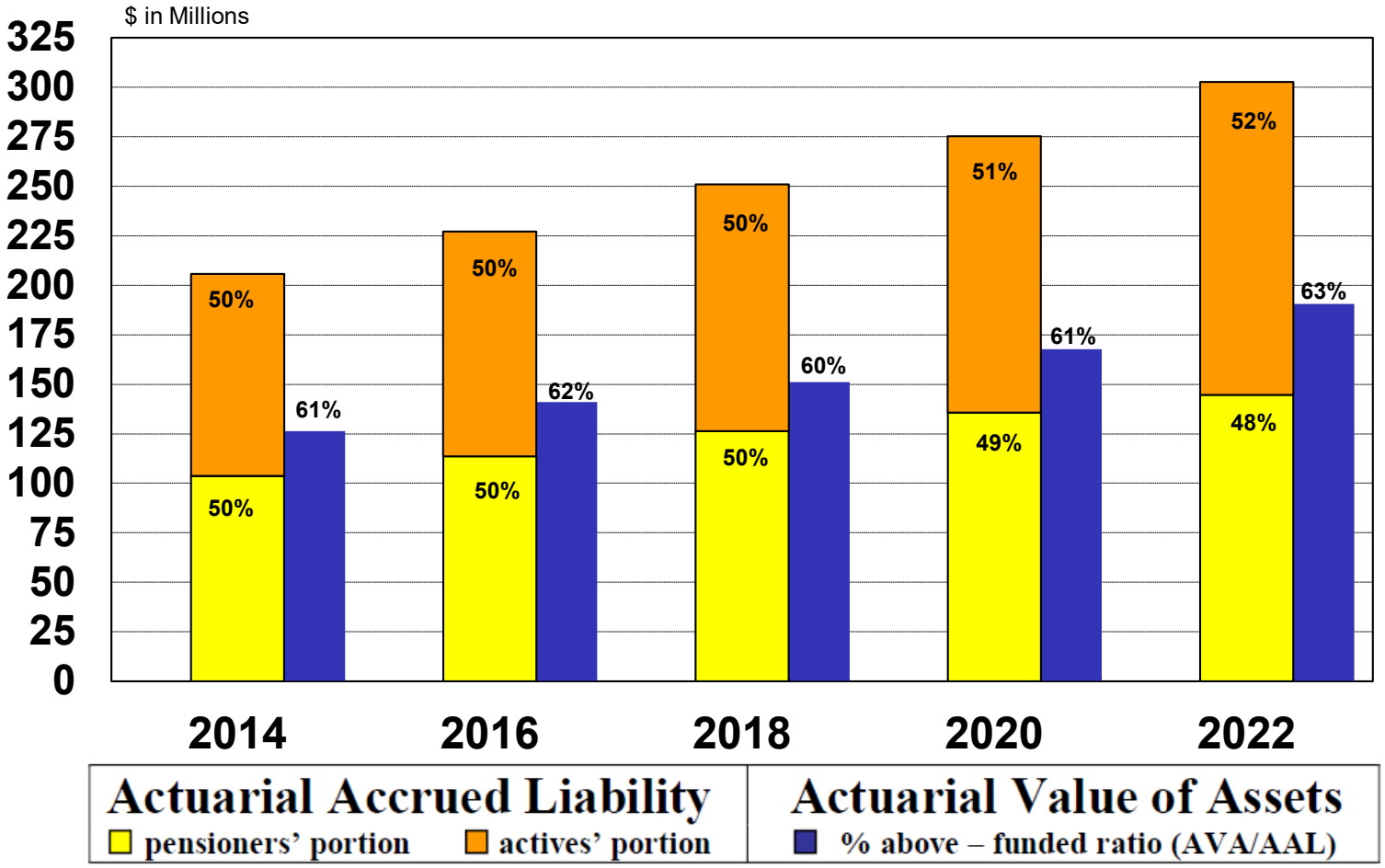


Exhibit 6

Summary of Asset Data

Asset Type	Market Value as of December 31, 2022	Allocation As a Percent of Grand Total
Equities		
Large Cap	$ 42,532,765	25.6%
Small Cap	18,824,839	11.3
International Developed	19,870,128	12.0
Emerging Markets	9,333,736	5.6
Total	90,561,468	54.5
Fixed Income	56,687,439	34.1
Real Estate	17,965,987	10.8
Cash and Equivalents	1,084,027	0.6
Grand Total	$166,298,921[1]	100.0%

[1] The grand total is the audited amount. All of the investment amounts except cash are from the December 31, 2022 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, 2020	December 31, 2022
Market Value	$176,686,804	$166,298,921
Actuarial Value	$167,695,254	$190,524,854
Actuarial Value as a Percent of Market Value	94.9%	114.6%

Exhibit 7

Statement of Changes in Assets for the Years Ended December 31, 2022 and 2021

	12/31/2022	12/31/2021
Additions		
1. Contributions		
a. Employer	$ 9,447,617	$ 9,488,575
b. Employees	5,616,586	5,521,762
c. Total	$ 15,064,203	$ 15,010,337
2. Investment Income		
a. Interest and dividends	$ 2,891,590	$ 2,608,295
b. Net appreciation in fair value	(29,610,786)	15,424,106
c. Total	$ (26,719,196)	$ 18,032,401
3. Other Additions	0	0
Total Additions	**$ (11,654,993)**	**$ 33,042,738**
Deductions		
4. Benefit Payments	$ 14,647,067	$ 15,459,507
5. Expenses		
a. Direct investment-related	$ 478,763	$ 545,464
b. General administrative	298,963	345,864
c. Total	$ 777,726	$ 891,328
Total Deductions	**$ 15,424,793**	**$ 16,350,835**
Net Increase in Assets	**$ (27,079,786)**	**$ 16,691,903**
Market Value of Assets (Fiduciary Net Position)		
Beginning of Year	$ 193,378,707	$176,686,804
End of Year	$ 166,298,921	$193,378,707
Rate of Return		
Net of All Expenses	(14.20)%	9.71%
Net of Investment-Related Expenses	(14.06)%	9.92%
Gross	(13.83)%	10.24%
Direct Investment-Related Expenses	0.23%	0.32%

Exhibit 8

Development of Actuarial Value of Assets

Calculation of Actuarial Investment Gain/(Loss) Based on Market Value for Plan Years Ending December 31				
	2022	2021	2020	2019
1. Market Value of Assets as of Beginning of Year	$193,378,707	$176,686,804	$157,587,141	$139,811,086
2. Firefighter Contributions	5,616,586	5,521,762	5,123,960	4,412,568
3. City Contributions	9,447,617	9,488,575	8,414,319	7,040,090
4. Benefit Payments and Administrative Expenses[1]	(14,946,030)	(15,805,371)	(15,722,713)	(14,591,993)
5. Expected Investment Return[2]	14,024,240	12,780,973	11,737,119	10,368,106
6. Expected Market Value of Assets as of End of Year	207,521,120	188,672,743	167,139,826	147,039,857
7. Actual Market Value of Assets as of End of Year	166,298,921	193,378,707	176,686,804	157,587,141
8. Actuarial Investment Gain/(Loss)	(41,222,199)	4,705,964	9,546,978	10,547,284
9. Market Value Rate of Return Net of Expenses	(14.06)%	9.92%	13.60%	15.13%
10. Rate of Actuarial Investment Gain/(Loss)	(21.31)%	2.67%	6.10%	7.63%

[1] Administrative expenses are included for all four years because the investment return assumption was net of investment-related expenses for those years.
[2] Assuming uniform distribution of contributions and payments during the plan year; actuarially assumed investment return was 7.25% for 2021 and 2022 and 7.5% for 2019 and 2020.

Plan Year	Investment Gain/(Loss)	Deferral Percentage	Deferred Gain/(Loss) as of 12/31/2022
2022	$(41,222,199)	80%	$ (32,977,759)
2021	4,705,964	60%	2,823,578
2020	9,546,978	40%	3,818,791
2019	10,547,284	20%	2,109,457
Total			$ (24,225,933)

Actuarial Value of Assets as of December 31, 2022	
11. Market Value of Assets as of December 31, 2022	$ 166,298,921
12. Deferred Gain/(Loss) to be Recognized in Future	(24,225,933)
13. Preliminary Value (Item 11 – Item 12)	$ 190,524,854
14. Corridor for Actuarial Value of Assets	
a. 80% of Market Value as of December 31, 2022 (minimum)	$ 133,039,137
b. 120% of Market Value as of December 31, 2022 (maximum)	$ 199,558,705
15. Actuarial Value as of December 31, 2022	$ 190,524,854
16. Write Up/(Down) of Assets (Item 15 – Item 11)	$ 24,225,933

Exhibit 9

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

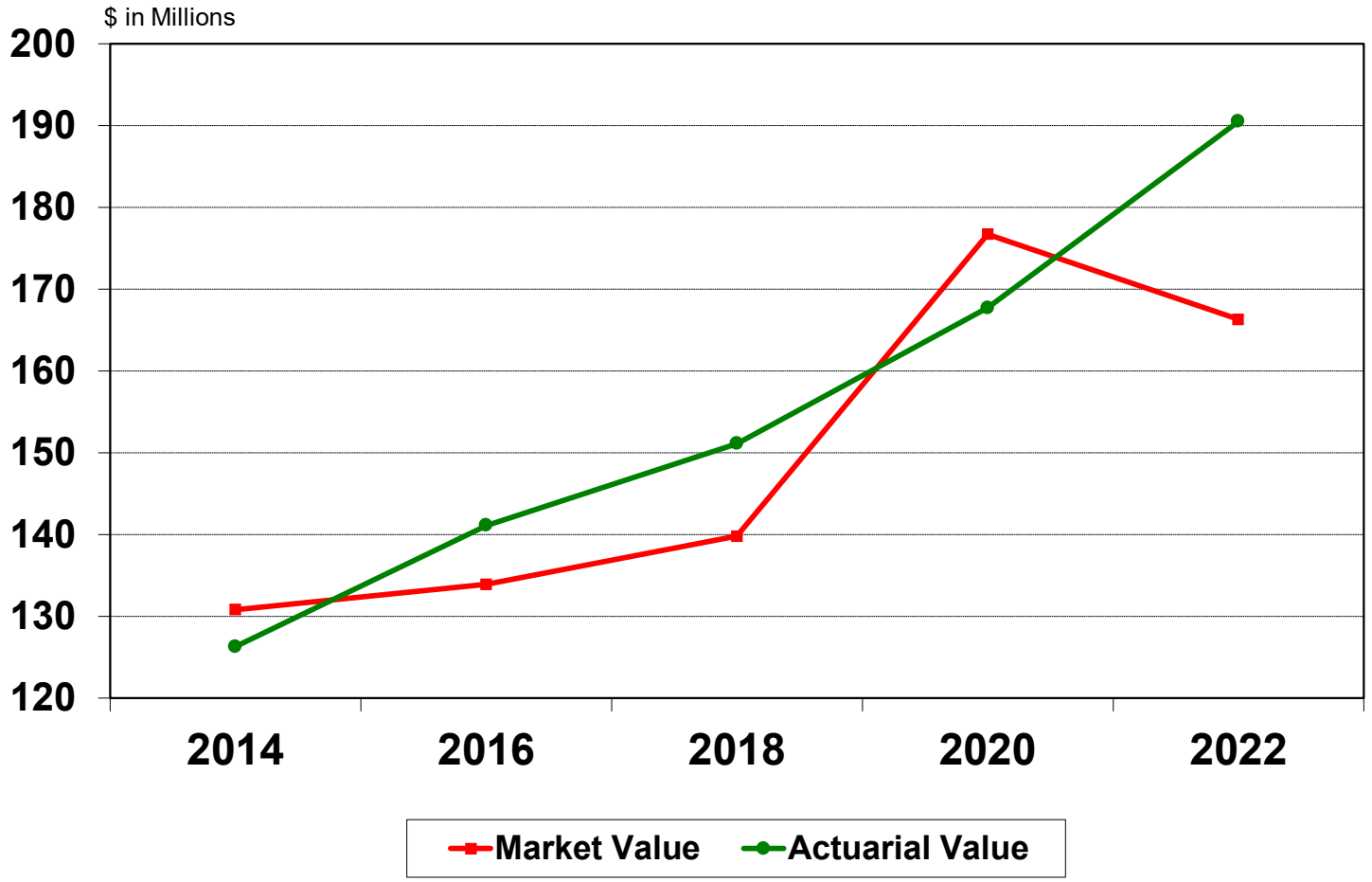
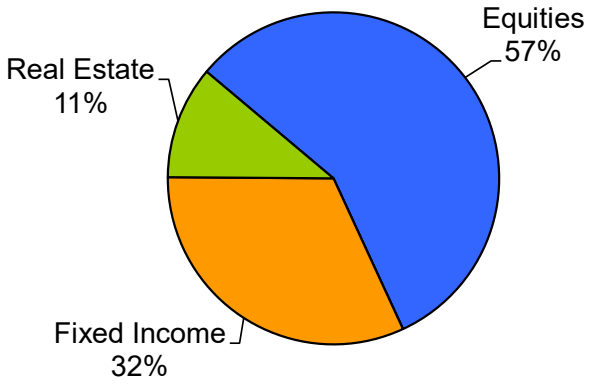


Exhibit 10

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

December 31, 2020



December 31, 2022

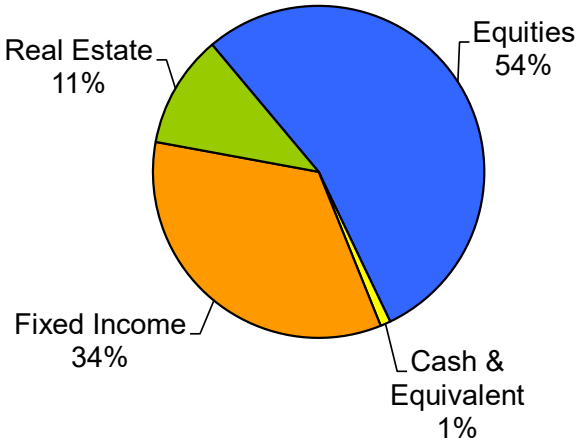


Exhibit 11

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 assumed 100% 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, would fund his expected benefits. Each firefighter's normal cost is calculated to be a constant percentage of his expected compensation in each year 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 2.65% 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. See Exhibit 8.

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 discuss them with the board before completing the actuarial valuation.

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 system for the long-term future.

1. Investment Return

   7.15% per year net of investment-related expenses.

2. Inflation

   2.65% 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-2018.

4. Compensation Increases

   General increases of 2.65% per year combined with promotion, step, and longevity increases that average 2.65% per year over a 30-year career. See Exhibit 12.

5. Retirement Rates

Age	Rate per Year for Paid Firefighters Eligible to Retire
54	7%
55	7
56	15
57	15
58	50
59	50
60	20
61	20
62	20
63-64	50
65	100

The average expected retirement age for paid firefighters not yet eligible to retire based on these rates is 58.0.

6. RETRO DROP Election

a. Percent of firefighters eligible electing RETRO DROP: 100% of service retirements eligible to elect at least a 12-month lump sum.

b. Months assumed for lump sum: Maximum they are eligible for, up to 48 months for retirement at ages 58 and above.

7. Termination Rates

See Exhibit 12.

8. Disability Rates

See Exhibit 12.

9. Reduction in Benefit after 2½ Years of Disability Retirement

45% weighted average reduction in benefit until eligible for normal service retirement.

10. Percent Married

85% of the firefighters are assumed to be married at retirement, disability, or death while employed, with male firefighters having a spouse two years younger and female firefighters having a spouse two years older.

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

    - Joint and 100% to surviving spouse for the 85% assumed to be married
    - Life annuity for the 15% assumed to be single

    To the extent early retirement is elected and the amounts are determined under an actuarial basis which differs from the basis used in the valuation, actuarial gains or losses will occur. These gains or losses are expected to be immaterial and will be recognized through the valuation process for those retiring since the prior valuation who made an early retirement election.

12. Surviving Child's Death Benefit

    None are assumed as a result of future deaths.

13. Firefighters' Contribution Rate

    14.10% of covered pay.

14. City's Assumed Contribution Rate

    26.2% of covered payroll ultimately, phasing in from 21.28% in the fiscal year ending September 30, 2020, with five annual uniform increases of 0.984% from October 1, 2020 to October 1, 2024, and continuing the 26.2% rate for at least as long as the period required to amortize the unfunded actuarial accrued liability. An additional 1% is assumed beginning October 1, 2023 for 12 years (an ultimate total rate of 27.2%) for the $110 COLA.

15. Covered Payroll for First Year Following Valuation Date

    Actual (or annualized) pay for 2022 for each firefighter without adjustment to reflect the relatively small 2% general pay increase effective October 1, 2022 and elevated overtime included in 2022. Special adjustment was made for firefighters with less than four years of service.

16. General Administrative Expenses

    The expenses paid by fund assets for other than investment-related expenses are assumed to be 0.80% of payroll. The normal cost rate as a percent of payroll is assumed to be 0.80% 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	60	1	12.92%
21	0.15	1	54	2	28.31
22	0.16	2	48	3	11.38
23	0.17	3	42	4	11.38
24	0.18	4	37	5	11.38
25	0.19	5	32	6	11.38
26	0.21	6	27	7	3.68
27	0.23	7	24	8	3.68
28	0.25	8	21	9	3.68
29	0.28	9	19	10	3.68
30	0.31	10	17	11	3.68
31	0.35	11	14	12	3.68
32	0.40	12	12	13	3.68
33	0.46	13	11	14	3.68
34	0.53	14	10	15	3.68
35	0.61	15	9	16	3.68
36	0.71	16	9	17	3.68
37	0.83	17	8	18	3.68
38	1.00	18	8	19	3.68
39	1.22	19	8	20	3.68
40	1.50	20 & Over	0	21	2.65
41	1.85			22	2.65
42	2.28			23	2.65
43	2.80			24	2.65
44	3.42			25	2.65
45	4.14			26	2.65
46	4.86			27	2.65
47	5.58			28	2.65
48	6.30			29	2.65
49	7.02			30	2.65
50	7.74			31	2.65
51	8.46			32	2.65
52	9.18			33	2.65
53	9.90			34	2.65
54	10.62			35	2.65
55	0.00			36	2.65
56	0.00			37	2.65
57	0.00			38	2.65
58	0.00			39	2.65
59	0.00			40	2.65

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 assumed 100% 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 and Disability Retirement Monthly Benefit is the greater of the Formula 1 Amount or the Formula 2 Amount	
(a) Formula 1 Amount is (i) plus (ii)	
(i) Percent of Highest 60-Month Average Pay	52.00%
(ii) Additional benefit for each year of service in excess of 20 years	$150.00
(b) Formula 2 Amount is for each year of service	$137.00
2. Normal Service Retirement Eligibility	Age 54 and 20 Years
3. Retroactive Deferred Retirement Option Plan (RETRO DROP) provides a reduced monthly benefit and a lump sum	
(a) Earliest RETRO DROP benefit calculation date	Age 54 and 20 Years
(b) Maximum RETRO DROP benefit accumulation period	48 Months
(c) Earliest employment termination date with maximum RETRO DROP accumulation period	Age 58 and 24 Years
(d) RETRO DROP lump sum includes	
(i) Monthly benefits that would have been received between RETRO DROP benefit calculation date and termination of employment,	
(ii) accumulated contributions made by the firefighter after the RETRO DROP benefit calculation date, and	
(iii) no interest	
4. Actuarially Equivalent Early Retirement Eligibility (Reduced Benefit Begins Immediately)	10 Years
5. Vested Terminated Benefit	
(a) Eligibility	10 Years
(b) Percent vested with 10 years	50%
(c) Additional percent vested for each year above 10 years	5%
(d) Percent vested with 20 or more years	100%
(e) Benefit is deferred to date person would have satisfied normal service retirement eligibility	
(f) Benefit is percent vested times normal service benefit	

6. Disability Retirement Monthly Benefit for Firefighters Who Become Totally Disabled while Employed
   (a) For initial 30-month period, is (i) plus (ii)
      (i) Minimum monthly amount based on 20 years
      (ii) Additional monthly amount per year of service in excess of 20 years
   (b) Following initial 30-month period, is the greater of (i) and (ii)
      (i) Initial benefit reduced by the portion of the initial benefit equal to estimated annual residual earning capacity divided by annual base earnings
      (ii) Initial benefit multiplied by percentage of disability
   (c) Upon attaining eligibility for normal retirement, the member's vested retirement benefit becomes payable if the disability benefit has been reduced

7. Surviving Spouse Monthly Death Benefit for Firefighters Who Die while Employed
   (a) Minimum monthly amount based on 20 years
   (b) Additional monthly amount per year of service in excess of 20 years
   (c) Surviving spouse may elect RETRO DROP if firefighter was eligible for a service retirement benefit at time of death

8. The normal form of annuity payment at retirement is a Joint and 100% to Surviving Spouse, and payment is the last day of each month. The same benefit payable to the retired firefighter is payable to the surviving spouse as long as the spouse is alive (and does not remarry if the firefighter terminated employment as a firefighter prior to February 25, 1997). If there is no surviving spouse or the surviving spouse is ineligible, the death benefit shall be paid to the guardian of the deceased firefighter's dependent children, if any.

9. Pay used to determine the Highest 60-Month Average Pay includes all pay except for unused sick leave, unused vacation, unused comp time, or injury pay. The average is based on the 130 consecutive biweekly pay periods during which covered pay was highest. Any lump sum payment for a retroactive pay increase will be allocated to the applicable past biweekly pay periods and excluded from pay for the biweekly pay period in which it was actually paid.

10. 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 system or request a refund from the system.

11. Contributions

(a) Firefighters (percent of covered pay)	14.10%
(b) City of Corpus Christi (percent of covered payroll)	
• on valuation date	24.232%
• ultimate expected rate—before the additional 1%	26.20%
• ultimate expected rate—after the additional 1% for 12 years for the $110 COLA	27.20%

Appendix A

Review of the Actuarial Economic Assumptions for the December 31, 2022 Actuarial Valuation

Theoretical Investment Return Assumption Development

Asset Class (Investment Manager)	Gross Real Rate of Return[1]	Investment-Related Expenses[2]	Net Real Rate of Return[3]	Asset Allocation 12/31/2022	Asset Allocation Target
Domestic Equity					
Large Cap Growth (Polen Cap Mgmt)	6.5%	0.64%	5.86%	5.0%	6.25%
Large Cap Growth (Clear Bridge)	6.5	0.59	5.91	5.6	6.25
Large Cap Growth (LSV Asset Mgmt)	6.5	0.69	5.81	15.0	12.50
Small Cap Growth (JP Morgan)	7.0	0.83	6.17	4.3	5.00
Small Cap Value (Fuller & Thaler)	7.0	0.89	6.11	7.0	5.00
				36.9	35.00
International Equity					
Developed (MFS)	7.0	0.85	6.15	5.8	6.25
Developed (Capital Group)	7.0	0.79	6.21	6.2	6.25
Emerging Market (Vanguard)	8.0	0.19	7.81	5.6	6.00
				17.6	18.50
Alternatives					
Real Estate (JP Morgan)	5.5	1.09	4.41	10.8	10.00
Fixed Income					
Domestic Core Plus (Garcia Hamilton)	2.5	0.27	2.23	24.9	27.50
Global (PIMCO)	2.5	0.71	1.79	9.2	9.00
				34.1	36.50
Cash	0.0	0.00	0.00	0.6	0.00
				100.0%	100.00%

Weighted Average Assumption		
Net Real Rate of Return (net of investment-related expenses)	4.56%	**4.53%**
Possible Theoretical Investment Return Assumption (Net Real Rate of Return Plus Assumed Rate of Inflation)		
Assumed 2.75% Inflation	7.31%	7.28%
Assumed 2.65% Inflation	7.21%	7.18%
Assumed 2.50% Inflation	7.06%	7.03%

[1] A gross real rate of 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 management expenses are based on expense information for 2022 from Ms. Gracie Flores and include both direct and indirect management expenses. They include 0.09% for direct investment expenses paid for investment consultant fees, bank custodial fees, and foreign tax.

[3] Net = Gross – Investment-Related Expenses

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
1957 – 2022	65	3.68%
1962 – 2022	60	3.87
1967 – 2022	55	4.02
1972 – 2022	50	3.96
1977 – 2022	45	3.54
1982 – 2022	40	2.82
1987 – 2022	35	2.74
1992 – 2022	30	2.49
1997 – 2022	25	2.47
2002 – 2022	20	2.51

Most inflation forecasts are for 10 years or less. For example, the average 10-year forecast in the June 2023 Livingston Survey published by the Federal Reserve Bank of Philadelphia was 2.40%. However, 10 years is too short a forecast period for a public employee defined benefit pension plan. In the 2023 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 3.25%.

Administrative Expenses Paid by the System

Plan Year Ending 9/30 (1)	Administrative Expenses Paid by the System (2)	Covered Payroll (3)	% of Payroll (2) ÷ (3) (4)
2022	$298,963	$40,175,866	0.74%
2021	345,864	42,150,855	0.82
2020	269,765	39,114,198	0.69
2019	316,029	33,683,725	0.94
2019-2022	$1,230,621	$155,124,644	0.79%

The administrative expenses are reflected as a percent of payroll that is added to the normal cost contribution rate. For the December 31, 2022 actuarial valuation, we recommend 0.80%, the average developed above for the last four plan years rounded up to the next multiple of 0.05%. The covered payroll was determined as the firefighter contributions for the plan year divided by the firefighter contribution rate during the plan year. This is 0.05% lower than the 0.85% that was assumed for the prior actuarial valuation.

Appendix A (continued)

Comparison of 12/31/2020 Actuarial Economic Assumptions with 12/31/2022 Actuarial Economic Assumptions

Actuarial Assumption[1]	12/31/2020 Actuarial Economic Assumptions	12/31/2022 Actuarial Economic Assumptions
Inflation (Price)	2.75%	2.65%
Net real rate of return[2]	4.50	4.50
Net total investment return[2]	7.25	7.15
Firefighter pay increase[3]	5.40	5.30
Aggregate payroll increase	2.75	2.65
Admin. expense (% of payroll)	0.85	0.80

[1] All assumptions are annual rates.
[2] Net of all investment-related expenses.
[3] For 12/31/2020, a 2.75% annual general compensation increase combined with promotion, step, and longevity pay increases that vary by length of service (highest in the early years) that average 2.65% over a 30-year career. For 12/31/2022, the annual general compensation increase assumption is 2.65%.